

**An Investigation into The Use of The Smartphone
Application '*Memrise*' in Supporting English
Vocabulary Learning among Undergraduate
Students in Saudi Arabia**

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A thesis submitted in partial fulfilment of the
requirements of Liverpool John Moores University
for the degree of Doctor of Philosophy

March 2019

Declaration

I hereby certify that this submission is my own work and contains no material which has been accepted for the award of any other degree or diploma of the University or other institute of higher learning.

Acknowledgments

All praises and thanks are due to **Allah** the most gracious and most merciful, who abundantly offered me health, strength, patience and knowledge to complete this exciting PhD journey.

My greatest gratitude and thanks go to my Director of Studies **Dr Amanda Mason**, who I have been privileged to be supervised by. Many thanks for her patience, constructive comments, guidance and invaluable suggestions throughout all the stages of my PhD journey. I would like also thank my second supervisor, **Ms Brigitte Hordern** for her invaluable advice and comments. Also, I am honoured and grateful to have **Dr James Turner** as my third supervisor who helped me a lot with his academic and technological comments.

To my loving parents, I would like to thank my late father **Abdullah** for his support, who died during my PhD journey, too unfortunate he cannot see me graduate (May Allah have mercy on his soul). My sincere gratitude and love to my mother **Sarah** who have always been there to support and encourage me in my journey in every way possible. Many thanks to all my brothers and sisters for their continual support and encouragement. Finally and most importantly to my beloved family, to my wife **Amal** for her sacrifice, patience and countless ways of help, by providing me with love, encouragement, support and for being always there for me. I also dedicated this PhD thesis to my two lovely daughters **Sarah** and **Yara**. I love and cherish you all. Thank you for all the love and support you have shown me over the years.

Last but not least, I must thank the government of Saudi Arabia, the Ministry of Education and Imam Mohammed Bin Saud Islamic University for sponsoring and providing me with this opportunity to complete my postgraduate studies.

Abstract

This research investigated students' use and perception of value of the mobile smartphone application *Memrise* as a support to their vocabulary learning of the English as a Foreign Language (EFL). This study followed a mixed method sequential explanatory approach in which data were collected through questionnaire survey, pre and post tests and semi-structured interviews. The total participants (n=225) were learners at the Imam University in Saudi Arabia who had completed the basic entry year to study the language to degree level. Data gathered from the questionnaire (n= 205), pre and post-tests (n= 189) and semi-structured interviews (n= 11). Participants were provided with the questionnaire at the beginning of the semester and vocabulary pre-test. Then, participants were randomly divided into two groups *Memrise* and non-*Memrise*. The findings of the study showed a significance in the post-test scores for *Memrise* users. It was further made possible to identify vocabulary learning strategies that students use to learn with and without the use of mobile apps and the results were indicative of improved performance in test score achievement for those utilising the app functions which aided vocabulary knowledge accumulation and retention. The students were not schooled in the use of the functions of the software, simply advised where to access it, to ascertain evidence of its ease of use and enable conclusions to be drawn of the motivation to seek their own methods of learning. The evidence showed *Memrise* to be valuable in the support of traditional learning for students, improving performance beyond that achieved by institutional teacher guided learning. Essentially, a conclusion drawn from the qualitative interviews is that independence and autonomy in the practice of learning must be taught. This finding enables propositions to be developed to change the somewhat authoritarian teaching attitudes and practice prevalent in Saudi institutions. The study has, as such, achieved its objectives and it is

expected to be submitted to the Saudi Ministry of Education in its review of the Vision 2030 initiative in 2020.

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1 Introduction Chapter

1.1 Introduction

This research study is being undertaken at the researcher's teaching institution, Imam University in Riyadh, with all the permissions sought and approved by that institution, the Embassy and the Ministry of Higher Education in Saudi Arabia. It will examine the use and student perception of value of the smartphone application *Memrise* for vocabulary learning of the English as a Foreign Language (EFL) of L2 students on the first academic year. These students have completed the basic entry requirements of the Language Department and English is their major area of study. The composition of the classes in terms of demographics and learning experience will be dealt with in the description of the research project. In the course of this chapter the purpose, aims and objectives of the study will be outlined in the context of the importance of the English language and the particular aspects of learning and teaching in the Islamic faith imbued education system of Saudi higher education. The value of the *Memrise* application to independent student learning outside of the classroom will be considered against a background of tradition which is impacted upon by modern technology and practice, promoted by the government as the Kingdom modernises its business and economic framework.

1.2 Context of Study: History, Culture and Faith in Saudi Arabia

The education system in Saudi Arabia has undergone a considerable change in focus in response to the national policy of diverting from oil product dependence to enable the Kingdom to become a major trade and commercial centre in the global market. This is stimulated by the rapid evolution of communications digital technology, the introduction of which, particularly into higher education, is viewed as the engine for domestic growth post the oil-era. The teaching of English is deemed central to the evolution of business development, and indeed has been part of the education curriculum in 1929 as the formation of the Kingdom (Alshahrani, 2016).

The establishment of a specific English Language department at the largest universities, King Saud and Imam, at the capital city of Saudi Arabia, Riyadh is a reflection of this drive; it is anticipated this study will assist in the improvement of teaching and learning practices. The English language programme of learning in the Kingdom is the 1975 brainchild of the British Council, which of course has a vested interest in promoting the use of the language in the rapidly developing economy. Given this motivation it was designed to attract students of Engineering and Medicine although it quickly expanded, by 1980, to become an adjunct to some thirty courses, incorporating an expanding student body of male and female learners. The programme is broadly administered at institutions of higher learning by colleges and departments of Art and Humanities. The use of smartphone applications is not proposed as a replacement for traditional classroom learning but a support to the formal teaching and textbook processes of vocabulary accumulation by students. It is a somewhat revolutionary proposal in a controlled education environment to introduce the level of independence of learning *Memrise* may provide students in the enhancing of their knowledge, although it is suggested it

constitutes an evolution of learning methods encouraged by government policy. Some understanding of the traditions of the Kingdom is necessary to provide background to the relative novelty of its potential effects on learning and teaching.

The Kingdom of Saudi Arabia was united as a result of the efforts by King Abdulaziz in the early decades of the 20th Century and has been ruled since by a monarchical succession based on adherence to the faith of Islam (Alothaimen, 2011). King Abdulaziz, aware that military power could not, of itself, found national unity, implemented a programme of social and economic reform, including an educational framework, the Netham Alkhajr, to promote the transformation of society (Alhamed *et al.*, 2007). Having sought his inspiration from entry to Mecca, in 1924 he invited scientists from across the region to what may be described as the first education conference of the new Saudi Arabia, resulting two years later in the establishment of the Ministry of Education (Alhamed *et al.*, 2007). The provision of standardised education was to be by the state to its people, free and compulsory, was decreed, to be implemented at four levels of learning development; foundation, primary, secondary and higher. The framework was revised a decade after national unity in 1932, the first two stages merged, requiring six years of attendance and learning, followed by three years of intermediate, then secondary education (Alhamed *et al.*, 2007). The Ministry of Education became a separate, independent department of government in 1954, and this change led to a radical shift in educational policy on what students should learn and the methods of teaching. Private colleges were established which a significant impact on improving higher education facilities within the country and were to receive extensive support from the Ministry (Al-Wabil, 2015; Ministry of Education, 2018).

It was not until 1958 that the first university was founded in Riyadh, Saudi students who achieved the required standards being educated abroad, in the USA, Egypt and Europe (Alhamed *et al.*, 2007). In 1976 a separate Ministry of Higher Education was established and did not come into the broad, consolidated Ministry of Education remit until 2014 (Ministry of Education, 2018). As a major part of this restructure and coordination of education policy for the economic global advancement and attraction of international academia and business, financial incentives ensured a growth in the student population to over 1,300,000, with over 64,000 faculty staff (Almarwani, 2011; Al-Wabil, 2015). The higher education institutional portfolio is comprised of 28 public universities, 11 private universities, 29 private colleges (Ministry of Education, 2018). Education remains key to the future of the Kingdom: its quality has improved exponentially whilst retaining adherence to fundamental principles and values predicated on the Faith of Islam, its tenets and cultural reflection. The education system and institutions in the Kingdom are single sex, with male and female learning on different campuses; separate, but equal (Ministry of Education, 2018). It remains embedded with traditional standards of behaviour, observance and modesty observed and the equal entitlement of female students to the same education as their male counterparts, albeit separately (Alhamed *et al.*, 2007).

It is under this system of education that the author-researcher achieved his degree in English Language, post graduate qualifications and has taught language studies in Saudi universities for some years. Whilst the author-researcher is not conscious of any specific bias which may result from this background, he remains aware of the educational perspectives and cultural demands of the Kingdom and has therefore addressed at least some of the more obvious issues in the Methodology Chapter.

1.3 Educational Technology in Higher Education

Researchers such as (Alhamed *et al.*, 2007; Almarwani, 2011) have asserted that the higher education system in KSA is not keeping pace with changing times and educational demands despite government policy and initiatives. Al-Wabil (2015), on the other hand, is more positive in his assessment, suggesting that technology is in the process of transforming pedagogy and the higher education curriculum in the Kingdom is regularly reviewed and improved to meet national demands in a technologically changing world. It is an optimistic outlook and indeed government initiatives and the funding of colleges and universities has made available presentational tools to aid teaching. Students and teachers have the benefit of multi-media facilities and universities advanced learner management technology. Video conferencing, the internet, campus Wi-Fi and virtual learning place the public universities at an advantage to private institutions (Al-Wabil, 2015). Technology enables the learning environment to evolve in a more inclusive manner, opening higher education to a larger student population and through the provision of distance and virtual learning programmes (Ageel, 2013).

Alhamed *et al.* (2007) points out that The Human Development Report of 2001 estimated that such was the relentless progress of technological development in the conduct of global communications and trade, over three trillion dollars would be invested in education across the world. This prediction was predicated on the evolution of teaching practices from Japan in the East to the UK and USA in the West over the previous two decades. Never has education been such a priority in world affairs. In Saudi Arabia, an astonishing amount of public money has been spent on improvement of education provision, some 154.7 billion dollars in 2011; the move toward electronic learning has, however, been slow (Allam, 2011). Communications technology is broadly considered as

a stand-alone discipline for study rather than a necessary adjunct or accessory to learning (Alhamed *et al.*, 2007). Traditional methods of teaching are hard to displace, and learner attention, rather than participation, remains demanded.

This perhaps explains, in part, Alhamed *et al.*'s (2007) assessment that perceptions of the value of technology and the utility of the advancements to education practice remain weak amongst those responsible for implementing the government initiatives. They attribute this to a cultural lack of institutional appreciation of the value of technology over the traditional teacher delivery-passive learning methodologies of practice which undermines fulfilment of the actual demands of the 21st Century learner (Alhamed *et al.*, 2007). The explanation may perhaps be simpler and be founded on a lack of awareness amongst planners of government policies and initiatives, inadequate teacher training and an institutional rigidity in attitude against change.

The theory is strong and initiatives sound on the value of digital technology, as will be noted in the subsequent chapter. Substantial financial resources have been allocated to educational improvement and the provision of digital technology access to students but it is not adequately utilised. Distance and e-learning programmes take the need for the classroom lecture out of teaching and create opportunities for autonomous personal development.

These initiatives are part of the government plans to meet the challenges of the future social and economic needs of the Kingdom (Almarwani, 2011). The Aafaq project, also known as the 'Horizons Plan', was launched in 2005 to build an integrated framework of advanced and innovative educational provision based on technological resources "*to promote a knowledge-based economy*" unrestricted by the need for institutional settings (Sawahel, 2009, p. 1). The widespread dissemination of knowledge per se, and by

association competence in the English language of business and commerce, is a realisable vision of government and in this form of delivery, encouraging of independent, autonomous learning (Alhamed *et al.*, 2007).

1.3.1 Saudi Arabia's Vision 2030

The latest comprehensive government initiative, Saudi Vision 2030 has as its headline purpose the building of a sustainable future for the Kingdom and its people, with an emphasis on digital communications which will transform and grow business in the region (Saudi Vision 2030, 2018) . It is a complex plan as the evolution of technology provides access to new financial and trade markets not previously considered, developing new relationships with other nations across the globe. Whilst accepting that political, security and cultural factors play key roles in this progress, opportunities for growth are limited only by imagination. Emerging technologies, available at relative low expense and utilising already present expertise and experience, facilitate data and information transfer through handheld mobile apps and smart infrastructure, with the cloud computing and storage capacity easing access. The challenges posed by technology and communications are simplified.

The digital transformation programme 2020 identified initiatives for the public sector utility of digital technology which included the establishment of a centre for English Language Education Development and the shift to digital education to support student and teacher progress. It is pertinent at this stage to consider the projection of the future image and practice of Saudi business and education as the Kingdom seeks to advance and preserve its global position in a time of geographical, environmental, cultural and economic change.

Commerce, industry, financial services and banking, for example, are asked to follow the path of government in the embracing of innovative practices, a somewhat ironic statement to make. The Council of Economic and Development Affairs has fundamentally updated its practices, introducing a technologically sophisticated programme of governance operation. It aims to enhance delivery of its services, enhancing and coordinating its way of working with its inter-departmental government stakeholders and those who look to it for assistance and advice in the operation of their business enterprises in the domestic and international markets (Saudi Vision 2030, 2017).

1.3.2 **Mobile Learning in Saudi Arabia**

It is a premise of this study that the availability of the *Memrise* smartphone application provides opportunities to the student for self-improvement, autonomy of learning. It is particularly of interest to understanding and communication of English through the development of an enhanced personal vocabulary bank. The researcher is conscious of the fact that any study of learner autonomy cannot be separated from an understanding of the social and cultural context within which that learning takes place and thus this study of the utility of the *Memrise* application is undertaken with that sensitivity in mind. This is not believed to compromise the need for objectivity in the research, but all education is subject to the cultural awareness of the society in which it takes place.

The concept of mobility and access to education is of particular importance in Saudi Arabia, a territorially large and diverse area of urban and rural institutional provision, serving different needs and meeting diverse demands of its learners. Each area has its particular communications requirements, variously met, of teachers and their students, administrators and those subject to institutional obligations. Institutional settings and places of education may not be easily accessible and the Aafaq initiative encouraging the

use of communications technology aims to fill gaps in provision through distance and e-learning programmes, albeit they are considered by some to be time-consuming to administer and expensive (Almarwani, 2011; Al-hujran, *et al.*, 2014).

It has to be wondered in the context of traditional learning whether such views are a reaction to the shift of responsibility and control from teacher to student. Mobile devices and learning software are invaluable where the e-learning environment seeks to accommodate and blend its use into other methodologies (Almarwani, 2011). It is attractive to the student population, relieving digitally aware and savvy learners of dependence on the classroom lecture and textbook for their future economic success (Almarwani, 2011). M-learning is still a somewhat revolutionary concept in Saudi education, competing with long-practiced traditions and perceptions, and it is only by demonstrating its value to the institutional providers of learning that the autonomy it offers will be respected and adopted in the KSA (Al-Hujran *et al.*, 2014).

1.3.2.1 Traditional Teaching and Learning Methodologies in Saudi Arabia

English language teaching and learning, and indeed schooling in most subjects in Saudi Arabia, has been characterised by the predominance of teacher-centred and led presentation in education. La Ganza (2008) argues this form of presentation of knowledge to be learned has acted as a barrier to learner autonomy. The acquisition of faith knowledge is stressed in Islam and Quranic studies, traditionally encouraged through the requirement of memorisation of the revered texts (Alotaibi, 2014). However, the learning of principles of the faith is also promoted in practice, by emphasising action, activities involving student participation (Azram, 2011). It is recognised that learners are not simply passive recipients of knowledge, but also active participants in its accumulation. Herein lies the faith root of motivation, responsibility and self-learning. *Memrise* may provide

for the needs of students who desire the variety of individually formulated and associative inter-relational community learning routes to vocabulary accumulation, at a time convenient to them, but enhances the experience through memory assisting options and stimulants such as memes. It then facilitates other ways of using and sharing knowledge through its interactive processes.

It has been anecdotally noted by the author in the course of his teaching experience in universities, and indeed borne out by Alrabai (2015), that even after several years of English language learning in Saudi Arabia, learners have gained, at best, only basic literacy aptitude and still have considerable problems with communicating effectively in the language. Alrabai (2015) suggests this has a basis in cultural attitudes and beliefs which undermines their perception of the importance of the English language to their future in the competitive commercial markets. It has been noted by this researcher that students, aged over 18 years old and thus of some maturity and economic awareness, show little enthusiasm or motivation during their induction into university education. In their orientation year little appears to change and many do not see the value of learning English as subject subsidiary to their primary choice given that Arabic is the official language of the country. This is despite the fact that, certainly at the Imam University, where this author teaches, learners are expected to at least pass the English placement test to be enrolled in the first full academic year. This is arguably more of an incentive to cooperate with rules rather than to learn for self-improvement which is the purpose of examining the value of *Memrise*. Given that it is the student perspective which is the target of the study, this can only be evaluated where there students want, and are motivated to, use the app.

Perhaps this is explainable by the way English teaching is practiced. In Saudi universities, language education has traditionally taken place in the classroom, with students being told by the teacher what they have to know. Griffiths and Parr (2001) assert that more proactive learning has already taken over in more advanced education systems because it is a more effective way of imparting knowledge and involving the student in the process of their own learning. The traditional teacher-lecture centred approach of grammar translation remains favoured by Saudi institutions and teachers of English. Al Asmari (2013) simply points out that this approach is about teaching rather than learning, fostering dependence on the teacher instead of interactive learning. Broughton *et al.* (2003) call this conventional method of teaching is a “*teacher-dominant interaction*” (p. 22). The lack of complementary interaction may result in boredom and, essentially, resistance to and mistakes in learning (Rosegard and Wilson, 2013).

In terms of stimulating interest and attention, the facilities offered by effective education methods must be made relevant to students, carried out in a manner they engage with; it is only when feel there is a point to what they are learning that they will be motivated (McKay and Bokhorst-Heng, 2008). Although the smartphone is studied herein as an independent supporting tool of vocabulary learning, there is no reason why teachers cannot use the interactive facility identified by the researcher in the choice of the *Memrise* application for study to communicate with their students, in much the same manner as the SMS system studied by Derakhshan and Kaivanpanah (2011) in Iran. It was not proposed in the preparation for the tests of *Memrise* to formally educate students on the features of the app but to leave the finding of these to the learners’ autonomous exploration to examine curiosity and motivation to use the software.

This study is carried out amongst students in their first academic year, when arguably their only motivation as learners is to complete year successfully and meet the university's language learning requirements, to continue with their primary courses of study. Rababah (2005) and McKay and Bokhorst-Heng (2008) call this 'instrumental motivation', essentially, learning because they have to meet a criterion. The simple practice of lecture and presentation, it is suggested, will essentially 'lose' the attention of at least a proportion of students who become disassociated from the learning process. It is only suffered as a necessary step to continue their studies, and a sense of inconvenience is hardly an incentive for long term retention of essential knowledge (Shemary, 2008).

The fault for lack of motivation and interest cannot fall solely to the responsibility of the student. Although government policy on the encouragement of technological, knowledge-based learning under the 2009 initiative and Vision 2030, its implementation leaves considerable scope for universities, and indeed schools, to develop their own teaching methods and formats (Alosaimi, 2007). There is certainly a more limited review and inspection of public education institutions than would occur in, for example, the UK, although private and international schools have become more regulated (Cook, 2017). The emphasis placed by government policy, comments Elyas (2008), is perhaps not borne out by the quality of the teachers, their experience of the language and their training.

The materials used in the imparting of knowledge also need to be reviewed in the context of basic methods of learning and approaches to teaching. The textbooks and other printed material used in Saudi schools and universities are devised and written in a country where English is the first language, usually the UK or America, and where language learning and teaching methods differ (Elyas, 2008). They may not therefore be geared towards the needs of the Saudi culture of education.

This introduces a disparity of learning approaches, an inconsistency between the classroom lecture and text study. Integration of language use skills and communication into this context is not achieved without effective teaching (Rababah, 2005). The value of paper based classroom teaching materials can only be realised by student participation in communicative activities and practice (Ellis, 1990, 2015; Savignon, 1997). In order to achieve competence in communication, the student must first learn the vocabulary, the words which are then capable of being structured into an understanding of their inter-relationship with each other; vocabulary learning is therefore the essential base of language learning and use.

Javid *et al.* (2012), in their investigation on the viewpoints of Saudi, university level learners conclude teaching based primarily on lectures in vocabulary and rote learning is not suitable for effective learning; participation in communicative activities have to be undertaken by the students. Although the act of communication is outside of the remit of this study, it is suggested that it can only be achieved with the benefit of a growing vocabulary bank of knowledge, and it is a purpose of this study to examine one method of achieving this utilising easily accessed technology. The purpose is the engagement of students in the practice of their own learning which relieves the sense of resistance to being lectured at.

The practice of learning how to use their vocabulary bank, commensurate with their level of ability and knowledge, is aided by artificially intelligent adaptive software (Traxler, 2009; Clark, 2017). Mobile technology is the most recent, conveniently available accessory to learning. It is important that its value to the education process is examined and evaluated, given the ubiquitous and essential nature of the smartphone. This study starts the process of such assessment through the examination of the proprietary free app,

Memrise. It is hoped that the problems experienced by higher education learners in the study of the English Language will be alleviated by new teaching approaches and smart gadgets.

1.4 The Fundamental Role of English Language in Saudi Arabia

This study is predicated on the assumption that command of the English Language is, and has always been the key to the economic development and success of the individual, corporation and state. It is a curious anomaly in a region of Islamic faith based Arab states but can probably be traced to 19th Century British trade interests (Alshahrani, 2016). The Kingdom has never been under European or American rule, but was long dependent on Western expertise for the exploitation of its natural resource oil wealth (Al-Seghayer, 2005). Nevertheless, the new and developing educational framework of the Kingdom in the 1930's, shortly after its inception, ensured the introduction of what is now called learning English as a Foreign Language in collaboration with commercial interests, particularly the Arabian American Oil Company 'ARAMCO' (Al-Seghayer, 2005; Mahboob and Elyas, 2014).

The syllabus was developed and adapted substantially from the relatively simple commercial and industrial need of communicating with the largest foreign investor in the Kingdom. A more comprehensive curriculum was produced in the 1960's in schools, colleges and by 1975 universities (Bersamina, 2009). This remains embedded as a fundamental educational need. High quality language education was no longer the preserve of ambitious wealthy families having to send their children to Europe and America (Bersamina, 2009).

Globalisation and the increasing use of technology in the conduct of international relationships and trade has increased the focus in universities on language learning,

including those in Saudi Arabia (Elyas, 2008). This has, for example, resulted in a large-scale scheme to send students for higher education to colleges and universities overseas, enhancing experience, contacts, knowledge and career development, as well as immersion in the use of English (Shemary, 2008). This has impacted on study and learning methods. The international scholarship programme which has exposed Saudi students to different cultures and ways of life has also affected the domestic cultural, political and economic codes and practices in society, albeit relatively slowly and with some conservative resistance (Bukhari and Denman, 2013).

In the national business context English is the primary language in such industries as video game development and production and the broad entertainment business as well as in the more traditional scientific fields of petroleum production, medicine and technology (Elyas, 2008). Arabic may be the official language of communication and government but matched by English translations in airports, on roads and highways, and in advertising posters and signs. The international commercial presence in the Kingdom has grown markedly since its admission to the World Trade Organisation and adoption of international rules of trade in 2005; indeed by 2010 it had already become the highest ranking nation for 'Doing Business' in the Middle East and Africa (WTO, 2011).

1.4.1 English Language Education – The 21st Century Imperative

Political, economic, social and environmental imperatives have altered the demands made upon the education system to grow and compete in the modern global markets and counter dependence on the finite resource of fluctuating oil wealth (Oxford Business Group, 2014). It is worth considering in some detail the words of Professor Osama Tayeb, President of King Abdulaziz University in 2008;

“Education is a prerequisite for sustainable growth, especially in today’s rapidly changing economic environment, part of this revolution means that educational offerings have to be tailored to meet the requirements of today, and crucially, the needs of tomorrow.... We have seen a focus on communication skills, English and IT. These are seen as imperatives in the modern workforce.” (Oxford Business Group, 2008, p. 194).

This emphasises the importance of investigating how societal, economic and technological changes in society and in the provision of learning evolve in terms of national need and the boundaries of teaching also change to accommodate such developments, especially in a highly structured traditional framework such as Saudi universities (Shah et al., 2013). The teacher is the guide, and has to be a source of advice and knowledge, and guide to achievement for their learners. This study therefore aims to examine that provision through this study and seek to reduce dependence on the teacher by students being enabled to seek their own learning to complement that of their instructors. It will encourage researchers then to determine how to develop educational advancement of practice through investigating improvement of service teachers deliver to those who look to them for knowledge and direction.

1.4.2 The Importance of Vocabulary in Language Learning

Vocabulary forms the basis of language learning; Wilkins (1972) stated *“without grammar little can be conveyed, without vocabulary nothing can be conveyed”* (p. 11). Schmitt (2008) considers that the decades spent teaching grammar in universities were somewhat wasted given that this led to a fundamental neglect of vocabulary learning and thus inhibited the lexical use of the language in communication. The learning of vocabulary necessarily leads to questions of how it is most effectively acquired and

retained, be it through direct presentation of information which is then memorised or incidental learning through use interactive exchange (Shostak, 2002; Hulstijn, 2003; Mehrpour, 2008; Qian, 1996).

These studies recognised the difficulty experienced by EFL learners in acquiring new vocabulary where it was accumulated in a relatively informal situational setting imbued with ambiguity of contextual use (Hulstijn, 1992; Laufer and Yano, 2001; Nation, 2013) (Hulstijn, 1992; Laufer & Yano, 2001; Nation, 2001). Shostak's conclusion is that learning vocabulary directly and intentionally is vital and should not be left to the vagaries of a more casual conversational setting. This the principle adopted by the Imam University in the practice of formal presentational teaching, and a conclusion adopted in the course of this study. It will be examined how *Memrise* expands the methods of learning outside of an institutional environment as a supportive instrument for independent, self-designed and operated vocabulary accumulation. An important factor in the implementation of the application as a tool of learning also depends on the enthusiasm with which students take up the technological opportunities of mobile self-education.

1.5 Theoretical Framework

A guiding principle of modern education in the West is 'active learning', experiential in the requirement of student participation in the process of knowledge accumulation and use (Freeman *et al.*, 2014). Students are motivated to develop and implement their own strategy for learning base on the particular way in which they retain information and develop their experiences, a humanist perspective (Stevick, 1980).

Constructivism, somewhat ironically it is suggested, complements this process by encouraging learners to develop strategies to manage and use the knowledge (Reinders,

2010). Both of these perspectives are fundamental to English language learning and require a high level of proactive self-education on the part of the motivated student (Naiman, *et al.*, 1996). Reinders (2010) suggests that teacher guidance play a prominent part in the learner developing the necessary skills for this method of knowledge accumulation to be effective. It is not proposed to investigate Reinder's (2010) rather pedantic argument about the interactive relationship, if, as he suggests, there is one, of proactivity in learning with autonomy and simply to equate self-motivated active enquiry with learner autonomy.

Teaching must provide a variety of activities, from the passive nature of lecture presentation to visual, auditory, reading and kinaesthetic learning reflecting the way individuals find most conducive to furthering their competence development (Pashler *et al.*, 2009). It is incumbent on the teacher, the facilitator, to be familiar with and provide the opportunities to use all suitable modes of learning mechanism, from paper to technology direction. Even the most motivated and knowledgeable autonomous learner requires the guidance of a wise teacher and instructor. This may satisfy some of the loss of control and respect concerns of Saudi lecturers in the next phase of learning methodology and technology.

1.5.1 Learner Independence

In English Language education, certainly in recent years, there has been a cultural shift in the Middle East universities from teacher-led presentation of knowledge to learner-centered approaches, placing greater emphasis on the role of the student in their studies (Al-Seghayer, 2014a). Independence is a relatively new skill which has to be learned by students in further and higher education for learners, despite their personal perceptions of

their considerable abilities. Benson (2013) indeed notes more broadly that the definition of autonomy is subject to change with context and individual perception.

It is arguably a political and moral term, elusive insofar as assessment and evaluation of comparative methodologies of learning is concerned, and “*comfortingly bland*” (Ecclestone, 2002, p. 28). In the Middle East it is imbued with cultural and faith imperatives. It makes the conduct of an evaluative study into the principle of independent learning subject to influences, which have a similar impact on the researcher. As a result, in this examination, the definition of an “*autonomous learner*” is one who is able to take responsibility for their own learning (Holec, 1981).

Learning a foreign language is not simply a classroom-instruction based activity but a continuing process of knowledge accumulation in which proficiency is achieved by practice and understanding, demanding considerable dedication and imagination on the part of the student. It is driven by motivation, attitude and, perhaps most significantly, personal interest of the student, all of which impact on the desire for and utility of self-learning techniques, strategies, and skills (Shabbir, 2009). Methodologies and activities which do not demand the immediate intervention of a teacher, must therefore evolve, where the learner sets their own objectives, applying strategies to meet self-assessed goals and challenges.

1.5.2 Learner Autonomy, Motivation and Technology

Al-Seghayer (2014b) suggests that the continuous improvement of artificially intelligent technology has enabled adaptation and challenge to individual capability and self-improvement. Mobile devices, such as smartphones, are relative inexpensive, portable, unconstrained in use by internet connectivity limitations and are now ubiquitous in all developed societies, an essential accessory to organising everyday life for the young

(Huang *et al.*, 2012). They open up the potential for informal learning to a range of activities limited only by knowledge of their existence and student imagination, motivation and learning style; chat rooms, social media sites and apps, individual and interactive (Huang *et al.*, 2012). ‘One size’ may not ‘fit all’, but there is something for everyone in the mobile technology market, offering further advantages of immediate feedback and monitoring of progress, arguably similar to the seemingly omnipresent games software.

The fostering of learner autonomy must start in a classroom environment, with the teacher guiding and advising on personal skills utility and development, as well as keeping abreast of the applications for, and operation of, technologically assisted learning. The teacher becomes the facilitator, developing appropriate strategies based on their evaluation of student personality, ability and performance which enhances formative and summative performance and learning support. Where learning is adapted to the needs and desires of the student, the opportunities are, it is suggested, more likely to be embraced.

Technology plays a fundamental part in the communications, social and recreational lives of the younger generation, and there is no logical reason, save perhaps the limited expertise of traditional teachers, why it should not be utilised in learning. Whilst it is beyond the purpose and remit of this study to seek measurement of student motivation as a factor in the examination of the value of the language learning app, Aggarwal's (2014) comment is worthy of note; “*desirable changes in a learner’s behaviour are only possible when he is properly motivated. No learning is possible without motivation.*” (p. 122). Student engagement is enhanced by encouraging learners to use their social skills to encourage participation in language learning (Shabbir, 2009). The development of technology and adaptive software has stimulated discussions on methods of promoting

learner independence (Moebert, *et al.*, 2016). Language learning has become more accessible and flexible through the use of technology anytime anywhere.

1.6 Teacher Training

In order for there to be effective learning utility of the *Memrise* app into the pantheon of learning tools and methods, the support of the teachers for this relatively new type of autonomous learning must be understood, appreciated and used by the educators. The study, it is hoped, will identify the learning needs of students in making comprehensive use of the *Memrise* app to aid their vocabulary accumulation. Achievement of the effective introduction of the app as a learning tool requires traditional educators to be accustomed with its value and utility. Students look to their teachers for guidance, be it in the classroom or more informally through seeking advice; good formative advice comes from those who are up-to-date with learning methods and assist in its promotion. Smartphone applications will not replace teachers but support their teaching (Bidin and Ziden, 2013, p. 724).

It is integral to the purpose, aims and objectives to ascertain how students adapt to the demands of autonomous learning, through their mobile technology, but this premise is based upon the need to teach independence to learners accustomed to teacher led presentation. The practice of a standardised format of curriculum based knowledge presentation saps interest in learning from the student. It would be expected that, in the interests of those who rely on them for their future success in commerce, teachers of English would implement interactive, participatory strategies with the students to enhance learning and knowledge retention. It can however prove a difficult task to persuade Saudi lecturers, who appear reluctant to release any degree of control over what students learn, whether inside or outside of the classroom, even in the comfort of their own home.

Alotaibi (2014) suggests this gives them a personal perception of loss of status, a compromise of the position and respect to which they feel entitled. Somewhat ironically, it is argued, the resistance to change of practice and failure to introduce interaction into teaching the impression of dominance, but cannot logically enhance reputation.

Despite the best efforts of the Saudi Ministry of Education, teachers still tend to use traditional methods such as grammar-translation, rote learning, and exam preparation (Abahussain, 2016). None of these methods promote interest, motivation or communicative skills so vital to language learning initiatives and investment in a modern Saudi economy which seeks to thrive in the global market context (Shabbir, 2009). Undergraduate language outcomes and competencies fall significantly below the expectations of the government, largely due to an inadequacy of resources, particularly the texts which are relied upon by traditional method teachers as the primary source of English language pedagogy (Al-Seghayer, 2014b). It is worthy of a reminder that smartphones learning apps are generally free and easily accessed; it just takes imagination on the part of the teacher to formulate a plan for their effective use.

Al-Seghayer (2014a) reports a further problem with English language teaching which is embedded in the inadequacy of their training programme, predicated on standardised methodologies, and the lack of ongoing professional development plan. In the implementation of a strategy to develop teacher training is suggested that English lecturers must learn how to apply new technology, not simply the 'old ways' (Abebe and Woldehanna, 2013). The lack of proficiency of the English language teachers also provides a significant challenge. It has been noted that many language teachers are not native speakers, and their proficiency in English is a reflection of the variable quality of their competences and training. It is questionable that where teachers do not have an

appreciation for their own professional development needs they can offer effective support for the development of self-learning skills in others. A Saudi government initiative planned for implementation by 2020 is termed “Future Gate”, a new Digital Education Transformation Project within the Vision of Kingdom of Saudi Arabia (Picard, 2018). It aims to develop a technologically based environment in which students have a more interactive relationship with knowledge and to support teachers in the enhancement of their own technical awareness, scientific competencies and pedagogical outlook (Fg.moe.gov.sa, 2018).

Teachers are under an obligation to their governmental stakeholders to promote the English language and it is only reasonable to assume they will be provided with the opportunity to become proficient and effective instructors in the subject. Current methods of teaching and learning are restrictive, rigid and fail to promote initiative and creativity (Alhazmi, 2010). Textbooks and lectures are not conducive to effective language learning, and although some improvement in education provision has occurred in the last decade, the interactive learning imperatives of language are still missed in their focus (Al Shammari, 2007). Unqualified English teachers in Saudi Arabia do not have the adequate necessary pedagogical skills (Alosaimi, 2007). Training requires improvement. Class size issues are also to be addressed as part of the 2020 initiative given that the compulsory nature of the course imposes considerable demands on resources and staffing, as well as training needs.

Emphasis is placed particular on training for tutors to effectively recognise individual learning needs and address them to stimulate motivation, positive study behaviours and consequently success (Monks and Schmidt, 2010). Given these systemic problems in the teaching of English, it is of little surprise that students are disincentivised to learn and

outcomes are low. The solution must be the introduction of new ways of motivating learning, making it easy to access but effective, providing instant feedback and understanding and available to the student when the inclination arises. In order to achieve autonomy of learning, students must also participate in developing their own plan of learning, of which smartphone applications, it is proposed, provides opportunities to individualise their learning structure. Teachers must be aware of how this can be undertaken and support through advice based on their own knowledge development of the technology. Supplementing classroom learning is expected of the higher education student; guidance is expected of their mentor lecturers.

1.7 The *Memrise* App in Language Learning

The range of free smartphone apps carries the benefits of portability to vocabulary learning, the convenience of mastering language at the comfort and pace of the learner's abilities; "*all they need is to spare some time and dedication*" (Vakil, 2018, p. 2). This is what is expected of students, certainly in further and higher education. The classroom is the traditional base of education, but students learn at different paces, in different ways, and with diverse levels of attention. With smartphone apps they might expand understanding, their vocabulary bank and assessment of their own progress, as well as interact with friends at home, at work and on the bus. It must be stressed, and cannot be stated strongly enough, that smartphone apps are complementary to the formal language education programme, not a substitute for course material and teacher advice and guidance. This was made clear to the *Memrise* users in this study.

The choice of the *Memrise* App for examination in this study was predicated on the researcher's familiarity with its operation and informal discussion with language students and teaching staff at the Imam University in Saudi Arabia. It is a free app, easily accessed

and downloaded from Android and IOS devices, to make learning “*quickly and effortlessly as possible*” (Memrise, 2018). It is not intended to investigate the relative merits of different available, open access applications. *Memrise* operates using a spaced repetition system, described as the “*scheduled repetition of learning material*”, rather than a single lesson type format, most suited to vocabulary acquisition and longer term memory retention (Sánchez, 2012, p. 26). The software application operation is said to be predictive and intelligent, using the practice history of the learner to schedule a review of past knowledge accumulation ‘just before’ it is forgotten (Wolf, 2012).

According to Lotherington (2018) *Memrise* was considered one of the top ranked Mobile Assisted Language Learning (MALL) app in the marketplace. This study investigates the application and its value to learning and student autonomy. It has been noted that autonomous, independent learning is subject to the influences of culture, faith, institutional and government policy. It is pertinent to the context of this study to consider the development of education philosophy in Saudi Arabia where the promotion of mobile learning be examined.

1.8 Problem Statement and Purpose of Study

The aim of this study is to undertake an investigation into how the smartphone mobile application *Memrise* can be utilised to improve the acquisition and retention of English vocabulary by Saudi students, and their attitude to, and experience of, this relatively new technology. There are numerous studies identified in the Literature Review which analyse advantages of, and challenges to, the use of personal mobile technology in education. These have indicated societal cultural resistance and practical problems of student attention diversion as well as advantages of increased learning opportunities and

convenience and so the Saudi education context is an important consideration in assessment of its value.

A gap in the research is however apparent regarding its examination in the Saudi higher education context because this type of study, on independent mobile learning, has not before been undertaken in the Kingdom. This is not a teacher controlled classroom based study of *Memrise* utility and so many of the identified problematic issues of such use in previous studies do not play a part in this evaluation. This does not mean that other cultural factors should not be taken into account. Wilson and Hodges (1992) concluded that behaviours are largely a result of context and attitudes assimilated and formed by the situation in which people live and operate. Saudi Arabia is a rigidly structured Islamic society and it is with awareness of this background of expectations that the *Memrise* software is examined. Where no such ‘cultural compromise’ is identified in the study, this will advance the promotion of the app as a valued tool of supplemental learning.

Its traditional faith and cultural imperatives necessitate a need to evaluate the benefit of new methods of learning, and teaching, in what has been an essentially lecture orientated process of higher education presentation in Universities. That is the primary purpose of the aim of this study. Whilst there has been some considerable development in technological methodologies designed to equip students with the knowledge and tools they need to thrive and compete in the modern global commercial environment, improvement of ways of learning must always be examined for value and use by instructors and institutions (Lee and Cherner, 2015). Wildavsky *et al.* (2011) assert “*higher education has to change. It needs more innovation*” (p. 1).

This is particularly pertinent in the constantly evolving technology market which has expanded access to educational resources from the stasis of the classroom to the learners’

smartphones. The recent history of higher learning development in the Saudi Kingdom and the introduction of government initiatives over the last decade, particularly the 2009 the public education development project *Tatweer* (Tatweer, 2018b). Whilst the emphasis is on science and technological progress in education, the programme is designed to build a “*knowledge-based society, ... based on a well-thought-out methodology and a clear long-term vision*” (Ministry of Education, 2018, p. 1). In the context of international business, the English language provides the basis for economic and market interaction. One of the recent initiatives from the *Tatweer* project in 2018 is *English for Everyone* which aims to increase students English learning by encouraging self-learning through online materials (Tatweer, 2018a). It is from this perspective that the research aims, questions and objectives are formulated to ascertain the support available to English language learners by mobile technology.

1.9 Aims and Objectives of the Study

The overall aim of this study is to investigate the role of the smartphone application ‘*Memrise*’ in supporting the learning of academic vocabulary. The study will therefore be guided by the following specific objectives.

- 1) To identify vocabulary learning strategies that Saudi L2 students use to learn English vocabulary.
- 2) To investigate the role played by the smartphone app *Memrise* in supporting vocabulary learning in English.
- 3) To explore students’ performance in vocabulary retention in post-test with and without the use of *Memrise*.

- 4) To understand learners' attitudes and motivation toward using smartphone applications for vocabulary learning and educational purposes in general.

1.10 Research Questions

The following research questions have been developed to achieve the objectives of the study:

- 1) What is students' attitude at Imam University, Saudi Arabia, toward the use of the smartphone applications and *Memrise* in supporting English vocabulary learning in higher education?
- 2) To what extent does the use of the smartphone application *Memrise* support students in promoting English vocabulary learning in the context of the particular, traditional educational practices of Saudi Arabia?
- 3) What challenges are encountered in the implementation of mobile learning in the Saudi higher education?

1.11 The Significance of the Study

The examination undertaken in this research forms an important basis for this study of the *Memrise* App and its use in supporting students learning English vocabulary, considered by the government to be so essential to personal and national development in the 21st Century. There is a paucity of research literature on the value of smartphone application as a support in vocabulary learning, particularly in Saudi Arabia, insofar as the facilities offered by the smartphone and application technologies provide increased opportunities for learning outside of the classroom.

This researcher proposes the *Tatweer* program and *English for Everyone* initiative as a suitable platform for the investigation of *Memrise* as a supporting vocabulary learning

material in Saudi Arabia as *Tatweer* focuses on improving English learning by updating technological materials and other tools which provide learners with opportunities to practice English using smartphone applications. *Tatweer*, in conjunction with this research, might draw together the elements necessary for implementation of smartphone applications in the Saudi Arabian education system.

It is hoped that this study will stimulate further investigation of smartphone applications utility in the modern learning environment, especially as it motivates the desire to learn by making information pertinent to directed education programmes as it is in the social, political and news spheres. The government has aspirations for the future of the nation; it is hoped that realisation of the ambitions of students can be facilitated in a manner which is easily accessible and promotes self-responsibility. This might help to focus on learners' autonomy and encourage a beneficial change in the environment of education provision.

Herein lies the significance of the study, commensurate with its aims and objectives. By adding to the research bank of knowledge of the effect of technology in education, and understand the institutional acceptance and introduction of the device as a support to vocabulary learning, it is hoped others will take up the challenge and continue the investigation. The Saudi tradition of lecturing and textbook enquiry, as discussed in the following chapter, has been superseded by technological and more interactive teaching methods across much of the developed world, to enhance the learning experience. The education framework needs to move from embedded perceptions to embrace the effectiveness of the new digital world. This is recognised and financed by government initiatives, but institutions are slow to change.

It is the experience of the author as teacher that the English language and communication cannot be learned by lecture. It has to be practiced by the promotion of motivation to learn

and that can only be achieved by students investing time in their own education. The study of the *Memrise* App and its value in Saudi higher education is designed to question the extent of autonomy permitted and expected of students. It is an examination of the learner attitude towards the use of their smartphone for educational, not simply social, purposes. The return on their investment of time, for the App is free, is more difficult to calculate, but is arguably reflected in test outcomes. The placement of mobile learning in the educational framework requires an understanding of the contextual framework.

1.12 The Structure of the Thesis

Chapter One has sought to provide a comprehensive view of the traditions and practices for the higher education structure in the Kingdom of Saudi Arabia. The context provides a review of the importance placed on English language education by the government on its political, social and economic future in the competitive global market. The wealth of the nation is predicated on the world reliant on oil, and whilst it is beyond the scope of this study, environmental imperatives and the finite nature of the resource demands diversion from this dependence. The chapter has provided a sound basis for understanding some of the problems which are sought to be addressed by the aims and objectives of the research, and the obstacle to learning which can be overcome by new practices in the advent of era of communications technology.

Chapter Two presents the academic foundation and explanation for the evolution of education practices and methodologies throughout the world and indicative of their adaptation to the Saudi higher education framework. This has been of a rather traditional orientation and the literature highlights studies which are indicative of improvement in knowledge presentation and learner autonomy, where students take greater responsibility for their own learning. It will provide a critical guide on how this can be achieved,

particularly through the use of mobile technology, the smartphone and associated applications which facilitate fast, easy access to knowledge accumulation.

The value of mobile learning must be established for it to have a credible basis for introduction into the formal higher education framework.

Chapter Three provides an explanation of the choices of methodology in the examination of how the *Memrise* App has the potential to support students to learn vocabulary. The methodology is predicated on the basis that all change to a fundamental activity and need should have a proven benefit, and so considerable thought and reflection has been given to the philosophical theory which underpins this research and the mixture of methods by which it was conducted.

Chapter Four thereafter presents the quantitative and qualitative findings from the study data by way of descriptive statistics gained from the participant students in terms of questionnaire responses, test performance results and personal assessments of the value of the mobile technology to their learning.

Chapter Five provides the information obtained from the two phases of the study then synthesised and discussed in to highlight particulars of significance to the introduction of a greater degree of smartphone use in education, enhancing autonomy, motivation to learn and the accumulation of knowledge.

Chapter Six reviews how the findings have addressed the research aims, objectives and questions. It provides conclusions, recommendations, limitations of the study, contribution of knowledge and possible further suggestion for future research.

2 Literature Review Chapter

2.1 Introduction

It is proposed in this chapter to examine literature pertinent to the purpose of this study, the improvement of education methods and promotion of learning autonomy through the use of mobile, smartphone technology in supporting English vocabulary learning by higher education students in Saudi Arabia. Galvan and Galvan (2017) assert that the two purposes of a literature review are to (i) provide a “*comprehensive and up-to-date review of the topic*” and (ii) demonstrate a “*thorough command of the field*” of study (p. 12). This investigation will provide a qualitative basis of understanding of the concepts examined through critical assessment of prior research and scholarly material. It will seek to place the findings and conclusions in the particular context of the traditions, culture and economic imperatives of higher education in the Kingdom of Saudi Arabia. As such, it is not a simple reiteration of the findings and opinions of others, but must consider relevance to its contextual application.

In the pursuit of this part of the study, considerable use was made of the library facilities of Liverpool John Moores University in the UK and the researcher’s home institution, Imam University in Saudi Arabia, Riyadh. The staff at Liverpool John Moores was of major assistance in accessing literature through the inter-university loan system and in providing guidance in the finding of academic journals. The internet was also a major source of information and pertinent academic material. This has facilitated reflection on the strategy necessary to access and assess material and its relevance to the theoretical and practical purpose of the research as set out in the problem statement and study aims in Chapter One. The fundamental points for examination are student autonomy and

responsibility for their own English vocabulary learning and how they can be promoted by the use of mobile technology, particularly the *Memrise* App, in a cultural framework of teacher-led education practices.

In the conduct of the literature investigation, the objectives of the study must be borne in mind, namely

- i) To identify vocabulary learning strategies that Saudi L2 students use to learn English Vocabulary.
- ii) To investigate the role played by smartphone app *Memrise* in supporting vocabulary learning in English.
- iii) To explore students' performance in vocabulary retention in post-test with and without the use of *Memrise*
- iv) To understand learners' attitudes and motivation toward using smartphone applications for vocabulary learning and educational purposes in general.

It will take account of literature which diverges from directly meeting these objectives where it appears pertinent to the examination.

The structure of the review will promote understanding of the benefits of independent learning by seeking a sound basis of awareness from primary research of how students are motivated to learn and their preferences for how they accumulate and retain knowledge. This will facilitate comprehension through this study of how learning can be enhanced by technology, easily accessed and used, via the ubiquitous smartphone. These enquiries guide the literature research and evaluation of prior academic studies and aid developing the structure of the study methodology to explore the value of mobile learning in higher education. The focus of the research is the improvement of learning English vocabulary by undergraduate students at the Imam University in Riyadh. The study must,

of necessity, include consideration of the broader methods of learning English as a Foreign Language (EFL) by those developing a greater self-responsibility for their future career and economic success.

The first step is to establish the importance of English vocabulary learning in Foreign Language education in Saudi Arabia. This will include a focus on the perspectives of government policy and initiatives which drive social and economic change in the Saudi Kingdom to enhance national status and relationships in global commerce and international politics. The study then requires an examination of the way students learn, the theories of knowledge acquisition and retention and how these can be used to promote autonomous learning responsibility in the Saudi context. This provides a basis upon which to analyse the role of communications innovation, particularly benefits and challenges posed by mobile technology in the advancement of independent learning.

The educational potential for the role of the smartphone *Memrise* App in English vocabulary learning is explored in Memrise corporate proprietary material and academic literature and critically explored in relation to the Saudi higher education context. This will facilitate investigation, through the methodology of this study, of a greater understanding of the cultural positioning of autonomous learning in a traditional based framework. It has been noted in Chapter One that personal, institutional and societal factors exert a strong influence on the way undergraduates learn. This is particularly significant for students in the Saudi traditional education structure. The review, in summary, will therefore examine the regulatory nature of Saudi education, the influences upon students, materials available and the encouragement to use them, and learner motivations in the independent search for knowledge (Walker, 2016).

2.2 The Role of Technology in Life, Learning and Prosperity

The smartphone is ubiquitous, omnipresent in all aspects of a student life, in social interaction, networking, appointment making, banking and communicating. Ling (2004) comments “*the mobile phone is competing with, or perhaps supplementing, the wristwatch as a way to coordinate social interaction in a way cutting the ‘middleman’ out*” (p. 69). In the course of technological modernisation over several decades, the Saudi Kingdom grew in geo-political and global economic influence. The government has been active in promoting the building of a state-of-the-art telecommunications network to facilitate and grow this dominance. An effect has been that Saudi Arabia is a country recording a high usage of smartphones in all areas of life’s functions (Seliaman and Al-Turki, 2012). There are few innovations which have had such a profound effect on the modification of the human lifestyle as the smartphone, challenging and changing traditional means of interaction with people and knowledge, embraced by the Saudi government and its young citizenry in particular.

In the educational context, the effect of the introduction of computerised technology into the pantheon of learning sources and materials in schools and universities has been well studied and researched over the last half century. MacDonald *et al.* (1977), for example, talks of the benefits, and challenges, of its facilitation of versatility, adaptability and learner emancipation; Lee (2000) points out the opportunities technology offers in language development of experiential activities, individualisation of learning plans, group interaction and the immediacy of feedback of gamification. Information Communication Technology (ICT) applications and tools, and changes in students' needs and interests, have been identified as factors driving the rapid rise in the use of smartphone applications such as *Memrise* (Staker and Horn, 2012). Teaching and learning practices come in many

forms using the best of traditional and novel methods of learning, a context both inside and out of the classroom which is “*dynamic, constantly changing, in part at least because of the part played by learners in helping to construct and reconstruct them*” (Ellis, 2012, p. 192).

2.2.1 Mobile Devices, Phones and the Smartphone

Quinn (2000, p. 3), defining mobile learning as “*e-learning through mobile computational devices: Palms, Windows CE machines, even your digital cell phone*”, dates the introduction of this practice to the early 1990’s. Stockwell (2007) charts the specific use of the mobile phone in English language learning to the independent initiative of students in Japanese universities. This prompted their teachers to research, develop and implement digital activities to encourage student advantage in this novel source of learning opportunities and education benefit (Van Praag and Sanchez, 2015). For the purposes of this study, although the smartphone is the primary device description for personal digital communications technology, terminology varies between researchers in their studies, for example, mobile phone, mobile computer, cell-phone, and mobile technology. Both smartphones and mobile phones, for example, support collaboration through a number of unique attributes, including mobility, applications, games, and collaborative contextual environments (Patten, Sánchez and Tangney, 2006). These may be used interchangeably but are deemed of the same type and subject to similar principles of assessment in this examination, provided of course, that they accommodate the *Memrise* App download.

2.3 English Language and Vocabulary Learning

Learning English as a foreign language presents a challenge to any student, especially when it is perceived as an adjunct to education choice which they must satisfy to proceed in their primary course of study interest. Whilst it is noted in Chapter One that the Saudi higher education framework considers mastery of the English language a priority factor in learning, different governments of non-English speaking nations place varying degrees of emphasis on its importance. Taiwan, for example, allocates 4 hours of class time to vocational students each week Lu (2008), Iran just 90 minutes of weekly classroom instruction (Derakhshan and Kaivanpanah 2011). Even in Japan, an aspirational powerhouse of global commerce, the perception is that despite considerable social and business use and the dependence on English language based technology, there is no societal or educational consensus of its value as a formal teaching subject (Shirai, 2011). It is perhaps a generational issue given that Sharples et al. (2005) suggest that higher education level student consider proficiency necessary? Or as a prerequisite? to provide access to enhanced employment prospects and career progression.

National government imperatives and attitudes in Saudi Arabia differ markedly as highlighted in the Vision 2030 initiative. This was formulated to promote the value of education and the use of digital communication advances in learning technology and the professional development of teachers in English language provision (Al-Zahrani and Rajab, 2017). Who? assert, and effectively summarise, the fundamental need for student competence in the language; *“English is one of the key factors in the success and continuity of the international economic relations...an essential element to build political, cultural and other relations with other countries around the world.”* (p. 89). Alrabai (2014, p. 241) argues the major obstacle to learning is the authoritarian nature of the

teaching process which imposes dependence of students on their teachers as “*the main source of knowledge and the ultimate controller of the class rather than a democratic leader and facilitator of learning*”. The focus and limitations of this study mean it is beyond its scope to investigate in detail the restructuring needs of the higher education framework and the need and methods of improving teacher quality and attitude. It is arguably not incumbent on learners to make up for any gaps in the effectiveness of the way they are taught, but they have to take control of their own fate, and higher education is the stage when, it is suggested, they should be exercising some autonomy over their future.

2.3.1 The Importance of Vocabulary in Language Learning

The learning of a foreign language starts, Schmitt (2000, p. 55), suggests, with the accumulation of vocabulary, the words necessary to facilitate communication and meaning. This is perhaps of more importance to students than command of grammar, phonetics or pronunciation, even sentence structure in the use of the new or unfamiliar language (Cook, 2016, p. 73). Wilkins succinctly describes the contextual placement of vocabulary in language learning; “*the fact is that while without grammar very little can be conveyed, without vocabulary nothing can be conveyed*” (Wilkins, 1972, p. 111). This explains why, in the 21st Century, EFL students will carry dictionaries rather than grammar books (Schmitt, 2010, p. 4). Anecdotally, from the researcher’s teaching experience, Schmitt appears rather optimistic in this assertion, but nevertheless dictionary services are available on the ubiquitous smartphones. Alderson (2005) conducted a study comparing the results of vocabulary word tests and the scores achieved in tests measuring broader language proficiency skills such as reading, writing, listening and grammar amongst the participant students. This examination utilised the DIALANG diagnostic test process developed by the Common European Framework of Reference for Languages,

software developed by the EU to facilitate measurement of competence in other European language learning (CEELC, 2018). The results of the analysis “*would appear to show is that the size of one’s vocabulary is relevant to one’s performance on any language test, in other words, that language ability is to quite a large extent a function of vocabulary size*” (Alderson, 2005, p. 88).

Harmon et al. (2009) suggest that the value of vocabulary development strategies in teaching and learning have become a basic focus of EFL teaching methodology research. A popularly utilised and effective stratagem of vocabulary acquisition therefore harks back for inspiration to West's (1953) general service list in the academic environment, whereby the seemingly unwieldy lexicon is reduced to a list of 2000 frequently used words words. The list learning does appear to remove one obstacle to the motivation to learn, namely perception of the size of the task confronted. Nation (2013) however suggests that learning English vocabulary by word list may have some value, but such a limited catalogue of activities does not reflect the technical differences across diverse academic disciplines, not only of the words themselves but of context of their use. Lists of individual words without context is an ineffective method of language learning per se, given the complexity of their use in communication, described by Nushi and Jenabzadeh (2016, p.52) as “*specialized/non-specialized, academic/general, formal/informal, receptive/productive, active/passive.*”

Coxhead (2000) however embraces the rationale of the academic word list as a measurable aid to vocabulary learning, abstracting 570 ‘word families’, sets of associated and contextually related words commonly used across university science, arts, commerce and law disciplines. These provide an essential foundation of vocabulary for language learning and communication for the university student, with sub-lists for advancement

(Coxhead, 2000). A relatively comprehensive word list, intensively researched for value to learning and communications, provides a sound focus for memorisation and understanding, and indeed was utilised in part in the conduct of this research for test and retention assessment.

What is essentially a motivational impediment to students who find English as a second language difficult enough to learn, or even appreciate why they should have to do so, vocabulary acquisition can be made a manageable and measurable activity. The primacy given to memorisation of vocabulary by rote is a method of learning with a high potential for tedium, and requires a teacher to make greater efforts to instil student interest. Baker (2012) comments “*I’m amazed how subtle and complex memory is, and how beautifully it can be interfered with.... We want learning to be less effort and more fun.*” (p. 3). The advent of mobile technology, it is suggested, also makes such knowledge and communication more easily accessible.

This study therefore concentrates on the improvement of the learning skills of students in their first academic year of higher education, encouraging the carrying of education materials outside of the classroom, namely smartphone software. Accessing learning materials and opportunities should be a habit instilled at the beginning of their journey in vocational education. Students embarking on a higher level of learning require a greater degree of motivation and autonomy (Han, 2014). Previous education, at the lower, preparatory levels, does not equip them with the skills and necessary development of foresight and understanding of the demands of this next, pre-career phase. Growing understanding of their own educational needs brings greater autonomy in their pursuit, and so the study seeks to provide them with evidence that their communications devices

will also enhance vocabulary learning, enhanced EFT proficiency and a better financial future.

2.3.2 Vocabulary Knowledge and Language Proficiency

The development of a personal vocabulary word-bank which facilitates a basic standard of effectiveness in communication and understanding is suggested by the work of Wilkins (1972), Schmitt (2010) and Cook (2016). Milton (2013) asserts the strong relationship between vocabulary and the broader context of language learning, the pursuit of effective communication, which in turn enhances vocabulary accumulation, and the process of learning continues.

Education is informally assimilated, autonomously and voluntarily, without the need for an authoritarian teacher-presenter in the classroom (Siyanova-Chanturia and Nation, 2017). Nation suggests proficiency in the use of vocabulary, as an aid to developing broader language competence reflected in the enhancement of additional understanding, listening, reading, and writing skills, heightens motivation through learning satisfaction (Nation, 2013).

In the context of classroom teaching, Nation and Yamamoto (2012) suggest greater use should be made of communication resources and activities which, in turn, enhance vocabulary accumulation and student confidence. These may be as simple as watching film clips, subtitled songs or reading stories. The focus is then on contextualising vocabulary which aids its understanding and use in communication. Liu (2016) calls this the conversion of “*pure data into useful knowledge systematically (through) concept mapping*”, relating vocabulary, the “*pure data*”, to images, for example, and series of words mnemonically structured to facilitate use in effective communication (p. 128). Although particularly suited to the functions of technological learning via smartphone

software, this is not a novel idea, Novak (1972) advocating practical methods of diagrammatical representation of vocabulary relationships which enhance storage, linkage and effective retrieval.

The adoption of different methods of providing opportunities for learning can be a problematic change of habitual practice for educators, especially those of an ingrained traditional bent such as the Saudi lecturer. Berne and Blachowicz (2008) suggest teachers may not be familiar with current ‘best practice’ in vocabulary teaching or the recommended manner, based on the latest research, for placing instructional emphasis on word learning. The large proportion of research and advice appears to emanate from western European studies which may not be accessible to or appropriate for the cultural foundations of Saudi Arabian education values and practices. Adaptation could essentially be seen as a surrender of the traditional control and demarcation of teachers and students.

Learners do not act in a uniform manner; they have different needs, style, values and preferences in the way they accumulate knowledge. In a system of mass education, individualised learning is an impossible aspiration for even the most modern of highly effective teachers. Nevertheless, there must be an awareness of the “*composite cognitive, affective, and physiological characteristics that are relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment*” (Keefe and Jenkins, 2008, p. 50). In determining the value of learning equipment, materials and practices, this view remains valid.

2.4 How Students Learn: Theories of Knowledge Acquisition and Retention

Understanding how students acquire and retain knowledge is central to effective teaching and the promotion of autonomous learning. This must logically apply whether it is subject discipline-related or English vocabulary. This research is not an assessment of advantages one particular student may have over another by assessing the values of theories of the way they acquire second language vocabulary, but the value, in a mass education context of mobile technology to such learning.

Nevertheless the perception that the student has of how they learn is a variable in motivation which must be taken into account, principally behaviourist, cognitive and innatist, even though the limitations of this study do not facilitate its measurement. In seeking a broad understanding of the effect of this, note is taken of the assertion of Peregoy and Boyle (2017) who suggest that innatist, interactionist and behaviourist theories are now relied on by researchers when analysing second language, L2, vocabulary acquisition (SLVA). It is a psychology based approach to understand how students gain knowledge, and is, arguably, broadly applicable to all higher education disciplines and subjects and certainly blurs the distinction between first and second language vocabulary accumulation.

The first and second language differentiation in vocabulary learning in any case arguably has some relevance, given the stages of life that the learner is or has learned, namely child at home imitating sounds at home and young adult at university undertaking a course of formal study. The environmental repetition technique of external stimuli in the first context, L1, may however be of value to the behaviourist L2 student. Certainly Lightbown and Spada (2013) consider that children will learn their primary language with relative

ease, identifying a somewhat mystical interaction of the effects of behaviourism, innatism, and cognitivism, or development. It is proposed to examine the learning strategies from a less ethereal, more practically basis of application to vocabulary learning.

2.4.1 Behaviourism

The behaviourist method of learning proposed by Skinner (1974) is a response to the result, whether positive or negative, of an action; the *“behaviourist might consider effective language behaviour to be the production of correct responses to stimuli. If a particular response is reinforced, it then becomes habitual, or conditioned”* (Brown, 2014, p. 22). Reinforcement may be a simple ‘well done’ from the teacher, enhanced status in the institution or improved examination results. The process of learning is therefore promoted by the selective strengthening of a given correlation between a specified stimulus and a corresponding response (Wang and Shen, 2012). The student will thereby develop the habit of a learning process or activity which produces the best observable results, and indeed be guided by the effectiveness of a methodology of learning by the teacher (Skinner, 1974). If the stimulus for vocabulary learning proves effective and measurable, for example in improved test outcomes, the student will use it if encouraged to do so (Javid, 2013).

In the case of mobile learning it is suggested that a productive correlation, upon which to assess progress, between a learning stimulus and response is manifest when a device presents vocabulary and prompts a response by the learner based on the level and grading of the knowledge tested. For the behaviourist learner, the mobile software effects a transmission of vocabulary to be mastered and the student responds, whereupon feedback is immediately provided by the device (Keskin and Metcalf, 2011). This appears an

ideally formulated method of behavioural learning, although not as a stand-alone tool without teacher guidance and other supportive methods and sources of knowledge including texts, and test activities (Jacob and Issac, 2008).

The behaviourist learner is perhaps most accommodating of traditional teaching methods in the formal, highly structured teacher-led context, relatively passive in acceptance of guidance and leadership, motivated by positively enforced stimuli and suggestion provided by the teacher (Wright, 2006). Imitation and repetition of words and sentences have long been considered key to vocabulary accumulation learning (Saragi, Nation and Meister, 1978). It is a simply applied method of vocabulary practice. This practice arguably makes the behaviourist well ‘qualified’ to provide an assessment of the value of the *Memrise* software to vocabulary learning, its operation being conducive to a planned repetition process which aids recall and retention. Nevertheless, (Brown, 2014) suggests “*today virtually no one would agree that Skinner's model of verbal behaviour adequately accounts for the capacity to acquire language, for language development itself, for the abstract nature of language, or for a theory of meaning*” (p. 36). Memory exercises such as rote learning, whilst useful in the initial stages of vocabulary accumulation, essentially only provides a basis in the broader language context for vocabulary use, for it only, arguably, has value when applied and practiced. The provision of mass education cannot accommodate a differentiation process in the classification of students based on learning strategy and preferences for methods of learning, although the traditional methods of teaching in current Saudi classrooms appear much suited to the behaviourist in terms of its relative simplicity. This study however takes vocabulary learning outside of the institutional constraints into the broader social and living context, stressing the need for autonomy of learning practices utilising the mobility of 21st Century mobile technology.

2.4.2 Cognitivism, Constructivism and Interactionist Learning

‘Communicative competence’ demands that the value of vocabulary learning is placed in the context of use, not simply an abstract process of memory; language learning is a social and communicative exercise requiring practice (Savignon, 2018). Learners are actively involved in the accumulation and construction of their knowledge, a process which is enhanced when the learners are challenged with problems that need to be addressed instead of assimilating the information delivered by tutors (Kadirire, 2009). The cognitivist student is considered to be more motivated and active in seeking their own learning experiences, assisted by guidance by the teacher who provides opportunities to develop, experience and organise that knowledge (Ertmer and Newby, 2013). This, it is suggested, provides the model for the student more likely to embrace autonomous learning practices with an awareness of needs which can only be satisfied by experience (Sahinkarakas *et al.*, 2010). They actively develop new concepts and contextual understanding based on the interaction of previous knowledge with new information (Priebe *et al.*, 2011).

In the planning and construction of their own learning programmes mobile technology provides an easily accessible opportunity to enhance the personal competency developed in the classroom by well trained and knowledgeable tutors. This constructivist paradigm, a sibling of cognitivism, is amply fostered by the functions offered through *Memrise* mobile software in developing their own, independent, bespoke path to vocabulary learning, integrating, collaborating and exchanging with their fellow travellers on the path of knowledge.

The Interaction learning approach by is indeed a key to learning and retention of vocabulary in the context of acquiring other language skills, be it in a social or

educational, classroom environment where activities encourage use rather than simple repetition (Lightbown and Spada, 2013, p. 19).

The role of the teacher is to facilitate opportunities for vocabulary use as part of classroom practice and activities in the promotion of learning; “*communicative give and take of natural conversations between native and non-native speakers as the crucial element of the language acquisition process*” (Sarem and Shirzadi, 2014, p. 65). Vygotsky (1978) suggests interaction can be only meaningful in a learning context when it leads to the creation of new vocabulary and knowledge acquisition. The quality of the learning, and the development of the student vocabulary bank, is therefore dependent on the nature of the input (Long and Porter, 1985).

Vocabulary is learned through language input at a comprehensible level which can be understood and recognised by the student in the learning of language, and it is the role of the teacher to essentially pitch L2 education appropriately through listening and reading materials (Krashen, 1985, p2). Krashen made this observation some years before the advent of freely available technology, but it is adaptable to the new teaching software, including the *Memrise* App which can be set to meet the students’ challenge level for learning. The appropriate, individual centered input then facilitates interaction and engagement with native or more experienced L2 speakers, environmental context which aids acquisition and retention (Gass, 2017). Swain (1995, p. 131) emphasises the importance of the quality of the output resulting from the first two experiences, input and interaction as a reflection of how effective they have been in stimulating the broader grammatical use of the second language as a whole, not simply the factor of vocabulary learning. It is not proposed to enter the somewhat semantic argument of the primacy of the input, interaction and output actions, save to comment that all form a part of the

experiential benefit to vocabulary and language acquisition and guide good teaching provision.

The cognitivist strategy and form of learning, which on the face of it can be developed in much the same way as a learning skill, is expanded upon by the associated concept of connectionism, whereby “*hearing a word brings to mind the object and seeing the object brings to mind the word or phrase.*” (Lightbown and Spada, 2013, p. 23). The accumulation of vocabulary is gained through interaction with other speakers, be they native or simply more advanced in their knowledge, and this draws into the context the role of the experienced teacher as the facilitator of opportunities for the constructivist learner.

2.4.3 Innatism

The most interesting strategy of language learners is perhaps the innatist, who is considered to be born with the capacity to accumulate and use vocabulary knowledge, in a sense ‘pre-programmed’ with the pattern which, Chomsky argues, underlies the principles of all languages (Mitchell, Myles and Marsden, 2013, p. 10). The innate skills, inherited or nurtured in first language learning, are triggered by experience and teaching of the second (Bryam, 2004, p.106). The anecdotal experience of the researcher raises questions, then, as to why there are so few of this psychological type undertaking the EFL course at the Imam University, given the difficulty with English vocabulary learning the student body has as a whole. Chomsky would perhaps suggest this difficulty in student “*programming*” does not undermine the “*innate structure*” theory of learning, showing it is “*rich enough to account for the disparity between experience and knowledge ... given limitations of time and access to data*” (Chomsky, 2006, p. 70). Peregoy and Boyle (2017) nevertheless assert that learning a second language does not differ from learning the first;

the ability and the rules are already programmed and constructed in the brain and all a learner needs is to synthesise and learn vocabulary and grammar based through innate mental processes. This, on the face of it, turns vocabulary learning in the context of second language skill accumulation into a somewhat mechanical programme, which suggests the process should be easier than students' actually find it to be.

2.5 Vocabulary Learning Strategies

Jamal (2016, p1) comments that the issue for students is not so much “communicative competence” as the acquisition of a basic or fundamental competence in the language.’ Their emphasis is on vocabulary, and the structure of communication will develop from that foundation. This somewhat correlates with the developmental analysis of Luczak (2017) in achieving communication competence through a lexical, relationship approach to vocabulary use. She explains this as “*collecting a large number of ready-made fixed fragments of a language facilitates the development of both fluency through easier, mechanical construction of longer, coherent utterances by the speaker and understanding the language by the recipient*” (Luczak, 2017).

Strategies, be they of teaching or learning, must focus on the achievement of a goal, in the context of this research, promoting vocabulary acquisition as a fundamental of communication in English, in a traditional based teaching culture in Saudi Arabian Universities. This does not lie simply with psychological approaches which seek to categorise students by how they accumulate and retain information, particularly in a mass education environment. They must (i) involve choice, (ii) a complexity founded in step by step development from which the student will (iii) gain knowledge and benefit and (iv) increase efficiency of vocabulary learning and use (Nation, 2013).

The accumulation of vocabulary knowledge is undertaken in three broad manners; (i) an incidental approach to teaching, the provision of opportunities to gain vocabulary knowledge, even if only through the traditional graded text book series of increasing challenge; (ii) explicit or intentional instruction by repetitive list memorisation, and (iii) independent strategy development, where the student is provided with opportunities and materials to expand their own learning (Anuthama, 2010, p. 10). Anuthama's interpretation of 'incidental' infers an activity-based exercise indicative of active learning. Boers (2018) argues, however, that L2 learning '*occurs as a by-product of communicative activities in which language learners pick up features of the target language while they are primarily engaged with the content or the message of utterances.*' (p. 2). It is essentially a passive exercise. Hunt and Beglar (2002) suggest vocabularies are usually acquired, incidentally, through reading and listening. Those ventures into contextual language use appear positioned at somewhat of a more advanced stage of learning, given that these activities are predicated on a basis of pre-existing, albeit limited, learner understanding of words.

There is a seemingly osmotic quality to this way of passively 'accumulating' knowledge rather than actively 'learning'; Ellis (2008), for example, suggests students are potentially unaware of the learning that has taken place, although it is evident in the behavioural responses they make. It would however be a hard lesson for the L2 students in this study to know that, according to Hill and Laufer (2003), they would need, as part of their incidental learning, to read, or hear, some 8 million words in order to accumulate a memory bank of 2,000. Some empathy therefore attaches to Schmitt's advice; "*it is probably best not to rely upon incidental learning as the primary source of the learning for new words*" (Schmitt, 2010, p. 31). It should be reserved for embedding pre-existing knowledge.

Intentional learning requires the employment of ‘deliberate techniques’ to accumulate vocabulary, the use of books, lists, memory cards and cetera (Elgort and Nation, 2010). Students need to be active learners (Schmidt, 1990). Dörnyei (2009) added that the learner makes conscious and deliberate attempts to master words. The techniques of vocabulary acquisition in this manner are reminiscent of the traditional, behaviourist orientated, learning by rote and list still practiced in the Saudi classroom. Nakata (2008) suggests that motivation is a necessary factor in intentional learning practices, but there appears, based methods employed, there remains an element of passivity and dependence on teacher-led knowledge provision. It is nevertheless a technique more easily satisfied by technological applications which accommodate processes of word repetition, graded tasks, practice exercises and contextual integration (Tozcu and Coady, 2004; Nakata, 2008). In vocabulary learning and retention, Laufer (2005) stresses the primacy of intentional methods of vocabulary acquisition, incidental, broadly environmental processes playing only a complementary role in development.

It is not a significant leap of logic to decide that in the process of any learning activity, effort and motivation, from both the student and teacher, will produce better outcomes than passivity. Herein lies the purpose of examining the value of the *Memrise* App to students. It utilises the intentional learning process in a context which enables the user-learner to develop their own, independent strategy of English vocabulary acquisition and growth in conjunction with the demands of their study and the input and guidance of their teachers. Students are enabled to prepare their own lesson plans. It further facilitates, albeit through the paid for Pro software, interaction with other learners and strategy exchange.

2.5.1 Mobile Learning and Vocabulary Learning Strategies

Learners in mobile learning context will have to modify their vocabulary learning strategies to effectively exploit the features of technology. Oxford (1990) asserts that such strategies must be adopted and adapted to meet the capacities and demands of more independent learning to exploit advances and extend learner abilities in a novel technological environment. Schmitt (2000) highlighted the benefit of adapting personal learning methods to activities incorporating memorisation, repetition and the challenges posed by the lexical context of words which are affected by individual development of motivation, proficiency and cultural awareness.

Strategic learning is enhanced by a new range of technological tests and activities, methods of recall for vocabulary embedding, rewarded by immediate feedback and the ability to correct (Nation, 2013). Tight (2010) suggests this requires a somewhat experimental exploration by the student to determine style of learning match, mismatching, and the development of a mixed modality which suits individual needs. This has considerable consequence for teachers to consider in a mass education environment of different learning style orientated students, particularly in identifying the most suitable software for classroom use, developing a teaching strategy to fulfil the requirements of learners. López (2010) suggests that there are specific software applications a learner can use to develop successful learning strategies to enhance their vocabulary acquisition but acknowledges the need for investigation of their individual particular value. Teaching using multiple modalities to suit diverse learning styles is more constructive in the classroom than concentrating on individual teacher preferences (Ou-Yang and Wu, 2017).

Learning strategies necessarily adapt to changes in practice. It is questionable whether this applies to the fundamental cognitive theories of learning which underpin them. Schunk (2015) claims that '*(cognitive) theories reflect environmental phenomena*' welcoming '*connectivism*' to the menu of philosophical learning theories outlined above, as a development of the new nature of knowledge access through specifically technological means (p. 11). The ways in which knowledge is acquired have expanded exponentially and demand adaptation of tradition to their use from teachers, students, institutions and society.

Gonzalez (2004) argues that knowledge in a rapidly changing social, educational, scientific and political environment becomes obsolete, is possessed of a 'half-life', a constantly declining value. It is replaced by new, more pertinent awareness dependent on the environment in which it is fostered and connected to. Siemens (2004) sees such '*connectivism*' as a successor to the traditional learning theories which he considers lacking in an intrapersonal view of learning, rich veins of knowledge provided by technology and the adaptation to a changing living environment where values are no longer fixed and accepted. Such a view would certainly not find favour in the Saudi culture and faith setting, requiring a fundamental social and political change which is unforeseeable.

Kop and Hill (2008) deny the novelty of connectivism, suggesting it is simply recognition of a philosophical paradigm shift that is naturally effected by the evolution of learning methods rather than a fundamental challenge to behaviourist or cognitive theories. Sharples (2007) suggests that the use of mobile devices in the education process is simply a resource addition, connected to the multiplicity of methods and philosophical thought

already expounded in the understanding of learning. It is considered as such in the course of this study.

This study examines the use of the *Memrise* smartphone App as an adjunct to learning, informal support for the traditional teaching activities of the EFL higher education course. It is argued that the fundamental cognitive understanding and strategies of learning of the undergraduate students do not require fundamental change, simply adaptation to new ways of acquiring and utilise vocabulary.

This not only applies in the classroom, the institutional setting, but the issue is perhaps more pertinent in the Saudi 2030 initiative drive to promote mobile learning. That will be subject to particular consideration of benefits and concerns in the context of technological access to knowledge and qualification provision, but the organisation of these paths to learning arguably differ from 'classic' education by degree rather than fundamentally. The course in EFL is devised and developed to the institutional standards and cultural expectation of Saudi Arabian society. The ways of learning simply evolves and the students adapt their learning style to, for example, memorisation activities with immediate feedback, from written tests and delayed results.

2.6 Mobile Technology and Smartphone in Learning

This study will replicate the practice of previous authors in dealing with the mobile phone as a precursor to the smartphone, the latter simply being a development of capacity and facility rather than a change in the application of the principles of the research. Thomas and O'Bannon (2013) for example seek to distinguish between the technologies, suggesting the smartphone as a new generation of mobile phone. As a classroom tool it permits better connection to the internet and incorporates a better range of facilities such as digital cameras, calculators and audio-visual recorders, amongst others (Thomas and O'Bannon, 2013).

Sharples (2006) therefore asserts three main considerations must be addressed and adopted in mobile phone research, (i) the technocentric perspective, how the device is viewed as a tool to support learning and teaching, its (ii) relationship to e-learning, and the perception that it is simply an extension of this facility and (iii) as a support to and augmentation of formal education, viewed as face-to-face institutional teaching. Winter (2006) considered these classifications identified stages of mobile learning development, adding a 'learner-centred' category to focus on the value of the smartphone based on learner mobility and access to fixed institutions.

Korucu and Alkan's (2011) emphasises the relationship of smartphone use as an integrated function to the mobile learning stable which enables students, through a variety of devices, to access e-education independently of geographical location, whilst allowing them to communicate with peers undertaking a similar path of study. This author, however, considers a further differentiation is necessary in the context of independence of the student in pursuing their own methods of learning either as a support to the institutional provision, or separate from it.

In the more informal, curriculum based e-learning courses, students may have a greater choice over where they study, but are expected to engage with formal, institutionally sponsored materials developed by a teacher, to be used in a structured degree programme of instruction (Gikas and Grant, 2013, p19). It is therefore the work of Sharples *et al.* (2007) on the supportive purpose of the smartphone and utility of the *Memrise* App which provides a backdrop to the nature of this study. The mobile phone is a tool to facilitate learning outside of an educational, classroom environment, be that an institution or a programme of study which must be uniformly conducted in compliance with curriculum standards to achieve certified success Gikas and Grant (2013).

2.6.1 Smartphone Apps in Vocabulary Learning

This section will discuss the developing value which smartphone applications development adds to vocabulary acquisition as the facilities offered improve. Although expressed in terms which for this purpose apply generally, these activity based reflections apply to the *Memrise* App, the operation which will be examined later herein. This is not to eschew the suggested value inherent in general social media platforms. Shahbaz *et al.* (2017) conducted a study to explore the effectiveness of the ubiquitous *Whatsapp*. Participants were required to memorise 40 phrases from the Martinez and Murphy (2011) Phrase Test using *Whatsapp*. A controlled group was asked not to use the app in the conduct of this exercise, receiving their usual classroom instruction. The experimental group performed better, which is *prima facie* indicative of the value of mobile social media software to learning, over the benefits of traditional education. It is suggested, however, that those using the app as a support to their classroom learning simply spent more time on the memorisation process via the secondary app use. To that end, the interpretation, predicated on logic, is that the more time spent, in different ways of

learning vocabulary, the greater the embedding and recall. This can only be enhanced by vocabulary learning specific software.

Memrise is not, of course, the only free proprietary language app which promotes vocabulary learning. *Duolingo*, for example, was created by Luis von Ahn and Severin Hacker in 2011 (von Ahn, 2013). It now has more than 30 million registered users and supports different languages for English speakers as well as others for non-English speakers in both desktop and mobile software format (Munday, 2016). In 2007 Stockwell lamented that the lack of academic research into learner perceptions of the comparative importance of digital based learning resulted in assessments of its value in improving student outcomes on the acquisition of vocabulary somewhat apocryphal. The role and benefits of mobile learning has certainly increased in the intervening years, taking into account cultural values in examination of its context. Research conducted Gafni *et al.* (2017) noted *Duolingo*, for example, aided access to learning programmes, methods and materials which facilitated learner independence through self-testing and the immediate feedback. These are capacities also offered by *Memrise*.

The assessment of utility in learning is arguably dependent on the receptiveness, age and maturity of students, and their expectation of the teaching process to which they have become accustomed. Lam *et al.* (2018) investigated student perceptions on the value of the *Quizlet* application as a support tool form learning Chinese amongst seventh and eighth grade students enrolled in a Chinese language program of a middle school. Participants were reluctant to use the application independently or as a class on regular basis, indicating a dislike for format presentation and activities such as the paper-based *Quizlet* materials. This was a small study focussed on the particular *Quizlet* app in a single, school based setting; Lam suggested a larger sample and broader base for study

was necessary to further examine the effectiveness of different proprietary language learning applications; evidently, 'one size' does not 'fit all' and students are more discerning about using apps specifically suited to their preferences and needs.

In the Saudi higher education framework much still needs to be done to ascertain potential benefits and problems of the smartphone app in vocabulary learning in the historically faith-value laden traditions of the Kingdom, hence the purpose of this study. This demands an explanation of the smartphone software operation, not simply techniques of use. In language learning it is not sufficient to simply assert that one of the primary purposes and benefits of using smartphone applications is to study and memorise vocabulary (Thornton and Houser, 2005). That, after all, is the purpose of considerable financial investment in its development.

Software programmes which facilitate a reminder process are considered particularly useful to learning, planned and set by the student who can schedule short message service (SMS) messages and notifications to prompt action and update with new learning programs or activities and track learning (Hubbard and Levy, 2006). Even the most dedicated of learners occasionally require a reminder. Alemi (2010) and Azar and Nasiri (2014) too found their student study participants considered the use of the mobile phone SMS invaluable in communicating and receiving vocabulary knowledge from the software provider, teachers and colleagues. Alemi et al. (2012) then examined the effectiveness in vocabulary learning and retention of sending a short message (SMS) containing foreign words, their meaning and example sentences. In the short term, students showed no significant improvement in vocabulary learning and retention between the SMS process and using a dictionary. As the study progressed, outcomes improved through SMS supported learning, recall of words and meanings enhanced

beyond the value attributable to dictionary use. The SMS utility of mobile smartphone suggests its value lies in the improvement of long term memory rather than short.

In exploring further sources of value-added learning by smartphone language apps, Rahman's (2016) study explains that adaptable, intelligent software facilitates vocabulary selection most suited to the lexical context of sentence formation. It develops understanding of grammar and expression of meaning, thus improving the communicative productivity of its use. Its mastery develops other personal skills, Rahman highlighting the production of Excel and other computer based documents in English. They have access to learning they choose and which matches their perceived needs (Ktoridou and Eteokleous, 2005). The software provides considerable capacity for use of imagination, creating a learning bank of audio or video recordings (Van Praag and Sanchez, 2015). Accessibility is the key identified by Evans (2008) as a primary advantage, integrating continued learning into the life of a user, regardless of the stage of life they find themselves. Essentially the accumulation of knowledge becomes another of the games so popular with the owners of the smartphone technology.

Stockwell (2007), it has been noted, commented that the use of mobile phones was utilised by language teachers, recommended to their students as a support tool for language learning activities. Educator awareness of this technology depends, of course, on knowledge of the local availability of innovative teaching products. On occasion, in the event of a lack of ease of access to, or institutional and cultural relevance of, commercial proprietary applications, local initiative projects were undertaken specific to the educational needs of the national and institutional setting.

Ivić and Jakopc (2016) studied the experience of their Croatian English Language students in the use of a mobile application, downloadable to mobile devices, named '*Test*

Your Knowledge' (TYK). This was a collaborative project between the Departments of English Language and of Information Science, developed in-house, aimed to fill gaps in vocabulary and language teaching provision at the university. *Memrise* and other apps had been considered, but deemed not to fit the perceived needs of the EFL learners in Croatia in the manner of presenting knowledge. Nevertheless the problem of time and numbers described is a common experience in institutional EFL learning throughout the world; lectures “*occur once or twice a week with a larger group of students (10-20 students in a group) having different previous knowledge and different needs regarding the remedial grammar problems*” (Ivić and Jakopec, 2016, p. 218). In choosing tasks provided by the custom software, students tended to avoid the time-consuming operations, preferring the simpler, quickly resolved problems. Mobile software was in any case found not to be conducive to detailed explanations of meaning and use. Despite these, albeit significant, limitations, scoring was higher than expected on vocabulary memorisation and use. In the context of this study, the conclusion is reached that the smartphone app *Memrise* cannot be considered, in the learning experience, a substitute for good, comprehensive teaching.

Students like the utility of their devices, certainly of proven value in their social life organisation, and indeed favour the choices in activities, tasks and tests of vocabulary learning offered, which carry immediate feedback (Kulikova, 2015). In the Saudi higher education framework, Alkhezzi and Al-Dousari (2016) explored the impact and value perceptions of EFL students of the use of a bespoke, in-house developed smartphone application, namely *Telegram Messenger*, in a controlled classroom lesson context. The enthusiasm was somewhat muted amongst the student, but they found it useful, a diversion from the usual lesson programme, and there was a determinable positive impact on their vocabulary learning, recall and use of phrasing and grammar.

Teachers however need to consider the role that ‘student choice’ plays in the furtherance of their learning, and therefore perceptions of smartphone software value in their education. They may find pleasure and enjoyment in finding new words and phrases on their phones, a diversion from the lecture learning (Ko and Goranson, 2014). Huelser and Metcalfe (2012) however suggest that they may harbour false beliefs about the value of their social tool in the scale of effectiveness of learning methods, and “*failed to realize that generating errors greatly facilitate recall.*” (p. 519). Repeating mistakes and misunderstandings, an evident risk of unsupervised education, is not learning, nor does it promote independent and autonomous learning. Even self-study requires guidance.

2.6.2 Student Independence and Collaboration through Mobile Technology

Holec (1981) developed a simple definition of learner autonomy as “*the ability to take charge of one’s own learning*” (p, 3). The concepts of ability and responsibility play key roles in effective self-learning, advanced by Littlewood (1996) who added student independence and capacity to the autonomy definitional mix. These appear rather semantic inclusions which unnecessarily complicate the fact that students are fundamentally empowered to make choices on what and how they learn. Benson (1997) joins the definition debate with the somewhat brutal assertion of autonomy as “*the act of learning a language outside the framework of an educational institution and without the intervention of a teacher*” (p. 19). This comment appears to prima facie dispense with the central role of the teacher in facilitating learning but this is not a factor in this study, nor is it accepted as a valid proposal for the supportive effect of smartphone learning. Whilst Yongqing (2013) suggests that educationalists and linguists have failed to reach a consensus of what learner autonomy actually involves, it should be pointed out that EFL is a curriculum based course, which meets Ministry of Education (in Saudi Arabia)

specifications, and as a point of reference for participant L2 students in this study, must be passed to progress.

Meeting academic specifications in learning does not nullify autonomy of learning, simply requiring professionally qualified and knowledgeable teachers to inform and guide the progress of their students to attainment and success by whatever means are available and culturally appropriate. In the vocabulary acquisition aspect of EFL, the mobile-smartphone app is the latest tool of learning, joining the other traditional resources and methods. It is also the source of capacity to independently self-learn and improve outcomes for the motivated student, aware of what needs to be achieved. Kukulska-Hulme (2013) argues that there are new skills languages learners must gain in a world where mobile devices are valued and essential in learning organisation and management, such as placing vocabulary in a lexical context to aid understanding and recall. Benson (2011) adds that the smartphone enables students to play an active role in their learning process and continue the process beyond the classroom, which one would have thought an imperative for an ambitious undergraduate (Gaved et al., 2018).

This does not undermine the primary purpose of a teacher, to provide learning, support and academic feedback with guidance for improvement. The tutor will not simply become a feature of the education background, but will focus on facilitating learning in the traditional classroom manner, whilst empowering the students through reflection, target setting and review (Little, 2007).

Macaro (2001) and Wenger et al. (2002) have argued that students motivated to learn and grow their vocabulary bank have to develop their own ways of accumulating and retaining knowledge, with greater self-reliance and access to self-study tools; this is more focused and therefore effective than sole dependence on teachers. The informal methods of

learning through mobile device technology are noted as powerful support to traditional education. This raises questions of how the teaching culture evolves as a result of this method of learning, the student showing independent initiative, aided, or prompted, by a teacher facilitator rather than provider (Farley *et al.*, 2015).

This perhaps has more pronounced application in the Saudi Arabian universities and in the context of this study, English vocabulary learning practices through the utility of *Memrise*, a free smartphone application which adds negligible cost but potentially substantial value as an educational resource. These latter factors, however, play little part in its acceptance and implementation; barriers and impediments source from the lack of instructor technology awareness and training, fostered by the reliance on teacher-led, lecture and textbook based, repetitive memory activities still promoted in Saudi traditional practices.

The introduction of mobile technology, it is suggested, reduces dependence on classroom learning and so on the authority of the teacher-instructor, facilitating student autonomy and collaboration with peers (Benson, 2007), with a loss of constraints on the place or time of learning (Kukulska-Hulme and Shield, 2008). The communication in learning opportunities are not restricted to the use of the app but involves students and teachers in an ethereal sphere of information based networking, through text, audio and visual aid transfer, and commentary and question exchanges (Liu, 2016).

2.6.3 Situational Learning, Autonomy and the Community of Practice

Student strategies for vocabulary learning introduce the concept of situational learning, a more socially interactive and collaborative activity involving the development of student groups and teachers (Brown, *et al.*, 1989). Cochrane and Bateman (2009) point out that using mobile phones engender greater interest amongst educators and benefit to students

if users through the creation of online activities they are involved in developing, and that facilitate interaction with each other regardless of geographical location. Online, app enabled, vocabulary practice groups enhance learning by sharing and communication with fellow students and teachers.

This arguably changes the context of language learning through practicing use, exchanging challenges and sharing interests. Lave and Wenger (1991) called this a 'community of practice', developed by students and teachers as a result of the use of compatible digital devices in the interactive advancement and support of learning. Wenger *et al.* (2002) developed this concept of 'community of practice' over a decade of study into a cognitive theory of 'situational learning'. Composed of three considerations and steps, it comprises (i) the domain, or purpose, in this context the acquisition and command of English vocabulary, (ii) a community of students who seek the mutual benefit and academic growth of each other and (iii) practice, sharing words, advice and techniques (Wenger *et al.*, 2002, p4). The capacity of mobile apps provides a cogent relationship of learning, which involves tutor guidance and direction, with meeting the challenges of the Saudi traditional cultural context. It also fosters greater independence and learning choices amongst students (Pimmer *et al.*, 2010).

Mobile phones are a useful tool for learners to access discussion groups, knowledge and experience, develop their 'own space' in which to grow learning experiences without the need for a formal institutional setting (Wenger *et al.*, 2002). The community is envisaged as an informal, independent, student led, sharing of common resources. Cochrane (2012) sees no reason why it should not be used as a formal pedagogic activity, organised and planned by the teacher. This form of organised implementation of course supports its

value as an autonomous student choice and practice in the sense that what is considered of value to learning must logically be attractive to those charged with providing it.

There is considerable benefit from teacher input, and this aspect of the institutional community, it is suggested, engages the practice and use of smartphone technology to the Saudi cultural expectations and traditions of education. Practically, it also avoids the transmission of mistakes and misunderstanding. Cochrane et al. (2012) would view this as inherent in his staged, scaffolder model of learning, with educators leading learners to improved outcomes whilst enhancing their own ability and confidence in the use of novel ways of teaching and learning. It enables instructors to identify weaknesses in learning.

Wang (2004) suggests that context awareness plays an influential role in the strategies facilitated by mobile learning in a lessening of institutional control over the presentation of accepted knowledge. Ineffective management of the situation and its operation, and indeed lack of tutor involvement and guidance, will inhibit learning per se and the value of the software as a potent device for supporting formal learning (Keskin and Metcalf, 2011). Peer interaction and knowledge exchange through collaboration are instrumental in the accumulation of knowledge (Naismith *et al.*, 2004). Supervision over the cultural, faith context of knowledge, so essential to the foundation of, and unity in, Saudi society, becomes compromised by mobile learning and collaboration independent of tutor direction. It is arguably unreasonable to imply that culture is responsible for depriving students of their autonomous desires to further their own education, where such motivation exists. Conversation theory, for instance, postulates that the learning process is enhanced through dialogue and conversation between different people, in the context of this study, discussing and sharing information in English on their devices; they seek to learn from each other (Kearney *et al.*, 2012). The use of a smartphone for the purpose of

conversation may appear somewhat revolutionary in the social context of modern youth, but the language apps, such as *Memrise*, are limited in the extent they can explore misconceptions, lack of understanding or vocabulary context inaccuracies of the student. There is a risk these can be passed on in the name of cooperation. Herein lies the need for the input of a knowledgeable, technologically aware tutor in the collaborative process of independent learning.

Autonomy is contentious in Saudi Arabia. Indeed education is a culturally embedding way of accumulation of knowledge in all nations, be it via citizenship studies in the UK and the role of the national anthem and creationist learning in USA institutions. Choices of learning strategy, the methods of facilitating access to knowledge, the use of value laden texts and what must be taught are not features to which the country has exclusive claim. They simply differ according to national history and culture of others.

In a period of rapid digital evolution, technology has become more mobile, and in L2 education, particularly vocabulary acquisition, the classroom is simply the institutional environment of learning which can be supplemented anywhere, at the students' convenience. Godwin-Jones (2017, 3) describes the burgeoning capacities of the smartphone, offering "*countless apps of all kinds, many available for free or at nominal cost ... (with) ...added multiple sensors ... integrated into wider networking options, including built-in Wi-Fi, Bluetooth, and (gradually) multiple cellular options.*" Smartphone applications, suggest Deng and Trainin (2015), have a considerable influence on enhancing English vocabulary learning in promoting motivation to communicate newly acquired foreign vocabularies in various social, collaborative and cooperative virtual environments. These can be impulsive actions or pre-arranged study groups, fostering independence and interaction without the need for teacher intervention. Students

can enjoy the ownership of their learning and a certain amount of freedom and independence (Uden, 2007).

Nevertheless enthusiasm for the technological facilitation of autonomy of learning must be tempered; students are poor judges of their own performance and of the best methods of learning vocabulary (Tran and Duong, 2018). Mobile technology does indeed promote “*the active, independent management of learning...where the learner sets or attempts to control the goals, curriculum, pedagogical method, or content of the learning program*” (Rivers and Golonka, 2011, p. 255). Setting aside the role of the teacher in the preparation of curriculum based learning needs, some students do not simply have the interest or motivation to be actively involved in the planning of their own learning or self-assessment due to ‘laziness, shortage of time, an inability to complete time-consuming tasks’ (Tran and Duong, 2018, p. 5).

Knowledge, experience and indeed interest of the tutor remain essential to goal orientated progress and achievement. In the traditional Saudi higher education framework, there is little to suggest that mobile technology will empower learners to the extent that their control over how they learn will alter significantly, nor indeed do the government initiatives promote this (Vision 2030, 12). Technology is simply a support to guided, directed learning. In this study, therefore, examination is undertaken of student perceptions of *Memrise* App value with the particular focus on vocabulary acquisition, exploring the contribution it makes to autonomous and collaborative learning.

2.7 *Memrise* Application

The focus of this study is the specific value to EFL vocabulary learning of the proprietary *Memrise* App, owned by a venture capital financed private company, described as the “*enabling customers to learn new languages and increase their vocabulary*” (Pitchbook,

2018). Kent and Sherman (2013), in their study of Korean EFL students using *Memrise* in a blended learning context, found the smartphone application to be considered of more use in the support of vocabulary learning than the online platform, given its mobility for learning outside of the classroom. Researchers such as Ivić & Jakopec (2016), and Korucu and Alkan (2011) acknowledge that language educators have demonstrated increasing interest in using applications such as *Memrise* in alternative learning and social environments to enhance students experience.

Kent and Sherman (2013) however comment that the geographic and cultural context of smartphone and mobile app use in learning is a significant influence in acceptance of its use in a traditional institutional context and the skills of both educators and students can potentially limit its benefits. This is particularly pertinent to the use of *Memrise* in vocabulary acquisition in the historically conventional, authority based, teacher-led education framework of Saudi Arabian higher education.

Further, it is with an eye to the proposed revolution in education practice envisaged by the Saudi Vision 2030 initiative, and its proposed obsolescence of textbook-paper learning resources, that the *Memrise* smartphone mobile software is examined. With the introduction of *Memrise* into teaching and learning, this will enable the researcher to seek and communicate understanding of the effect of mobile, technocentric learning on the development of English vocabulary both inside the classroom and out, promoting independence and autonomy of learning.

In this examination the study of the *Memrise* App, accessed via the smartphone, in vocabulary accumulation is considered from the technocentric perspective rather than an extension of e-learning or traditional lessons. Traxler (2005, p. 262) has defined mobile learning as: "*any educational provision where the sole or dominant technologies are*

handheld or palmtop devices", but this is not an attractive viewpoint in the Saudi cultural context of traditional education. The mobile device is a tool of support for classroom learning, not a replacement for classroom instruction and formal teaching activities (Winter (2006); Sharples, 2006). It is another, different way of learning vocabulary.

Central to its value is the fact that learners can access information, learning and challenges anytime and anywhere with convenient devices that they regard as user-friendly and personal (Traxler, 2007, p. 129). The decision when to learn lies with the motivated student. It should however be seen as enabling tool rather than as a driver of learning and teaching activities, integrated and supportive to improving and expanding the learning experience and teaching methods (Brown and Mbatia, 2015).

This gives rise to a necessity to assess its value to tutors and students which forms the basis of this study into *Memrise* and its utility in vocabulary learning in EFL studies. Buckingham (2008) suggests the simplification of the subject is inherent in the technological process on which mobile learning relies, making it difficult for educators to assess progress. This concern, it is argued, has reduced in significance, given the artificial intelligence and range of feedback orientated challenges now offered by modern software apps.

The applications and technologies which enhance smartphone functions change their psychological, economic and social value. A concern must therefore be dependence on the device, already somewhat prevalent in the social sphere of modern life organisation. The smartphone can become a fundamental necessity rather than a simple tool, and this is where the role of the talented teacher-guide in the classroom becomes essential in ensuring learning is provided by a broad range of challenges to satisfy institutional and course curriculum compliance.

The *Memrise* software was developed and launched in 2010 by Professor Greg Detre a computational neuroscientist of Princeton University and Ed Cooke, according to Barry (2012, para7) ‘The Grand Master of Memory’, both world renowned experts in memory function, vocabulary and language learning (Detre and Cook, 2017). Baker (2012) quotes Ed Cook; ‘*Memrise, uses cognitive science and crowdsourced mnemonics to teach vocabulary in about 100 languages, from Catalan to Haitian Creole. Anyone can upload a word list and users can suggest new mnemonics -- called mems*’. It is a free, downloadable mobile smartphone application, with an opportunity to upgrade to access ‘Pro’ faculties upon payment of a fee. This research utilised operations of the free app, leaving the choice to upgrade later to the student. In this review of its operation, much of the detail is taken from the website, unless otherwise referenced. A search engine ‘*Memrise*’ enquiry produces

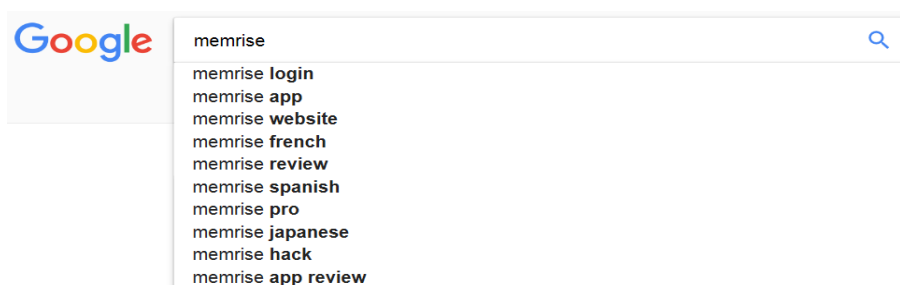


Figure 1: Google search for *Memrise*

Memrise is built upon three main scientific keys (i) elaborate encoding, placement of the vocabulary in context to aid understanding of meaning, (ii) choreographed testing, varying methods of ensuring embedding and recall to encourage engagement with the memorisation process, and (iii) and scheduled reminders. The creation of an account is commenced by clicking onto the preferred way of use, via a computer or, for the purposes of this study, the app. The mobile application is provided by both the Apple store and Google Play. The student enters a personal, distinctive username, email, and password,

or simply uses a social media or search engine account, and declares the language course, or courses, for study. The choices are comprehensive in arts, literature, history math and science, to name but a few, but it has achieved its reputation on language learning. Tutorials, available at the time of writing at <http://luczak.edu.pl/wp-content/uploads/2011/12/Memrise-tutorial.pdf>, provide a thorough guide to the use and potential of the software, downloadable for ease of access to the students' ubiquitous smartphone. It is noted, in Figure 3, that other opportunities are provided by downloading the software, particularly joining a learning group or starting ones own. This option was explained but left to individual student choice with a view to discussing its uptake in the context of value assessment and autonomous decision-making.

Searches related to memrise login

memrise sign up	memrise.com spanish
memrise login with google	how to join a group on memrise
memrise groups	memrise desktop version
www.memorise.com english	memrise groups on app

Figure 2: Google searches related to *Memrise*

Detre and Cook (2017) suggest that as a formal teaching and learning tool *Memrise* should be internet sited for direct access and examination of the extent of its use, considered in technology terms as indicative of value. Nevertheless, having gone through the search engine access path, the student or teacher will find a modern space for learning placement whether in class structured lesson format or independent activity development. The former is, in a formal educational setting, the preserve of the instructor-tutor, the latter receiving learner development input, with or in the absence of tutor direction. This space is reserved for the autonomy of the motivated student in their learning.

The website and app have relatively easy to understand instructions to operate the software to its full capacity, enabling learners to memorise through imaginative exercises multiple words and meanings, testing and self-assessing, and sharing challenges and learning to alternative environments and participants. Clear instructions facilitate the formation of learning groups, promoted by teachers or independent minded students, supplementing classroom instruction. It allows teachers create groups with their students. In the use of the App, once one ignores the somewhat personally irritating premium upgrade prompts which are not necessary for this study, other features and challenges are flashed, but these were considered extraneous to the research focus and not accepted by the author. It is a reflection of the popularity of the App, and therefor indicative of its perceived value, that it accumulated over a million subscribers in the three years from its launch; Figure (4).

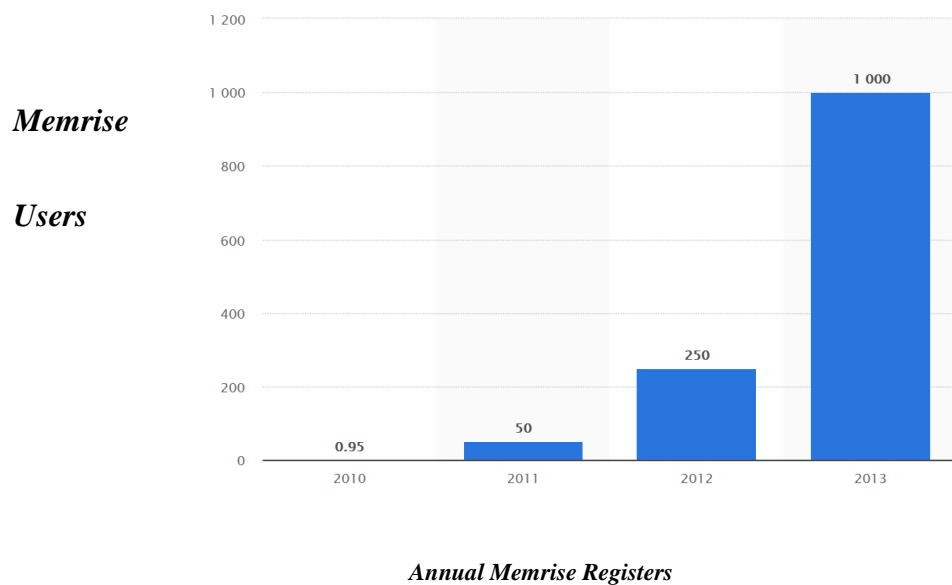


Figure 3: Number of registered learners on *Memrise* from 2010 to 2013 (in 1,000s) adopted from Statista (2017).

2.7.1 Flashcard System of Learning and Memorising Vocabulary

As an introduction to the faculties of the App, preset learning sessions of a collection of vocabulary to memorise are available for practice at different levels of challenge. The user takes control in setting the number of words, from 5 to 20, and degree of difficulty desired to test their prior knowledge.

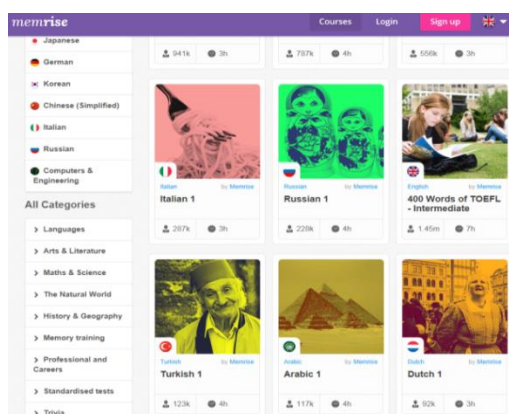


Figure 4: Flashcards used by *Memrise*

Students are enabled to create their own learning programme using a simple set of flashcards, integrated with mnemonics for contextual understanding, which they formulate to contain the information they want to learn, including meanings and definitions, either pictorially described or in their native text for ease of recognition (Luczak, 2017, p. 145). The mnemonic devices of their choosing, be they audio, visual or contextual format, help form sensory memories. The application allows students to select tests according to their preferred learning style, needs, content and duration.

Memrise aims to motivate learners intrinsically by providing them with opportunities to set individual, periodic goals, keeping track of their 'streak', their score or even how many days they have engaged with the programme and completed their goal. They may choose

an avatar to ‘accompany’ them through their tasks, which will ‘advise’ them of progress, time and who has joined them on the crowdsourced path to knowledge.

According to Ono (2017), exposing learners to a repeated words through spaced system but is a beneficial practice in that it better embeds knowledge by providing multiple exposure to the vocabulary in different mnemonic settings. The *Memrise* developers limit the number of words to prevent boredom and cognitive overload. Audio files provided in mp3 format can be downloaded and added by the lesson developer, be it the teacher or autonomously learning student, to facilitate pronunciation. Students may even record their own, thus expanding their own technology skills. It is perhaps a more interesting and engaging repetition process than that provided by the dictionary. Short video clips are made available of native English speakers, with a choice of age and gender, as phonological models, speaking the word or phrase to be memorized in its social or grammatical context.

2.7.2 Memory Schedule and Spaced Repetition System (SRS)

The Spaced Repetition System (SRS) utilised by *Memrise* is more complex version of the flashcard, providing the learner with a word on one side to be memorised, with appropriate mem aids, and its translation on the other. In 2010, the year of the launch of *Memrise*, Godwin-Jones was examining improvements in the flashcard system of intentional, planned learning commonly utilised by vocabulary learning software, and identified added value to the process provided by spaced repetition facilities which aid knowledge review and ensure embedding. The target English word is ‘flashed’, learned by repetition throughout the test and the answer recorded by, for example, typing the meaning, identifying it from a tick list or responding to an audio prompt, to facilitate scoring. In this manner, Lewis (2013) claims that SRS exploits modern technology,

replacing old school practices of vocabulary learning. It is the primary tool of self-evaluation of how well the learner recalls the words ‘flashed’ and defined at different stages of the memorisation process.

Reminders scheduled by the learner, based on their own perceptions of need for testing were incorporated into the *Memrise* programming because "*reminders are most effective when they occur just before a memory fades completely and that successive reminders should be separated by longer and longer intervals*" (Memrise, 2018). It is recognition of the value of studies some half a century before into the role of psychology in L2 learning conducted by Dr. Paul Pimsler. In his study to provide empirical evidence of his theory on the integral part played by staged reminders in vocabulary embedding he noted “*each time a memory is ‘boosted’ it retains its strength longer than the time before*” (Pimsleur, 1967, p75). The practice was developed in vocabulary learning in the decades before personal computers, but proved effective in algorithm programming of even the most unsophisticated, by modern standards, digital devices (Gorzalanczyk and Wozniak, 1985). Godwin-jones (2011) asserts that parts of the SRS process are supported with *SuperMemo* scheduler algorithms, aged but still highly effective digital technology, which require learner to evaluate how well he or she can be in remembering a specific word from 0 to 5. *Memrise* uses this feature to fulfil much of the operation requirements for the application.

Memrise provides users with feedback and testing features to evaluate their learning and build on their learning experience. Walker (2016), in his study of Latin vocabulary learners found that they enjoyed using the app, which enhanced motivation, and found it of more value to embedding their knowledge than their own self-selected methods such as note taking in lesson presentation or textbook use.

Corrective feedback was the feature which proved to be a priority in student perceptions of the software. Indeed teachers also found it of value because it facilitated more regular assessment and resolution of difficulties with command of the vocabulary and its use in communication by reason of the scoring and test answer and result retention. Problems were however evident in the ability of some students to use the app effectively particularly in posting digital assessment results for examination by their tutor.

2.7.3 Crowdsourced Vocabulary and Lessons – Interaction and Collaboration

Crowdsourcing essentially means that a collaborative and exchange approach is taken to enhance vocabulary acquisition, using contribution to a personal learning programmes from connected internet ‘colleagues’ be they teachers or fellow students. Autonomous, independent learning does not necessarily mean learning alone. Kessler (2013) notes that mobile software programmes encourage interaction, mutual participation and indeed a culture whereby students set their own rules for learning and who may be involved in their journey of knowledge. This is an advantage afforded by *Memrise*, the ability to create a bespoke collaborative learning community in which participants provide input in the way of tests, games, challenges and quizzes. Wu (2015, 46) notes the considerable potential for learning offered by this faculty, and the benefits of communication in the mutual development of an online education community; *“in this participatory culture, learning and teaching will become more and more crowdsourced since students and teachers are co-constructing the learning content and tools. Autonomous learning will be further promoted among students due to the increased sense of ownership attached to the content and tools created by them.”*

Whilst students take effective control over their learning in terms of lists, time spent, organisation and means of recall, crowdsourcing has the advantage of teacher involvement

and guidance in the programming of curriculum directed activities. These not only enhance knowledge and the planning of its acquisition, but allow the student to adapt and exchange ideas on course learning management. It will, it is suggested, enhance the learning of the individual behaviourist and interactive, contextual cognitivist, and may even activate the inherent skills of the innatist.

2.7.4 Gamification - Community Engagement

The *Memrise* features and capacities outlined allow students to formulate and develop lessons by exchange. There is little more significant in online learning community participation than active involvement rather than passive receipt of knowledge; the latter is, arguably, simply a transfer of the classroom presentation context. Gamification offers opportunities to the individual learner to test their knowledge through the spaced repetition memorisation system of *Memrise* in terms of points won for test scores, moving successful learners through levels of in-house grading and achievement such as ‘Memtor’. Hamari (2017, 469) is somewhat cautious in assessing its empirical value to learning: *“popular positive belief in the effectiveness of gamification has often been based on the anecdotal conception that because most games are ‘fun’ and intrinsically motivating, then any service that uses the same mechanics should also prove to be ‘fun’ and effective in invoking positive further behavioral outcomes.”* Denny (2013) and Domínguez *et al.* (2013) certainly identified increased motivation and usage of software activities where status awards were achieved, but, ironically, little evidence of a substantial improvement in learning results on the tests.

Crowdsourced interactivity brings in a more competitive element to the learning process, accompanied by a leaderboard which marks comparative progress of the participants in the game (Hung, 2017). Self-evaluation becomes pitched not only against personal

standards outside of the classroom, but competitively in terms of quizzes with one's peers outside of the classroom. *Memrise* has indeed sought to create a virtual classroom through community engagement efforts of students and teachers in the collection of lesson development functions facilitated by the software.

The promotional website information suggests learning with others inspires curiosity and creativity in the learning process, which results in more motivated learners and effective learning environments. This need not be classroom colleague based, but open avenues to meeting, online, other EFL students from around the world undergoing a similar course of learning. New groups are created and members recruited. Whilst guarding against the anecdotal rather than empirical conclusion that this must promote motivation, interest and involvement, new learning relationships, a pooling of resources, imagination and ability expand the breadth of vocabulary accumulation and its mnemonic use. The game context adds an extra element of competitive learning. *Memrise* facilitates this, and it just takes one user to set the scheme into effect, and it is free.

This adds to the social media 'feel' which the developers sought in the *Memrise* software, to increase its attractiveness and use, especially in the creation of a learning community. Students create personal profiles, make contact with others showing a similar interest, interact with friends and colleagues and 'follow' others to check their progress. The company has involved Facebook, Twitter and Google in its registration process for marketing and making the wider body of EFL students aware of its existence and capacities. It provides an on-site forum where learners can share ideas about learning, teaching, and their progress in the language. Staff members have created a blog where they share ideas and update users on current projects aiming to improve the software.

2.7.5 Review Sessions

Throughout the course, users are encouraged to review words that they have previously learned, enhancing personal memory skills which have been support in the individual activities by the digital SRS process. *Memrise*'s creators based their review system on cognitive science, their assertion being the brain must be challenged in recalling a word to strengthen the memory. A word should be seen often enough to challenge the memory, but not too often so it fails to do so. The *Memrise* algorithms, claim the website description, are able to determine when and how often a learner needs to review a word to store it in their long-term memory, based on time of exposure, amount of practice and repetition of success in identification (*Memrise*, 2018).

The creators posit "*by tracking when you should review and practice material, we do the hard work for you- making your learning as effortless and fun as possible*" (*Memrise*, 2018). In the course of a review session, learners are given a definition and asked to supply the correct word in the target language or listen to an audio recording of it, and be asked to type the answer. Should the word be a wrong answer, the mem previously chosen for that particular piece of vocabulary will appear, as an aide memoire, with the definition and an audio recording, and users will be asked again to supply the correct word. The success will then enable the logarithm to gauge the need and frequency of further in course testing of recognition and recall. The student is therefore able to self-assess the success of the learning strategies they have utilised in the design of their own courses and modify same to limit weaknesses therein.

2.7.6 *Memrise* – Its Value to, and Effect on, Vocabulary Learning

Memrise is a freely available smartphone application, easily accessed and downloaded incorporating an interface and digital programme which is relatively simple to navigate

and use. It is *prima facie* an ideal tool for support of learning English vocabulary in a manner which suits diverse types of learner, including those who prefer oral, visual or kinetic knowledge relayed with immediate feedback and the capacity of its presentation to be changed. Nevertheless, research on the effectiveness of *Memrise* in vocabulary is limited and thus this study is intended to add to the empirical evidence of comparative value of its novel digital operation, a supplement to the traditional presentation of knowledge in the Saudi Kingdom, rather than a replacement.

In 2017, Luczak examined the use of *Memrise* in the teaching and learning of English legal vocabulary finding on review of study plans of the student participants that those who used *Memrise* tended to score better results than those who, as an exercise of choice, did not integrate the application into their learning. The facilities of the app aided improved management of time and learning, making the student-user more aware of their learning and weaknesses, not just in vocabulary but also in their learning methods, particularly in study time planning and lexical association of the words.

The effectiveness of the use of *Memrise* was in the use of basic learning, short, simple vocabulary to create definitions (Luczak, 2017). Better utility was made of the range of faculties of the software when time was spent developing a positive attitude to investigating what could be done and how it could be used for the necessary learning. Students received considerable motivation from the feedback mechanisms which dealt not only with scoring, but itemised the numbers of words, terms and time covered in each session, and the immediate guidance for improvement and suggestions of advancement. Luczak (2017, p152) was able to conclude from this learner feedback that '*all in all, the use of Memrise proves to be very beneficial both for the users and the authors of the courses. Memrise courses can be created almost instantly with just one click and later*

the vocabulary base can serve other purposes, i.e. to generate tests and glossaries or for conducting oral examinations.' Value in the app as a teaching tool is evident from this study, although the perceptions and results have to be considered in the Saudi education context, and the environment of its use.

Classroom utility has been questioned; there are however limitations in the free software which require consideration and concern about the distraction potential of the smartphone device. Unless, for example, the user pays the fee for the Pro version of the app, there is limited opportunity to hear vocabulary in an authentic, native context in order to understand its use in communication environments. There are limits to its use in teaching and learning grammar, demonstrate the conjugations of verbs and other mnemonic and lexical sentence contexts. The lack of what Long (1991) called 'focus-on-form' means that simple knowledge of the words will not provide the learner with necessary understanding to analyse sentences for deductive learning. That is a role which must continue to fall upon the teacher.

The author-researcher has examined, used, considered and reflected upon various language apps easily accessible and downloadable without expense to the student to mobile and smartphones from the internet. Anecdotally, in his capacity as an EFL teacher at Al-Imam University in Saudi Arabia, it is clear that L2 students in their induction year struggle with English vocabulary learning and memorisation.

As part of the evaluation of the most suitable app for independent learning, respected reviewers were also studied, and the conclusion reached was that *Memrise* is the most apposite mobile digital software to utilise in an effort to ease the student burden of learning vocabulary (Librenjak *et al.*, 2016). The researcher also understands the contextual environment of learning and the values of the Saudi Arabian society in which

it occurs; sharing values with the social context, it is suggested, will enable him to exercise a more critical view of the value of *Memrise* to Saudi students.

2.8 Saudi Education: Context and Technology

It is evident from the emphasis placed on the language as a study imperative that learning English vocabulary is historically considered a central tenet of student higher education and the economic advancement of the Kingdom (Alqahtani, 2015). Al-Seghayer (2014) points out that a large number of universities have even begun to teach in English instead of Arabic, so clearly the emphasis on English learning is fundamental, not simply a symbolic option of student choice. This makes English not just a subject in which there are weekly or daily classes but a key language, without which learners cannot complete their higher education qualifications

The acquisition of vocabulary and its lexical utility has proved difficult for Saudi L2 in achieving coherent communication proficiency and confidence, despite the innatist belief that some are already pre-programmed by their knowledge of Arabic. Government initiatives on teaching practices have sought 'to take the lead in the transition to a knowledge-based economy and to take a globally prominent position' via its Aafaq programme, launched 1 April 2006, propounding the importance and implementation of technology to the classroom (Ministry of Education, 2018).

This has required a substantial change in teaching practice of lecture presentation in the higher education environment, and greater attention from the instructors to the individual capacities of their learners. Alqahtani (2015) suggests that before presenting the meaning or form of words, a lexical mnemonic practice which is essentially the next stage of language learning, teachers must have more awareness of the basic type and purpose of the vocabulary. This requires developing new skills of determining student ability, level

of learning attained and capacity, style and techniques they employ to learn (Alqahtani, 2015, p. 31).

This is not a simple change of attitude challenge for teachers, especially given the cultural principles of the Kingdom and their social and working environments (Alfahadi, 2012). Alfahadi (2012) points out that even the use of standard text and course books has caused concern amongst practitioners, given they are imported, and written in western, English speaking countries with their divergent cultural and value contexts. It is a relatively uncomplicated process to lecture-present knowledge, and even classroom based computers and software can be programmed to facilitate value learning without substantially affecting its quality. Alfahadi (2012), however, further considers compatibility issues of traditional values and the independence of access to, and autonomy of, learning afforded by mobile devices. Cultural reflection is potentially compromised by the use of mobile, smartphone devices, utilising standard western software programmes. This invites resistance to their use as formal educational equipment, a challenge to global participation and national economic need, met by strong and vibrant distinctive values.

The Saudi social, faith and therefore education culture is predicated on gender segregation, profoundly different from western practice, and this has considerable influence on the geo-political impact on attitudes and norms of social media use (Baker et al., 2007). In this context, difficulties are evident when designing a research programme to examine technology use in EFL learning among young university students.

Account is taken of the views of teaching professionals of the social and educational value of incorporating mobile technology into formal learning programmes.

Almutairy et al. (2015) found in their study of student perspectives that mobile learning provided unique opportunities to enhance learning even in the classroom environment, indicating positive improvement in the development of study skills and knowledge acquisition.

Alfarani (2015) in her study of attitudes and viewpoints of female teachers suggested that whilst benefits are identifiable, the Saudi higher educational framework contained cultural obstacles to technological, institutional, pedagogical and individual obstacles to change.

Al-Fahad (2009) studied the perceptions of 186 female undergraduates at King Saud University to seek insight into what students want from their education provision; the overwhelming view was that, in terms of vocabulary learning and retention, undergraduates found their familiar mobile devices invaluable.

Similar enthusiasm was expressed by the students in Nassuora's (2013) quantitative study which explored the extent to which 80 university students accept the use of mobiles for learning in Saudi Arabia.

Attention is further drawn to the more recent examination of specific mobile software programmes conducted by Rahman (2016) to consider classroom use of 'Viber' and 'Telegram' in vocabulary learning. Students indicated greater levels of motivation and enthusiasm for their teacher set tasks, but also a flexibility with their exploration of new vocabulary and language contexts, perhaps somewhat to the expense of the repetition process deemed essential to retention, but nevertheless productive in expanding knowledge.

It remains unclear how the Vision 2030 initiative will alleviate the entrenched resistance to change in a fundamentally strong societal and faith culture to facilitate mobile learning

in the higher education context. Research suggests failure to alter attitudes will lead to a loss of opportunity.

2.8.1 Mobile Phones in EFL Context in the Middle East

Motiwalla (2007), and Thornton and Houser (2005) argue that mobile applications have considerable effectiveness in utility for learning vocabulary and other language development activities as a result of the diverse range of tests, activities and graded levels offered in their programming. They are practical and accessible and always available in the language learning context, unrestricted by time and place. Students need little encouragement to use the mobile or smartphone in their social activities or indeed in the organisation of their lives and occupation of their leisure time. The initial enquiry must therefore be regarding their attitudes to it becoming a learning instrument, utilised in the sphere of their education. This was the basic finding of the study of Kuwaiti EFL students at the College of Basic Education undertaken by Dashti and Aldashti (2015), indicating that a high percentage of study participants were indeed keen to use their ever-present mobile phones to enhance their vocabulary and grammar learning.

The caveats in the sense of perception of value were personal circumstances and attributes; age, intelligence, anxiety, motivation and understanding are significant factors influencing learner ability to use the technology in this context (Al-Emran *et al.*, 2016). In Saudi Arabia, Ahmed (2017) highlighted the importance of learner attitude variable on the value of the smartphone in their vocabulary and language learning. In what is arguably a reflection of the dominant expectation of how education should be provided, they indicated a dependence on EFL teachers to develop effective learning strategies to present to their students. This in turn required a new personal attitude on the part of the tutor to

the provision of teaching instruction. This being achieved, there was much positivity in considering the smartphone a valuable tool of EFL learning.

Cavus and Ibrahim (2009) studied the views of educators and learners on the use of smartphone devices and technologies in five academic institutions in Oman and the United Arab Emirates. Most participants had positive attitudes and enthusiasm for the use of their mobile phones in learning and teaching, the study found no significant differences in terms of the influence of variables such as gender, major and level of study. As in the Kuwaiti study of Dashti and Aldashti (2015), the influencing factors were identified as student age, mobile ownership, and nationality, most enthusiasm being shown by younger adult learners. Integration of mobile phones in a higher education context for teaching and learning languages was considered apposite and beneficial by both students and teachers for use inside and out of the classroom.

In Morocco, Omari et al. (2017) researched the views of undergraduate EFL students, again finding a high level of positivity for the use of their mobile technology in learning, but identified no evidence that such attitudes were influenced by gender, age, or level of education. There is an unease, anecdotally in this author's experience amongst teachers, that the formal permission to use the smartphone may result in diversion from learning activities onto social networking by young people. Omari however found that those who engaged in such activities as checking their email accounts actually had better attitudes towards learning English.

Some concerns were expressed by participants about the operating system and network used during the research, variables which might undermine ease of use. Applications must provide immediate feedback with a user-friendly design and interface of the app. Omari

and his team (2017) suggest this can be taken into consideration when producing a new generation of mobile phones and software.

A major motivating factor for students encouraging the introduction of another method of learning and accessing vocabulary activities relates not so much to the principle of its use in the classroom but a personal understanding of the importance of learning English and its significance to their future economic prospects (Omari et al, 2017). Warschauer (2001, p201), for example, had determined that online learning activities “*are generally quite motivating for language learners, in part because learners feel they are gaining technical skills which will prove beneficial in the future*”. This encourages positivity of attitude to the smartphone utility as an additional tool of learning. This has a powerful resonance in the Saudi Arabian historical, political and commercial context.

2.8.2 Mobile Learning in the Lifelong Context in Saudi Higher Education

Although the focus of this study is on university learning under the Vision 2030 initiative, sight must not be lost on the value of mobile learning in other areas of education. Vocabulary and language must be nurtured and used in order to grow. Setting up the highly innovative Saudi Electronic University (SEU) in 2011 under its National Transformation Programme (NTP) for 2020, it aims to tackle higher education provision needs to a large diverse country of widely dispersed learners (Oxford Business Group, 2015). The distance programme of course provision has been adopted by other universities, recognising that knowledge acquisition and personal development are not reliant on fixed time and institutions, practiced outside the classroom setting throughout a person’s life (Laal, 2011).

Life is acknowledged as a learning experience, and in the EFL context, vocabulary is acquired by use, interaction and the environment, a process of informal, independent

accumulation of knowledge, even without conscious effort. Elsafi (2018) suggests this is more common amongst adults than younger learners, the former tending to have commitments which cannot be met by travel and time expenditure to accommodate learning needs.

Herein lies the necessity for new ways of learning and a reconsideration of the value of mobile technology and apps; “*we now need a theory for the digital age to guide the development of learning materials for the networked world*” (Siemens, 2004, p. 18). In the context of learning theories outlined above, it is arguable that traditional philosophies of behaviourism, cognitivism, innatism et al do not provide a satisfactory explanation for the cognitive needs of new, alternative learning experiences. ‘*Connectivism*’ has been considered, but it is argued that young adult learners must be adaptable in developing use of a variety of strategies which suit the way they think and learn. Distance and e-learning courses are broadly similar to those provided in the institutional setting. The use of technology and the smartphone is simply a facilitator, albeit more novel and innovative in its option choices for learning. The student needs not seek adaptation in the psychological process of learning, just the method.

2.8.3 Mobile Phones in the Formal Learning and Teaching Context: Challenges

The ubiquity of mobile devices in modern society needs little research, simply observation. They are considered essential to the organisation of modern living. Nevertheless Common Sense Media (2009) suggest that mobile phones should be banned from the classroom because they are disruptive to education. Simply being a hand-held, easily carried, always accessible source of information does not make them a more effective teaching tool than lectures, dictionaries and text books (Runnels and Griffiths, 2013). They lack a basic education function of noting learning and ease of access to

teacher oversight and review of progress. This has been tried with compatible phone hardware.

Chartrand (2016) considered the value of ‘*note-taking*’ devices, but found

“One of the main problems was that it used handwriting recognition as the main method of text input but it was highly ineffective. The character recognition problems were initially so severe that it contributed to the unpopular image of the device and even though the software substantially improved, it was not enough to keep the device alive”. (p.2)

Less advanced features offer less capacity, and thus may not survive in the market as more progressive apps provide greater complexity. Being smart, good looking and up-to-date may make the phone attractive, but does not necessarily make it useful.

Their interactive features add to the authenticity and focus of the vocabulary learning process and student autonomy (Smeets et al., 2004). Maharaj (2017), however, perhaps reflecting the views of EFL students, is more wary of the enthusiasm which lies in the promotion of smartphone vocabulary learning, particularly when the software adopts a dictionary format of memorising and explanation. Clarification remains necessary in vocabulary learning, which he argues cannot be achieved through the current limitations of the smartphone app. The teacher remains integral to the avoidance of the transfer of misunderstandings.

Teachers nevertheless became more amenable to the use of smartphone language apps where value to learning and engagement in the activity process was detected (Thomas and O’Bannon, 2013). The main concern, after the potential disruption and ease of attention diversion, was ensuring students all had access to the same app and were using it in the same way to facilitate the effective use of class time in learning. Wang and Higgins (2005) nearly a decade earlier had pointed out that the benefits of the mobile can

only be gained if the user has access to the internet, whether in class or out, device and software were of sufficient quality for the work and the students possessing of appropriate technological skills.

These potential problems had been alleviated in subsequent years, but adjustments will always be required in accessibility, quality and skills accumulation in a mass education exercise of instruction and learning. Nevertheless, Klopfer, Squire and Jenkins (2002) aver that different benefits accrue to teachers and students, many of which have been outlined above, including integrated online communities of learning and instruction outside of the classroom environment. Portability, social interactivity, context sensitivity and individuality of use add to the ability to access them for teaching and learning at any time and from anywhere (Derakhshan and Kaivanpanah, 2011; Sandberg, Maris and De Geus, 2011).

Seliaman and Al-Turki (2012) identify a related challenge, one of student motivation to use the devices they consider essentially social in a learning context. They do not challenge the inherent worth of the device as a teaching and learning aid, but do have concerns about learner perceptions of its primary value and whether this includes an education role.

Thomas and O'Bannon (2013) note mobile phone devices were banned from the classroom in USA schools until recently, believed to be disruptive to learning and teaching. If ease of communication is considered an expression of freedom and autonomy, there is an inherent risk of students diverting attention to other, covert activities which leads to loss of engagement and opportunity to learn. Their increasing pervasiveness and potential for learning have motivated some schools and teachers to re-evaluate the ban and consider the benefits associated with allowing phones in the classroom.

Van Praag and Sanchez (2015) examined educators' beliefs and rationales for the value attributed to the use of mobile phones in a second language classroom, concluding that they perceive the classroom as a complex, isolated context. They may have identifiable worth to individuals in their informal learning time, but in the formal setting of a classroom are viewed as a nuisance and distraction. Self-control, or the lack thereof, in the permissible use tends to encourage diversion into recreational activity, which is what they perceive the phones to be for (Lui *et al.*, 2014).

Campbell (2006) identifies the simple irritations for teachers which relate to less covert misuse, the ringing and inevitable excuse of forgetting to switch it off. The issue is teacher control, and through that, the preserving of engagement in learning. The classroom does not provide the ideal context in which to use mobile phones in learning. There are too many problematic variables, from simple ringing, through cheating to diversion of attention and argumentative distractions from learning. Mobiles are seen as devices that are used to communicate socially, respond to emails and share status in social media.

Ottenbreit-Leftwich *et al.* (2010) assert teachers can only allow the use of mobiles in the classroom if they are convinced that their use considerably promotes efficiency and effectiveness of learning, motivates students to engage and interact, and develop critical thinking skills. It is essentially a risk-reward assessment.

This study has effectively eschewed the smartphone as a classroom tool; it is viewed herein as an external class learning support. Other researchers may wish to further examine this option.

There is the financial issue to consider, a differentiation between students of what they can afford by way of mobile technology which is constantly changing and developing, potentially a source of some conflict (Cavus, 2011). Anecdotally, the iPhone marketing

machine is adept at telling the youth of the world they must update their devices on an annual basis or miss out. Patten et al. (2006) however suggest that educators need to think beyond the financial challenge and focus on teaching and learning considerations before financial, logistical or technical concerns. This is perhaps a sustainable argument, but impracticable in terms of promoting learning needs. There is a sense of inevitability however to the introduction of mobile smartphone technology to classroom and individual learning.

Korucu and Alkan (2011) argue that despite the challenges of use, the expense of purchase, or indeed a plethora of unidentified or new factor that inhibit educator enthusiasm and use, they will be adopted, sooner or later. This does not help teachers make the apposite decisions on classroom use, ban or limitation. Nor do Korucu and Alkan (2011) provide guidance for overcoming student self-control issues. The problems militate against classroom use, but there is unquestionable value in individual utility for independent learning, albeit with teacher guidance, in a context of supervisory oversight to ensure accuracy. This is the arena for technological interaction. It is therefore pertinent to consider the cultural contextual of mobile technology as a challenge to its perceived value in the decision-making process of how its use is most appropriately effected.

In the development of plans for this study, much reflection was undertaken on the Saudi cultural context of placing mobile technology into an historically traditional framework of teaching, even where government sponsored change was in progress. Indeed Wei and Kolko (2005) assert that researchers wishing to study the use of mobile phones in education need to consider the societal context, including complex interrelated issues of culture, social acceptability, politics and economics.

This study aims to provide evidence-based information about the perceived role of mobile devices in the Saudi EFL learning context, where traditional expectations, of both teachers and students, are that vocabulary knowledge requirements emanate from the tutor-provider and memorised by rote from textbooks for tests. This is considered a major challenge to be met by the *Memrise* App, from overt infrastructural technical obstacles, lack of teacher-learner skills and training to the covert, culture, religion and society (Al-Kahtani, 2004). It is the covert factors which require educators, business and governmental stakeholders in learning outcomes which will guide acceptance or bar, and so empirical research evidence is a fundamental need, of considerably more importance than anecdote and belief. The Saudi Ministry of Education is proactive in the introduction of technology; it is not sufficient to simply try to tie the smartphone into that drive.

2.9 Conclusion

The focus of this research is on the use of smartphone application *Memrise* as a support to vocabulary learning, and the development of autonomy of learning in the faith traditions of lecture based, teacher provided learning in Saudi Arabian higher education, where considerable emphasis is placed on the importance of the English vocabulary and learning.

There is a concern that the increase of learner autonomy will dilute traditional societal cohesion; it is not appropriate to write this off as an inevitability of technological advancement. Every nation is based on values, be they secular or religious and culture need not be undermined for what is essentially the quest for commercial success. Nor should the education system inhibit individual, personal development; faith must be placed in the ambitious learner to follow the path he or she determines to be appropriate.

It does not undermine research which suggests interaction is a necessary component for learners to develop productive skills (Gass, Behney and Plonsky, 2013).

The rapid involvement of digital technologies in learning and teaching EFL has attracted and motivated researchers to examine the extent to which the use of such devices may support the teaching and learning context. The response has been some enthusiasm tempered with classroom suitability concerns, technical difficulties with the software and digital skills of students. This last consideration is somewhat surprising given how much time young adults spend engaged socially and in gaming on their smartphone devices. *Memrise* is essentially an expansion of both of those capacities into the realm of preparing for a successful economic future.

There are of course more covert, less visible obstacles to the independence of learning offered by the mobile app in Saudi Arabia, a traditional, faith based society with strong values of expected conduct, not least the segregation of genders in the education framework and freedom communications between them. Words carry meanings and implications. The use of a mobile app undermines social control over the content of learning English. The role played by *Memrise* may be envisaged by the developers as an all-round, available to all support for learning in the development of student communities, online, and on the same path to knowledge enhancement.

The cultural environment of learning adds complication to this scenario. Nevertheless, permission having been given by the appropriate education authorities in the Kingdom, this study will fill a gap in empirical research on the changes sponsored by the government, to ascertain the role the smartphone may play in promoting vocabulary learning. This Literature Review has been of considerable value to the researcher, highlighting the inherent learning utility of the *Memrise* app and its use in the traditional

education framework of Saudi teaching practices. It has further developed a more focused perception of the prospective role of mobile apps in education. Modification of the aims and objectives has been undertaken as a result of the greater knowledge attained from previous academic studies.

3 Methodology Chapter

3.1 Introduction

The following section will review a range of research philosophies, the ways data is gathered, analysed and used, with a view to explaining how this work contributes to the progress and improvement of language education in Saudi Arabia, particularly through the utilisation of mobile phone technology and the *Memrise* application (the App). It will focus on the method and justification for the qualitative and quantitative collection and evaluation of data to examine and clarify the proposed hypothesis of the study to seek to answer the questions raised in the aims and objectives of the research. To reiterate, the primary aim is to investigate the role of the smartphone application ‘*Memrise*’ in supporting the learning of academic vocabulary and in the achievement thereof the objectives are to

- i) To identify vocabulary learning strategies that Saudi L2 students use to learn English Vocabulary.
- ii) To investigate the role played by smartphone app *Memrise* in supporting vocabulary learning in English.
- iii) To explore students’ performance in vocabulary retention in post-test with and without the use of *Memrise*
- iv) To understand learners’ attitudes and motivation toward using smartphone applications for vocabulary learning and educational purposes in general.

The context for the study is the Imam University in Saudi Arabia. Account will be taken of the introduction of the app into a traditional, teacher-led educational framework through the examination of the value of the smartphone software as a complementary tool

to the promotion of more independent learning. These include investigation of the qualitative reflections and attitudes of students to mobile learning using the hardware technology of smartphones to access a specific software learning application (app). The purpose of the App is vocabulary development and enhancement to promote Arabic to English learning, competence in the latter being an essential skill in employment opportunities in the Kingdom.

A flexible research strategy has been adopted for data collection and analysis process in this research, given a range of differentials to be discussed and the fact that institutional restrictions were placed on the choice of participants. It is expected that this will facilitate a broader understanding of the use of *Memrise* mobile learning. This will enable consideration to be given to proposals for other associated institutional teaching measures which will need to be taken to develop its full value from the perspective of vocabulary learning. Much of the cogency of the findings also depends on frank disclosure from the students who were involved, particularly those randomly chosen for post App use interview. It is therefore essential to the acceptance of the results of the research that a full, clear explanation is given of the philosophical and contextual basis chosen to examine the value of the *Memrise* App, accessed via the smartphone, to the promotion of independent vocabulary learning and student development.

The focus is on smartphones rather than desktop or laptop computers, or indeed pads, because the use of the same is all pervasive in modern society. Anecdotally, and from the author's observation, it certainly appears from the near constant presence of the device in the hands of young people that they find it hard to live without one. The methodology has to be designed to evaluate their use for learning both in and outside of a classroom setting, and this examination of use is expected to assist evaluation of independent learning

motivation and strategies. Thereafter the methods use in the research will be discussed in the context of the methodology theories.

It is important at this stage to differentiate between methodology, the philosophy of choices in the way the research is conducted and the methods, how the theory is put into practice. Research methodology, notes Achari (2014, p. 19), is differentiated from research methods, the latter essentially being the instruments and techniques used in data and information gathering and its analysis; the methodology is the systematic, scientific and philosophical principles underlying the appropriateness of method choices.

McGregor and Murnane (2010) also differentiate 'method', namely the mechanism of data collection, from 'methodology', the latter they argue which is the philosophical basis of the research impacting on the conclusions drawn in critical analysis of the information. The researcher seeks herein to avoid such potential confusion, simply made, through the particular care and reflection on the separation of practice from philosophy.

With that in mind, the initial objective of the formulation of the study methodology has therefore been to identify the most effective and persuasive process of collecting and analysing data in a manner most appropriate to the investigation. Considerable caution has therefore been taken in this study task to analyse method options and techniques, in the knowledge that each has comparative flaws which the author will seek to overcome. Blaikie (2010, 14) argues that researchers tend not to sufficiently appreciate the value of particular methods of presentation of substantive research, stressing the need for a structured approach, adopted herein, to the elements of methodology, strategy and design. Theory and practice must coalesce to direct the research and enhance credibility. It is a relatively new area of research, particularly in the Saudi context, and it is hoped that the results will facilitate a change in higher education practice in disciplines beyond the

parameters of this language topic. It is with this broader application of the study in mind that the methodological principles embrace practices used in the mixed quantitative-qualitative research approaches as most appropriate to achievement of the aims. It is therefore important to discuss and explain the theoretical and philosophical process toward the methods of data collection and analysis utilised.

3.2 The Approach to Research Philosophy and Theory

This study must commence with some basic presumptions on the personal nature of learning for each individual student, before it can assess the value of software to its promotion. This work is to specifically examine the attributes of the *Memrise* App in the promotion of English vocabulary learning as a foreign language and its value to student development. It will examine the student perception of its use as a learning support tool and ascertain how it affects their retention and test scores. The Saudi context of the study is relevant and indeed important given the traditional teacher led education framework and the need to encourage more independent learning arising from of the government initiatives which support technological development in the Kingdom and enhance employment prospects.

The value of this method of learning and its adoption by institutions and students is therefore necessarily dependent on learner perception as well as on results production from App use outside of the formal environment. It is thus necessary to consider the methodological approaches available to researchers to explain decisions on the design of this study. It is beyond the remit and limitations of this research to examine in detail student personality, ways of information assimilation, technological expertise and independent learning inclinations. Academic studies, such as those undertaken by

Hassanzadeh *et al* (2012) and Chao *et al* (2016) provide valuable insights into such motivations.

3.3 Research Paradigm: Overview and Appropriate Philosophy

The paradigm, in its broadest terms, is a process for the conduct of a study examination widely accepted by “*worldviews and belief systems that guide researchers*” (Teddlie and Tashakkori, 2009, p. 17). Academics consider there to be three principal, academically accepted types of research model paradigms which guide the fundamental basis of the conduct of research: (i) quantitative, a positivist paradigm predicated on objectivity of data gathering, somewhat replaced by more critical post-positivist thought which recognises complete researcher and participant detachment is not achievable; (ii) qualitative, understanding that information is “*value laden*”, subject to interpretation and, difficult to reach a definitive cause and effect conclusion, and (iii) mixed methods, essentially seeking to reach evidence based conclusions by coalescing techniques of information gathering which allow for bias to be limited and checked (Houser, 2015, pp. 102–103).

The quantitative and qualitative determination of real and interpretive paradigms, which give rise to the adoption of the applied methodological theories apposite to this study, are those which traditionally employed in social science research to facilitate understanding of data gathered on the subject of research where human subjects are questioned and tested. Quantitative research involves a numerical representation and manipulation of observations for the purpose of both describing and explaining phenomena, a replicable process which will produce similar results across different bodies of subjects (Rasinger, 2013, p. 27). Variables which are taken account of might include financial constraints, software availability and access to app functions as well as personal attributes of learners

such as motivation (Alrabai, 2014). These cannot be measured within the institutional limitations of this study, but will be commented upon as potentially significant where appropriate.

By contrast, qualitative research uses a broader data collection methodology of text, opinions, images and impressions, seeking understanding of a phenomenon without necessarily seeking a definable truth or hypothesis (Guest, *et al.*, 2013, p. 3). It gives emphasis to processes and meanings which cannot be, rigorously examined or measured in terms of their quantity or frequency in contrast to quantitative principles which seek reconciliation of variables in behaviour to explain a defined process or action (Bryman and Bell, 2015). In this study, much emphasis is based on *Memrise* application as a tool to support vocabulary learning and attitudes of the major stakeholder, namely the students, in the results analysis. It is they who will be evaluating through use, both in the course of the study and generally in their education, the utility of the software to their learning. Variable such as time available and test outcomes have some degree of measurability, but this is less possible in terms of motivation and inclination, especially in the context of the variation in use of the faculties of the app. Assumptions can be made on the basis of the findings of measurable variables, such as particular methods of app use, but caution has to be exercised in attributing these to the more amorphous factors of degrees of independence and motivation exercised.

Newman and Benz (1998) suggest that the purpose of quantitative research is the search for statistical patterns through which social and behavioural variable can be measured and explained. This, in its purest form, it is suggested, is of limited value to this study which is dependent on understanding from the data relevant findings on learning behaviours and value perception in the use of a relatively new kind of software technology. There is little

argument that the statistical collection of data is considered essential to the conduct of this study, but rather than being for the purpose of establishing a positivist ‘truth’, it is married to the qualitative principles of sampling and measurement of less tangible but no less important behaviours.

The quantitative approach of deductive testing of relationships between variables, such as app use, time, motivations and the personality traits of learners, will assist in the provision of evidence to determine app value without the need for a pre-specified hypothesis (Newman and Benz, 1998). The introduction of technology into learning methods, particularly the mobile software app, appears a beneficial development, but its value must be proved, especially when the innovation has to overcome traditional and cultural resistance; “*the evolution must be systemic, consistent, and scalable*”, involving students, teachers, institutions and government (Serdyukov, 2017). As such, the utility of mixing the two basic traditional methods of research and the philosophies underlying the procedures add qualitative perceptions and views to quantitative proof of change, in the context of this study, of the student stakeholder.

The methods are devised and actioned in a manner appropriate to the different stages of seeking to achieve the study goals, the quantitative approach at stage one for the purposes of induction, qualitative to mine data from learner perspectives in value of the app, motivation and attitudes that are not directly observable or which are “*in someone else’s mind*” (Patton, 2015, p. 341). It is to be noted that whilst seeking evidence of the use of the app in the improvement of independent vocabulary learning and enhancement of achievement, traditional classroom learning practices will continue by both designated app users and the control group during the study period. As such, it is a variable in the data collection method which if practically unmeasurable within the parameters of the

research, but must be kept in mind and accounted for in reaching conclusions on the value of the smartphone app.

3.3.1 Development of Positivist to Post-Positivist Theory

It is important to understand the use of a broadly post-positivist approach taken on both quantitative and qualitative data collection given which impacts significantly upon the way in which the research question and aims are investigated (Remenyi, *et al.*, 1998). The positivist approach in its purest form tends to seek broad trends and correlations in social behaviour from quantitative data which can generally only be collected in large scale studies which is beyond the financial and time constraints of this research. Its determination of rule based conclusions is at odds with the more individual approach to explanations of behaviour. Whilst it “*lacks the capacity for self-reflection and cultural production*” which is inherent in this examination, in assessment of qualitative data it enables “*a relatively commonsensical and realist approach to ontological and epistemological approaches*” (Prasad, 2017, p. 2).

Herein lies a potential conflict of pure positive realism with interpretism. This is the reason the post-positivist approach is preferable. Bryman (2012), for example, argues that according to the interpretivist paradigm, there can be no one real truth in a world built upon different social perspectives and meanings, social constructed and fluid, lacking, arguably, objective examination.

In the context of this study, it is acknowledged that technological change has considerable capacity to alter attitudes, motivations and indeed learning ability and success. This does not undermine the post-positivist paradigm which is favoured as a basis for this assessment. Research in the natural sciences, for example is underpinned by the belief that “*there exists a single, objective reality or ‘truth’ which can be discovered by scientific*

investigation” (Gilbert and Stoneman, 2015, p. 33). It is not, upon reflection, a strong basis for the consideration of social and educational change, given that the concept of ‘truth’ is essentially subjective, even in the interpretation of objective evidence by persons of differing social and political perspectives. That ‘truth’ may be considered indefinable, constructed by individuals through their experiences and perspectives of what is changing in their social world. It is on this basis that the post-positivist view is taken herein on the matters of information collection and analysis.

3.3.2 Epistemological Approach

Epistemology is described as “*the characteristics, the principles, the assumptions that guide the process of knowing ...*”, a way of determining what knowledge is achieved of the outcome examined by a study (Gialdino, 2009, p. 4) The theory and quest for understanding of this research is the investigation of the scope and validity of the *Memrise* software App in its contribution to the promotion of independent vocabulary learning. Education is a continuous process which is not simply dependent on classroom, teacher-led instruction (Ismail, *et al.*, 2016), but improved, it is suggested by the use of technological software of even the most basic mobile app manifestation of artificially intelligent programmes which provide immediacy of feedback.

This essentially answers the philosophical imperative of epistemology, defined by Marsh and Furlong (2018, p. 18) as a “*view of what we can know about the world and how we can know it*”. Simply expressed, it is how knowledge is attained of the relationship, in this context, of the value of *Memrise* toward improvement of the student independent formative learning framework. It is arguably a basis of evaluation indicative of a positivist contextual approach to the design of the study in order to meet the paradigm requirements of identifying “*a set of assumptions, concepts, values, and practices that constitute a way*

of viewing reality.”(McGregor and Murnane, 2010, p. 421). The data search in this study is based on the experience of the students in the use of the *Memrise* application to identify causal explanations, where outcomes of analysis permit, which are indicative of improved learning experiences, whether through formative accumulation of vocabulary or summative test benefits in results.

The student explanation of experiences with *Memrise* and their own evaluations are both observable and enable conclusions to be reached on the value of *Memrise* to learning and enable assumptions to be made by the researcher based on generalisations which arise amongst the test body of participants. This is essential to a determination of the viability of the introduction of this method of learning as an attractive option to increase the learners’ vocabulary bank, competence and confidence, should the results permit such findings.

The nature of the study reflects an epistemological realist approach to awareness of how *Memrise* works for the student in vocabulary improvement through perceptions and results, and what elements of its use can be improved (Gill and Johnson, 2010, p. 242). There is necessarily a high degree of learner input dependence required in the study methods, to meet the primary aim of value assessment of *Memrise*, based on their own, qualitative based personal assessment and perception, although this will be compared to an evaluation of the actual results of use in the quantitative examination. This is the reasoning behind consideration of the questionnaire process, which satisfies these requirements in ascertaining a broad view of student awareness and knowledge.

Education must set parameters, an accepted government and institutionally approved set of standards for graded achievement. Although there can be a tendency on the part of the

researcher to advance quantitative interpretations of qualitative feedback from learners, this author is conscious of the potential therein for bias.

There is no financial stake in the success of the *Memrise* App and the only concern of the study is its value to vocabulary learning, formative assessment and continuing training and the promotion of student autonomy, self-learning and summative success. Academic credibility lies in the ability of the researcher maintain objectivity in the interpretive “*understanding*” process of examining the meaning of data (Kasi, 2009, p. 95). Epistemological reality sees the research process as the search for evidence of what is perceived by students to actually work for them in the use of a relatively simple to operate mobile app, capable of being accessed anywhere, anytime the learner wishes to independently learn.

3.3.3 Ontology, Realism and Relativism

The perspective of realist research ontology is a search for a ‘positive truth’ from the data, which herein would facilitate a definitive conclusion on the value of the *Memrise* mobile app as part of the structure of English language learning in Saudi Arabia. It is differentiated from the relativist approach, a fluid, individual ‘reality’, which would undermine an assessment of app value applicable in a broad classroom and institutional setting (Killam, 2013, pp. 16–17). There is little value in a broad introduction of a mode of general learning practice where there is no clear indication from the evidence of inherent benefit to all motivated learners. In the collection of data in this study, note has been taken of the need for evaluation of the quality of mobile app learning to the student, the quantitative results thereof, and the qualitative feedback.

In this theoretical context, three methods identified by Johnson and Christensen (2017, 33) are considered pertinent to this study;

- i. Quantitative research relying principally on the collection of numerical data.
- ii. Qualitative, non-numerical data, for example opinions and feedback.
- iii. Mixed methods, relating to the comparison of student reaction with performance.

This has the potential to integrate realist and relativist ontologies, initially attractive as all-embracing and comprehensive, but poses a risk to evaluation of the mobile app as a standard education and learning tool.

Klenke (2016) points out that in the collection of qualitative data, much of the credibility of analysis depends on the objectivity and reliability of the researcher in the conduct of the study, from the development of the research problem through methods of investigation and evaluation of results. Described as features of the positivist paradigm, it further stresses “*validity, generalisability, replicability and falsifiability*” in the methodology of the research (Klenke, 2016, p. 13).

The positivist approach proposes that a scientific method of data gathering and evaluation is the only way to establish objective reality closely associated with the philosophy of realism; “*if something exists, it exists in quantity and can be measured*” (Chilisa and Preece, 2005, pp. 23–24). This reflects the ontological approach of this study in terms of analysis and explanation of the qualitative elements of the research.

The author takes the view that the external regulatory framework of higher education assessment supports the existence of a reality which can be examined independently of personal beliefs (Rachel, *et al.*, 2013). Education environments are essentially ‘*social world(s) governed by normative expectations and shared understandings*’ and the role of mobile app software must be tested in that context to establish if it fulfils a worthwhile role (Rachel, *et al.*, 2013, p. 24).

3.4 Scientific Approach to Research and Analysis – Discussion and Assessment

A scientific approach seeks to provide “*explanations of educational activities and behaviours*” (Scott, 2002, p. 83). Critical analysis of quantitative data and academic qualitative knowledge dominates the method, aimed at a thorough insight into the issues investigated in order to deliver coherent conclusions, and truths, thus reducing the tendency to “*speculate*” (Krishnaswamy, Sivakumar and Mathirajan, 2009, p. 6). It is differentiated from the

- 1) utopian, seeking ‘ideal explanations’ from research data,
- 2) deliberative, a practical theory judged favourably only where it leads to improvement in educational practice and
- 3) evaluative, somewhat static in the contextual justification of existing practices (Scott, 2002, p. 84).

It is the third of these features which provide the basis for this study, given that the quality of empirical data is variable in the context of the different motivations, personalities and preferred methods of learning of the subjects. The research is also limited by time and expense, and the academic parameters of the thesis specification. This does not undermine the importance or credibility of the results, but is simply indicative of the reflection necessary to provide cogency and credibility to the results.

The scientific discourse on methodology and techniques of data collection and analysis seeks to satisfy the objectivity requirements of research as it is to command respect from government, institutional and student stakeholders in the utility of mobile technology as a fundamental basis of new ways of independent vocabulary learning (Bracken, 2010). It will more effectively facilitate evaluation of results in the context of a proposed

implementation of an alternative method of student pedagogy and formative assessment of progress. As a result, the philosophies outlined will draw together the mix of quantitative and qualitative data from the investigation into a framework which credibly examines the operation and value of the *Memrise* mobile App which envisages a more student-centred, adaptive process of readily accessible learning.

In order for the study to achieve broadly accepted academic respect, not only for the specific EFL course but more generally, it is noted that May (2011) states that on the subject of research philosophy “*there are not only different perspectives on a given phenomenon, but also alternative methods of gathering information and analysing the resultant data*” (p.8).

The decisions made on the utility of philosophy and practice, Cohen *et al.*, (2018) suggest, has the prerequisite that a researcher needs to understand the world around him or her, how this world is viewed by participants and “*what we take understanding to be and what we see as the purpose of understanding*” (p. 8).

Howe (1988) warns that the real challenge of any research study is to select the research design that not only responds to inquiry but where the design avoids assertions of the incompatibility between philosophical theories and conduct methods.

This carries the risk of disjunctive information collection and assessment methods which undermine the cogency of conclusions; it is necessary therefore to know “*how the research was conducted and what philosophical assumptions underpin the research*” (Quinlan and Zikmund, 2015, p. 177).

The development of the choice of research paradigm as outlined herein is to ensure credibility and trust in the nature of this study, and avoid the personal bias of the researcher which is inherent in the readers reflection on the conclusions reached (Collier,

1994, p. 17). Kuhn and Hacking (2012), and indeed Creswell (2018) suggest a significantly wider concept of 'research paradigm' than those considered by the researcher.

Traditional and 'revolutionary' paradigms have, however, the potential to mire the researcher in an academic exchange of ideas and methods which divert from the task of assessing the subject of study. Creswell and Poth (2017), for example, suggest Kuhn and Hacking's (2012) twenty plus paradigm practices provide a greater freedom to tackle complex problems in complicated contexts which are real-world practices.

It is not for this study to establish academic approval for relatively novel methods of research. Whilst it is appreciated that there are alternative ways to explain behaviour and learning, there is sufficient interaction of the principles of quantitative and qualitative research in the mixed method paradigm to establish credibility for the results of this study, subject to effective management and reflection on potential faults and bias. The aim is to examine how the use of the *Memrise* smartphone application by undergraduate students might enhance vocabulary learning in a complex context of education standards and procedures. The traditional mixed method paradigm eschews the need to address the relevant issues from alternative perspectives.

Khanal (2012), in any case, argues that regardless what a paradigm constitutes or means, they are either positivist or interpretive. They both seek to attain explanations of social phenomena, albeit through different forms of information collection and assessment. Hammersley (2005, p. 35) considered this to raise tension and criticism of methods between adherents of competing philosophies, with early positivists becoming somewhat 'fetishised' over interpretivist researchers. Where research funding was sought, it was considered preferable to promote the quantitative, positivist design for the pursuit of

'truth' (Ungar, 2006, p. 269). This conflict, it is suggested, is perhaps tempered by the post-positivist acceptance that in an ever-changing environment, a single truth is elusive. The advent of the mixed methods approach, and acceptance by academics of the credibility of its conclusions, introduced a considerable level of pragmatism into the choices of the researcher of methods and techniques of data gathering and evaluation.

3.4.1 The Principle of Pragmatism

Tashakkori and Teddlie (2010) consider that 'pragmatism' is a separate paradigm, another option for researchers in the design of their study. It constitutes, they suggest, a rejection of "*the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in the interpretation of results*" (Tashakkori and Teddlie, 2010, p. 5). It complements the scientific approach of the research methodology outline and explained above, facilitating the objectivity sought in the collection of data with analysis which makes findings therefrom conducive to implementation in the Saudi higher education context. The practicality of action on the philosophical theories must be a major consideration in their use, an example of which is the operation of this study within the context of Saudi culture and traditional constraints.

As a consequence thereof, the decision taken on the utility of a methodological framework must consider the nature of the subject examined; there is no instance of a one size fits all scenario which suits different purposes and objects of study. It is nevertheless wise to utilise academically accepted ways of research and information gathering, provided it has a strong argument for describing, explaining, and understanding the subject. It is not the role of this research to develop novel methodologies for the collection and analysis of data, essentially seen by the author as a diversion from the main purposes of the study.

This is the fulfilment of the objectives of the research with the practical purpose of determining the value of the technology investigated to autonomous student learning.

Awareness of the potential of researcher bias looms large in the consideration. It is not appropriate in this study to develop abstract, revolutionary methodologies and epistemological considerations in evaluation of the concepts examined herein (University of Sydney, 2014). Apart from the issue of academic acceptance of the process and results of the study, the combination of traditional methodologies and practices outweigh the value of imaginative techniques of examining the highly complex subject of the smartphone use phenomenon and its value to education.

All researchers must reflect on the most effective method of ascertaining and evaluating information for the subject of the study, particularly, as here, when it is not primarily based on the search for evidence of a hypothetical truth. A pragmatic paradigm has therefore been adopted which combines features associated with both positivist and interpretive paradigms (Creswell & Guetterman, 2018). This is supported by the mixed methods approach in which due attention has been paid to compatibility of techniques utilised.

The suitability of mixing the beneficial features of traditional methods in this type of research, is supported by the capacities and assistance to understanding afforded by the “*Methodological Triangulation*” process in analysing results. It facilitates the correlation of data gathering from different sources and in alternative ways to enable production of a single set of qualitative and quantitative results (Denzin, 2017, p. 27).

The researcher recognises that this educational study into the value of technological software, which incorporates a high degree of social and cultural impact, may deal with ever more complex problems, an evolution which enhances understanding of how a

society such as Saudi Arabia functions (Creswell & Clarke, 2017). This coalescence of traditional paradigm principles, incorporating post-positivist and interpretive methodologies, will, it is hoped, provide a valuable insight into the value of smartphone applications in education, particularly the use of *Memrise* mobile software in the independent learning of Academic English vocabulary by Arab students.

The major advantage of this approach is that it assists in ascertaining, by tailored methods, how the quality of learning reflected in the results of the quantitative tests can be '*complemented by community participation interventions or by incentives that shift preferences and behaviours*' in how students effect and manage their learning (Masino and Nino-Zarazua, 2016, p. 55). This meets the objectives outlined in Chapter One in understanding attitudes and motivations towards the use of the *Memrise* application in the context of the outcomes produced in pre and post-tests. It will enable reflection on the value of *Memrise* application based on understanding of its value to learning perceived by those who will actually be using it, namely the students. This results in the choice of the mixed methods approach to collect data on the different steps of the study needed to fulfil this purpose.

3.5 Mixed-Methods Approach

This approach, adopted herein for the reasons set out and clearly explained in the course of this chapter, facilitates the collection, use and evaluation of a broad range of data and information without compromising the academic acceptance of the research methodology where it is effectively managed and explained. Simply put, Leech and Onwuegbuzie (2009) this is a utilisation of a mix of methodological approaches pertinent to different parts and aims of the study. It uses the philosophies and practices of traditional, recognised processes, questioned only by the veracity of their implementation and researcher bias, rather than seeking novel ways of seeking understanding of personal, social and technological developments.

This research has various objectives relating to the investigation of the role of smartphone applications in learning support, identify vocabulary learning strategies that student use to learn with and without the use of mobile apps, determine any difference in performance between students using traditional learning and smartphone application *Memrise* and explore student experience of retention in using *Memrise* for vocabulary learning.

This demands different approaches to measurement and analysis, thus guiding the methods chosen for the examination. The mixed methods research paradigm and the traditional methods of data gathering and analysis is well suited to carrying out multi-level analysis of such a complex set of issues. It is therefore appropriate for analysing, in the context of the objectives this study, the value of smartphone app use in the learning of English vocabulary, utilising the pragmatism of ‘what works’ not only in the process of data collection and evaluation, but also the implementation of results where appropriate to the promotion of learning.

The opinions, strategies and assessments of a body of participant undergraduate students at the Kingdom of Saudi Arabia, Imam University however give rise to variable personal levels of motivation, imagination and skills in planning learning and assimilating knowledge which are not measurable in this research; every student is different. In the field of applied linguistics and education this research approach has been increasingly adopted for the last three decades, combining different methods of data collection which complement each other (Dornyei, 2007). Mertens (2014), for example, suggests that using the mixed methods approach helps the researcher to highlight inconsistencies and identify contradictions and deviations in data collected and analysed. This allows the reader to consider and develop their own, alternative, evaluations of the data, perhaps as a basis for further research or practical action.

The quantitative measurement of satisfaction and perceived value of this specific piece of mobile learning application, initially through the Likert Scale general enquiries of the student participant body was necessary to set a basis for quantitative testing and qualitative interviewing. It is a logical assumption that students will only use what they believe to be of value to their lives, hence the ubiquity of the smartphone device. The mixed methodology enables the relationship between student perception and practical quantitative effect to be evaluated and compared in the pursuit of the study objectives noted in the last paragraph. The qualitative process in phase two allows for flexibility in the gathering of information, recognised as a somewhat value-laden mechanism of the semi-structured interview of randomly selected students.

The mixed methodology of data collection utilised is well suited to dealing with a relatively small number of respondents, within a limited period of time and the cost-funding restrictions on this examination. Quantitative collection and analysis per se would

be compromised by such limitations, and the results therefore of more academically challengeable value, particularly in the face of the number of variables, such as inherent motivation and attitude to learning of a diverse student body.

It is noted that this form of methodology is supported by the comments of Bryman (2012) who considers it advantageous to adopt different data collection methods to offset any perceived weaknesses in the process. Johnson and Onwuegbuzie (2004, 15), too, assert “*If you visualise a continuum with qualitative research anchored at one pole and quantitative research anchored at the other, mixed methods research covers the large set of points in the middle area*” The combining of quantitative and qualitative methods is academically acceptable and desirable, giving “*a greater prominence to the strengths of the data collection and data analysis techniques with which qualitative and quantitative research are each associated*” (Bryman and Bell, 2015, p. 644).

Researchers are effectively advised by accomplished academics to adopt a methodology which, in the context of this study, suggests the gathering of quantitative and qualitative data from individuals and placing same in a broader societal context. This promotes a more comprehensive understanding of the subject, the combination of evidence from complementary sources providing corroborative support for the research outcomes and enhancing research value (Onwuegbuzie and Johnson, 2006).

There are other difficulties which arise in any data collection process, given the nature of a subject and the potential for bias which operates upon the researcher insofar as they concern motivations and stake in the result. The author is a university lecturer in linguistics but has no financial, emotional or cultural interest in the *Memrise App* or its manufacture and development. The motivation for this study is the assessment of value to students of this method of mobile technology learning. In the choice of the mixed

methodology approach, a pragmatic perspective overcomes, or at least balances the limitations of other approaches. Reflection occurs on the part of the author in planning and assessment of results in this approach to seek elimination of personal choices and influence, not least on the time ordering of each stage of the quantitative and qualitative data gathering process (Johnson and Onwuegbuzie, 2004, p. 19).

The fundamental basis of the philosophical debate on research principles does not disappear with the decision to utilise a pragmatic paradigm as suggested by Creswell and Clarke (2017). The paradigms are not mutually exclusive, and indeed in the context of this study, given the constraints on access to the student body in Saudi Arabia and the need for practical methods of introducing independently accessible learning, are complementary. Rather it gives effect to a critical balance mechanism, offering a middle-way between methodology and philosophy so that ‘real-world’ research questions get answered (Johnson and Onwuegbuzie, 2004). This is highlighted by the specific mixed methods approach used in this study.

There is considerable attraction to the utility of this mixed methods based paradigm, but academic researchers have a tendency to highlight problems when there is a conflict with, or undermining of their preferred methodology. Maxcy (2010), for example, argues that quantitative methods are better suited to the search for an objective reality. The ‘objective reality’ in this study is an examination of test outcomes to ascertain improvement or otherwise in the group undertaking the Memrise exercise in contrast to those not so involved, and reliant on traditional institutional learning programmes at the university. This aids analysis of value of the app in the context of objective (iii), exploring student performance. Maxcy further considers that the qualitative methods are somewhat ancillary and explanatory in value, given its basis in determination in a more fluid social

context. In the mixed methods approach this will help place the quantitative findings in the context of the other objectives of ascertaining how students value the app as (ii) a support to their learning and (iv) attitudes and motivation to use their smartphone devices in learning. There appears little philosophical reason for consideration of the potential of integration and complementary practices as being binary and exclusive (Sandelowski, *et al.*, 2009). There is little in the literature on research methodology which undermines the value of the methodology in the context of this research, provided it is conducted with attention to the amelioration of evident and perceived limitations as outlined.

3.5.1 The Sequential Explanatory Mixed Method Design

The mixed methods choice of study design requires consideration of whether the analysis and collection of the quantitative and qualitative data requires a general, concurrent overview or accessible successions, where one practice follows another to aid development and comparison (Ivankova, *et al.*, 2006). It is a development of the study programme of data gathering from the broad inquiry of the pilot questionnaire, through the choice of participants in the Memrise and control stages of the study, and subsequent testing of both groups to ascertain any difference in test outcomes achieved.

The sequential explanatory mixed-methods design incorporates three specific steps of implementation; priority, implementation and integration (Ivankova *et al.*, 2006; Creswell, 2018):

- i) Priority denotes the emphasis placed on the methodological process at each stage. Herein the quantitative methodology is chosen as to satisfy the primary step in the examination. This is a particular factor in the testing process and the evaluation of outcomes, which must be undertaken in this study in the context of knowledge of student use of smartphones and their assessment of its value to their learning.

- ii) Aspects of data collection which are emphasised in the course of this study and its analysis are based on the individuality of student perceptions in the use of the Memrise app and in their personalised experiences thereof, as well as accomplishment in testing.

The next part of the study was qualitatively based, to substantiate, investigate and explain the mathematical outcomes of the quantitative section to ascertain the medium, robust, or weakening effects of The App on learner vocabulary improvement.

- iii) Integration of the results of the implementation of information collection methods, by the use of the individual paradigm methodologies over a period of time, is the final phase of the study (Tashakkori and Teddlie 2010). It is at this stage that the 'mix' assessment occurs and findings are made and presented. The researcher connects and integrates the qualitative and quantitative information at the end of the qualitative stage and results gathered from the sequential steps are linked and incorporated through the interpretation and the discussion stage of the research.

In reflection on the course of implementing the process of data gathering, the concurrent method requires that the compilation methods of quantitative and qualitative information occur at the same time and are examined and compared to seek similar patterns and findings (Morse, 2010). This was considered ineffective in the conduct of this research given that it was to be conducted in what was essentially an exploratory process to aid clarification and development of the main part of the study. In consequence, the explanatory sequential mixed-methods paradigm was used in this study.

The plan for this study was to collect quantitative data using questionnaire and vocabulary tests, the goal of this first phase being to understand learners' attitudes towards

smartphone application use for vocabulary learning per objective). In the initial pilot investigation on the viability of the research and the potential value to education of the research questions, quantitative, numeric knowledge is collected, employing a self-administrated form and a vocabulary test (Ivankova *et al.*, 2006).

The nature of this exploration was complemented by qualitative methods of collecting diverse views and attitudes of the software users, in pursuit of objectives (i), (ii) and (iv), with the quantitative results of the vocabulary test as a base upon which to gauge improvement in outcomes as a result of use of the app comparative to the control group (Tashakkori and Teddlie, 2010). It would further facilitate the identification of differences in vocabulary test scores after using the smartphone application *Memrise*. The analysis of data from what was essentially the quantitative phase would provide a deeper understanding of how continued use of the *Memrise* App would result in learner improvement after one semester, that stage based on a gathering of student perceptions of its value to autonomous learning.

In this study, the aims are to determine the views, opinions and motivations of participants to the use of smartphone application in vocabulary learning. Evaluation can then be undertaken to assess the vocabulary tests scores both before and after the use of *Memrise* application. This will then facilitate discussion, in a semi-structured interview, of the findings of the qualitative stage with the intention of exploring, confirming, and improving outcomes in the passage of time of the study.

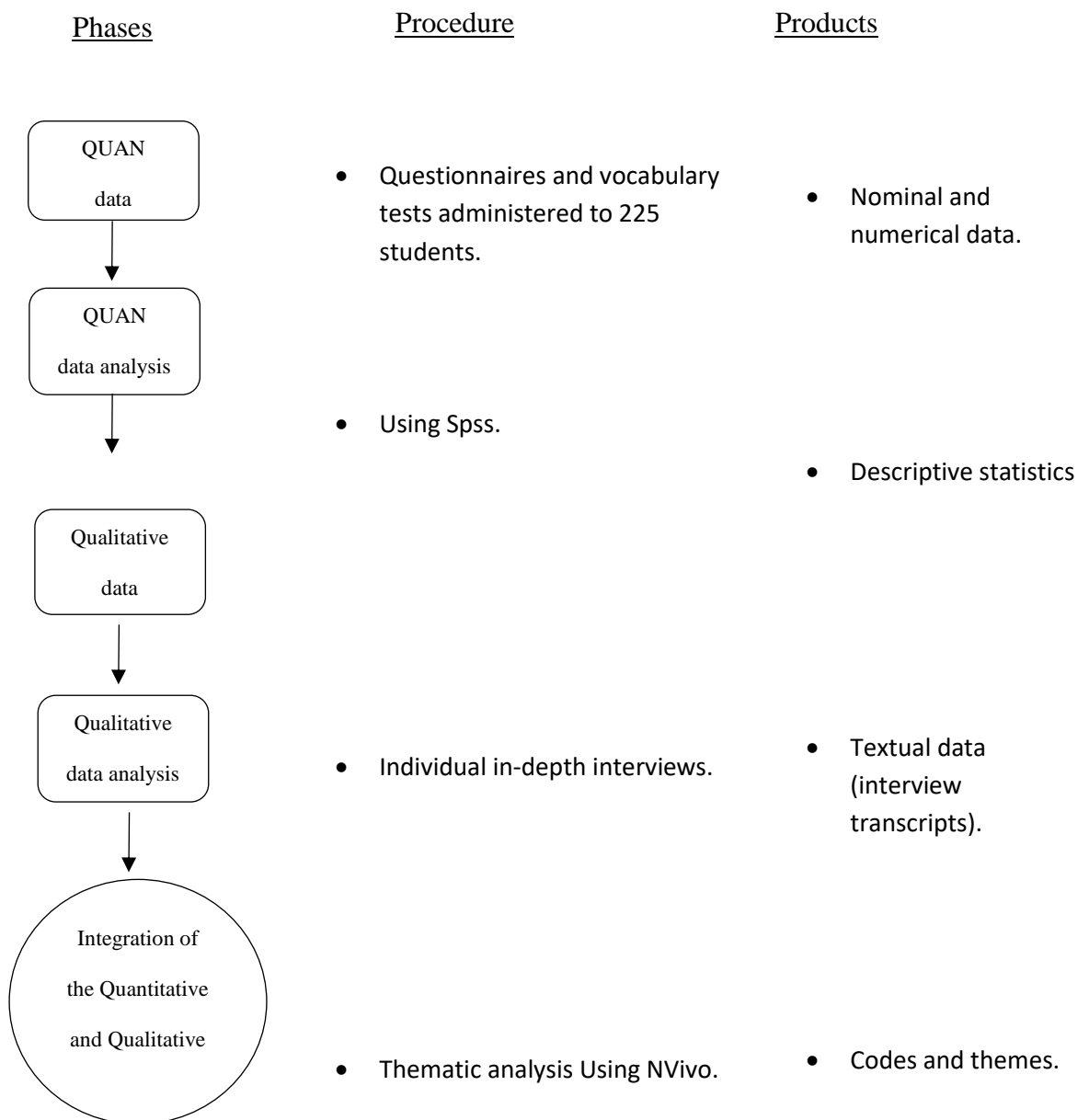
It is acknowledged that in the course of the quantitative testing, numerous variables have the potential to interfere with the causal link between outcomes and The App, particularly use by students of alternative methods of learning, particularly the textbooks used in class. It is a weakness which is impossible to ethically eliminate; students cannot be asked to

avoid methods of learning for a whole semester in favour of one experimental technique. It is expected that its effect can however be ameliorated in the qualitative interview process of information gathering.

3.5.1.1 Sequential Explanatory Visual Model

In order to facilitate a clearer understanding of the operation of the sequential explanatory model for reader with a visual learning style preference, the flowchart developed by Ivankova et al., (2006) is reproduced at Figure 6. This is adapted to explain the process undertaken by this researcher in the preparation of the practical methods and techniques of information gathering, developed as a result of the reflective application of the mixed methods and pragmatic paradigms outlined in the preceding sections of this chapter. It describes the evolution of the practices utilised in the implementation of the philosophical methodologies, facilitating decisions on order and timing to enhance objectivity and elimination or limitation of biases potentially experienced by the researcher personally and were considered compromising to the research outcomes.

Figure 5: Visual Model Sequential Explanatory Mixed-Methods Design Procedures (Ivankova et al., 2006)



3.6 Research Design and Methods

This section of the Chapter will describe how the methodological principles are adapted to the collection of the data used in this study to examine the value of *Memrise* to higher education vocabulary learning, as a support of traditional, institutional methods of education.

Attention focuses on the use of methods which meet the requirements of the objectives pursuit, namely

- i) To identify vocabulary learning strategies that Saudi L2 students use to learn English Vocabulary.
- ii) To investigate the role played by smartphone app *Memrise* in supporting vocabulary learning in English.
- iii) To explore students' performance in vocabulary retention in post-test with and without the use of *Memrise*
- iv) To understand learners' attitudes and motivation toward using smartphone applications for vocabulary learning and educational purposes in general.

In the description of the methods utilised to meet these requirements, justification will be provided based on the theoretical methodological basis for the reflective choices by way of explanation. This facilitates the link between philosophy and practice which is essential to the credibility of the methods and their value to meeting the aim.

It is also important to deal with the inherent limitations of the processes and potential effect on the results and conclusions. These have been ameliorated so far as in possible to meet professional credibility standards and the avoidance of bias, but all conducting studies with human subjects must maintain constant awareness of variable which may undermine outcomes.

The approach to data gathering and analysis can be described as a sequential explanatory mixed method design, integrating positive and pragmatic aspects of quantitative and qualitative study. The qualitative consideration of studies on the use of technology in teaching provided an essential basis upon which to proceed to formulation of this research. It has been noted that the choice of methodology is principally guided by the research question or problem, and it is suggested this is true particularly when evaluating qualitative literature (Silverman, 2015, p. 13).

Previous studies, it has been noted in Chapter Two, have examined principles, type and use of technology in pedagogical and assessment contexts, approaching their data gathering in accordance with their authors' evaluation of suitability. It is not proposed to develop herein any novel methods which would simply add to credibility questions. Within the specific remit of this research, and the assessment of the value of the *Memrise* App in the development of learning autonomy, these studies provide a valuable source of broad teaching technology principles and findings for evaluating the pedagogical and learning process.

The study is divided into two phases, the first providing a broad overview using the quantitative test and questionnaire mix across a broad range of 225 students of English language at the Imam University in Saudi Arabia, which will then guide the qualitative phase two of semi-structure interviews, carried out following end of study period vocabulary tests and utilising the Likert Scale to determine attitudes and motivations toward use of the *Memrise* App.

This brief summary of the pragmatic mixed methods sequential approach does, of course, require more detailed examination of the research programme utilised to explain how the approach will aid the best understanding of the study aims and problems (Creswell, 2018).

It is proposed to explain method of research choices in the context of the student body of the Imam University, because it is apparent that all those involved in the phase one process cannot participate, for reasons of time and study limitations, in the second process.

Research participant sampling, design specifications, vocabulary test format, questionnaire and semi-structure interview procedure requires justification in the context of identified latent variables which arise in application of the different methods to sample selection, data collection, preparation, analysis and strategy used.

The first inherent variable is the research history and methodologies of study into recent and continually developing technology, especially the smartphone which facilitates access to a broad range of application which change the way young people in particular live their lives. Severin and Tankard (2008) suggest early studies tended to address the political propaganda benefits to an all-consuming public body, but the potential of the technology is clearly far beyond such parameters.

Sociology academics have concentrated their studies on communication and changes to life planning and structure in a broadly social context. Chatterjee (2014), for example, highlights the “*concept of the mobile phone*” as an object of communication, “*identity, self-esteem and symbols ... leisure and entertainment*” and even emotion (p. 58). It has the potential to be an all-pervasive tool for personal living.

3.7 Study Setting and Participant Sampling

This study was conducted at Imam University. The rationale for the setting is the responsibility of the author-teacher to promote the learning of his students in the field of English Language as a Foreign Language. Indeed, the author’s employment at the

institution somewhat eased the approval process, given the conduct expected of university staff. There is no reason apparent to the researcher why its results and assessment should not be of value to consideration of the smartphone *Memrise* app as a tool of enhancing the vocabulary learning of Middle Eastern students in general. The specific context of the placement of independent mobile learning in Saudi Arabia has been discussed in its framework of traditional, teacher-led practices. It should certainly foster examination on the part of teachers of novel ways in which their learners can, at their convenience, access suitable technological methods for their own independent development. The target participant body was full-time registered male students in the English Department at Imam University, Saudi Arabia.

There are 850 males (n=225) and females (n= 625), all studying English language using the same materials and undergoing the same method of teaching and learning, in first academic year of the 2016-2017 (n=850). For cultural reasons, males and females are educated on different parts of the campus, separately, and the researcher was only permitted access to the male student body for this study, (n=225). Although the sampling process was subject to limitation of the target audience of males, considerable thought was given to whether this would affect the validity of the result. It was decided it would not, because the smartphones are used in similar manners by all youth, regardless of gender, and this is borne out by the Literature Review. It cannot form part of this work to try to examine differences in gender usage, which it was presumed would be a fruitless exercise. This was dealt with in the literature research.

The students in the L2 classes are at the beginning of their university experience, moving from the teacher led classes of their earlier education to a new emphasis on independent

self-learning, and this survey was an opportunity to embed this concept. Issued with standard texts, they were made aware of alternative methods of learning and were invited to become involved in the examination of the *Memrise* App which they could access through the ubiquitous smartphone to grow their personal vocabulary bank.

It was expected from the researcher's teaching experience that easing the process of learning will promote the effort made. Some students indeed indicated in preliminary preparations for the study they were familiar with the App, and virtually all had used smartphone apps in social contexts. *Memrise* technology was chosen for the examination because it was indicated in the preparation of the pilot that this was the app most commonly heard of, if not actually used. This was confirmed by the pilot study which had been conducted to assess general aspects of familiarity with mobile technology to enable a random sample to be extrapolated from the group for involvement in the evaluation project.

In order to determine the research sample and size, Figure 7 herein, a list of all students (n=225) enrolled in the first academic year was obtained from the students' affairs office. From that 225 initial sample, 201 students responded to the online questionnaire, with 198 actually attending class to participate in the vocabulary part of the study. The sample for the study of the vocabulary tests was divided into the categories Q4 and Q5 based on the taught textbook. The Q Skills for Success 4 text is for the less advanced students than those in the group using the Q5 text. In order to qualify for admission to, and continuation on, the course of study, students are required to score 80% or more in language tests, equivalent to B1 in the Common European Framework (CEF) and 4 to 4.5 in IELTS. It should be noted that they are all taught by the same teacher.

- (i) The participants (n=198) in both Q4 and Q5 class groups were then randomly divided alphabetically from the lists into two groups,
- (ii) those who would use *Memrise* for the semester
- (iii) the second concentrating their studies on traditional, textbook and lecture.

There resulted effectively 4 groups for investigation of methods of learning, Q4, with a *Memrise* and non-*Memrise* group, similarly with Q5.

It is incumbent on a teacher to ensure the best access to learning materials for his students. At no time was it impressed upon the participants that they had a duty to the research programme to avoid or not use whatever they needed to promote their learning. This introduces the potential for unmeasurable variables into the data because no control can be imposed on how students learn or the materials they utilise and following the data from the pilot, questions were developed to investigate what methods of learning were utilised by individual learners.

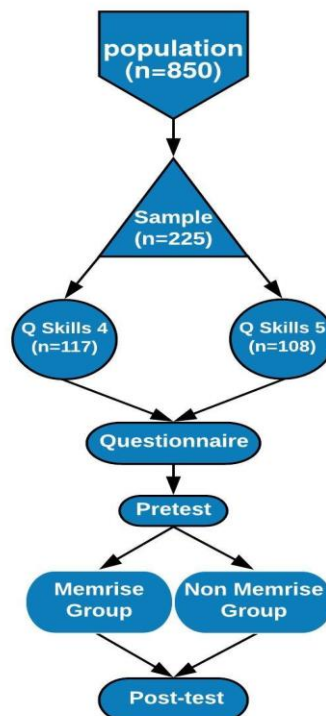


Figure 6 Research Sampling Procedure

3.8 Data Collection

The methods of data gathering and assessment are directed to the purpose of this study and its value as an education tool, complementary to more traditional methods of learning. Language teaching and learning constitutes a specific, profession in its own right, an essential part of the overall education structure in Saudi Arabia, only improvable when subject to critical examination. The teaching and learning of English as a Foreign Language (EFL) is a particularly important discipline in the Kingdom given that it is the language of business in the region and a fundamental basis for student development in commerce, social and political development. It is thus important to gain a deeper understanding of the use educational tools, particularly mobile smartphone applications accessible at any time or place, for vocabulary enhancement and independent learning.

There are anticipated difficulties to be surmounted in the pursuit of value assessment which necessitates the use of different, complementary methodologies and methods of examination. These largely stem from the nature of the students themselves, their individual personalities and motivations, as well, in the case of study in Saudi Arabia, cultural limitations on access to the student body.

This dual methodological approach, combined with descriptive and documentary content in the techniques of data gathering adopted, seeks to facilitate, so far as is possible, a better understanding of the role, purpose and value of the “*Memrise*” application in supporting vocabulary learning among L2 students at Imam University in Saudi Arabia. This body of learners range from 18-23 years old, have the general qualifications which enable their attendance at an institute of higher education and, specific to the English Language course, they have passed a basic aptitude test.

Consideration having been given to the philosophy of the study and the practical utility of methods of information collection, much reflection and research was undertaken on software assistance to analysis of data accumulated. The choice was made to use proprietary software commonly used for data examination, correlation of statistics, descriptive capacity and reliability checks, namely the IBM software technology, Statistical Package for the Social Sciences (SPSS) for Windows (George and Mallery, 2016). It proved valuable in the context of the mixed methods process in facilitating comparisons and understanding of divergence.

This process of analysis was complemented by the use of Nvivo to organise the data particularly obtained from qualitative phase, the semi-structured interviews. It is described by the developer as “*the most powerful software for gaining richer insights from qualitative and mixed-methods data*” and indeed it proved to be of considerable value to enable a visual understanding of the results (Welsh, 2002). The capacities of both software packages proved of further assistance in facilitation the triangulation process of divers results obtained from different techniques of data gathering.

3.9 Pilot Study

During the process of determining the detailed aims and philosophy of the study it was considered important to the efficacy of the process to conduct a broad review of the subject and the available methods of information collection and data analysis. Mackey and Gass (2005) indeed suggest a small scale trial of proposed procedures is important to “*assessing the feasibility and usefulness of the data collection methods and making any necessary revisions before they are used with the research participants.*” (p. 43). It essentially involves the conduct of an exploratory pilot study which would involve evaluation of

- (i) the similarity of experience and status of the participant body,
- (ii) appraising the students of their role in the study design,
- (iii) explanation of the research instruments,
- (iv) the gathering of performance feedback on operation of the methods and results of the testing, and
- (v) reflective revision of research procedures, methods and instruments (Thomas, 2017).

3.9.1 Pilot Questionnaire

In the preparation for the research subject investigation, quantitative method based questionnaire was distributed to the body of L2, EFL, students at the Imam University. This enabled the sampling of the larger data set to identify a level of statistical significance of the results to provide a supported basis for any generalisations which would guide the information and results process (Newman and Benz, 1998; Quinlan and Zikmund, 2015). This pilot was on a sample of students (n=40), selected randomly by the student affairs office in late December 2015. Online surveys utilising Survey Monkey were administered in the classroom, through the use of Survey Monkey site. The researcher visited all classes and wrote the link to the relevant site page on the white board which the students then typed in their smartphones to direct them to the online questionnaire to ensure connection and access

The conduct of the pilot study assisted measurement and adaptation of the study design, by identifying problems in data gathering and processing which became apparent and would affect the validity, consistency and reliability of the results of the main part of the investigation (Mackey and Gass, 2005, p. 45). This includes, for example, consideration of the nature and format of the questions which would be asked of participants to focus

the second phase of the study more effectively on meeting the objectives. The time spent of reflection and planning proved invaluable given that there was little which required any major change for the main study.

Interestingly, in the questionnaire completion stage, clarification questions were asked in class during the conduct of the questionnaire completion process included the meaning of terms; for example, a student asked what was meant by 'mobile devices', the others were asked if they knew, and four more indicated confusion. The questionnaire was drafted in both Arabic and English, simply because the students were in the first year of academic learning; this, somewhat encouragingly, gave rise to clarification questions as some of them matched their Arabic understanding to English translation. The term was subsequently changed to 'smartphone' upon confirmation that all knew what was being described. It was this kind of clarity which guided the vocabulary learning tests subsequently undertaken following assessment of the pilot results of the questionnaires, aided by in class exchange of clarification queries.

Although this description of the pilot study appears to veer into the realm of results analysis, it does provide an insight into the way in which it would assist, on reflection, in guiding the conduct of the main research. The feedback from participants to the questionnaire items was consistent and clear. It proved of value to include an exploration of vocabulary learning strategies in the design of the main study questionnaire to provide a broad image of how Saudi students actually learn English vocabulary.

3.9.2 Pilot Vocabulary Test

The vocabulary test part contained 50 multiple choice questions, accessed via a link to online vocabulary test designed by the researcher through the *Testmoz.com* website. This aimed to examine the different levels of challenge in the test and the extent to which the Academic Word List in the standard course text book was recognised and learned (Appendix B). The freely available *Testmoz* online software provided immediate results feedback and improvement option for students, which could some of which were utilised in improving the quality of the main study tests.

Participants in the questionnaire (n= 40) were offered to participate in the pilot vocabulary test the following week. Only (n=27) students participated in the pilot vocabulary test. There was no time limit imposed. It was simply to be completed during the class period. It was estimated by the researcher, not a criteria, that the vocabulary test should take 20-30 minutes but some participants exceeded that, three somewhat significantly. Hence it was decided that, such was the variation in observed concentration, a time limit should be utilised in the main study to ensure equality for all participants and encourage focus.

3.9.3 Pilot Semi-structured Interview

The purpose of the pilot semi-structured interview was to evaluate the appropriateness of questions asked and provide the research with interview skills in asking questions, answering respondents and managing the digital software (Skype) and recording device. The pilot semi-structured interview was conducted with a two senior colleagues at the faculty where the study was conducted. This resulted changes in interview questions grammatically and sequencing according to the themes presented in the study.

3.10 Main Study: Design and Procedure

Having tested some of the available data collection and analysis options available to researchers in the pilot study, the amendments and reflection of processes to be utilised in the main part of the study could proceed. It is now pertinent to more definitively identify and describe the choices of techniques which guided the route to the study results in the two phases of the examination, designed to elicit quantitative and qualitative information on the value of the *Memrise* App.

3.10.1 Questionnaire Design

In the conduct of this research, having proved valuable in the pilot study in developing the processes of the research, the closed question method was used as to generate quantitative statistical evidence of respondent attitudes and perceptions on the value of the *Memrise* App (Dawson, 2009). It elicits subjective individual assessment on the subject in a quantifiable form which encouraging forthrightness through respondent anonymity (Cohen *et al.*, 2018). This is particularly important when examining attitudes of students to learning and their experiences of different methods of facilitating knowledge accumulation (Dawson, 2009; Thomas, 2017). The closed questions gave the participants specific options to tick, or simple yes-no options, with eight open questions designed to allow more freedom to express themselves (Seidman, 2013; Zohrabi, 2013).

The format of the questionnaire incorporated in the first part questions about ownership and use of a smartphone and the purposes which may be described as educational. They were asked about their familiarity with the potential of the device and availability and utility of apps. Enquiries were made of them regarding whether they had used strategies for learning and how they learned vocabulary, what instruments they used, for example

textbook, visual, oral, pen and paper, computers and cetera. The respondents were then asked about their experience of English language learning, how long they had been studying the subject, their thoughts on its value to their learning and career intentions and thus the level of their motivation to learn (See Appendix A).

It proved possible to reach a large number of students in a relatively short period of time via email or in a classroom setting where access was afforded through the university intranet system which enabled the time allocated by the whole study procedure to be monitored and enforced. The questionnaire process therefore fits the profile of an effective research method for the evaluation of the smartphone app in vocabulary learning, giving an insight into how undergraduate students utilise the facilities for learning which are made available to them.

Researchers have found the questionnaire-survey process has the potential for a statistically low response rate given that it cannot be controlled how respondents will interpret questions on self-administered research instruments (Cohen *et al.*, 2018). In the preparation of the enquiry, conscious attention and reflection must be paid to the effects on the validity of data, and its meaning, of an incautiously formulated questionnaire, and the value of the pilot review facilitated reflection on the nature and construction of the enquiries to aid fulfilment of the study aims. This was part of the benefit of the pilot exercise.

Limitations of particularly the closed question format were reflected upon in contemplation of the sociological value of that particular method of data gathering; this highlighted difficulties in reaching conclusions on the occurrence of data answer

frequencies and the formation of judgements and conclusions on significance of the results (Queirós, *et al.*, 2017). Dornyei and Taguchi (2010) also points out the potential of difficulty in student understanding of questions in a second language, which it has been noted was indeed highlighted in the pilot and the questionnaire amended for clarity. This was why the questionnaire was drafted in both English and Arabic, and the author or a teacher was present to answer questions regarding clarity of meaning. No guidance was given regarding answers, because this would clearly impact adversely on the independence of their answers. Answers on meaning were essentially given as one would in a summative examination, such as defining ‘social purpose’ as ‘keeping in touch with friends’ or recording dates and appointments, to mention but one example raised by a student. Much reflection was therefore undertaken both prior to the pilot and thereafter on the structure of the main study to ensure, within the additional institutional restrictions on this work, that this relatively easy method of obtaining information on a topic of considerable current social and educational interest was credibly quantified for understanding (Berg and Lune, 2016).

3.10.2 Vocabulary Test Design

In order to examine the comparative value of the *Memrise* App to vocabulary learning, the experimental pre-test post-test controlled group design method was adopted. This is defined by Fraenkel *et al.*, (2014) as an experimental procedure whereby two randomly chosen groups, one subject to the ‘treatment’, in this case use of the app, is compared to another which did not use the technology, to guard against extraneous variables, were tested at the beginning of the semester, then again at the end. Whilst their research on the technique is of some age, it has featured prominently as a reference point and been adapted in more recent evaluation methods in educational studies, such as that of Koksál (2013) in the pedagogy of science.

In this study the design enables comparison of improvement or otherwise in vocabulary test scores between the *Memrise* and Non *Memrise* users (Podesva and Sharma, 2013). Given that this is an evaluative study on the utility of the *Memrise* App, the non-*Memrise* group serves as a control upon which the *Memrise* assessment of value can be undertaken by way of comparison. They continued to use their textbooks and other guided learning from their teachers, as indeed did the *Memrise* group, to review their vocabulary and continue their learning. It should be noted that, on an ethical point, the control group were not denied access to whatever instruments they felt they required in their education. They had not used the app, and were willing to forgo the opportunity for a three month period to assist in its evaluation. Other variables, too, could not be controlled such as access to other learning materials and individual motivation, but these were matters which would be raised at the post-test interview.

3.10.3 Semi-structured Interview Design

The purpose of the interview was to elicit information related to the individualised learning and vocabulary techniques of respondents preferred methods of learning, and their perception of the value of the *Memrise* App in promoting learning. For that purpose, eleven participants were identified. The interview is a qualitative, non-numerical method of data collection, enabling respondents to “*speak in their own voice and express their own thoughts and feelings*” (Berg and Lune, 2016, p. 96). Information is obtained from talking to the study participants. The interview protocol adopted required students to be asked the same eight primary open questions, with follow-up enquiries made on the basis of their responses. To reduce potential confusion, the interview questions were carefully designed using both simple and natural language to avoid equivocal words or obscure questions (Zohrabi, 2013). The interview questions were categorised into five themes:

- (i) smartphone applications experience,
- (ii) *Memrise* application experience,
- (iii) vocabulary learning strategies,
- (iv) learner attitude, and
- (v) learner motivation.

In this research it was considered pertinent to seek directly from the students their personal views on the value of the *Memrise* App, per objective (iv), because it was for their academic benefit that the technology was being examined. It is noted above that the non-*Memrise* control group continued with their education in the usual, institutional manner, and in accordance with their own learning strategies. Essentially they were doing what the *Memrise* group would have been undertaking in the course of their learning had they not been involved in the *Memrise* use test. With that in mind, it was only necessary to interview the *Memrise* users for their views on the software in accordance with the aim of the study.

It was important to the results evaluation to ascertain their familiarity with smartphone use and its resources. This had been asked and considered in the initial closed question questionnaire, and supplementary information gathering questions incorporated in the interview process to elicit potentially useful further data on the range and variety of smartphone use. Their assessment had to be elicited in this manner by a carefully constructed procedure to endure all participants in this part of the process received the same enquiries and time for expression, especially those who used the app. In this way it was possible to “*build a holistic snapshot, analyses words, reports detailed views of informants*”, albeit in a tightly controlled setting (Alshenqeeti, 2014, p. 39).

The aim of this study requires, in part, a more targeted interaction with the student participants, but the warning of Harris and Brown (2010, 2) is borne in mind; “*While interviews provide contexts where participants can ask for clarification, elaborate on ideas, and explain perspectives in their own words, the interviewer can use questioning to lead or manipulate interviewee responses.*” The interviewer has control over the order of questions, supplementary queries and the use of time. This is the primary reason for developing a structured series of questions on areas arising from the questionnaire data, enabling all interviewees to be examined in an identical manner, save for their own requests for clarification on points of question confusion.

The standardisation of how the interview is conducted, and, where possible, what questions are asked, it is suggested, enhances the validity of the responses, discouraging somewhat ‘off the cuff’ answers to move onto the next question. It promotes interviewee reflection. The researcher must be wary of leading or directing responses, introducing bias or preconceived perceptions which are broadly unmeasurable but compromise data validity. The avoidance thereof is dependent on the professionalism, planning and experience of the interviewer, but control of the flow lies essentially with both the questioner, and participants in the process must be aware that they are not there simply for a “*good conversation*” (Knapik, 2006, p. 86).

Practical considerations therefore arose with regard to the actual method of conduct of the interviews, given limitation of cost and time. The decision was made that their effectiveness in eliciting information from structure questioning of the students chosen would be enhanced by face-to-face contact, rather than the more amorphous focus of the telephone and email. This had to be achieved by skype and cyclops software for time

constraint practical reasons, given the subjects were in Saudi Arabia and the researcher in the UK. Albeit electronically achieved, the face-to-face process made it easier to observe reactions, body language and gauge forthrightness in the answers given and expanded upon by the participants (Hannah and Mwale, 2017, p. 260).

It should be noted that such observation techniques play no part in the analysis of the answers because they are not amenable to quantitative or qualitative measurement, but they did allow the opportunity to seek clarification at times of mutual confusion. Hannah and Mwale (2017) also assert that whilst there is a hierarchy between the researcher and interviewee, especially if it is their teacher, the sense of distance experience through electronic video-audio means reduces that and can lead to more honest responses.

Sarantakos (2012, p. 178) suggested that the interview technique allows the researcher “*a high degree of freedom to manipulate the structure and conditions of the method*” and indeed there is a risk, should the open nature of the process be adopted, for the student to pontificate on complementary assessments and achievement. With this in mind, the series of questions were drafted to be pointed to specific aspects of the examination, with follow up queries used only for clarification and comprehension rather than expansion whilst allowing a level of free expression to the participant.

The quality of the interview and its outcomes depend on the ability of the researcher to remain conscious of the risk of introducing bias in principal and follow up questions. It has been noted that the face-to-face process is considered more effective in the eliciting of information capable of analysis. It achieves this through the building of trust and a rapport which encourages forthrightness (Hannah and Mwale, 2017, p. 260). The

reliability and validity of the data collected from the interview vary with the type of interview employed. It is

- (i) structured with closed answer questions,
- (ii) semi-structured, allowing for some expansion but primarily clarification or
- (iii) unstructured, giving both the interviewer and subject free range to engage in a more general discussion (Edwards and Holland, 2013, p. 3).

The successful collection of valuable data depends on the professionalism and experience of the interviewer (Warren, 2012).

The unstructured interview can be viewed as an informal, open-ended enquiry, a “*trawl (which) may lead to unexpected information*” (Gillham, 2005, p. 47). It may be a useful and attractive method as a preliminary study, with the intention of testing responses and identifying areas for exploration, and thus more suited to a focus group pilot to guide the main project (Seidman, 2013). It was rejected as a method for reasons of time and focus of the enquiry into *Memrise*. There was a fear it would allow the respondent to divert from the issues in question for reasons which could not be ascertainable, introducing another unmeasurable variable.

The structured interview, by contrast incorporates a defined series of questions presented to the participants for their answers (Edwards and Holland, 2013). It is nevertheless inflexible in the ranges of responses available to the interviewee and creates an obligation to answer questions which are not completely understood or where it is the best response of a disagreeable set of options (Kvale and Brinkmann, 2015). Neither of these methods of interview were considered suitable to question first year undergraduates on their study of a second language with which they were not yet wholly comfortable.

The principal reasons for the use of the semi-structured interview process, conducted face-to-face via electronic means has already been briefly explained in the justification of using the substantive interview method of qualitative data collection. Having been used in a relatively directed pilot enquiry to facilitate clearer drafting of questions for the students, it was possible define the main focus of each enquiry and a set of supplementary follow-up questions were they to be needed. Assumptions could be made that respondents were either familiar with the technology or not, and enquiry explorations developed to provide a standard approach to each group, with the capacity for them to elaborate on experiences within a planned framework. Galletta (2013) calls this “*the exploration of lived experience as narrated in interview in relation to theoretical variables of interest*”. The interviewer guides the enquiry, permitting interviewee expression and expansion on answers within parameters predetermined by the researcher.

This author takes the view that in this study, the technique may be termed ‘directed freedom’ and is considered the most appropriate way to examine the use and value of the smartphone *Memrise* App in vocabulary learning. It makes for the best use of the respondent undergraduates’ valuable social time, acknowledged by the researcher in the level of preparation required. Time limiting through reflective preparation also relieves the risk of boredom setting in, with resultant less than focused responses (Berg and Lune, 2016, p. 210).

Qualitative interviews should not be seen as simply supplementary to the more easily measurable quantitative questionnaire process, for it has considerable potential, where effectively planned and managed, to enhance knowledge of the subject under

examination. This is particularly important in this study where understanding and clarity are likely to be compromised by use of a relatively non-familiar second language. The need to understand English as an essential prerequisite of future economic success is of itself value laden and so this must lead to the conclusion that methods of information accumulation possess that inherent limitation (Rascón-Moreno, 2014).

The questionnaire provides the most effective method of meeting the objectives of this study in ascertaining the opinions of students, in a targeted manner, on the use of Memrise, via the smartphone, as a tool of supplemented learning. It facilitates the gauging of degrees of support and assessment of value by those who will be using the software and in using the theme method based on the analysis of the objectives. It allows the research to focus particularly on the issues raised in the qualitative process, understanding student perceptions on its effect in adaptation of learning strategies, (i) and (ii), and on motivation, (iv). From the perspective of management of bias and promotion of reliability, the awareness, professionalism and experience of the researcher in sampling, planning, methodological choices and techniques and reflection is exercised at each part of the process. In the context of this study, it is important that the reader has a clear understanding of the potential difficulties which are overcome to the best of the researcher's ability and ethical responsibility.

3.11 Validity and Reliability

Consideration of methods and results validity constitute the degree to which a study actually measures what it purports to determine, whether "the truth" is accurately identified and described (McDermott, 2011). It is supported, so far as is possible to do so, by the use of specifically prescribed and well-entrenched procedures and strategies, and this explains further the traditional methodology choices made for this study (McDermott, 2002). They avoid the need for justification of more novel, experimental methodological

approaches, ensuring academic acceptance of reliability of the process as established practice (Bashir *et al.*, 2008). This may be described as the dependability, consistency over time, and repeatability of a study's data collection, interpretation, and analysis (Joppe, 2000). It is not the purpose of this study to introduce a discussion on validity of novel methodology or methods, but to use established ways of data gathering and analysis of results. This has been explained in detail in the foregoing sections. The realisation of validity and reliability therefore requires reflection not simply on the practicality of methods and techniques, but inherent features which may devalue the quality of the research, such as, particularly, unchecked bias (Ofir *et al.*, 2016). This can only be accomplished by researcher reflection on the nature of methods and questions, to ensure objectivity, so far as this is possible in a 'value-laden' project context.

The Saudi Arabia context of the study purpose has been considered repeatedly so far in the reasons for the research, the choice of participants and the issue of replicability. It has been noted in the Literature Review that all changes in education practices are imbued with cultural considerations, and this is the case herein, most obviously with the fact that this researcher was only permitted access for the purposes of the study to male students. Academic freedom, it continues to be failed to acknowledge by western practitioners, is not so available in the Saudi faith based framework; this may be changing, but at the time of this study it is not such an open field for research. In the choice of methods for this research, opportunities are opened for the basis of further studies, using accepted and approved methods, in such a traditional context. In terms of validity, the results arising from the process are able to be considered in the broader context of smartphone use and value, as it has indeed be promoted and critiqued by other researchers.

These issues have been deliberated upon in the discussions of methodology and techniques herein, examining potential flaws in the quest for trustworthiness, summarised by Punch (2014) as credibility, transferability, dependability, and conformability. It is expected that the methods used will be replicable by other researchers to facilitate critical discussion of the issues and findings of the study; this has been an important consideration in reflecting on the methods used and questions asked. Whilst different approaches have been used in the particular phases described in this study, they are predicated on traditionally respected and utilised techniques, accompanied by a high degree of testing, implementation and professional reflection. It is submitted that any reliability faults in the process which may be identified by readers and academics do not detract from the overall validity of the research.

3.12 Phase one: Quantitative Data

3.12.1 Questionnaire

Self-completion questionnaires were chosen for the survey section, distributed by email to the participant body and, where possible, completed in class, to ensure a significant volume of replies. The students were advised of its nature and purpose, invited to consider the formal Participant Information sheet, and the researcher was present in a teaching capacity to provide clarification of meaning only, when confusion was indicated. All present in the classes indicated willingness to participate. This takes advantage of the efficiencies and strengths of the technique in describing model trends and clusters in the data due to the fact the study was dealing with new software technology, a smartphone app and variation of student familiarity with more general app use (Creswell, 2018).

The use of Survey Monkey permitted the employment of choice from a variation of questionnaire designs and enabled participant data to be transferred into a program format for later analytic functions. With appropriate safeguards for confidentiality and identification the programme allowed respondents to access the form remotely from any smartphone or pc connected to the net and data collected from an outsized pupil population whilst ensuring ease, and thus attractiveness of student use. Utilisation of the internet further encouraged use of electronic technology in terms of access and use of the software, which, at least in a small but relatively significant way, mirrored the use of the *Memrise* App by smartphone for vocabulary learning.

3.12.2 Reliability of the Questionnaire

Much has already been discussed on the importance and promotion of reliability in the study in a more general context of planning and method utility. In developing the use of the questionnaire in this phase of the research the Alpha Cronbach coefficient reliability test was used as a measure of this process apparatus by assigning a correlation value between 0 and 1 (Cohen et al., 2018). In preparation for this phase, it is noted that George and Mallery (2016, 240) suggested a rule of thumb for the Cronbach Alpha:

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

Analysis of the results indicated scores for the questionnaire format between .70 and .90 indicating a high level of reliability.

Table 4: Cronbach's Alpha Test

Aspects	Number of items	Cronbach's alpha
Smartphone ownership and Application Use	8	0.73
Vocabulary Learning Strategies	18	0.80
Students attitude toward smartphones uses for vocabulary learning	11	0.87

3.12.3 Vocabulary Pre and Post Test Design

These tests were developed and prepared by the researcher to measure the variations in student scores before use of *Memrise* App, at the beginning of their first semester, and after, to assess comparisons with and without the use of *Memrise* App. The design aimed at testing the two groups of English students studying the following textbooks:

Q Skills for Success 4

Q Skills for Success 5.

The test consisted of fifty multiple-choice questions taken from vocabulary lists students had to learn over the course of the semester. The test content was checked for compliance with the curriculum requirements of the stage of learning for each set of students by experienced ESL professors and the first draft amended to take account of advice for any alteration of the words used and definitions sought by way of answers.

The length of the test itself at a forty five minutes during the lesson followed the recommendation of Suwantarathip and Orawiwatnakul (2015) to maintain focus and desire for involvement. In order to ensure consistency in measurement of comparative

test performance over the semester, the same vocabulary was used in the post-test phase at the end of the semester, albeit in a different order. The evaluation of reliability of the process was carried out with the advice and input of other education professionals at the university. It is always of value for a teacher-researcher to discuss their work and ways of doing academic tasks with their peers, and certainly anecdotally, ideas and improvements will arise in simple social conversations on how to do things better. Credit is therefore given here for such informal, conversational input which aids reflection.

The planning was facilitated by the encouragement, advice and support of University supervisors and associate professors at the English Department. A hard copy consent form was distributed to the participants in class in the course of their lesson, the author having sought permission from their specific lesson teacher to address the class for 30 minutes on the research. They were given sufficient time to consent to participation, approximately 10 minutes to digest the Information sheet in silence, save for questions of clarification. An explanation was given of how to access the vocabulary test via their smartphones. The link was noted on the whiteboard and time allocated at 25-30 minutes. Participants were informed the test was designed for a scientific research purpose and it had nothing to do with their grading, nor would refusal to take part be noted. Given it was the end of their class period, they were given the choice of doing the test or going; they stayed to do the test without any coercion or persuasion.

The pre-test exploration was to provide a baseline analysis against which to compare the post-test use of the *Memrise* App. Fifty multiple choice vocabulary questions were included in the pre-test, with marks for each correct answer (Appendix C). In terms of setting university target specifications for the students in vocabulary knowledge

accumulation the AWL standards set out in their course text books were used and widely available to the students.

3.12.4 **Memrise Base Course Design**

The reader is reminded that the non-Memrise control group simply continued with their education using their more traditional sources of learning, name teacher and textbook led. They serve a valuable role which facilitated comparison with the Memrise group, the latter's evaluation of the software being key to the aim of the study. This explains the concentration of the study process on the Memrise group. It is an examination of what changes are measurable in the satisfaction of the objectives upon which this research is based arising from the use of the smartphone software, rather than an assessment of the general Saudi higher education process. It is a search for evidence of whether improvement is evidenced, learner behaviour changed and learning enhanced through the independent learning opportunity offered by the app.

Upon the completion of the pre-test task process, participants in (Q4& Q5) were assigned to one of two experimental conditions: Memrise and Non-memrise. Those in the *Memrise* condition were asked by the author to download the application via a link provided in the classroom. This directed them to the 'sign up' page of *Memrise* and then to a specific course pre-designed by the researcher. These courses contained all the vocabulary items listed in the course books Q Skills for Success 4 and 5 with English definitions, Arabic translations and examples. The online courses designed by the author, based on textbook examples were geared to the Q4 level, with a more difficult vocabulary task for the Q5 group, in accordance with the class texts.

Participants were then advised to use *Memrise* as self-study tool to assist them in learning vocabulary. It was from this basis of a starting point that students would begin their use of the device, and then develop their own, autonomous enquiry into the software facilities which would be discussed in the interview stage. The non-Memrise group continued with their usual methods of learning, as indeed did the Memrise group, who continued attendance at classes and their institutional learning. Both groups therefore carried out their commitments to the traditional learning programme of the university, the only difference being the Memrise group were asked to utilise the app in support.

In the two visits conducted with the classes, with the permission of their teachers, the first was used, as noted, for the distribution and completion of the questionnaires, from which the smaller test groups were randomly chosen by the administration department at the university. They were then met with, as described above, and consents obtained, whereupon the Memrise group was given the link to download the app for use. This was undertaken within the first two weeks of the first semester of their first year. It should be noted that the classes had already been graded into Q4 and Q5 as part of their induction to the course testing by the university, which the researcher was not involved in.

The instructions given to the Memrise group were brief and limited to providing access information. They were not told how to use the app, nor were they given instructions about what faculties to use. This ‘guidance’ would have compromised, by the introduction of researcher bias, the pursuit of the objectives which stress autonomy of learning and the development of self-learning strategies and planning. They were not told how long to use the app for on a daily basis, simply to use it when they wished. To have ‘ordered’ otherwise would have undermined motivation indicators and value assessment analysis.

It will not be forgotten that these were university qualified students, albeit in their first year, and the aim of the study was to facilitate assessment of their personal learning skills and the value they placed on the app in supporting what the institution provided to them.

3.13 Phase Two: Qualitative Data

Reference is made to the discussion herein of the value of the interview process utilised in this part of the study, carried out at the end of the first semester. It will be recalled that Cohen *et al.*, (2018) describe an interview as a verbal communication between the interviewer and the interviewee used to gain important information about a particular topic, and a common feature in educational research. The technique utilised in this study was the semi-structured interview enquiry. Cargan (2007) asserts that questions put in the semi-structured interview are characterised by flexibility and the interviewer may change the order, delete, explain, or even modify questions if s/he believes it is appropriate and facilitates data elicitation.

Care was taken, nevertheless, in reflective planning, to develop a series of enquiries which would apply to all respondents, with follow up questions anticipated for clarification. The reasons underpinning the standardisation of questions to be asked, the order in which they were put, and considered follow up enquiries, have been mentioned above. All interviewees had to be treated in the same manner to collect reliable data in pursuit of the objectives. The researcher believed it was important to the credibility of this information gathering process that, whilst embracing the flexibility afforded by the process, all respondents were dealt with in the same manner with regard to nature of enquiry and time spent.

Interviews were undertaken with 11 of 18 participants in the research, randomly chosen from the *Memrise* groups in Q4 and Q5. The non-Memrise group did not need to interview because the aim and objectives of the research are focussed on the value assessment of Memrise. Their role was to provide a comparison to the learning outcomes of traditional teaching, essentially representatives of the traditional class group of learners which all participants continued to be involved in, and identify any improvement in outcome which could be attributed to the app use. All are similarly qualified in their relevant class sections (Q4 and Q5) given that they have all achieved prerequisite qualifications for higher education status. In reflection on the method processes of similar studies in the Literature Review, particularly with regard to sampling and taking into account the time and costs limitations examined in some detail herein, no significant further differentiation was required in the identification of participants. After the questionnaire procedure was completed, the allocation of participants was a task ascribed to the administration department at the university, as stated. This was not a duty which the researcher considered it appropriate for him to be involved in due to his perception that it potentially introduced bias of choice in the involvement of those who, for example, would show, from their questionnaire answers, support of aims as opposed to more objectives study.

Six of those chosen from the 18 did not wish to take part in the interview process. It was considered that rather than select replacements, the credibility of the survey required note to be taken of this rather than substituting candidates. In any case, given that the formal Memrise evaluation period had passed, this would have meant seeking replacements from those in the broader class groups who had used Memrise, but were not involved in the formal study process. That made little sense in the context of an academic research process. The interviews were then undertaken individually rather than as a group, to

facilitate ease of discourse and avoid the contamination of views through cross-exchange. Cohen, *et al.* (2018) had also noted “*we may expect a variety of different stories to be told concerning a setting or context where the topic to be discussed is sensitive*” Students were being asked about their efforts, focus, and ability to learn vocabulary in a particular manner. These were considered sufficiently sensitive topics to avoid inter-group discussion.

3.13.1 Semi-structured Interview Protocol

This was prepared with similar care to that of the questionnaire and in the same manner, with considerable reflection upon and attention to the nature and content of the enquiries to be made of the participating group. The themes, related to the objectives, which aided preparation of the specific questions were to elicit changes in post-questionnaire and quantitative test attitudes and perceptions

- i. smartphone applications experience,
- ii. *Memrise* application experience,
- iii. vocabulary learning strategies,
- iv. learner attitude, and
- v. learner motivation.

The questions put to each interviewee were the same to ensure consistency in the qualitative process of information gathering. The input and design reflects the benefits gained from utilising the pilot study process. It guided the drafting of the questions and supplemental enquiries arising therefrom, as well as the order in which they would be asked and timing. The majority of the questions pertaining to the themes were similar in substance to those utilised in the questionnaire process, and attached in the Appendix section, to ascertain if there was any measurable change in learning strategy, motivation.

To these updates were added enquiries regarding attitudes towards, and perceptions of the value to learning of, the smartphone software tool. The interview plan combined both closed and open-ended questions, avoiding specialised or otherwise obscure language. They were designed to be simple, to ease immediate understanding without the need for the researcher input of clarification, to avoid any risk of directing responses.

3.13.2 Conduct of the Interviews

Logistical demands dictated that, although the interviews may be described as face-to-face, they in practice had to be undertaken by the electronic audio-visual technology of Skype with the participating students. They were reminded that their participation was voluntary, and they had indeed been given, and allowed the opportunity to read, the participant information sheet at the beginning of the study. Each who participated confirmed consent before the interview started. Appointments were arranged via individual email with the participants, and all kept to those timings. The closed questions gave specific options for choice and grading of answers and the structure of the process allowed clarification in the event of confusion or meaning, already anticipated and prepared in advance. Notes were taken and all follow-up questions were limited to enquire 'why' and 'what do you mean' without adding or repeating what the interviewee had said to give rise to that enquiry. This ensured the student did not in any way feel challenged in his responses. Each interview was time for and lasted 20-30 minutes and was conducted in Arabic. They were recorded on windows 10 software recorder. The interview protocol is attached (Appendix D).

3.13.3 Interview Transcriptions

The answers and notes were thereafter translated into English by the researcher-author (Appendix J), a qualified English translator with a BA degree from the college of languages and translation. Whilst conscious of the potential for bias in translation, the researcher was conscious of costs restrictions, but remained fully conscious of his training as a translator, occasionally called upon by government departments and lawyer to produce objective, politically sensitive work in this field.

3.14 Ethical Considerations

When dealing with people, especially impressionable youth in the cultural context of the Imam University, ethical behaviour played a central role in planning. Ethical concerns not only the moral principles and obligations identified by a researcher in relation to participants but also to what extent a researcher is aware of the risks of the research context, and how to protect oneself and other participants without influencing the research findings or validity (Brinkmann and Kvale, 2017). The issues pertinent to this study are noted;

- 1) The students were known to the researcher and had the opportunity of anonymity during the tests, although this could obviously not be afforded in the face-to-face interview structure. They would of course regain this in the collation of the results and in the survey presentation, save for an expression of gratitude for their assistance.
- 2) When confidentiality could be afforded, or any step in the process did not require identification, it was preserved. No-one will be able to identify any individual participant in the research report.

- 3) It was not a particularly sensitive subject of examination, but the care was taken for the potential desire to avoid discussion of personal based activities in a group setting, so interviews were conducted individually (Guenther, 2009).
- 4) Authority was also obtained for involvement from all participants, who had all attained the age of majority with the promise that involvement was voluntary.
- 5) Participant information sheets and consent forms for the participation in the research were signed in which the research purpose was explained at the initial presentation, participating students being advised they could withdraw from any part of the study at any stage (Appendix E and F).

4 Results Chapter

4.1 Introduction

This research was based on three data collection instruments, the questionnaire, pre- and post-testing and qualitative semi-structured interviews.

In order to reach the aim and answer the research questions. This chapter will analyse the results of the processes in order to identify how they achieve the objectives of the research, and thus meet the aim of investigating the role of the smartphone application ‘*Memrise*’ in supporting the learning of academic vocabulary in the Imam University, Saudi Arabia. The objectives are identified in Chapter One as the

- i) To identify vocabulary learning strategies that Saudi L2 students use to learn English Vocabulary.
- ii) To investigate the role played by smartphone app *Memrise* in supporting vocabulary learning in English.
- iii) To explore students’ performance in vocabulary retention in post-test with and without the use of *Memrise*
- iv) To understand learners’ attitudes and motivation toward using smartphone applications for vocabulary learning and educational purposes in general.

The semi-structured interview questions in the post-test phase were categorised into five themes: (i) smartphone applications experience, (ii) *Memrise* application experience, (iii) vocabulary learning strategies, (iv) learners’ attitude, and (v) learners’ motivation. These directly reflect the objectives and allow for conclusions to be drawn from the qualitative results which advance the aim of the study.

It is intended to extrapolate patterns and meanings therefrom in order to assist in determining the value of the *Memrise* mobile, smartphone app in assisting student learning of English vocabulary. Graphs, tables and charts are used to present datasets and facilitate understanding. Descriptive statistics such as mean, median and standard deviation (SD) are used to define students' attitudes and the result of pre/post test scores. The attitude was ranked according to relative importance of learning statements using descending order of mean and median. Differences in scores between pre/post-test were examined using paired t-test (parametric test).

It is important in the evaluation of the results to recall that a supplementary purpose of this study, as noted in the Introduction Chapter, is the contribution the results can make in promoting autonomous self-learning as a support to the traditional classroom and learning environment of Saudi Arabian universities, perceived by the researcher as an integral part of the Saudi Vision 2030 reform initiative. The Literature Review has accomplished a greater understanding of the plethora of opinions and research on effects of technology, mobile devices and smartphone app learning of English vocabulary as a foreign language, and it is intended to direct the analysis conducted in this research to the Saudi experience.

In achieving this aim and to ensure credibility of the conclusions, reliability of the methods and value to consideration of the aims, as well as stimulating new research based thereon, considerable reflection has been given at each stage to explain the unit of analysis and measurement of the data for analysis. This covers the questionnaire stage, pre- and post-test undertakings as well as the interviews conducted in the quantitative and qualitative phases.

The statistical analyses for the data of the study were performed using SPSS Statistics software Version 23 (George and Mallery, 2016). The data collected via the online survey of the first phase was transferred into an Excel worksheet from the web server, Survey Monkey, which had been utilised in the quantitative phase in this study, is widely used for creating surveys, gathering data and reporting results descriptively through statistics or graphs (Creswell, 2018).

Descriptive statistics were then used to explain the characteristics of the learner-respondents and correlate this to their questionnaire answers through mean, minimum, and maximum gradings of perceptions and opinions in the quantitative data analysis of this first stage of the study. In explaining the key characteristics of the descriptive statistics information, an identification and value of the tendency for variables in the statistics to arise is made and associates with other apparent features of significance (Phakiti, 2015). This provided an excellent technique to sum up the data and the meaning it conveyed.

Consequently, NVivo software was used for the qualitative data in order to achieve this understanding. The researcher used graphs, frequency distributions to presents data sets and summary statistics such as standard deviation (SD), mean, and median were used to define student attitudes to the value of the *Memrise* App and the result of pre-post test scores.

Participant attitudes were then ranked according to the relative importance of learning statements used in the questionnaire and answered by the participants using the descending order of mean and median. This part of the analysis enabled correlation and appreciation of the strength of relationships between, for example, attitude, motivation, daily learning activities and pre- and post-test outcomes. Differences in scores between

the pre- and post- vocabulary test outcomes were examined using paired T-Test (representing the parametric test).

4.2 First Phase: Quantitative findings

The results of the questionnaire were collected from the whole class survey conducted prior to the *Memrise* evaluation and vocabulary retention tests (pre and post). The process of analysis of the data provides broad foundation for the more directed stages of the study.

4.2.1 Questionnaire Data Analysis

This section proposes to analyse the primary stage questionnaire findings, the process providing broad demographic results which indicate smartphone ownership by the majority of university student participants, a generally high level of apps use, largely for social purposes, with further data on self-assessed levels of English language competency and learning strategies. The reliability of the analysis is of primary concern in establishing the cogency of the results.

4.2.2 Reliability

Internal consistencies of the designed questionnaire were needed to be assessed. In other word, Reliability was needed to ensure the appropriateness of the questionnaire in measuring the variables. Alpha Cronbach coefficient reliability test was used to test the overall reliability of the research apparatus by assigning a correlation value (Santos, 1999). George and Mallery (2016) system based on the coefficient reliability test was utilised as discussed in the methodology; $\alpha > 0.9$ – excellent; $\alpha > 0.8$ – good; $\alpha > 0.7$ – acceptable; $\alpha > 0.6$ – questionable; $\alpha > 0.5$ – poor; and $\alpha < 0.5$ – unacceptable. Table 1 indicated all the resulting Cronbach's alpha was lying between .70 and .90 indicating that the questionnaire was reliable.

Table 1: Cronbach's Alpha Test

Aspects	Number of items	Cronbach's alpha
Activity	10	0.73
Vocabulary Learning Strategies	18	0.80
Students attitude toward smartphones uses for vocabulary learning	11	0.87

4.2.3 Questionnaire Descriptive Statistics

The research data on the questionnaire was gathered and recorded using the Survey Monkey web server, the majority of survey questions using a Likert Scale grading of 1-5 to determine the range of students' attitudes/opinions? This enables students to indicate strength of opinion toward smartphone application use for vocabulary learning from 1, meaning they strongly agree with the content of the question and 5 indicating strongly disagreement. Similarly, some questions used multiple choice answers. Out of the 225 individuals invited for the study, 201 contributed to the online questionnaire, a statistically high response rate indicative of high confidence level in the results (Nulty, 2008). Likert Scale questions were analysed quantitatively using the degree of importance rating scale (Phakiti, 2015).

4.2.3.1 Demographic, Personal information regarding Participant app use

The survey questions in this section fell into five broad categories, the first incorporating essentially personal information, to establish a basis for consideration of answers and provide a broad demographic of the student participants;

- (i) Background knowledge of English.

- (ii) Vocabulary learning strategies.
- (iii) Smartphone ownership by students.
- (iv) Use of applications for vocabulary learning.
- (v) Participant attitude to the purpose of the study.

4.2.3.2 Vocabulary Learning Strategies

The study then analysed 18 statements in the questionnaire to explore student use of learning strategies for English vocabulary, using a Likert Scale grading of level and strength of view, in order to ascertain from their answers what category may be academically ascribed to the methods of learning used, in particular, behaviourist and cognitive. In retrospective evaluation, the scale perhaps should have incorporated a range of answers from ‘never use’ applications for the purpose indicated in the strategy question, to ‘always use’, rather than the strength of views regarding value to vocabulary learning to pursue knowledge accumulation. That said, the latter scale does provide a clear indication of the strength of perception on smartphone application value to vocabulary learning. Each statement in the first section of 10 used a median basis upon which to determine relative importance ascertained from participants, examining and listing activities from strong agreement to strong disagreement, expressed to facilitate reactive answers without the complication of introducing contextual variables which may affect the result, per table 2 below.

Table 2: Descriptive statistics of Vocabulary Learning Strategies

Statement	%					Median	Mean	SD	Rank
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
I make vocabulary flashcards for new words so that I can memorize them	3.6	7.7	32.8	43.1	12.8	4.00	3.54	.937	14
I keep lists of new vocabulary words	1.5	6.7	16.4	49.2	25.6	4.00	3.91	.909	7
I go through my vocabulary list several times until I am sure I know all of the words on the list	1.0	3.6	16.9	47.2	31.3	4.00	4.04	.849	5
I make vocabulary cards and take them with me wherever I go	10.3	35.4	31.3	15.9	7.2	3.00	2.74	1.07	18
I make regular review of new words I have memorized	1.5	3.6	15.9	49.2	29.7	4.00	4.02	.861	6
Repeating a new word aloud helps me remember it.	5.6	14.9	21.5	31.8	25.6	4.00	3.57	1.18	12
When I am studying new words, I repeat them silently in my mind	1.0	11.3	25.1	40.5	22.1	4.00	3.71	.968	10
When I try to remember a word, I write it repeatedly	3.6	7.7	22.6	38.5	27.7	4.00	3.79	1.04	9
I write both the new words and their translations repeatedly in order to remember them.	5.1	14.9	22.6	34.4	23.1	4.00	3.55	1.14	13
To remember a new word, I put it into an English sentence.	1.0	3.6	16.9	38.5	40.0	4.00	4.13	.890	4
I link a new word to an English word that sounds similar	6.2	21.0	26.2	31.3	15.4	3.00	3.29	1.14	16

I link a new word to another foreign language word I know to remember it	7.7	24.1	23.6	30.8	13.8	3.00	3.19	1.17	17
I associate words that look similar.	6.2	14.9	29.2	34.9	14.9	3.00	3.37	1.09	15
I create a mental image of the new word to help me remember it	1.5	4.6	23.1	47.7	23.1	4.00	3.86	.877	8
I learn words better when I put them in context (e.g., phrases, sentences)	1.0	1.0	12.3	34.4	50.8	5.00	4.34	.812	2
When I guess the meaning of a word, I try to understand what part of speech it is.	3.6	13.8	25.1	35.4	22.1	4.00	3.58	1.08	11
I like to use online dictionaries to look up new words	1.0	7.2	11.8	33.8	46.2	4.00	4.17	.967	3
I use smartphones to study new words	1.0	.5	4.1	40.0	54.4	5.00	4.46	.698	1

Keys: 1=strongly disagree, 2=disagree, 3= natural, 4=agree, 5=strongly agree

The most popular strategies for learning replicate those used in the classroom setting, namely introduction to new words, repetition and their use in sentences and context to facilitate understanding. One student noted

'I write the word first and then repeat it many times until I think I master the word which takes around 20 mins. I think writing the word is the best strategy for vocabulary learning. I revise the vocabulary at the end of each unit by answering questions related to vocabulary. Learning from smartphones (is easier) as it is available all the time anywhere. Also it is easier to reach the application but books and pen might not be available all the time.'

The student indicates herein the use of his classroom learning experience to utilise the smartphone app and aid the process of increasing his vocabulary bank beyond the institutional setting, independently. The capability of making mems, developing reminder and associative aids for memorising proved to be much less popular.

Essentially, the results show that (i) 80% of participants said that they use online dictionaries to look up new word; (ii) 85% of respondents indicated that learning words was facilitated by including them in a context representing their meaning, and (iii) 94% found vocabulary learning and study by smartphone valuable. The table shows they are able to use the software in a manner most suitable to their preferred style of learning, adapting the same to their needs, which are essentially behaviourist and similar to their traditional learning.

4.2.3.3 Smartphones Ownership and Applications Use

The other 8 questions focused on the category of smartphone ownership which was to be considered in this study to determine use for educational purposes. 98% of student participants confirmed having a smartphone. Out of the 98% who were able to use smartphones, 68% indicated their smartphone operation system was Apple iOS, 29 % Android, 1% Nokia and 2% others such as Lenovo.

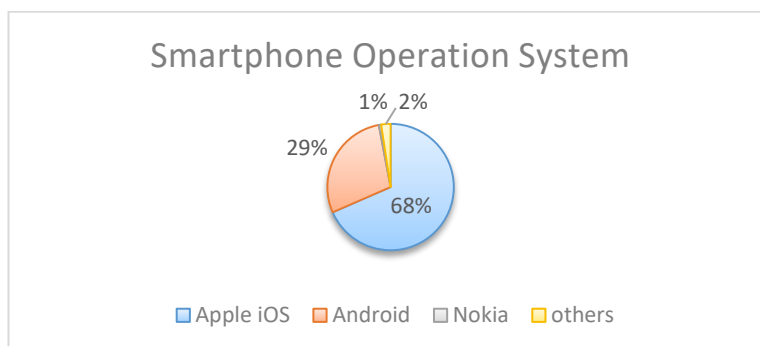


Figure 7: Smartphone Operation System

It may therefore be concluded that virtually all of the participants have access to devices capable of accessing and operating *Memrise* and given that the software is free (subject to add-on facilities which do not form part of this study), it is concluded that there is no financial or technological bar to this self-learning tool. Those who did not own a mobile smartphone were unable, of course, to participate in the *Memrise* part of the study. It is

also of concern that the Vision 2030 initiative to embed technology as the basis of classroom and institutional teaching will prejudice the learning of those who do not have the devices, or indeed, do not like to use them. It will be argued in the Discussion Chapter that technology, in all its forms, is a tool for teaching, not a replacement.

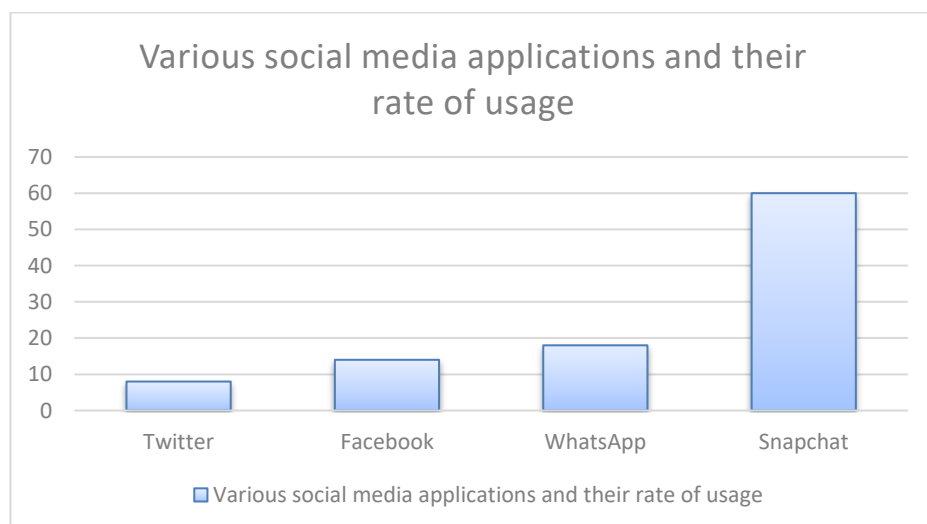
4.2.3.4 Smartphone Applications Experience

One of the objectives of this research was to explore student experience and familiarity with mobile smartphone applications in daily life. All participants in the questionnaire stage provided answers to this enquiry, all indicating they had social media applications in particular on their smartphones. The most commonly used applications were WhatsApp, Snapchat, Twitter, and Facebook, with

- i. Snapchat the most used at 60%.
- ii. WhatsApp followed with 18% regular use,
- iii. Facebook at 14%, and
- iv. Twitter, 8%;

these results are displayed in Figure 9.

Figure 8 :Various social media applications and their rate of usage



4.2.3.5 Smartphone Use for Vocabulary Learning

The results provide evidence that many students used their smartphone to learn English vocabulary. The number of participants 34% (n= 68), indicated that they use their smartphones less than 1-2 hour per day for that purpose, while 18% (n= 12) said they use 1-2 hours per day to surf the internet. The rest remained neutral about how often they use their smartphones to learn English vocabulary.

4.2.3.6 Smartphone Applications for Vocabulary Learning

Participants in the post *Memrise* test interview stage were asked if they had used any applications specifically for vocabulary learning. 35% indicated they had. Figure 10 shows the applications used by participants for vocabulary learning. Some of whom indicated that *Memrise* was one of the preferred smartphone applications in pursuit of vocabulary learning.



Figure 9: Smartphone Apps for Vocabulary Learning

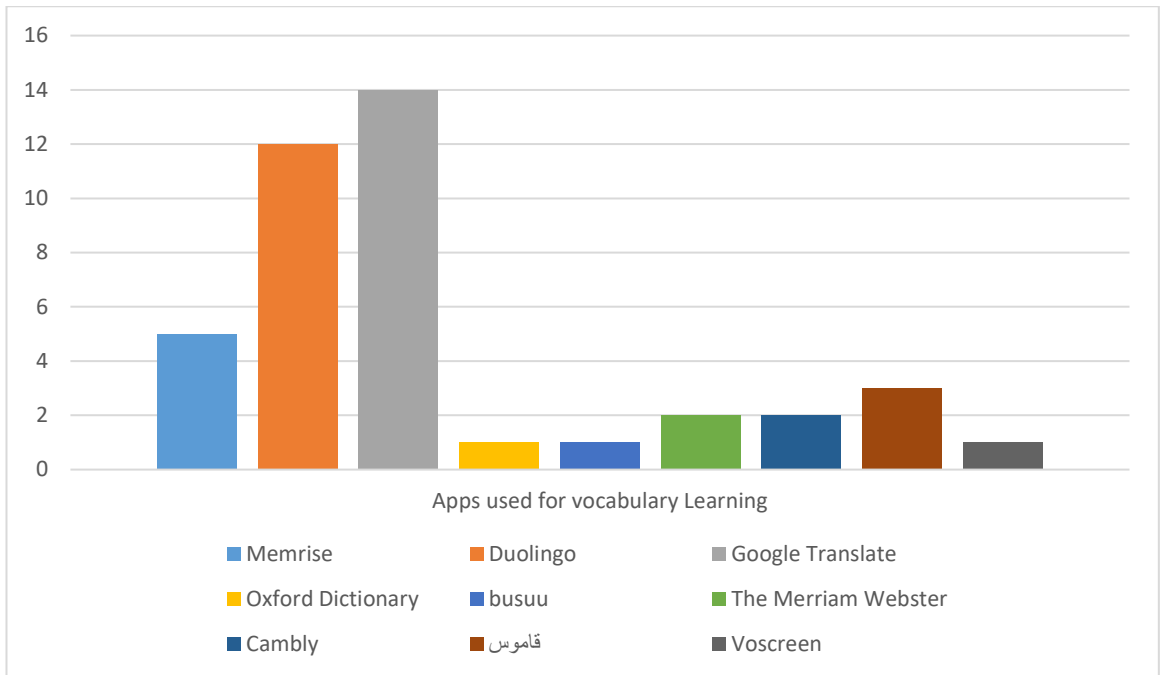


Figure 10: Smartphone Apps for Vocabulary Learning

4.2.3.7 *Students' Attitude and Motivation toward Smartphone use for Vocabulary Learning*

The questions on the last category asked respondents to indicate their attitudes and motivation toward smartphones uses for vocabulary learning. It will be borne in mind that this occurred before the main study use, and the views of the students, particularly those who indicated they did not use the device for that purpose, were largely based on perceptions rather than evidence. Table 3 below describes the statistical findings from learners' attitude toward smartphone uses for vocabulary learning.

Table 3: Descriptive Statistics of Students' Attitudes toward Smartphone use for Vocabulary Learning

Statement	%					Median	Mean	SD	Rank
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
I like using my smartphones to learn English vocabulary.	1.0	2.6	11.8	37.4	45.6	4.00	4.26	.847	2
Smartphones are useful for learning English vocabulary.	1.0	1.0	5.1	36.9	55.4	5.00	4.45	.734	1
It is interesting learning English Vocabulary on my smartphones.	1.5	2.6	12.8	39.0	43.6	4.00	4.21	.877	3
The use of smartphones to learn English language vocabulary is fun	1.5	4.1	15.9	39.5	38.5	4.00	4.10	.919	4
I like learning English vocabulary on my smartphones because of the features, such as colour, graphics, games, animation, and layout	1.5	8.2	19.5	33.8	36.4	4.00	3.96	1.017	6
I think English teachers should encourage the use of smartphones for learning English vocabulary.	1.0	3.1	23.6	30.8	41.0	4.00	4.08	.929	5

Revised statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Median	Mean	SD	Rank
I am not willing to download paid applications on my mobile phone to improve vocabulary learning	12.3	15.4	35.9	20.5	15.4	3.00	3.11	1.212	5
I do not like to use smartphones for vocabulary learning	3.6	9.2	8.7	37.4	40.5	4.00	4.03	1.094	1
The use of smartphones for vocabulary learning is a waste of time.	1.5	7.2	7.2	26.2	57.4	5.00	4.31	.992	2
The use of smartphones for vocabulary learning is difficult.	13.3	19.0	13.3	26.2	27.2	4.00	3.35	1.407	4
The use of smartphones for vocabulary learning is boring.	5.1	7.2	23.6	29.7	33.8	4.00	3.80	1.139	3

Keys: 1(5 for revised statement)=strongly disagree, 2 (4 for revised statement)=disagree, 3= natural, 4 (2 for revised statement)=agree, 5 (1 for revised statement)=strongly agree

This clearly indicates that the majority of participants have positive attitudes toward the use of smartphone applications for supporting vocabulary learning

- 83% of the participants indicated that smartphones are useful for learning English vocabulary, although
- 25% thought it boring and a waste of time even though a number therein had indicated it did have its uses; the remaining
- 5% indicate no views.

Table 4 provides a summary of the analysis of the student attitudes to the value of the smartphone software which are relevant to the motivation to use Memrise in their learning programme

Table 4: Descriptive Statistics of Students' Motivation toward Smartphone Use in Vocabulary Learning

Statement	%					Median	Mean	SD	Rank
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
It is effective to use smartphones to learn English vocabulary	.5	2.6	10.3	38.5	47.7	4.00	4.31	.800	2
I like learning English vocabulary on my smartphones because of the availability anytime, anywhere.	.5	2.1	7.7	30.3	59.0	5.00	4.46	.769	1
I like learning English vocabulary on my smartphones because of instant feedback.	.5	3.1	15.4	39.5	41.0	4.00	4.18	.842	4
I am willing to download free learning applications on my mobile phone to improve my vocabulary learning	.5	4.6	11.3	34.9	48.7	4.00	4.28	.844	3

The majority of participants 89%, of all respondents are motivated to learn vocabulary through the use of smartphone for its available anytime anywhere. There is even a clear indication of enjoyment from the use of the application and this is an obvious conclusion that the ease of smartphone use in learning has a positive effect on motivation. The

positivity of student towards the app are indicative of a willingness, even enthusiasm, to supplement learning outside of the classroom

Student five comment provides a cogent synopsis of the motivating value of the app:

'If apps will be like Memrise I will use it as it helps me in revising the words many times and put them in context. Learning from Memrise encouraged me more and motivated me in learning vocabulary as I was addicted in learning from Memrise When I try to close the Memrise app, my finger pushes me to learn new words and so on.'

4.2.4 Pre- and Post- Vocabulary Tests

One of the objectives of this study is to explore the difference in scores within the same groups in the pre and post assessment processes for each participant, a statistical test for the paired sample was required. In order to choose the apposite test procedure, the researcher examined the normality distribution of data (George and Mallery, 2016).

4.2.4.1 Normality Tests:

Normality of data is one of the important assumptions in multivariate analysis. It is the comparison of skewness in the graphical display of variable data and the Kurtosis value of normal distribution which is propounded by Tabachnick and Fidel (2013) and Field (2017) as a measurement of symmetry of distribution, the histogram representation, and 'peakedness', the Kurtosis. The equal correlation of skewness of variable data and the Kurtosis norm is considered zero, with values deviating from this point indicative of non-normality of distribution (Field, 2017). Positively skewed data is represented by low values, on the left side of a graph negative scores, on the right, are shown as higher values.

The following sections will discuss the normality tests performed for all participants in the pre and post tests (Q4 and Q5) to ensure that the distribution of data were normal.

Group Q Skills for success 4

Table 5 below shows the results of normality test from Shapiro-Wilk and Kolmogorov-Smirnov analysis for both the pre and post-test results. Regarding the pre-test, the p. value for Shapiro-Wilk is 0.733 for the Traditional Group, using standard teaching and learning methods of vocabulary acquisition, and 0.663 for the *Memrise* Group which also used the smartphone app.

Since, the p. value for both groups is greater than 0.05, they are both normally distributed.

According to Ghasemi and Zahediasl (2012, 487), “*If the p.value of the Shapiro-Wilk/ Kolmogorov-Smirnov Test is greater than 0.05, the data is normal. If it is below 0.05, the data significantly deviates from a normal distribution.*” This means that the distribution of data variables associated with the measurement is considered normal, and therefore, in that particular context of measurement, extrapolated results are valid.

Table 5: Shapiro-Wilk and Kolmogorov-Smirnov Normality Tests for the Traditional and *Memrise* Groups

	Group	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	Df	p. value	Statistic	df	p. value
pre-test	Traditional	.087	33	.200*	.978	33	.733
	<i>Memrise</i>	.077	36	.200*	.978	36	.663
post-test	Traditional	.169	33	.017	.912	33	.011
	<i>Memrise</i>	.135	36	.094	.958	36	.180

Similarly, regarding the post-test, the *Memrise* Group is normally distributed at 0.094 for the Kolmogorov-Smirnov test and 0.180 for Shapiro-Wilk analysis.

However, again, the Traditional Group data is not normally distributed because the p-value is less than 0.05, 0.017 for the Kolmogorov-Smirnov and 0.011 for Shapiro-Wilk, indicating a more random operation of learning variables in the latter Group. It would be wrong and introduce a bias to speculate on this anomaly.

Table 6: Skewness- Kurtosis Normality Tests for the Traditional and *Memrise* Groups

		Skewness	Kurtosis
Traditional	pre-test	-.140	-.506
	post-test	-.856	-.134
<i>Memrise</i>	pre-test	.015	.015
	post-test	.320	-.399

Data is skewed when there is non-symmetric representation of data plotting results which does not depict a bell-shaped image of normal mean-median-mode distribution of study information (Doane and Seward, 2011). Therefore, considering Table 5, for the Traditional Group, the pre-test skewness is -0.140, meaning the distribution is approximately symmetric. Similarly, the post-test skewness is -0.856 meaning that the distribution is moderately skewed to the left.

Considering the *Memrise* Group, the pre-test skewness is 0.15 and the post-test skewness is 0.320; for that Group, therefore, both distributions are approximately symmetric.

Group Q Skills for success 5

Table 7 below indicates that in the pre-test the p. value for both the Traditional and *Memrise* groups is greater than 0.05, and therefore, the data is normally distributed (Ghasemi and Zahediasl, 2012). However the Traditional Group in the post-test procedure produces a p. value at less than 0.05, illustrating non-normal factors arising from the collection process. This is contrasted in that part of the study with the *Memrise* Group which maintains p. value indications of normality.

The researcher has been unable to identify specific factors which may have skewed the normality in distribution which contributed to the non-normality of the Traditional post-test result, and it would be wrong in the context of a study to speculate, an act laden with potential personal bias.

Table 7: Shapiro-Wilk and Kolmogorov-Smirnov Normality Tests for the Traditional and *Memrise* Groups

Normality Tests							
	Group	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	Df	p. value	Statistic	df	p. value
pre-test	Traditional	.129	32	.189	.947	32	.120
	<i>Memrise</i>	.110	39	.200*	.955	39	.117
post-test	Traditional	.200	32	.002	.921	32	.022
	<i>Memrise</i>	.113	39	.200	.957	39	.144

Table 8 below shows that for the Traditional Group, the pre-test skewness is -416 giving a moderately skewed distribution so that the post-test result of -0.832 means that the distribution is moderately skewed to the left .

Considering the *Memrise* group, the pre-test skewness is 0.135 and the post-test skewness is 0.124, and these mean that both distributions are approximately symmetric.

Table 8:Skewness-Kurtosis Normality Tests for the Traditional and *Memrise* groups

	Skewness	Kurtosis	
Traditional	pre-test	-.416	-.828
	post-test	-.832	-.135
<i>Memrise</i>	pre-test	-.135	-1.15
	post-test	-.124	-.913

This normality of the distribution provides support for the veracity of the data. The normality assessment using the Shapiro-Wilk test, kurtosis and skewness showed that there was approximately normal distribution. Therefore, the paired t-test for two dependent samples was used to show the difference between each group’s post-test and pre-test results. Also, the researcher used the independent t-test to show the difference in post-test and pre-test between the Traditional and *Memrise* Groups.

4.2.4.2 Paired Samples T-Test

It is necessary to examine the potential difference between the results of pre- and post-vocabulary tests to investigate any difference in scores with and without the use of *Memrise* application. So, paired t-tests were used to compare mean of score differences at two groups of data (*Memrise* & traditional) to identify any statistical divergence.

Group Q Skills for success 4

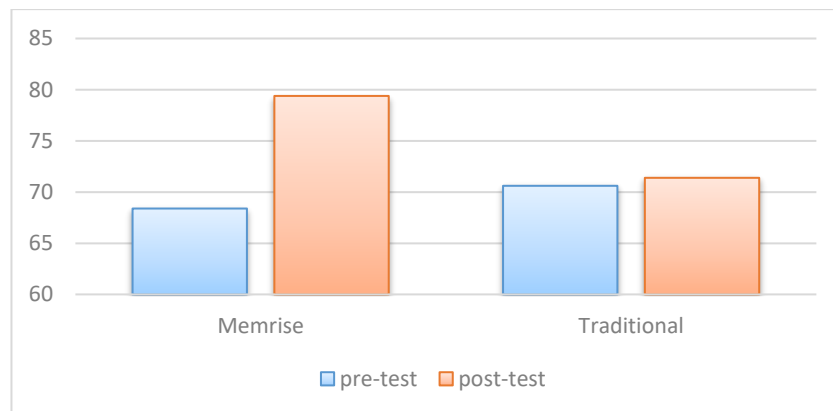
As shown in table 9 below, the results of the paired t-test showed that there was no significant statistical difference in the performance of the traditional group regarding the

vocabulary pre and post tests ($t=.284$, $p\text{-value}=.778$) For the *Memrise* Group, the results of the paired t-test showed that this group improved; the mean post-test score was higher (79.39) than the mean pre-test score (68.39) and this was statistically significant ($t=-8.68$, $p\text{-value}<.001$).

Table 9: Group Q4 Paired t-test between pre and post assessment for *Memrise* and Traditional Groups

Group			Mean	Std. Deviation	Paired t	p-value	Effect size
Traditional	Pair 1	pre-test	70.61	15.728	.284	0.778243	0.631
		post-test	71.39	19.465			
<i>Memrise</i>	Pair 1	pre-test	68.39	16.595	-8.68	0.000698	
		post-test	79.39	10.835			

Figure 11: (Group: Q 4) Means +/- SD for pre-test and post-test for *Memrise* and Traditional Groups



Group Q Skills for success 5

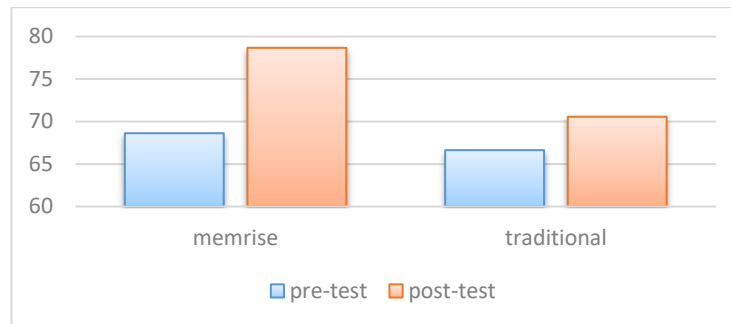
It is noted from the results in table 10 below that the traditional group shows a slight increase in their vocabulary score from the pre-test (66.63) to post-test (70.56), having undertaken the traditional course teaching routine of the classroom and textbooks, which would of course be expected. However, in terms of statistical analysis of the test results after the three month Memrise test period, this improvement for the traditional group, using the paired t-test analysis standards, is considered statistically insignificant as the p.value was higher than 0.05 ($t=1.453$, $p\text{-value}=.156$) certainly when compared to the level of improvement in the *Memrise* group,

For the *Memrise* group, the result also improved, from a pre-test score of (68.62) compared to the post-test result, (78.67). The paired t-test analysis shows that the difference between pre-test and post-test in the *Memrise* group was statistically significant ($t=1.732$, $p\text{-value} 0.0006$).

Table 10: Group (Q5) Paired t-test between pre and post assessment for *Memrise* and Traditional Groups

Group			Mean	Std. Deviation	Paired t	p-value	Effect size
Traditional	Pair 1	pre-test	66.63	15.429	1.453	0.156245	0.354
		post-test	70.56	20.117			
<i>Memrise</i>	Pair 1	pre-test	68.62	18.807	-7.16	0.091439	
		post-test	78.67	13.259			

Figure 12: Means +/- SD for pre -test and post-test for both *Memrise* and Traditional Groups



Summary

Over the period of the Memrise utility test period, both the traditional and Memrise groups in the Q4 class and more advanced Q5 EFL class showed some improvement in vocabulary learning at the time of the quantitative test. The traditional groups from each class, who had simply continued with their usual classroom and textbook learning as before showed less improvement in test outcomes than those who were tasked with the use of Memrise. Indeed in the t-test analysis, the Memrise groups test performance improvement was considered significant, clearly indicative of its value to learners, even those who showed no more than the most minor of support for the software.

The results of the traditional groups in each class, whilst showing improvement, in t-test analysis terminology, this is considered 'insignificant'. The findings are of course subject to variables, unmeasurable in the context and limitations of this study. It is perhaps indicative that students should be making more effort to learn, especially in their first semester, and show more consistency in vocabulary accumulation and understanding. This however requires entry into the realm of speculation rather than explanation by the teacher-author who expects the best from his students. In the qualitative part of the study,

the opinions and attitudes of the students were gathered and analysed to provide insight into their methods of learning and motivation.

4.3 Second Phase: Qualitative Findings

In the qualitative interview process 18 students, chosen from volunteer students who wished to try the software, all of fairly similar ability given their enrolment into the first year of EFL degree learning, were invited to participate. 11 actually consented when the time came to start the study, the remainders declining the opportunity. Eleven participants actually undertook the semi-structured interviews combining closed and open-ended questions to obtain data on their perception of the utility of the *Memrise* application, its advantages and limitations, in relation to vocabulary learning. The interview questions were categorised into five themes:

- (i) Smartphone application experience.
- (ii) *Memrise* application experience
- (iii) vocabulary learning strategies
- (iv) Learners' attitude
- (v) Learners' motivation

and thus evaluation of the responses is based on those categories see Appendix .

Key Findings in the Course of the Research Analysis

It has been noted that the key findings of the research considered to this stage are

- i. All of the participants have access to devices capable of accessing and operating *Memrise* and given that the software is free (subject to add-on facilities which do not form part of this study), it is concluded that there is no financial or technological bar to this self-learning tool.

- ii. 35% of participants indicated a previous experience of using smartphone applications for vocabulary learning;
- iii. 80% of participants said that they use electronic online dictionaries to look up new word, indicating a familiarity with the value of technology to the enhancement of learning;
- iv. 85% indicated that learning words was facilitated by including them in a context representing their meaning, indicative of the value of interactionist learning, and
- v. 94% found vocabulary learning and study by smartphone of value, albeit to a diverse level of self-preference for its use in learning
- vi. The majority of participants, 89%, are motivated to learn vocabulary through the use of smartphone due to the anytime, anywhere ease of availability.

4.3.1 Smartphone Applications Experience

As a basic premise of this research it was necessary to explore student experience and familiarity with mobile smartphone applications in the realms of social media and lifestyle management and knowledge organisation on a daily basis. Eleven participants provided answers to this enquiry, all indicating they had social media applications in particular on their smartphones.

Although all of the participants said that they use these applications primarily to connect and keep up with friends, some indicated they used them for learning purposes. One of the respondents used Twitter to follow an English teacher's account where he acknowledged learning benefit in vocabulary acquisition. The example given was that the teacher would tweet a word with its different meanings and use it in context to facilitate memorisation, learning and application. This is support for the implication which

pervades the study that teachers do have an important role in the utility and value of learning support using the smartphone.

Another respondent confirmed learning from WhatsApp English, stating that he had enrolled in a variety of groups where they share videos and clips about learning English and sharing information with other students. This is indicative of the kind of cognitivist exploration and learning which lends itself to autonomous vocabulary accumulation and interaction which enhances learning. Another participant also confirmed membership in a WhatsApp group where important news about their courses was shared by ESL students. Although all of the participants said that they use these applications primarily to connect and keep up with friends, some indicated they used them for learning purposes. One of the respondents used Twitter to follow an English teacher's account where he acknowledged that he found this social media facility of value in his vocabulary acquisition. The example given was that the teacher would tweet a word with its different meanings and use it in context to facilitate memorisation, learning and application. This is support for the implication that teachers do have an important role in the utility and value of learning support using the smartphone.

Use of Social Media apps for EFL Learning

It is indicated by three of the students in interview that they had explored some level of interactive exchange on their social, communication apps the exchange of EFL knowledge or findings. This is arguably more significant than the more limited use they made of the actual *Memrise* app, because learning was introduced into the social sphere, A respondent believed that he learned new words and contextual use from *WhatsApp* English, stating that he had enrolled in a variety of groups where they share videos and clips about learning English and sharing information with other students. This involved

sharing findings, new words and contextual use ideas and questions, and is indicative of the kind of cognitivist exploration and learning which lends itself to autonomous vocabulary accumulation and interaction which enhances learning. Another participant also confirmed membership in a *WhatsApp* group where important news about their courses was shared by EFL students.

4.3.2 Memrise Application Experience

The second set of thematic questions informed the research by focusing on the *Memrise* application experience, the results particularly enlightening in the particulars of time spent by students using the app. The data for these findings was obtained in the course of the qualitative, post-test interviews as evidenced in Figure 14.

Figure 13: Time spent on *Memrise* application daily basis

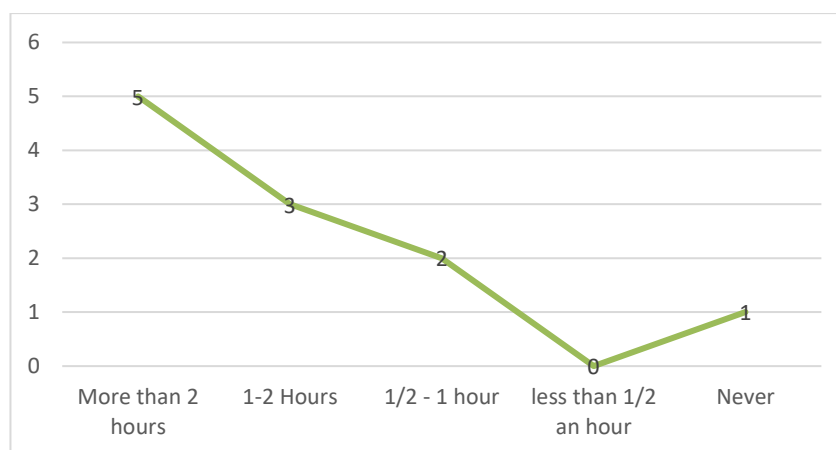


Figure 14 above shows that of the 11 interviewed participants, nearly half, used the *Memrise* application more than two hours per day used it for 1-2 hours and 2 for an hour or less. One participant did not use the application.

Of the eleven participants who provided answers to this question, all but the student referred to above, who found the app too simple, indicated that they found the *Memrise* application easy and simple to download and use, ‘a great app’, with two from the eleven

interviewed going so far as to describe it as a ‘doctor’ or ‘teacher’. Others, it has been noted above, were less enthusiastic, but still acknowledged value to learning vocabulary. These findings were indicative of significant benefit to learning and language development; nine of the eleven interviewed mentioned that they believed that spelling improved significantly as a result and seven stated that the *Memrise* application helped them to pronounce, spell and use vocabulary.

One typical response is worthy of detailed consideration;

“What I liked most about the app is the revision feature, when you make mistake words appear again and again until you fully master the word. I open the app at a minimum between 6-10 times every day for a total of around 1-2 hours as I enjoyed using it (see Figure 14). Before using the app I don’t check new words from the course book, but now with the app, I always learn and revise them. I learned a lot from the app and will absolutely continue learning from it.”

Opportunity for Repetition

One of the participants however concluded the app was of no use to him specifically in vocabulary learning. He stated that he did not use the application very much because of the spaced repetition system embedded in the application and that he already knew most of the vocabulary items:

“I used Duolingo but it was boring because it focuses on the very easy words such as pronouns. I didn’t like the repetition in Memrise it makes you feel boring I wish I could skip. I aim to use Memrise for another language which is French to assist me in the university module.”

The repetition process for English was something he associated with the class room task setting, and he indicated that this may be useful for beginners in vocabulary learning for

a new language, it was of less value for more advanced learners. Instead of using the app for vocabulary learning, he did find the courses of advantage where the developer which offered not only words for repetitive learning but statements in which the word was used to provide context.

4.3.3 Vocabulary Learning Strategies

The third thematic set of questions demonstrated the primary strategies used by the respondents in learning new English vocabularies and again 11 participants answered this interview question giving valuable insight into how they personally learned words. It is acknowledged that different circumstances will arise which promote the accumulation of English vocabulary, and essentially a mix of the ways illustrated by the answers will aid learning; this part of the study questions the primary method of planned acquisition by students. The results show

- a) 32% of the total participants stated that they write down the difficult words with the meaning and search on Google picture to connect the image with the word so that the word could stick in their minds with the picture.
- b) 14% approached vocabulary learning through watching movies, reading books, speaking with friends and classmates.
- c) 23% said that they first get the meaning of the word and then put it in a daily life context. They explained that understanding the meaning and then using it in a context helps in recalling the word in the future.
- d) 16% indicated that their way of acquiring new vocabulary was through listening, as they learned English mainly through watching TV shows.

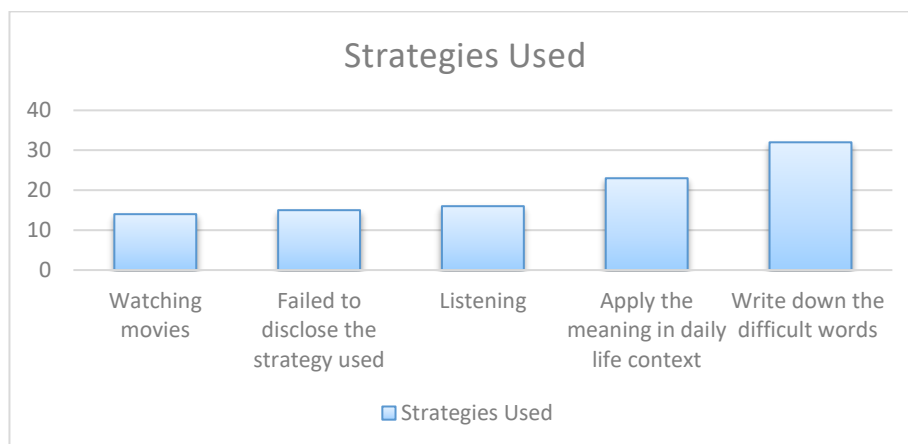
One of them said that

“Listening helps me to understand the pronunciation and usage of the word. Learning from smartphones is good but I prefer using listening and reading. I

don't just learn vocabulary when I listen or read. I learn something new like reading a novel for instance which doesn't make me bored."

This is indicative of cognitivist learning, the presentation of words and language for learning, with a contextual base to aid understanding of its use. The remaining 15% did not indicate what strategy they use to learn English vocabulary. They indicated in discussion that they tended to use whatever opportunities they particularly experienced to learn, and it would have been inappropriate to 'label' such random methods of learning with a specific category. It was effectively a random use of different strategies which they were unable to explain cogently and which the author was concerned would be influenced by pressing for a more definitive answer for the study purposes. Figure 15 summarises the strategies results data.

Figure 14: Strategies Used to learn new vocabularies



4.3.4 Learners' Attitude toward Smartphone Use for Vocabulary Learning

In the fourth thematic questions, the interviewees were asked for their views on using smartphones to learn English vocabularies. The results enabled the identification of two categories,

- (i) Those who found it a new enjoyable method of accumulating vocabulary and thus useful, which was by far the majority of the interviewees or those surveyed.
- (ii) One participant who stated it was boring, ineffective and of no value to his learning.

The analysis of responses is pertinent and valuable in understanding of attitudes to using their smartphone as an education tool.

“When I make a mistake in a word it doesn't appear immediately at the same time, rather it brings other words to learn and then bring the word that I didn't answer correctly I find it enjoyable and useful.”

Another indicated that it supported learning strategies he had already implemented, although he did combine its use with the traditional features of class room learning;

“It might help when you look for the meaning of new words like using smartphone application dictionaries, but memorising with pen and paper helps to keep the word in your memory longer than smartphones.”

This is indicative of the smartphone as a valued support to traditional learning, but certainly not a replacement, and it has implications for the Saudi government initiative of making educational institutional learning primarily technology based

A further student added to this assessment of using smartphone apps for vocabulary learning;

“The applications actually help in learning vocabularies such as dictionaries and other smartphone apps and I use it to support in learning vocabulary.”

It should perhaps be stated that although the students used the nomenclature of ‘app’ the interview was based on their evaluation of *Memrise* in particular, although they nearly all called it ‘the app’. If reference was made to any other app, for example *Dulingo*, or a social media platform, it was specifically named.

The participant who eschewed the use of the device as a learning instrument said there is nothing interesting that drags him to learn using smartphones, but instead, he learns through reading stories, listening or watching TV shows.

4.3.5 Learners’ Motivation toward Smartphone Use for Vocabulary Learning

The final thematic questions informed the study on factors relating to the learners’ motivation to learn vocabulary using the smartphones, and again, the participant pool was 11, all of whom indicated high motivation to learn new English vocabulary via their personal mobile devices. This was not a particularly surprising outcome given that vocabulary learning formed an integral part of their course choice.

Two responses are indicative of a finding of learner motivation to use applications to further their classroom and textbook learning;

- *“I used the application to support my learning but not all applications are helpful in learning vocabulary”* - aspect of the *Memrise* faculty such as listing words, repetition and understanding in the contexts provided by the app were the main features identified by this student, but he did not find the use of building mems something which attracted him
- *“I think I have learned a lot from Memrise and will continue learning from the application in the future”*.

The responses were indicative of the software supporting the embedding and consolidating of knowledge rather than of a search for expanding their vocabulary bank, the significance of which will be addressed in the Discussion Chapter.

4.3.6 Validity in Data Collection – Semi-Structured interview Stage

The concept of validity is concerned with whether the research findings gained through a measurement tool are accurate, what they appear to be in the context of the data used to reach or portray a conclusion drawn therefrom (Zohrabi, 2013). The method of data collection used in this part of the study is the interview. Moreover, the specific content for each dimension in the interview was designed after reviewing a large volume of relevant literature and studies in the Review process of Chapter 2.

4.4 Relationship between Quantitative and Qualitative results:

The analysis and consideration of the data collected in the quantitative and qualitative processes of this study is evidentially indicative of the existence of the relationship between the methods of examination utilised to demonstrate the five thematic postulations. Table 9 demonstrates this relationship.

Table 9: Relationship between quan and qual Results

The five thematic questions	Questionnaire	interview
Smartphone applications experience amongst all participants in the study compared to knowledge amongst those chosen for the Memrise testing	65%	90%
<i>Memrise</i> application experience amongst all participants in the study compared to	35%	90%

knowledge amongst those chosen for the Memrise testing		
Learners' Attitude toward Smartphone Use for Vocabulary Learning amongst all participants in the study compared to knowledge amongst those chosen for the Memrise testing	70%	90%
Learner's Motivation toward Smartphone Use for Vocabulary Learning amongst all participants in the study compared to knowledge amongst those chosen for the Memrise testing	88%	90%

The results of the first question on the experience of students with smartphone applications, (n=130) of students confirming their knowledge of its use as a learning tool in the quantitative questionnaire stage and 90% in the qualitative interview procedure, shows clear majority of the participants who took part in the questionnaire and the interview are experienced in using smartphone applications in general and for vocabulary learning in particular.

Similarly, in terms of the *Memrise* application experience, (n=40) of participants in the questionnaire have experienced the use of *Memrise* as a tool to support vocabulary learning. In the post interview (n= 10) participants found that the *Memrise* application was helpful and enjoyable for learning vocabulary anytime anywhere.

Moreover, on the learners' attitude thematic questions, (n=180) of the participants have positive attitude toward smartphone use for vocabulary learning, although two participants mentioned that they prefer pen and paper for vocabulary learning.

It is evident that majority of the participants had a positive attitude toward the use of smartphones in learning vocabulary. They indicated they were, in the main, keen and motivated to use smartphones in order to learn new vocabularies in the interview stage, especially having actually used them in their learning strategy, compared to the 88% of the respondents who took part in the questionnaire. There were some reservations about the level of enthusiasm some offered in interview about the value of the app, and these concerns have been outlined. The results indicate the remaining (n=24) of the total questionnaire participants felt that using a smartphone to learn new vocabularies was not useful. In general therefore it is appropriate to conclude both the quan and qual results show that use of smartphone applications is an effective way of learning vocabulary, at least when students are aware, through use, of its value to improvement aims.

4.5 Conclusion

The results of the survey and analysis will be discussed in greater detail in the following chapter, but they have been valuable in identifying relationships between smartphones as a learning tool and the perspectives of students on its value on independent learning activities. The benefit is shown to be measurable, in both a quantitative and qualitative manner, with a standard of cogency and validity which it is hoped will be accepted in the traditional Saudi teaching and learning context.

The chapter has focused on data collection and analysis based on both the qualitative and quantitative data collection phases.

- (i) In the quantitative phase, statistical analysis of the questionnaire and the pre and post test results indicates test performance and outcomes are prima facie improved by the student who used *Memrise*.
- (ii) In early questionnaire pre-test stage, there was a considerable level of support recorded for the use of mobile technology per se and in particular in advancing educational aims where the software could be proven to be of value.
- (iii) The qualitative phase presented the interview results which showed support for the *Memrise* application as a learning tool, thus supporting the findings and conclusions of the quantitative stage.
- (iv) Account has been taken of the reservations expressed by several students about the value they place on the app, in terms of simplicity and interest, which has implications for improvement of the software development to make it more interesting and challenging for more developed language learners.

5 Discussion Chapter

5.1 Introduction

This chapter focuses on discussing findings from both quantitative and qualitative data, which were collected and analysed in the course of this study. The review of the literature and previous studies provided a foundation for this study on the use of mobile application in supporting vocabulary learning. The study investigated the utility and value of *Memrise* as a smartphone application in supporting English academic vocabulary learning in Saudi Arabia, where its adoption as a tool of vocabulary learning is necessarily affected by cultural imperatives of its context.

It has been highlighted in various studies noted in the Literature Review that the traditions of teaching methods, teacher-led, are developing under the various government initiatives to encourage the use of technology which frees students from the constraints of cultural and faith controls. This exploration and discussion will therefore be directed toward the effect of the research findings on student methods of assimilating and retaining knowledge and perspectives on the value of the *Memrise* application to support vocabulary learning in the Saudi social, cultural and educational context.

Behaviourist learning has always formed a part of Saudi traditional education,

- (i) responses to stimuli provided by the teacher,
- (ii) habitual and
- (iii) conditioned upon reinforcement (Brown, 2014).

It is a highly structured, intensive way of learning a second language. The role of the instructor has evidently changed as students seek learning elsewhere, be it from books,

television, films, and ICT. It is concluded from the study that the classroom cannot provide for all the learning needs of higher education students, perhaps due to limitations of time or manner of teaching. Those in higher education should in any case be expanding their own knowledge through independent study. Nation and Yamamoto (2012) acknowledged that the students in their study felt the need to develop their personal strategy of learning, and this study indicates strongly that this holds true for Imam University students. Learners evidently experiment with a range of cognitive styles,

- (i) the behaviourist methodology arguably being a solid grounding for fundamental learning of vocabulary
- (ii) from which cognitivist interactionism will enhance embedding of learning.

It was evident that students find the use of a mix of behaviours a most effective way for them to learn and retain knowledge, especially if they are shown how to implement the diverse choice of methods. Given the prevalence of mobile and smartphones as a primary method of communication in the modern social, business and education environments, the study results are indicative of widespread familiarity of young adults with their capabilities and value to their academic progress.

5.2 Objectives of Study

The overall aim of the research was to investigate and critically assess the role of the *Memrise* Application in supporting academic vocabulary learning of L2 students in the context of higher education in of students at the Imam University in Saudi Arabia. Those objectives, to reiterate, are

- v) To identify vocabulary learning strategies that student use to learn with and without the use of mobile apps.
- vi) To investigate the role played by smartphone app *Memrise* in supporting vocabulary learning in English.

- vii) To explore students' vocabulary retention with and without the use of *Memrise*
- viii) To understand learners' attitudes and motivation toward using smartphone applications for vocabulary learning and educational purposes in general.

The study therefore investigates the use of the *Memrise* app as a tool to support vocabulary learning in Saudi Arabia, improvement in test outcomes and attitudes of participants regarding their general smartphone application use and more specifically for vocabulary learning use. Within each section the results will be discussed in relation to the objectives.

Further, in the course of this chapter, the specific use of *Memrise* by male Imam University students of EFL will be discussed and how they found the software as a support to traditional methods of learning. This will assist in determining the value of *Memrise* to education of male students in the Saudi cultural setting. It was not possible, for cultural and faith reasons, for a male researcher to examine responses from female students. This will be further discussed in the course of this chapter, where it will be suggested this limitation does not undermine the value of the findings. It is suggested, however, that there is a need for specific research of this nature with female students in the Saudi context to facilitate improved consideration of the value of this form of learning under Vision 2030 principles.

The results, analysis and discussion will contribute to the understanding of the smartphone as a formal learning tool, thus meeting the research objectives which support the stated aim. It will be borne in mind that each study, no matter how much it is reflected

on prior to conduct, will have institutional, practical and personal limitations, and it is hoped that, with clear expression, they will be considered and overcome in future research studies

5.2.1 Key Findings

In the course of the qualitative programme of the research, key findings are noted, arising from the questionnaire and interview themes and interviews; these are identified as follows;

Vocabulary learning strategies: The results show that

- a. 80% of participants said that they use electronic online dictionaries to look up new words, indicating a familiarity with the value of technology to the enhancement of learning;
- b. 85% indicated that learning words was facilitated by including them in a context representing their meaning, indicative of the value of interactionist learning, and
- c. 94% found vocabulary learning and study by smartphone valuable

Smartphone ownership and application use: All of the participants have access to devices capable of accessing and operating *Memrise* and given that the software is free (subject to add-on facilities which do not form part of this study), it is concluded that there is no financial or technological bar to this self-learning tool.

Smartphone apps for vocabulary learning: 35% of participants indicated a previous experience of using smartphone applications for vocabulary learning.

Learners' attitude toward smartphone apps for vocabulary learning: participants have positive attitudes toward the use of smartphone applications for supporting vocabulary learning.

Learners' motivation toward smartphone apps for vocabulary learning: The majority of participants, 89%, are motivated to learn vocabulary through the use of smartphone due to the anytime, anywhere ease of availability.

Vocabulary Retention tests (pre and post test): Participants in the *Memrise* groups in both (Q4 and Q5) resulted in higher scores than those in the traditional groups.

Other findings pertinent to the aim of the study, which gives rise to implications for the smartphone learning introduction as a supportive tool in EFL education are;

- a) Behaviourist, intentional learning strategies are embedded in the student practice of vocabulary learning, whether institutionally based or utilising mobile apps.
- b) Student motivation to learn is improved when it is easy and relatively immediate to do so with clear feedback, and artificial intelligence of the *Memrise* app fulfils that need. It was asserted, particularly in the context of the contribution of *Memrise* to motivation student 4 commented;

'If apps will be like Memrise I will use it as it helps me in revising the words many times and put them in context. Learning from Memrise encouraged me more and motivated me in learning vocabulary as I was addicted in learning from Memrise When I try to close the Memrise app, my finger pushes me to learn new words and so on.'

- c) When using the mobile app, students embraced the opportunity for a device which advanced their knowledge, but they restricted activities and use to such behaviourist practices as list and rote learning, aided for some students by the use of associative mems, No student indicated that they investigated the potential for interactive learning through a 'community of learning' with other students, a cognitive-interactionist activity, which suggests that Saudi students find learning to be a more private activity than a shared quest. The comment of one student was

particularly pertinent to this point, especially when it is noted that despite significant use of the app, he did not suggest that it occurred to him to interact with others via the app although even the basic operations improved social interaction. Student 6 commented:

'I have gained a lot of information and knowledge from this application. The idea of multiple choices to choose the correct word is very good feature it's helped me more. Before using Memrise I could not speak good English I was hesitating when I speak I can't complete a full sentence now I can speak fluently I noticed the improvement even at home I speak with my family different than before using Memrise.'

It cannot be established how direct an effect of *Memrise* use this shows, given the operation of unmeasurable variables arising in continued traditional learning, but the student certainly ascribes a positive significance.

- d) Participants who used the *Memrise* application produced better test results than the traditional pen and paper. This is clearly shown in the results chapter whereby those students allocated to the *Memrise* group scored higher in vocabulary tests than those who only used the formal institutional methods of learning.

It is evident in the context of learner use that students place considerable value on the smartphone app as a tool of support to their institutional, formal learning and it generally works for them in building their vocabulary bank. This gives rise to the clear implication that teaching methods, using smartphone apps for supportive learning, adds value to the institutional education success. This implication from the findings is cogently summarised by Higgins (2016) *"the evidence from research clearly shows that it is the pedagogy surrounding the use of technology, and the skills of the teacher or learning technologist in designing, supporting and enabling learners to interact productively*

which makes the difference in terms of successful learning” (p. 1). The findings are now discussed in the context of the research objectives, assessing the impact of the *Memrise* smartphone app on learning, and, given the implication of the findings, teaching EFL in Saudi Arabia.

5.3 Objective 1: Identifying Vocabulary Learning Strategies used by Saudi L2 Students to Learn English Vocabulary

This part of the discussion will examine how students plan their learning and the strategies they adopt in the use of their smartphone devices. The discussion will use, for comparative purposes, relevant studies from other countries and interpreting them in the Saudi contextual framework to aid understanding of the findings of this study. It will assist in identifying the personal strategies adopted by students to acquire vocabulary. The findings revealed that each participant was able to identify a strategy that worked for them, how they preferred to learn vocabulary. It was noted that they broadly adopted one of the three categories of plans of action outlined by Schmitt (2000), namely

- (i) Memorising
- (ii) Repetition
- (iii) Recognition of the lexical context of words.

Student 7 commented that his strategy before he used *Memrise* involved “*I write the word first and then repeat it many times until I think I master the word which takes around 20 mins. I think writing the word is the best strategy for vocabulary learning. I revise the vocabulary at the end of each unit*”. Another said “*I first get the meaning of the word and then put it in a daily life context.*”

5.3.1 **Smartphone App and Intentional, Behaviourist Learning Strategies**

In the context of smartphone app use it was striking to find that in the pre-questionnaire section of this research that 94.4% of participants made use of their mobile phones to look up and learn translations of words into English. An interview respondent stated, for example, that he followed an English teacher on Twitter and described the style of teaching of words used. It is a practice which may be easily used by Saudi tutors.

This is indicative of a conclusion that students were aware of inadequacies in their vocabulary bank, suggestive of a need to supplement classroom instruction. It is tentatively suggested that awareness of the need for support in their learning leads more inquisitive autonomous learners to seek to fill gaps in their knowledge through the use of mobile apps to ease and speed of access. This, it is reasonably concluded, will encourage higher education students to develop existing and alternative strategies of learning to aid improvement in their learning outcomes.

5.3.2 **Student familiarity with smartphone apps**

Familiarity with smartphone applications is considered for the purposes of this study to be indicative of motivation to adopt them as a tool of learning. Study participants were therefore asked about how they utilised their smartphones and *Memrise* in vocabulary learning both in the pre-questionnaire and at the concluding interview stage of the investigation to seek insight into their awareness of apps. The findings indicated that the majority of students had a high level of familiarity with apps and that they used them to manage their social, organisational and learning needs. Given that they are unlikely to have received instruction in such use, it may be surmised that there is an evident intent and ability to use the mobile app service to facilitate their needs and incorporate this into their learning strategies.

5.3.3 Student use of Vocabulary Learning Applications

It is an intentional act with a desired conclusion, that of planning and organisation of learning. This corresponds with and complements the assertions of Guzel (2017) who asserts that the advent of mobile assisted language learning (MALL) makes intentional learning easier, enjoyable and interactive and therefore students are more likely to seek out apps which might facilitate their needs rather than simply wait for an incidental experience.

The survey findings revealed that nearly 30% of questionnaire respondents and five students involved in the interview stage indicated that they had actually sought out apps for vocabulary improvement, including *Memrise*, intentionally and actively looking for tools which might aid their learning without formally being directed toward them, indicative of motivation to learn via that method. It may therefore be surmised in the meeting of the principle aim of this study, that

- a) Learning strategies will be adapted by students with the awareness of alternate, technological, ways of advancing learning, promoting independence and self-learning, as evidenced by the findings set out in Table 2 of the Results Chapter, adapting their class based learning to the independence offered by the app to self-learning.
- b) Suggestion of a need to adapt the traditional tutor presentation-led culture of Saudi universities to stimulate more student autonomy in self-study, certainly within curriculum requirements, as evidenced by the under-utilised faculty of the *Memrise* app to develop a community of learning, given the comment of a student that he finds it useful to follow the Twitter activities of another EFL teacher.

- c) Implication for teaching practice need to develop a strategic institutional ‘use’ of this enthusiasm for mobile learning by tutor activities and challenges which certainly the above enterprising student found useful on his social media investigation of Twitter. Given the broad enthusiasm of students for the app noted in Table 2, and the improved quantitative outcomes, learning can be enhanced by teacher involvement.
- d) As a result, it may be argued that formalising the app use by incorporating this student recognised value into, it is suggested, a class community of learning will benefit extra-classroom accumulation of vocabulary.

Learners will use the *Memrise* app outside the classroom, and their teachers may set tasks and monitor performance,

- (i) Mitigating the effects of limited formal class time.
- (ii) Advancing learning as a continuing activity.

The formal Saudi delivery of vocabulary education is based on repetitive memorisation, the lecture-orientated practice of the classroom presentation and textbook use. The learning strategies developed by the students must therefore arguably be geared to the presentation of information and learning by the teacher. It was noted, however, in the Literature Review that language in general is more effectively embedded by interaction, contextual conversations and the incidental collection of words (Siyanova-Chanturia and Nation, 2017). This suggests that students utilise the value of both intentional and incidental learning to achieve their aims, borne out by the results of this study. One particular learner, Student 2, concisely summed up his strategy mix;

I approach vocabulary through watching movies, reading books, speaking with friends and classmates. I find listening and reading are good sources of learning

*vocabulary. I write down all difficult words in the classroom at the end of the day
I try to memorize it two times before bed.'*

The findings of this study indicate that the Saudi student participants appeared to find it more effective to vocabulary learning and retention to direct their attention to the behaviourist activity of receiving instruction and memorising the words. This is evidenced by the preferences for the use of the app in the Results Chapter, particularly Table 2. The more associative and interactive faculties of the app, such as the preparation of aid memoires were less popular than accessing the word, contextualising it, and rote learning the vocabulary. As was noted in the Literature review on learning strategies, these activities are considered the most common practices amongst behaviourist learners. They were able to supplement that with a mixed intentional-incidental autonomous use of the mobile software learning tool which supports rote EFL vocabulary learning student 11 commented;

'I try to link the word with the Arabic meaning and find a logical link and it works with me. Some difficult words take time to be learned. The apps are very enjoyable such as Memrise unlike the boring books because it offers a new way of learning.'

It is perhaps unsurprising that the main institutional based learning strategy of the classroom will not inhibit motivated students from pursuing other sources of vocabulary such as cognitivist practices of seeking out alternative ways of acquisition, often by way of Incidental learning practices.

These included watching English television programmes, conversing in the language with fellow students to practice vocabulary use, listening to conversational exchanges between more experienced or native speakers, and of course, interacting with mobile apps. This

was noted by Student 2, above. Higher education students are expected, of course, to promote their learning outside the classroom.

5.3.4 Smartphone Apps as an Adjunct Support to Classroom Learning

The learner priority, it is presumed from the variety of strategies involved, is to build a larger and broader vocabulary bank, recognising the benefit of the English language to their financial future. This is supported by the findings of Schmitt (2010), Cook (2016) and Nation (2013) who identify the importance of motivation and goals in the development of learning strategies. Hence, from the results of this research, particularly the improvement in test scores experienced by the *Memrise* user groups in both (Q4 & Q5), it can conceivably be hypothesised that

- (i) Motivation and the development of learning strategies are interconnected themes which reflect on the value of the *Memrise* app to personal development
- (ii) aiding pedagogic understanding of that relationship and developing student and teacher awareness of the diverse range of study tools, and
- (iii) The use of mobile technology as an extra-classroom learning strategy support improves test outcomes.

The comment of Student 7 perhaps explains a reason for the adoption of the app into the pantheon of learning strategies;

'I found it very easy and useful to use the app to gain new vocabulary.'

It is suggested from the results that students have identified a need to compensate for the lack of opportunity for formal classroom instruction, a limited lesson timetable for EFL learning which was noted in the Taiwanese research of Lu (2008) and in Iran by (Derakhshan and Kaivanpanah, 2011). A few hours per week are dedicated to English

language teaching in Saudi Arabia despite the emphasis on its importance. This limited allocation of institutional time to English vocabulary learning, leads to

- a) The obvious conclusion that students in higher education must pursue their own independent study (Nation, 2013), giving rise to
- b) a reasonable assumption that motivated students will need to find more supportive, easily accessed sources of knowledge, and thus
- c) adapt their methods of learning to accommodate the identified advantages of mobile learning.

That might satisfy a need for enhanced test outcomes which cannot be satisfied simply by the teacher. It is also entirely conceivable that the passive receipt of information in a traditional presentation approach of being lectured at by teachers, with limited opportunity for interaction, may not be considered the most stimulating method of knowledge accumulation by students. Nevertheless, outside of the classroom environment it was noted that technology is not the answer for all students as student 5 commented;

'I prefer the traditional way of learning vocabulary because if you hold your smartphone you will be distracted easily and go to twitter and forget learning vocabulary.'

It was noted from the contribution of the majority of students in this study that the advent of mobile digital learning enhances the ease with which vocabulary knowledge can be accessed and adds to the resources they can call upon for support. Their answers indicate they found their mobile devices and *Memrise* software it to be part of an intentional learning strategy, integrated with the classroom guidance and direction. The use of

smartphone support was valued by the majority of students, albeit with differing levels of enthusiasm. Comments noted from student 7 were:

'actually, learning from smartphones is useful because it is available all the time anytime anywhere' and *'if you use pen and paper your concentration is much more than with the smartphone.'*

5.3.5 Intentional and Incidental Vocabulary Learning Strategies

Given that it has been noted that students will adopt a mix of intentional and incidental learning strategies, it is reasonable to hypothesise from the results that the learning process would be further complemented by greater classroom, domestic and social opportunities for incidental accumulation through conversation and listening. Schmitt (2008) argues that incidental learning is a somewhat inadequate way of acquiring vocabulary, but enhances the range of vocabulary when knowledge is used and not simply memorised.

It is a fair conclusion that the student participants found the intentional behavioural use of their own mobile technology based learning strategy, utilising *Memrise*, a valuable adjunct to institutional vocabulary learning at Imam University.

- (i) Implying that cognitive-interactive activities of the software will enhance the value of its use, and given this facility was not significantly investigated by the students.
- (ii) There is role for the teacher in encouraging, becoming involved and monitoring progress via the app.

This arguably expands the role of mobile technology from a simple student support to a valuable teaching tool.

The students' contribution to this study, it is indicated, shows institutional presentation and textbooks cannot satisfy, on their own, the self-perceived need for vocabulary improvement. All participants in this study developed personal strategies to support classroom learning rather than treating it as sufficient to their needs per se. Some read books or watched English language programmes, benefiting from sub-titling, but this mix of intentional and incidental learning through context and explicit vocabulary use was proportionately low. It came as no surprise that all were familiar with how to use their smartphones for more than social purposes and to enhance learning.

The majority were aware of learning apps which they used to learn vocabulary, and even the student who found *Memrise* to be inadequate to his needs, and boring, was able to explain the problem he experienced and how he set about finding another app more conducive to his requirements that student continued to use *Memrise* to embark on learning another language, Spanish, impliedly finding the learning strategies supported by the simpler app programmes a valuable and easy to use starting tool for learning.

5.3.6 Student reservations on smartphone use

It has been noted in the Results chapter that although there is general support for the App as a EFL learning tool, and the one who did not like it at all still used it for other language learning, reservations were expressed by several students about its value. A second such respondent also found it too simple and not sufficiently geared to the needs of Arabic EFL university level learners. One had indicated that he preferred '*pen and paper*' to aid retention, a typical behaviourist classroom practice and another who was forthright enough to advise that he is easily distracted by the social media function of his phone, a diversion from his vocabulary accumulation. He too found his learning better served in the discipline of the classroom. These behaviourist, written word and memorisation by

repetition practices were preferred by the others who expressed reservations on smartphone value.

These reservations have considerable implications for the fulfilment of government initiatives for turning learning into a technologically based activity, freeing the classroom from the need for paper and texts. Into this category of learners who must be accommodated are those, the 2%, who do not own smartphones, and should not be required to as a condition of learning. It will be recalled that this study examines the Memrise app as a support tool, not a replacement for traditional education. It certainly undermines any argument of value in the classroom for learning which was considered in the Literature Review for a broadening of the education value perspective before rejection.

The smartphone and Memrise app clearly has a wide range of levels of support, from boring and simple to 'like a doctor'. The choice as an independent tool of learning and increasing vocabulary is voluntary, and whilst it is considered by some as invaluable, this finding cannot ignore the contrary view, which can be summarised as 'it's ok, but adds little to learning'. All opportunities to learn must be utilised in university education, and the variation in opinion does not exonerate the teacher from facilitating each student's needs, so the discussion herein on pedagogical obligations are not undermined. The variation in support levels is indicative of a need for further research into whether perceptions and attitudes of students will change with greater teacher support, or indeed a broader interactive use of the faculties of the app.

5.3.7 Institutional Developments in Second Language Learning

In an institutional strategy to promote English learning at the university, the L2 students are required to adopt a "no Arabic" rule in EFL classrooms to encourage learning and use

of vocabulary as a fundamental strategy, replacing the prior emphasis on grammar translation and audio-lingual teaching strategies (Hamdan, 2014). This, it can be suggested, facilitates both intentional and incidental learning, the latter being of particular value in communication, and in the context of the Saudi Higher Education EFL learning framework.

It is certainly arguable that in order to enhance understanding in such an environment of learning, the participants found it necessary to examine other ways of developing their vocabulary bank to ensure they were understood and to understand conversation interaction. The mobile app is a valuable tool to aid such interactive, incidental learning, complementing intentional methods through actual use of the vocabulary.

5.4 Objective 2: To investigate the role played by smartphone app

Memrise in supporting vocabulary learning in English.

It is important to link the discussion on this objective to the context of government technology based initiatives for the furtherance of education in the Kingdom and compare the findings to other, similar studies in different cultural frameworks. The findings in this study have indicated the relatively entrenched preference for the behaviourist based strategy of learning which has been experienced by students throughout their education and this too is considered in the comparative context of independent learning and the smartphone software.

Fixed, institutionally based technology such as computers, provide valued access to online dictionaries and libraries, of which 80% of the study participants availed themselves. This is indicative of students becoming accustomed to technological methods

of learning that ease of access, such as is provided by more mobile software, will enable the adoption of learning strategies which are not institutionally dependent. Seliaman and Al-Turki (2012) have asserted that Saudi Arabia boasts a high usage of mobile phones for the pantheon of life's purposes, and it is fair to assume that amongst HE students this will provide an easy point of access for their learning and understanding.

Given Saudi student history throughout their schooling of teacher led learning, it is of little surprise that more traditional memory exercises remained a popular choice for embedding knowledge using the *Memrise* app. The findings herein indicate vocabulary learning strategies to assist retention:

- i) making lists (78.9%),
- ii) repetitive note writing (66.6%),
- iii) using mental image aids (78.8%) and
- iv) regular list review (78.9%)

This is descriptive of the way the students used *Memrise*, in that they did not investigate other faculties of the app. The lexical strategy of learners relating to the vocabulary and its contextual use was notably more apparent in responses gathered in the post-interview stage rather than referred to in the pre-questionnaire enquiry. The majority of students who used *Memrise* confirmed the app aided understanding of words.

5.4.1 Promotion of Incidental Learning

This, it is suggested, is a common in strategic, planned learning. Nation and Yamamoto in their (2012) study, had postulated that students of English vocabulary should include different words acquired in their strategic learning to familiarise themselves with their contextual application. This included participation in incidental learning activities such

as listening to songs, watching films and reading (Nation and Yamamoto, 2012). It appears from the findings that what was used as an intentional learning device added value to incidental learning. Incidental learning, it has emerged from the findings, is not a prominent vocabulary learning strategy amongst Saudi students. In the interview process of 11 student participants, only 14% considered watched movies, read books and speaking English with friends to practice vocabulary were significant to their learning choices. This strongly suggests that leisure activities are not considered opportunities for incidental learning by Saudi students.

List making and memorisation indicate a use of the more conventional brain-training behaviour learned by students in the course of their institutional class based education throughout their formal schooling in English. This is evidently now supplemented by the use of the ease of access to information provided by technological advances. A substantial majority of the subject group indicated a preference and desire for contextual use and involvement in communication activities, be they conversation or secondary observation.

The incidental, communication-based strategy and attitude to learning has been supported by the assertions of Lightbown and Spada (2013) based on their evaluation of existing research and qualitative conclusions. They assert that interaction is a key to learning and retention of vocabulary rather than simple repetition. The *Memrise* app does provide this faculty of community learning, but it is somewhat surprising that this was not significantly investigated by the Saudi learners.

Given that the participants herein received very limited instruction on how to use the app, but left to investigate it themselves, this leads to a question of how much more could be

achieved by more comprehensive use of the faculties. Thus, the role of the teacher as instructor comes into play again to advise on how best to use the software for independent learning.

The results of studies on the importance of incidental learning are suggestive of a willingness on the part of students to seek other sources of learning, particularly interacting with each other, which can be developed by the facilities afforded by the smartphone app and arguably aids learning strategy development beyond behaviourist conduct as technology promotes more opportunities for cognitive interactionist learning.

5.4.2 Accommodation of Mixed Strategy Learning by Memrise

What is particularly evident from this part of the study is that there is no single, individual learning strategy adopted by students. They learn in a variety of ways, individually adopting more than one strategy, many unrelated to their traditional classroom training. It is of particular interest in the often controlled, faith orientated methods of learning that students who have experienced and developed years of habitual practices are now adopting practices suggested by Dornyei (2009) and Nakata (2008) of more actively seeking alternative methods of learning. This is an indication of maturity and greater understanding of their future economic needs, increased familiarity with technology and has implications for a broader role for teachers in incorporating learning planning via mobile technology into a more formal context.

The learning strategies mentioned by students, autonomously and independently, to support their institutional learning, are accommodated by the *Memrise* App. The breakdown of the methods used by students for vocabulary learning was addressed again

in the interview stage and technological sources of learning and clarification were highlighted. Of the 11 respondents

- i) 32% reported they would note difficult words then check meanings using Google, and in that process seek images or mems which would assist recall, with
- ii) 23% of others researching meaning for use in contextual communication to aid recollection.

These findings indicate that students are becoming more aware not simply sources of learning, but they are adapting their strategies to the types and methods of what suits their personal memory needs, and ease of access to information which plays a major part in the support of their institutional learning.

There are individual preferences and those identified in both quantitative, pre-test questionnaire and qualitative interviews do show a considerable disparity in the proportions of strategies used by the respective respondents. The larger pre-test group indicate a much broader uptake of the opportunities afforded by technology in vocabulary learning than the percentage in the smaller post-test participants, although this may be reflective of the much reduced scale of numbers involved in the latter. There was much greater support from a majority of students for contextual opportunities to use learned vocabulary, even simply as an observer of television and films rather than conversational participant.

The nature of the enquiries in both parts of the examination were broadly the same so it is suggested that the disparity may perhaps lie in the inherent weaknesses of the study arising from its logistic, academic and institutional limitations. These essentially inhibited

the carrying out of a more expensive and time consuming main study using all participants in the pre-test stage.

The author is however reticent about speculating on reasons without statistical foundation in support, given this may undermine the veracity of the research. Nevertheless this does not affect the finding that independent learning using mobile technology is beginning to evolve and thrive in Saudi higher learning, away from the time constraints and institutional provision of education. The capabilities of the *Memrise* App, as explained in the Chapter Two Literature Review, potentially satisfy all the strategic learning needs of the student outside of the classroom.

The findings on the development of student learning strategies, as expressed by the respondents themselves, somewhat undermine the assertion of Hamdan (2014) that Saudi language education is wholly reliant on the teacher transfer of knowledge. It is suggested that Hamdan has not taken proper account of the Saudi Education Initiatives introduced in 2006 and 2012 which promoted the introduction of technology as a basis for learning access.

The variety of learning opportunities available to the students does not aid a definitive determination of type of learning strategy for the individual student, be it behaviourist, cognitive or any other derivative to learning strategy choice. It is evident from the comments noted in the interview, repeated above, that every student has different needs and perspectives and is capable of developing their own, independent learning plan and fulfilling their learning requirements in a variety of ways. The findings show that technological devices can have an effect on strategy development through providing

learning exercises that are adaptable to the way students acquire information. From the list memorisation practices of the behaviourist mindset to the interaction needs of the cognitivist, behaviourist strategies remain the most popular methods of learning.

Digital technology enhances the learning experience beyond the classroom formality of simple presentation of curriculum based knowledge. The Imam University students however still use the memory list process of acquiring their vocabulary bank, normally associated with behaviourist activity, but they combine this with searching out their own sources of learning to compensate for the gaps left by traditional teaching. The findings provide evidence for an assertion that the evolution in information and communication technology (ICT) tools and applications meets their demands and alters their behaviour, at least outside of the classroom.

5.4.3 Cognitive Interactionist Learning and Memrise

Whilst Sarem and Shirzadi (2014) assert that vocabulary and language learning is effected by the psychology of behaviourism, innatism, and the cognitive category of interactionism, this was not supported by the range of students interviewed in the course of this study. There was not definitive category into which any single student could be 'placed'. The distinction in the type of activities 'set' for such defined category learners is somewhat blurred and students adopt strategies which are a mix, so necessary in a mass learning environment and a vital skill of adaptation in the workplace.

The cognitivist-interaction process of learning vocabulary emphasises input, output and interaction (Boers, 2018). In the traditional teacher presentation of knowledge in the classroom cognitive interaction in the form of conversation and lexical use of vocabulary plays little role in Saudi EFL vocabulary learning. The teacher shares knowledge, the

learners input, and the student responds, output (Sarem and Shirzadi, 2014). Participants in this study

- (i) did not report any formal, planned interactive sessions as their way of learning English vocabulary but,
- (ii) needed to use words in context to appreciate meaning and embed learning, and therefore
- (iii) sought to augment knowledge through their personal mobile software as well as, for example, television and English language listening.

Student 10 comment of note is

'I learn the vocabulary mainly from the context. I don't sit and study specific words as I can get the meaning from the context.'

The transmission of knowledge from teacher to student is said by Jamal (2016) to be an incidental approach to learning rather than intentional. This is not described as such by the participant students, who indicated that the teacher input-student output was a primary intentional learning institutional strategy. It was not however a purpose of this study to examine student perceptions of current classroom teaching and learning strategies, so this will have to be further examined in the future. However given the learners' embracing of the mobile learning strategies and enquiries, it can be surmised that

- i. the Saudi higher education system requires an academic curriculum that will train teachers to employ intentional, incidental and independent strategy development,
- ii. a more student-centred approach to teaching,
- iii. making students more responsible for learning the second language.

The results show a desire for engagement in the learning process, a key to the acquisition of second language vocabulary. It can be assumed that where the attention and interest of the student is not maintained, difficulties will be experienced in assimilation of the

learning. As a strategy for student engagement it is concluded that the support to formal teaching must account for and use to develop teaching

(i) the fact that student participants have developed their own range of strategic vocabulary learning outside of teacher direction, and

(ii) the majority consider this is facilitated by the evolution of mobile technology.

This form of autonomous learning, it is safe to presume from the consideration of the studies examined in the Literature Review such as that of Sharples (2007) will enhance the value of the classroom lessons as students become more independently knowledgeable.

5.5 Objective 3: To Explore Students' Performance in Vocabulary Retention in Post-Test With and Without the Use of Memrise

This theme of the study addresses the data which supports the aim and objective of identifying the extent of participant smartphone ownership, access to and familiarity with the capabilities of the mobile-smartphone in education.

Particular emphasis was placed on student perceptions of the value of mobile, smartphone technology, free and easily accessed and constantly available for use. This is a vital part of the consideration of the educational value of the device as an educational tool because it is the students who will actually be using it in their course of study. On the most basic reading of the both the qualitative and quantitative results as a whole, the students, arguably dependent on their phones as a tool of life organisation, were enthusiastic about

its use for learning and this was indeed reflected in the test results. It is however acknowledged that in the pursuit of this aim, variables arising from the effect of other methods of learning, including class lectures and textbook activities will affect the quantitative results of the vocabulary test in particular.

In the conduct of this study there was no suggestion, implied or otherwise, that the *Memrise* group should eschew any other of the methods of learning, nor was any prohibition placed on the non-*Memrise* group to avoid it. Such stipulations would be professionally and ethically inappropriate and institutional learning does not in any case form a purpose of this research. Applications were generally accessed through the Apple and Google Play stores, both of which provide free and easy access to *Memrise*. The increasing, autonomous level of use in social and education contexts, as indicated in this study, provides evidence that students are now seeking alternative sources of vocabulary learning Saudi educational framework must accommodate and use more directly as support to teaching, particularly young adults.

Their responses in this study indicate that student appreciate the benefits of portability, social interactivity, context sensitivity, individuality and accessibility, recognised herein in the Saudi educational context as they are in the SMS studies of Derakhshan and Kaivanpanah (2011). The participants were certainly familiar with social media platforms such as Facebook, Twitter, WhatsApp and Snapchat, with some using several such platforms for social purposes. This provides evidence of the fact that incidence and quality of social interaction has changed fundamentally in terms of what can be communicated, with whom, as an individual or collective activity in a diverse range of media.

5.5.1 Test Result Outcomes

The findings from this study of Saudi University ESL learners reflect those of Luczak (2017) in Poland. Luczak (2017) found that Polish University students attained better test results, reflected, again, by the results in this study, even taking into account that the students indicated they had used the various other learning materials available (Luczak, 2017). This too is supported by the findings of the tests conducted in this research. In this research the first test was conducted on Group 141 whose participants were categorised into Traditional and *Memrise* groups both before and after the *Memrise* use period. The analysis of the results show that performance had improved for both groups with pre- and post-test mean scores of the

- Traditional Group rising from 70.61 to 71.39, with the
- *Memrise* Group experiencing a more marked increase in attainment, from 68.39 to 79.39.

T-test comparison found the change in mean score for the Traditional Group was of no significance. As a teacher, one would expect that the three months of the study period would have improved the learning and retention of a vocabulary bank of all students.

The t-test outcome for the *Memrise* Group was however significant in showing that learning benefits will arise from using the app as a support to the traditional learning programme. The results were similar with the second experimental Group 142. The Traditional and *Memrise* students produced a rise in mean scores from

- 66.63 to 70.56, and
- 68.62 to 78.67 respectively.

Again, t-test analysis highlights the importance which may be placed on *Memrise* in raising the performance in the vocabulary learning of students. The test results in this study, showing improvement in knowledge and scores, meet this requirement and

- all 11 respondents embraced the use of their devices as
 - a valued support,
 - improving their education,
 - easy to use, certainly insofar as the most basic of features were concerned.

There is little question or doubt that those who must use the technology, namely the students in this study, understood the benefits of mobile learning and were attracted to its implementation in pursuit of their learning, supporting the principle of the device as a support to vocabulary learning.

This reflects the findings of Almutairy *et al.* (2015) who examined the response to smartphones as a classroom tool of vocabulary learning in a Kuwaiti school. Their study participants were selected from both genders, and the overwhelming majority of students supported its use. There is no suggestion in this study of any evaluation of the smartphone as a classroom tool, but in order for mobile technology to be an effective tool of learning teachers must be prepared to invest time in studying the facilities provided by language apps to determine how students can interact with the software to increase outcomes (Ahmed, 2017).

The interview part of the study, post-test, indicates there is evidently an increased and growing awareness and interest in this application, and the majority of those interviewed who had used the application said they would continue to do so, even the student who found it rather simplistic for his purposes, although he would use it to learn basic French or Spanish.

Respondents restated the straightforward and familiar advantages of *Memrise* using the simpler to operate facilities rather than for interactive community learning. This again

suggests the Saudi learning process to be an individualised activity, even with the programmable interactive technology.

5.5.2 Smartphones: Unsuitable for Classroom Learning

In this study, of the 201 online survey participants, 98% owned smartphones with diverse operation systems mainly Apple iOS and Android. The research target is based on a presumption that young adults comprise the main body of smartphone users, and indeed in the pre-test stage, 88% of the participants in this study were 18 to 24. Participants who completed the online questionnaire in the pre-test stage of this study reported that they used their mobile devices for a diverse range of purposes in their vocabulary learning. It should however be pointed out that this was not the sole reason for the social platform use; these are young adults, after all. It was clear, and unsurprising, from their responses that there was considerable dependence on the smartphone for communication and organisation.

Nevertheless given the ubiquity of smartphone ownership, some consideration must be given, briefly, to the use of the device in formal learning, particularly because the quantitative test results show those using the app achieving higher scores than the other students who indicated dependence on traditional tools of presentation and text books. Runnels and Griffiths (2013) had argued cogently that smartphone use in the classroom is disruptive and should be discouraged, diverting attention, increasing temptation to use of non-educational purposes in limited class time, and ringing.

The findings cannot provide any support for this in the Saudi context, simply because it can take time for a new method of learning to be introduced into institutional practice. The findings of Runnels and Griffiths (2013) do not undermine smartphone app use and

its value in vocabulary learning outside of the classroom; the techno-centric view that they are tools which promote learning and teaching (Sharples, 2006). The latter perspective received considerable support in this study from the participants.

5.5.3 Traditional Classroom Teaching in Saudi Arabia

Macaro (2001) asserts that reliance on teachers presentation, the lecture process and classroom activities is not as effective in learning and retention as relying on one's personally devised tools and strategies and developing collaborative learning through peer interaction in the process of knowledge exchange. This is evidence of the need to utilise an effective support strategy. Advances in ICT continue to introduce more sophisticated mobile devices and applications for smartphones, used for diverse business, educational and communications needs. The students in this study proved very familiar with those which fulfilled their social and learning requirements; learner awareness of app function and access to the software, as well as ownership of the hardware smartphone device forms a basic requirement for participation in this research into the value of *Memrise* for vocabulary learning.

5.5.4 Multi-Use Value of Smartphones to Students

As with all questionnaire surveys carried out by their teachers, one should be wary of unmeasurable variables such as willingness to please or answer in a manner they perceive is expected. This did not appear to be a factor in this study, probably because the participants were simply confirming smartphone use in a manner expected of their function.

The range of use of their smartphones is however significant in establishing the value of the device to their opportunities to learn. Some 11% indicated their smartphones enabled them to watch TV shows broadcast in English for one to two hours per day, 8%

downloaded and listened to podcasts in English for over an hour, and 16% internet surfed for vocabulary related information.

This espoused dedication to vocabulary learning using their phones is certainly impressive for some of the students, but the percentages are unexpectedly low, indicating very limited use of such ease of access to information. I would have been thought that such flexibility would have encouraged greater use, but perhaps this was because they had not been directed to the value of language apps as part of their education. The findings of the qualitative interview process indicated that 20% of students reported use of a diverse range of platforms for more than two hours per day for vocabulary learning and 5% test themselves online compared to 12% who used the traditional texts and reading books outside of the classroom.

The actual use may be subject to student estimate-based variables, but the actual utility of this method of learning, independent, autonomous, and lacking the usual control expected by traditional teachers, is in fact occurring outside the classroom, and has a considerable benefit to be harnessed.

5.5.5 Mobile Learning and the Development of Autonomy

Benson (2013) highlights the fact that mobile devices enable learning of a foreign language away from a fixed institutional education environment, do not require the intervention of a tutor and thus give students greater autonomy in the control of the fulfilment of their own learning needs.

Access to aids such as audio and video resources, shared and applied to suit the individual language student's vocabulary learning preferences and proclivities is easily achieved with minimal effort (López, 2010). It is evident from the survey and interview results that apps are widely used for many purposes by student 1 commented;

'I have social media applications and the application I use most on a daily basis is Snapchat to view friends' daily snaps'

Some had discovered their educational use, without their teacher's direction, in vocabulary accumulation student 3 commented;

'In twitter I follow an English teacher account and have learned a lot in vocabulary.'

Independent learning is not new to the Saudi higher education context, just not encouraged, regulated or directed. Mobile software is certainly not suggested as a replacement for classroom teaching, paper resources or indeed fixed base technology, but the findings show that its popularity adds a new dimension to the faculties of independent higher education learning.

5.5.6 Student Use of the *Memrise* App for Learning

In the context of language learning, however, participants reported on interview only the simplest of personal use in looking up words, practicing and memorising them using *Memrise*. It was surprising that they had not, for the most part, investigated the further actions of the app, for example, to pursue new forms of interactive, collective learning and the setting up of groups.

This is arguably indicative of the traditional behaviourist learner using even the most up to date technology, seeking individualist learning activities with instant feedback through the provision of tests, exercises and questions (Keskin and Metcalf, 2011). This helps with memorising of concepts that are already taught because it involves repeating information, with reminders of new learning strategies to choose from which best suits their demands from learning (Hubbard and Levy, 2006).

According to Rahman (2016), such students may choose appropriate vocabulary levels, with stimuli to use in a sentence, with the added benefit of automatic correction of

grammatical errors. This was effectively the extent of the study participants' use of the app functions; the evidence from the study shows students know how applications work, what they can achieve with their extensive facilities. Those who used *Memrise* noted the facilitation of self-challenge and corrective and immediate feedback stimuli a boon to behaviourist vocabulary learners and was remarked upon by respondents.

Young people, it is suggested, tend to desire instant gratification, or at least information, and this is provided by their electronics, stimulating motivation. They confirm using easier functions of the app to access information necessary at the time they wanted, then move on without significantly operating the test and activity functions. The researchers own pre-study investigation of the software showed the *Memrise App* does explain the capacity for interactive learning, simply and in the native language of the user. It has the programmed capacity to encourage collaboration with friends and classmates and sharing of experiences without restriction on time or place, but student participation

- (i) Tended to consider this a social activity carried out on their more familiar social media platforms.
- (ii) Reported that they were involved in WhatsApp groups in which they helped each other learn English by sharing relevant videos and clips and to update each other about their courses and academic programs.

The shared data network capacity of smartphones enables students to communicate with each other in the progress of their learning without dependence on teacher direction and instruction (Kearney *et al.*, 2012).

Active engagement in the language learning process essentially draws in the involvement of the constructivist learner, seeking new words and adapting to the lexical use requirements to understand meaning of new concepts and embed prior knowledge (Wang and Suwanthep, 2017).

Kearney's 'conversation theory' suggests that such interactive learning not only enables students to find out the extent of their colleagues knowledge, but how they use it, increasing their own incidental learning.

A correlation between the *Memrise* app and its use in vocabulary learning and more familiar social media platforms was not evident in this study as a way of more imaginative mobile resource use in learning; 8% of participants in this study did not use any of the social media platforms (Facebook, Twitter, WhatsApp and Snapchat) for the intentional, direct purpose of learning English. However, on occasion in their social interactions took the opportunity to correct vocabulary and lexical errors in their sentences and those of their friends.

This, it is suggested, does however foster personal clarification of meaning and embedding of their own learning in a less judgemental environment than that provided by their instructors.

5.5.7 Constructivist Learning Strategy and Motivation

In constructivist learning, predicated on content and context, students with mobile devices indicated they

- (i) approached mobile device capacity as a response to their own needs,
- (ii) personal competency, arguably
- (iii) limiting the development of interaction, decision-making and sharing.

It was somewhat surprising that only three participants in the interview process disclosed interaction with others in *Memrise* learning and the group remained close and familiar, involving only class colleagues. They decried any perceived need to go beyond a class or friendship body into the network of learners beyond. This, it is suggested, is somewhat of a lost opportunity to broaden knowledge incidentally.

The evident value placed by students on their experience of mobile learning devices has considerable implications for teachers and their role as instructors and guides. The conclusion of Higgins (2016) is worthy of repetition;

‘the evidence from research clearly shows that it is the pedagogy surrounding the use of technology, and the skills of the teacher or learning technologist in designing, supporting and enabling learners to interact productively which makes the difference in terms of successful learning’
(p.1)

Proposals for change and adoption of the technology in the Saudi context derived from the results of the study interview and test process mean that tasks may be set, based on curriculum specifications to guide syllabus compliance, encouraging interaction and technological skills beyond vocabulary learning.

5.5.8 Mobile Learning, Teaching Strategy and Motivation

Derakhshan and Kaivanpanah (2011) highlighted the value of SMS text messages from educators, even simply in the provision of words or short lists to be learned. The capacity of the *Memrise* software provides visual and audio aids, questions and comments to improve and advance the pace of learning English and whilst respondents were not asked to comment on teachers involvement in activities beyond the classroom to promote learning, one student did comment that he followed a particular English teacher on Twitter He used his sessions to gain vocabulary knowledge, meaning and understanding of context.

It is fair to conclude therefore that EFL teachers in Saudi Arabia should consider such a support service to their students, easily facilitated through *Memrise* promoting holistic interactive learning value through a ‘community of learning’ which will enhance digital

skills as well as language learning amongst those less comfortable with the practical operation of technology.

This moves away from the simple teacher-lecture model of transferring learning, the tutor presents, the student learns, introducing a more socially based collaborative exchange more conducive to the learning and retention of knowledge (Brown, Collins and Duguid, 1989). The value of apps to learning promotes a constructivist, student-centred approach to teaching English. The study shows students are now autonomously supplementing teacher-presented learning to self-educate.

This will encourage students to be more active in designing their own learning (Kadirire, 2009) which the participants in this study indicated they are already doing, but not to the full potential of the technology and without guidance or assistance from their teachers.

5.5.9 Institutional Implications of Mobile Learning

This takes on a more significant level of importance in the extra-institution and has implications in the lifelong learning environment. Students undertaking e-learning courses did not form a part of this study, but should not be ignored, particularly when similar principles apply. The use of mobile technology, and the student perception of value in this study strongly suggests that independent learning and teacher interaction will advance vocabulary education howsoever it is taught. Indeed, the vast size and environment of the Kingdom of Saudi Arabia necessitates that all forms of EFL education are available at different levels of formality, from curriculum based university degrees, distance learning and the informal, almost hobby learning (Laal, 2011). The perceptions of this Imam University study apply equally to these forms of learning, as does the value of the *Memrise* App. The portable nature of smartphones promotes lifelong learning.

5.5.10 Memrise and the Contribution to Learning and Retention

The objective sought to examine the popularity of *Memrise* as a vocabulary learning tool amongst users, their perception of its value, and how it supported academic vocabulary. Of the 11 participants who were interviewed, only one had never used the application, nor indeed was he aware of its existence. No-one had recommended its use to colleagues. These were somewhat surprising indications by the students because none mentioned being advised of the app by their teachers and essentially found it themselves as part of their own exploration of understanding, a somewhat impressive use of self-motivation and desire for learning. The fact that they used it as an individual tool, not as part of an interactive study group, and did not ‘advertise’ its use, leaving one student in blissful ignorance, was also of concern. None gave any cogent reason, it just did not occur to them to mention it.

All who had used *Memrise* in the limited manner described revealed they appreciated the ease with which they could access words and translations, the effusive praise of student 4 worthy of recall;

‘It was a great app really I call it doctor or teacher.’

Other research, it has been noted, stresses simplicity of operation as a major factor in app evaluation (Ono, 2017). In this study, nearly all found this a vital attribute of the app, although one student considered it too easy. Others also had reservations on value, considering it useful but boring or simple. Teachers may wish to bear this in mind should they adopt the device for task setting outside of the class room.

This is an endorsement of the value of the app, and a justification for a more wholesale study into broader, more formal institutional use. In the interview stage the particular student referred to commented that he had stopped using the application because he had learned all the vocabulary available. This basic application proved somewhat

unsatisfactory to his learning pursuit and lexical needs. *Memrise* incorporates programming which enables enhancement of challenge and creativity to be implemented in the reminder mem process, and the mnemonic contextual based use of words. Although nearly all students did not make significant or any use of this facility, it does have the potential to make learning more imaginative and fun were they to be so encouraged.

5.5.11 Aid to Retention

The ‘scheduled reminders’ and correction strategies process was considered valuable by all in the memorisation process, much favoured by behaviourist learners, student 5 commenting;

‘When I make a mistake in a word it doesn’t appear immediately at the same time, rather it brings other words to learn and then bring the word that I didn’t answer correctly.’

"Scheduled reminders", according to *Memrise* (2018), allow an individually organised interval time between initial word learning and need for testing recollection, which varies for each student and is based on the algorithm software calculation. Learning is monitored by intelligent software. One student indeed reported his use of *Memrise* at about six to ten times each day; he found this ‘fun’. The student who indicated he considered the use of the app too easy for his purposes was less enthusiastic about this facility student 9 commented;

‘I didn’t like the repetition in Memrise; it makes you feel boring I wish I could skip.’

Learning, testing and recollection, it appears, have entered the lexicon of gamification, especially through the spaced repetition system (SRS) which the majority students confirmed improved what they believed would be long-term retention of vocabulary.

This, it will be recalled, is a complex type of flashcard system, where the learner gets a word on one side and its translation on the other, memorisation promoted by mems and checks (Ono, 2017). It facilitates immediate feedback and evaluation which is appreciated by the students, who can then take up the software ‘offer’ to increase their level of challenge.

It is fair to conclude from these findings that learning development occurs outside of the classroom, and its promotion is not the preserve of teachers. It provides justification for greater utility of the app facility as a teaching tool as well as student support, as indicated by this student 7 comment;

‘The application helped me a lot in preparing for the exams. It was very easy to use. The vocabulary items were new to me which made me motivated to learn them. I used it for the course only.’

Baker (2012) provides an assessment for reflection on the use of *Memrise* in this study, stating that whilst it sought to make learning less challenging it did add more fun to the process.

Luczak (2017) also found that *Memrise* users had performed better than their classmates on a standard test. It enabled engagement with the creation of course context, facilitating sufficient time for the individual learner to meet their own language learning targets and manage time appropriately. It was considered that these attributes would appeal to the Imam ESL students and the findings did indeed correlate with these observations.

Second language learners have need of a reliable, easy to use application that can match their changing interests and abilities and in interview six respondents mentioned they

would choose such mobile software based on benefits they can receive from it in terms of variety of words, exercises of memory and growing challenges of tasks. Student 4 stated;

'Before using the app I don't check new words from the coursebook, but now with the app I always learn and revise them. I learned a lot from the app and will absolutely continue learning from the app'

and student 5;

'The idea of multiple choices to choose the correct word is very good feature it's help me more.'

The two respondents however found it "boring", limited to memory tasks on straightforward words.

During the interview, learners who used *Memrise* reported daily use of the app. When recording the overall duration, five respondents said they spent more than 2 hours each day to learn vocabulary on *Memrise*, three for one to two hours, and the others from half an hour to a full hour. They believed this improved their English vocabulary knowledge, using the capacities of the app. Two hours is a significant amount of time, outside of the classroom, for young adults to spend on a learning app. They were not challenged in interview on their assertion, nor did the author show any element of disbelief, simply because there was no reason to. When asked, one replied 'it's just an estimate' and another 'I find it fun'. The latter was the only student who made pictures and mems with any regularity. Although researchers using questionnaires and interviews had point to the potential variable of pleasing the teacher, nothing was indicated by any of the students

that this affected their estimate, and it seems inappropriate for the author to draw any adverse conclusion on the reliability of the figures.

Luczak (2017) identified those further advantages of *Memrise* which appear to have been simply not used by her learning group which is mirrored by those who participated in this study. These included the access to training tutorials offered to new users, building learning groups. Also, it allows activation testing functionalities to enable users to examine and compare their learning progress and enhance experience.

Walker (2016) suggested that creating, moulding and using their own self-selected learning methods on *Memrise* was considerably more enjoyable and beneficial than using the app standard material. It is somewhat of a surprise that none of the participants in this study conducted their own examination of the advanced capacities of the app. *Memrise* allows learners to develop their own such exercises, and the time spent in doing so increases the benefit of autonomous learning of vocabulary but also improving kinetic cognitive skills valuable in the workplace. This is supported by other research which reports findings with students similar to those participating in this study;

- Baker (2012) highlights the benefits of crowdsourcing lessons and challenges, and the development of personal vocabulary learning lists through exchange but this was not an opportunity taken up by the Imam University students who indicated that they stuck to the pre-programmed proprietary exercises to advance their vocabulary knowledge.
- Luczak (2017), too, asserts that insufficient attention is paid by researchers in exploring the benefits of the range of vocabulary and other competences which are made available to the student by its use.

It is argued that failing to use what is effectively a community of learning feature is a lost opportunity to interact with fellow travellers on the road to language competency, and has a clear implication for the role of the teacher in promoting at least a class-fellow student community, with considerable social and educational benefits.

It is shown from description and evaluation of how the students used their smartphones for learning that behaviourist activities such as memorisation tasks and intentional learning predominate in how the device and software is utilised, perhaps with some cognitive-interactive activities using the flashcard system. The students tended to stick to the pre-programmed basic courses. There was no involvement in community formation and participation and building, no mention made of using the video or audio downloads, or mems, as aide memoires. They did not make their own. The majority describe their experience of the app highly positive, such as student 5 comment

'it was very very good and useful I have gained a lot of information and knowledge from this application.'

The study was however indicative of the fact that they have a great deal to learn to make better use of its facilities and enhance its learning effects. It is therefore fair to conclude that the students are losing out on learning by being left to themselves in the use of what they find is a valuable tool for its learning. The results clearly show they have to be taught how to use *Memrise* if it is to be utilised as a tool of supportive learning; even the most inquisitive of cognitive learners need guidance and instruction. The study has produced clear data on the beneficial value of the Memrise App in vocabulary learning, and as such, promotes its use as a support to both teachers and students. Its regulated and monitored use in the educational context will facilitate further research into its other capacities and the role of the teacher in this method of learning advancement.

5.5.12 Pedagogic Role of the Teacher in Memrise Use

Memrise seeks in its introduction to incorporate interactive learning, but given that the facilities were not used to their full advantage, it is fair to assume the students simply passed over this into a realm of instinctive use, getting straight to the point of their enquiry, namely the learning activities. Although the evidence of this study indicates that Saudi students, in common with those of other nations, appreciate and embrace the ICT revolution in its various forms, they still have to be taught to get the best out of its operation for education and vocabulary learning purposes. All respondents appear to manage and manipulate similar apps which organise their lives and entertain, for example student 10 mentioned;

'The basic applications I have are social media apps. The most app I use is called Fantasy for football game which I use daily.'

In Saudi Arabia Nassuora (2013) and Alqahtani (2015) noted in their research for the implementation of the Unified Theory of Acceptance and Use of Technology (UTAUT) that there is full support for the principle of the smartphone as an educational tool. Venkatesh (2016) asserts that the acceptance of technology by a society is based on the expectations of its performance in return for the effort expended and how it facilitates improvement in society.

The role of the teacher will, it is suggested, reign in this inclination with greater direction to full value of the app. This requires an instructor with the following

- i) A strong interest in the promotion of autonomous learning
- ii) Knowledge of the advantages of technology
- iii) Continuing education beyond limited class time

- iv) Understanding the benefit of mobile technology to their students
- v) Set up a department based community learning body (Detre and Cook, 2017).

In the Saudi context of traditional lecture practices, the individual tutor should, it is suggested

- i) Carry out a personal assessment of how, or whether, to accommodate student independence
- ii) Assist with vocabulary activity input
- iii) Monitor progress and
- iv) Identify weaknesses in knowledge.

The students will then learn how to branch out into the wider learning community with starting their own groups or simply joining others. It is evident from this study that this was a capability of the *Memrise* App which was not pursued by any of the students although the results indicate the app provides a viable supplementary teaching tool for Saudi instructors to pursue the aims of government initiatives to make the English language central to higher education learning.

5.5.13 Review of Class Room Value

The evidence of classroom value is limited, but the Chapter 2 Literature Review outlines a plethora of studies from across the world that smartphone apps such as *Memrise* contribute considerably to the gaps and learning style inadequacies of the lecture process. Cochrane and Bateman (2009) argued that mobile devices are more effective if they encourage online activities and promote interaction between learners and educators, regardless of geographical location. It is therefore appropriate to conclude that teachers must therefore learn the ways of the technology, search for applications that serve the academic task they have in mind and support their charges in their pursuit of learning by

any means they find conducive to their personal success. There is no student support identified in this examination for the smartphone to be used other than as an external aid student 2 commented;

'I try not to use my smartphone when studying as I get easily distracted and find myself in Twitter or chatting in Whatsapp.'

Campbell (2006) indeed also suggests the classroom is not the best environment to use smartphones because the discipline and attention to the teacher requirements does not support the full range of applications covered by the devices. It rather facilitates the more social media diversion from learning. It is right to comment that these studies into the smartphone value as a classroom tool do not undermine the outcome of the intention or focus of this exploration. The mobile app is herein examined for use as an extra-curricular tool of supportive learning, a complement to the limitations of classroom time and has proved attractive to students.

5.6 Objective 4: To Understand Learners' Attitudes and Motivation toward Using Smartphone Applications for Vocabulary Learning.

This section deals with a simple presumption that even where a method of learning is considered valuable, it will not be used to its full capacity unless the student wants to use it and finds it valuable. It has been noted in Chapter 1 Introduction that the learning of the English language is not simply a necessity to progress on the student's chosen course, but a government imperative, recognised as a necessity to secure economic development and growth in a global market of immediate communications networks. Vision 2030 stresses the importance of the introduction of technology as a basic, fundamental resource in higher education, with a proposal that universities can become 'paper-free' by 2020.

Students in this study have found the *Memrise* app of considerable assistance in the improvement of their vocabulary learning outcomes, and that is only on the basis of their own, independent, self-learning investigation of limited attributes of the programme.

It was important in the consideration of the value placed on the tool as a learning device that students access the designed courses by the researcher on their own and discover the application features. They were of course given guidance by the author where needed to access and download it, and were then simply advised to follow the link to the designed courses, and use the software to seek to satisfy them.

This proved to be an effective way of determining how they perceived the device as a supportive tool the particular findings and implications being students treated the accumulation of vocabulary exercises and tests as an individual pursuit, only on occasion sharing with colleagues, and the role of the teacher is more integral to mobile, autonomous learning than was anticipated or reflected upon in study planning.

A lack of awareness was evident in the study on the part of the Imam University participants of the full capacity of the digital learning tool they have on their omnipresent smartphone.

5.6.1 Learners' Attitude toward Smartphone Application for Vocabulary

Learning

The 'learner attitude' factor of the aims and objectives investigates the extent to which students embrace the introduction of their technology tool of social, business and economic interaction into the education sphere in Saudi Arabia, and this clearly depends on evidence of its value. In Kuwait, Dashti and Aldashti (2015) surveyed students at the

College of Basic Education and found a high number of participants indicated considerable positivity in attitude to the use of their phones in vocabulary learning. They appreciate the use of a mobile app supplemented insufficient class time, allowed them to prepare their own learning plans and carry them out at a time which suited them, without fixed institutional restrictions.

In this study a student 7 commented

'smartphones are available all the time whenever I find a new word.'

Alwraikat (2017) focused on teachers and learners in Oman and the United Arab Emirates, and found a similar level of popularity for mobile learning, predicated on the same bases as those outlined by Dashti and Aldashti (2015).

It was noted in Chapter 1 the cultural and institutional reasons for concentrating this research on male students, and concerns were stated by the author that these may undermine the findings given the exclusivity of gender. Alwraikat (2017) however noted in his research that there was no significant difference when the study involved other factors such as gender, specialisation and level of study. In Islamic based Morocco, Omari *et al.* (2017) too found no divergence in the value recognition of mobile app benefits to vocabulary learning by gender, age and education level. In this study of Saudi students, for institutional faith reasons, the research had to be restricted to the male campus of the university. However, the findings of student perception of value of mobile learning correlate closely with those of Dashti and Aldashti (2015) and Alwraikat (2017). According to Omari *et al.* (2017) the findings will apply regardless of gender.

Al-Fahad (2009) found having examined the attitudes and perceptions of the effectiveness of mobile learning among 186 female students at King Saud University; women

undergraduates are no less enthusiastic about progressing their education and vocabulary learning than their male counterparts in a separate part of the campus. Smartphone technology improves their education outcomes. They embrace this opportunity; any limitation or differentiation on its provision, it is suggested, can only come from their teachers.

Ebadi and Bashiri (2018) investigated views of 50 male and female EFL learner's in regard to vocabulary learning experience with the use of smartphone application. The findings showed that learners had positive attitude toward using the smartphone application (*Vocabulary Flashcards 2016*). The findings from the independent t-test showed that no significance differences in gender and vocabulary proficiency on participants app usage.

This study presumes that attitudes to mobile app use for supportive learning apply broadly equally to the male and female schools of English education at Imam University. Essentially, there is a dependence for communication, information access and life planning on the ubiquitous smartphone;

'I have many applications like Twitter Whatsapp Facebook and Instagram', said student 11.

In the examination of the learning value of apps, this research found that four of the *Memrise* using interview respondents indicated they liked the operation of the simple artificially 'right-wrong' feedback and corrections, and increase of challenge features. This is indicative of the way mobile technology simplifies each aspect of daily life, including education. The implication being that it must be recognised and adopted as a teaching aid, not simply a tool of supportive learning.

Autonomy of learning through applications which lack the inherent control of teacher input may arguably be perceived in the context of traditional Saudi institutions as a threat to authority, undermining respect for the role of the teacher. There was no complaint or adverse comment made by any student in this research to suggest this. They concentrated their evaluation of mobile learning on its supportive role. It is clearly considered to be of value to and by students in this study, so it appears obvious that it needs to be adopted into teaching practice.

The questionnaire survey preparation for the value testing of *Memrise* indicated students already used the app, at least on the basic level, albeit there was no evidence of even the most informal collaboration which could be termed a ‘community of learning’. It is an individual learning exercise tool. The evidence is clear; change is occurring, and the test outcomes of this study show evidence of positive outcome development in vocabulary test scores.

5.6.2 Learners’ Motivation toward Smartphone Application for Vocabulary Learning

It is the purpose of this part of the discussion to consider the effect of mobile learning, particularly its ease of access, on the motivation to use the smartphone tool and develop their autonomous learning plans. In the context of traditional teaching methods, attention and motivation, the creating of an interest in the subject, is arguably only achieved when students perceive value in what they are doing. This was broadly addressed in this study by student 11;

'I have not used any application before Memrise but I think I have learned a lot from Memrise and will continue learning from the application in the future'

The Imam University participants were able, in interview, to explain their perceptions of the importance of English vocabulary learning as an imperative to their success in the new Saudi Arabian economic vision.

Such motivation and positivity of attitude toward English language learning may reasonably be interpreted from the answers of the participants as achievable describing the use of their smartphone app for education development rather than simply social pursuits. It supports the presumption that motivation to learn must logically enhance test and knowledge outcomes and all contributors to this research acknowledged the value of their precious personal devices to the success of their future as student 5 commented;

'when I speak I can complete a full sentence now I can speak fluently I noticed the improvement even at home I speak with my family different than before using Memrise.'

Warschauer (2001) asserts that online learning activities greatly motivate language learners because

- i) learners feel they are gaining technical skills that also benefit them in future careers
- ii) freedom to plan and implement one's own learning encourages exploration of software capacities, and
- iii) the creation of new colleagues in online learning groups and the sharing of knowledge, ideas and tips.

The Imam University students however did not take advantage of the benefits of the last facility, but were clearly able to develop a coherent strategy of learning of their own as student 11 noted;

'I use it as a game and challenge. I like to challenge myself and visit the app from time to time.'

Whilst there is overwhelming research support for app use in learning, the students of Imam University of course had their own self-analysis of the value to learning and 'fun' factors of the *Memrise* application and differing levels of opinion. In the online pre-test survey,

- i) 70% indicated that smartphones were a significant support and enjoyable way of vocabulary learning, although
- ii) 25% of the rest, who had previously accessed pertinent apps, found them quite dull, and
- iii) 9% of participants in the post-test interviews indicated they found *Memrise* 'useful but quite boring', to quote one response, who indicated a preference for reading story books or watching TV to improve vocabulary.

Seliaman and Al-Turki (2012) assert that any benefits from using a smartphone for educational purposes depend on learner's motivation and intention to use the devices, but if a culture does not support change it becomes impossible to promote the building of motivation to learn a new way of doing things.

It is not the remit of this study to examine whether motivation is innate or trainable, but to simply establish its existence. Student 6 rather dramatically asserted

'I was addicted in learning from Memrise'

The results of this study have achieved that in the academic context as far as learners are concerned, although another clearly preferred the classroom setting as student 9 commented;

‘There is nothing that motivates me in continuing doing the course. I don’t like to learn vocabulary in isolation.’

5.6.3 Independent Learning Strategy Development

Learning strategies have been considered earlier in this Discussion, but particular attention must be placed in autonomy and independence of learning. It has been noted that in the use of the mobile app that learners have, broadly, simply transferred their psychological learning preferences to add this extra tool. Adventurous activities make students more creative and productive, exploring other more extensive varieties of strategies of learning, either individually or in self-chosen collaborative exchanges. Strategies must be learned. Flexibility is a key feature of the Memrise learning programme, and, as the saying goes, variety is the spice of life. There is no dichotomy in the proposition that independence must be taught and learned.

In the context of smartphone use Thomas and O’Bannon (2013) suggest that learner age is a common factor for resistance to the use of the device in learning, rather than teaching culture. The young adult students participating in this study were well versed in the operation, for social and organisational purposes, of mobile technology, but lacking in experience in terms of its education value. This supports the finding of Bick (2005, 53) who suggests

“...there is still some resistance among both school and university teachers concerning all things technical.”

Rahman (2017, 10) stated that as there is greater acceptance of the smartphone as a educational device

“the students gradually became more adventurous and started to bring more variety into their language production”.

There is no suggestion in this research that there was any subterfuge activity in using the device in Saudi Arabia; simply that there are cultural obstacles and perceptions of loss of teacher authority which can only be overcome by changes in attitude. That can only be achieved when outcomes are evidentially improved, as has been achieved by this study. Indeed this has given rise to implications for broader change to the education framework than originally anticipated at the beginning of the research, some more tentative than others. Motivation to learn comes, at least in part, from the ‘fun’ factor and outcome improvement, both of which were highlighted in this research as student 4 stated;

‘I learned a lot from the app and will absolutely continue learning from the app’.

This indeed was evident through the various stages of this study, support for the conclusion that mobile technology has arrived in Saudi learning and the teachers, within the framework of teaching and learning practices, must be embraced, or traditional cultural imperatives will be compromised.

5.13 Collaborative Learning and the Smartphone

It has been noted by researchers that communities of practice and learning have assisted students and teachers in identifying how learning outcomes can be improved in a collaborative, enjoyable and thus motivating manner, especially

- i) through informal group discussions on *Memrise*,
- ii) with learners freed from formal learning and teaching environments,

- iii) thus improving self-confidence and independence
- iv) in the collaborative building of one's vocabulary bank,
- v) rather than simple reliance of teacher instruction;

this then aids improved performance (Wang and Ma, 2017). This, it has been noted, was not an activity undertaken by the participants herein.

Students need education and guidance, with input from a forward-thinking teacher, to develop their own class based, tutor guided learning group, to supplement the limited class teaching time, before moving onto the global learning orbit of the online ESL community. Focus on extra-classroom, use, testing and outcomes from use provide a more cogent basis upon which to assess value with the simple question, 'does the device and software improve outcomes in curricular based tests when compared to classroom presentation alone?' If the answer is 'yes', there appears no logical reason for resistance to use. That was shown in this study, the proof lying in enhanced test performance. The teacher has a role in promoting motivation through encouragement, feedback and their own overtly expressed attitude to device use.

5.7 Traditional and Cultural Influences

The findings of this study relating to the nature of app use supports the implication that in the Saudi education framework the perspective of the teacher is integral, at least in part, to the success of autonomous learning. Simply, when the teacher accepts the technology, it is easier to convince students to apply it. Research is therefore necessary to focus on the socially constructed perspectives of Saudi EFL teachers to understand what factors affect attitudes and training, and the implementation of their beliefs in their classrooms. The issues have a significant base in culture, both local and national. Alfahadi (2012), for example, has reported that teachers were particularly concerned about what they regard

as lack of alignment between textbook content with cultural and social values in their locality.

In its application to mobile learning, with its greater inherent capacity for limiting cultural influences, this can potentially undermine the value placed on the use of the tool. Many of the students however, without prompting, searched other, mobile, digital sources. It is a habit to be more formally and effectively harnessed by teachers in guiding learning.

Baker *et al.* (2007), it has been noted, assert that

- (i) Saudi Arabian culture is founded on gender segregation,
- (ii) suggesting that men have more flexibility in the sharing of ideas more freely than women, especially where personal learning needs are explored.

The implication is arguably that women will be inhibited in learning opportunities available to males in EFL mobile communities due to local and national cultural imperatives. This is not borne out by the other researchers identified and it is therefore appropriate to conclude that the cultural limitations of the study will not of themselves undermine the cogency of the findings.

There are instances evident in this study where entrenched learning habits are the bar to the embracing of 'technological assistance' in their learning,

- i) one interview participant in particular commented that *Memrise* was very useful when looking up words but the "pen and paper" was more helpful in memorising it
- ii) another stating that the application was not much different from a dictionary.

Some students will always prefer their traditional way of learning vocabulary, perpetuating a reluctance or resistance to change, and this too must be accommodated by

teachers. It raises concerns for how the success of the Vision 2030 plan for paperless learning will be calculated, because in part

- i) behaviourist learners should not be disadvantaged by their reluctance to embrace technology, which must be viewed, in all its forms,
- ii) as a support to learning, not a replacement of teaching;
- iii) change and growth is good, but not for its own sake,

Whilst the traditions of Saudi Arabian learning may appear retrogressive to outsiders, it has worked, and simply needs amended and restructured, not replaced. This has been the focus of this study and its results bear out the assertion that

- i) whilst the smartphone app is considered easy to use and a valuable learning tool by most students,
- ii) the needs of all learners have to be accommodated; at the very least,
- iii) purely behaviourist learners may react well to the device where they are
- iv) appraised by their teachers of its value and effect on their results.

Al-Kahtani (2004) broadly categorises factors influencing adoption and use of mobile devices into overt and covert obstacles

- (i) the overt factors tend towards technical competency including a lack of skills and training which was evident in the limited student uptake of the *Memrise* app capabilities
- (ii) the covert as cultural, religious and social factors.

This is a prima facie fair distinction to draw, but there is some argument that the nature of Saudi faith tradition and practice in the social and education sphere make culture an obvious, overt resistance feature in effecting change. As a teacher in a segregated

institution in Saudi Arabia the researcher has an acute awareness of the cultural expectations of the education process, and these have been taken into account throughout the study process.

According to the research of Van Praag and Sanchez (2015) teachers only broadly accepted app use as good for making notes and information retention tools in an isolated context; otherwise they were deemed a nuisance and distracting. This was not supported by this study, given that the mobile devices were only used as extra-classroom learning support devices. It is hoped that the general acceptance by students of its value will stimulate a more productive attitude to supporting teaching and learning.

Korucu and Alkan (2011) suggest that despite all the challenges that educators believe will arise with the use of mobile devices in the classroom, the devices would soon enter the building. It is fair to say that the technology does not of itself put social and religious values at risk; it is the lack of management and direction and indeed it did not occur to any respondent to suggest this compromise, even in a faith led university. Mobile phones do not challenge culture but the software does improve outcomes.

5.8 Conclusion

As the discussion draws to a close, it is necessary to round up other findings from the Literature Review research in the context of this study;

Alfarani (2015) for example identifies technological, institutional, pedagogical and individual obstacles which must be accounted for in promoting the use of mobiles to support teaching and learning; there was no issue identified on affordability or internet access for the purposes of the participant students;

There are considerable overt challenges to changing educational practices, but perhaps it is the individual covert, personal attitudes which provide the most immediate threat to student outcome improvement by the acceptance of the smartphone as an independent tool of self-learning.

This study has not advocated the departure from the traditional ways of learning through teacher presentation and instruction and need not be instrumental in elevating the importance of ESL learning in Saudi higher education. The students made no complaint about their teachers or knowledge presentation, but simply made comments which suggested that they understood the need to improve upon their learning. This supports the contentions of Al-Seghayer (2005), who notes English learning is already integral in universities, with numerous such institutions replacing teaching in Arabic with English, viewed as the language of commerce.

This is perhaps indicative of a government promoted change in cultural tradition in exchange for greater global influence. This is not to assert that it marks a compromise in the prevalence of ingrained national and faith values;

- i) No student mentioned any concern regarding this.
- ii) It is only tentatively suggested that it is an explanation for their reticence in the interactive community of the app.
- iii) No-one mentioned they avoided getting involved because they thought it was a cultural threat.
- iv) They just simply failed to fully investigate the facility.

Rifkin (2010, p. 476) notes “*We are approaching the sunset of the oil era in the first half of the 21st century*” and the Saudi Kingdom is embracing the evolving communications technology revolution as a route to its “*less oil-dependent economy*” (Salameh, 2018, p. 238). The contextual of this study has been to show that Saudi students are investigating alternative ways of learning vocabulary to promote their future individual prosperity;

- i) their ESL education process remains broadly traditional, teacher dependent and time limited,
- ii) it works, but is insufficient; it requires supplementation;
- iii) it is an intentional, curriculum led framework
- iv) which students are aware can be supported by new mobile innovations such as *Memrise* mobile app learning.

Mobile phone ownership is as extensive amongst young adults in Saudi Arabia as it is in the rest of the world. This is not per se a cultural risk phenomenon, but it does open opportunities to expand learning beyond the social and faith mores of Islamic society for both males and females. Students are already using the devices for vocabulary learning.

Memrise is a relatively new application for vocabulary learning but is well received by the students in this study; some were already using it, and it was broadly considered valuable to learning in post-test interviews. It is however not being utilised to its full capacity; it is simple to use and improves outcomes, but it only achieves value and respect, in the Saudi context of a lifetime of traditional learning by presentation and instruction, when participation is encouraged, teachers are involved and a learning community attitude developed.

This is a conclusion drawn from the nature of the participant responses. Reflection by this researcher on whether this requires a cultural change has not reached a definitive conclusion; active teachers must desire successful outcomes and adapt their methods to the new technology. This is a government vision.

Involvement in student learning of ESL vocabulary is the same as traditional task setting; it is simply undertaken as a digital supplement. When teachers are motivated, so are their students. Vocabulary learning by mobile software and smartphone devices is already a feature in Saudi ESL higher education; resistance to its development, or even simply ignoring it, denies the student opportunities to progress, and inhibits the effect of the government vision for learning.

6 Conclusion Chapter

6.1 Introduction

This study has been predicated on the conduct of exploratory research with the overall aim of investigating and critically assessing the role and value of the smartphone *Memrise* Application in supporting academic vocabulary learning in Saudi higher education. The project had two bases noted in the early stages of research reflection;

- i. Smartphones have opened access to a world of information, social activity and commerce to all, regardless of gender and age, through rapid evolution of communications technology, and
- ii. It was not an academic examination which had been undertaken before in the particular context of the heavily directed, traditional, teacher-presentation based education framework of the Kingdom, a society in which the faith of Islam permeates every area of behaviour.

The context of the study lies in the higher education framework of the Kingdom of Saudi Arabia, and in the programmes and initiatives developed by the government for the advancement of education to enhance the commercial competitiveness of Saudi business development in the global market. The central role of communications technology and enhancement of the learning of English as the international language of business are bases of the Vision 2030 initiative. It is anticipated this study will be presented as evidence before the Review in 2020.

6.2 Barriers to Mobile Learning – Traditional Teaching and Learning Methods

Reflection on the achievability of the objectives of a study requires not only the consideration of its purpose and methodology but the context in which the research will

be conducted and potential obstacles faced particularly in the cultural values which attach to a national education framework. The value of learning strategies in the use of mobile technology for independent learning lies in the encouragement and facilitation of its use by students. It is impacted upon by the nature of their learning environment as they develop their education towards university level, how they have been taught previously and how the experience is enhanced by new software. As such, the achievement of the four objectives is dependent, most directly, on the perspectives of learners and their teachers, and how it reflects and enhances the socio-educational structure of Saudi higher learning.

It has been noted throughout the study that there exists overt resistance to the independent, autonomous use of mobile software to develop vocabulary learning through institutional methodologies of teacher-led presentation of knowledge, and the more covert, yet no less significant demands of traditional and cultural attitudes to change. This arguably arises from the student experience of learning throughout their years in the Saudi education framework, permeated with the traditions of Islamic teaching practiced in Mosque rote learning of religious texts to school.

This should not be viewed as understating the value of technology, promoted vigorously by government initiatives in public higher education institutions, as integral to the economic and social future of the Kingdom's prosperity. Indeed, although the national, cultural and faith context of education cannot be avoided in its substantial effect on expectations and methods of teaching and learning, the essential nature of learning English vocabulary, and the ability to use it effectively in communication situations, is powerfully advocated by government initiatives. However, time in the classroom is limited, rote learning by memorisation is limited in its lexical context and control over what is learned is an imperative in the Saudi Kingdom.

6.3 Cultural Imperatives in Saudi Education

Regulations and expectations necessarily impose constraints and while cultural directives permeate all education frameworks, including those of liberal democracies, but it is a question of degree, and the edicts of Islam are inherent in all aspects of Saudi life. It has not therefore been necessary for the purposes of this study to distinguish between overt and covert obstacles to the introduction of mobile software technology, such as Memrise, as a welcome support to learning, because they essentially interact in terms of formal rules and personal attitudes. This context is pertinent to the objectives of examining the contribution the app potentially makes to the development of autonomous learning and the introduction of Memrise as a learning tool which promotes the student to take responsibility for their own independent learning.

The *Memrise* App was chosen for this study following the author's research for the top free language and vocabulary application on the market suggested by (Lotherington, 2018). It was identified following that research as the most simply navigated and could be effective for vocabulary learning, embedding the spaced repetition facility, which reflected teaching practices the Saudi students were accustomed to and the opportunity for expanding their learning skills. Whether resistance to its use in autonomous learning is societal, cultural, personal or inherent in institutional regulation has little bearing as far as distinction between them is concerned. The fact of such reticence in the promotion of independent learning had to be borne in mind when reflecting upon the objectives, themes of the study and recommendations.

6.4 Saudi Initiatives for Development of Learning

Recognised by the Saudi government, the last two decades have seen numerous initiatives to promote and manage the introduction of ICT into classrooms, particularly the most recent Vision 2030 programme. This will essentially base the operation of all government departments, including education, on artificially intelligent technology. Schools and universities have seen the building of an adaptive ICT infrastructure to aid learning and divert from traditional presentation and textbook based learning.

This has been studied quite extensively in the West, East and Middle East, but in the latter case, especially in the Saudi Arabia experience, little consideration has been given to the use of mobile phones and vocabulary education apps, and their value to learning support. As has been noted in each of the previous chapters, this method of learning is controversial, a loss of control and authority over what is learned, and a greater autonomy for students. Nevertheless, what has become apparent from the target group of L2 learners at the Imam University, the smartphone vocabulary app, especially *Memrise*, is already being used by learners as an aid to study, supplementing needs which are not satisfied by traditional, time limited classroom teaching.

6.5 Research Objectives

The fundamental purpose of this research, as outlined in Chapter One, has therefore been to investigate how smartphone mobile applications such as *Memrise* can be utilised to support vocabulary learning by Saudi students, and their willingness to embrace the benefits of this relatively new technology. The objectives demanded and achieved were to examine learner perceptions and attitude towards using smartphone applications for vocabulary learning and educational purposes in general, not simply the ubiquitous social media interaction. Specifically, therefore, the research project sought

- i) To identify vocabulary learning strategies that Saudi L2 students use to learn English Vocabulary.
- ii) To investigate the role played by smartphone app *Memrise* in supporting vocabulary learning in English.
- iii) To explore students' performance in vocabulary retention in post-test with and without the use of *Memrise*
- iv) To understand learners' attitudes and motivation toward using smartphone applications for vocabulary learning and educational purposes in general

In the exploration of the role played by smartphone applications in supporting vocabulary learning in English individual learning strategies of students were identified and taken into account in the assessment of value to a diverse student group. In the course of attaining these objectives, improved memory and test performance were noted through the implementation of the research instruments in using mobile device software which the students were generally attracted to in supplementing their vocabulary learning. In considering the how the study has achieved the objectives of the research, a synopsis of the influences of the traditional educational structure of Saudi education is reviewed.

6.6 Objective 1: Vocabulary Learning Strategies

The findings of this research reflect variable levels of enthusiasm toward supporting vocabulary learning through the utility of the smartphone app on the part of the participant students. They are indicative of a broad willingness to alter their strategy of learning to include the convenient use of mobile technology more to supplement than supplant existent ways of achieving expansion of their vocabulary bank. Given that the student experience of education in Saudi Arabia is predicated on what is viewed as traditional, teacher-led presentation, textbook learning and memorisation, there remained a high

degree of preference for such behaviourist practices. Nevertheless, this must change given the emphasis placed on the role of technology by government initiatives. Learning has become more easily and quickly accessible, and it has been noted in the discussion chapter that over 80% of students in the pilot study made use of online resources such as dictionaries not just for meaning of vocabulary, but to enable them to place the words in context.

This suggests a development of strategic learning beyond memorisation into cognitive interactionist contextual use which facilitates a higher level of communication capacity. It has considerable implications for development of competence in the use of language, essential to future workplace advancement. Thus even without the specific use of the Memrise app, new developments in classroom learning are changing the way students access information.

It is trite to assert that learning not only takes place in the classroom, but in the conduct of life, and the ubiquity of the smartphone lends itself to taking a central role in this process; all, bar one student, owned one. An intrinsic part of the examination of the objective was the investigation of self-learning as a support to the classroom. This necessitates a change in learning practice, and thus strategy, for students in the employment of their socially orientated devices.

6.7 Objective 2: Role of Memrise in supporting English vocabulary learning

This objective of the study has been considered in part in the first objective review in the context of its effect on strategies employed by students in vocabulary learning. The findings indicate that the *Memrise* app was considered by a majority of students to be of considerable value to support their vocabulary learning, and the outcomes of the tests are

strongly suggestive that users will achieve better scores. It is encouraging to note that most found it of benefit to their vocabulary accumulation, albeit that they only used the most basic of the app faculties. It has been noted that the software provides valued support for those who wish to actively pursue self-learning. The importance of individual motivation is integral to this objective of the study. It is a driver of autonomy of learning and as such, instilled by student perception of

- (i) The value they attribute to the *Memrise* software to their vocabulary learning.
- (ii) Ease of use.
- (iii) Challenges facilitated.
- (iv) The 'fun' factor.

It is also reflected in the 'Attitude to Mobile Learning' theme of the research, which subsequently impacts on the development of 'Vocabulary Learning Strategies' as students' seek improvement in their educational performance.

The Imam University students proved very supportive of its use as a supplemental aid to vocabulary learning, enhancing memorisation processes particularly through spaced repetition system. It is an obvious necessity of promoting independent learning outside of the classroom which is predicated on the student's understanding of the need to progress as an imperative for building a successful financial future. It is to be expected that students undertaking higher education in EFL will be conscious of the need to expand their vocabulary knowledge, as an aid to the use of the English language, beyond the classroom and its limitations, particularly time. Enhanced performance in testing is a further potent motivation source.

Relevance of vocabulary learning to their future economic well-being is stressed by government initiative effected by institutional practices, but these are not sufficient.

Attention is drawn again to the opinion on *Memrise* of one of the participants that the behavioural learning utility of the app, which reflects classroom practices, is demotivating, and he had to search for alternative means to fulfil his learning plan strategy. The objective sought to identify ways in which *Memrise* supports vocabulary learning. One considered it an essential tool, a ‘doctor’, a ‘teacher’, others found it occasionally helpful in quick access checking, some used it as a more organized word list and context learning exercise preparation tool, and two found it to be simple. Different students behave in different ways, but this does not undermine the finding that it is of value as a support tool when the student wants, or needs, to learn. As such, the objective has been met by the study.

6.7.1 **Student Autonomy**

Some students had already discovered the *Memrise* app to forward their vocabulary learning before this study was implemented, indicative of their understanding of the need to self-learn and motivation to do so. This is indicative of their awareness of the need to build on what they learn in university. In the provision of a method of learning support, the smartphone app meets the needs of the objective in identifying how learning strategies, or perhaps more simply, ways of learning, as new opportunities arise or are developed.

The development of independent, autonomous learning, as a part of the overall aim was reflected in the study through examination and discussion of the themes of the student experience of using smartphone applications in general, and the *Memrise* application in particular. In order to be an effective tool for vocabulary learning, it is the perception of the student of its value which will promote the use of the *Memrise* software and promote the inclination to self-educate.

In fact, the main complaint about its value was that it was too simple and therefore did not satisfy the more advanced needs of some students. There is a risk of confusing ways of learning with strategies, especially when there is a variety of learning support tools available to students who wish to use several. The smartphone proved useful to those who learn in different ways because they were able to access and adapt its use to suit their immediate needs. Two however found the old methods of pen and paper remained most suited to their needs, and others thought it distracting. This does not mean the study, or indeed the app, has failed to meet the objective, but given its support tool status, it facilitates the 'as and when' needs of each student in the study.

There was little of assistance to indicate that the smartphone would serve strategic value in the classroom. This was considered in the Chapter 2 Literature Review, to provide an overview of the capacities of the smartphone in the broad educational environment. An assessment of its value to learning in the institutional environment may have prompted enquiries of the Saudi student participants in this study. Although use of the device as a classroom tool did not form a part of the exploration in this research, a positive evaluation by other academics in other national settings would have enabled consideration to be given to further research in Saudi Arabia universities. However, although value to learning was identified, all prior researchers found this to be outweighed by its diversionary, distracting and irritating effects on student attention. It is not therefore suggested that in the traditional Saudi institutions that the classroom is not a suitable place for mobile phones.

The Imam University participants found the smartphone *Memrise* app a valued supplement and support to institutional learning, neither integral to teaching practice nor a replacement. It was simply an easily available implement of strategic assistance, there to solve particular problems for some, and to develop new strategies of learning by designing their own word lists and contextual exercises. They described their use of the software, but indicated limited use of its facilities, concentrating on the wordlist preparation, memorisation and repetition process rather than joining a learning community. These methods are similar to those adopted in the behaviourist practices of the institution and classroom.

Note has been taken of the view of one student who found this rather limiting to his learning, thus undermining the value of *Memrise*, because he was looking for the increased challenges of lexical, contextual use. Although the community learning utility of the app supports this, it was not the purpose of the study to promote any of the faculties, but to ascertain how students, using their own initiative, adopted use of the app per se in their pursuit of independent learning. This cognitive, interactive learning strategy was somewhat lacking, and it will be noted that this has implications for teaching practice.

The objective of identifying vocabulary learning strategies students use to learn with and without the use of mobile apps has been met insofar as the study has shown that behaviourist learning is ingrained by the Saudi traditional education framework. It is evident however that there is a desire to learn in different ways, enhancing a cognitive interactionist approach which develops essential communication capacity. There is no 'one size fits all' strategy which can be attributed to students who participated in all stages of the research. What is evident is that considerable value is placed on the *Memrise*

software in independent learning, and this has further implications in the pedagogical framework of encouraging self-learning methods for self-advancement.

6.8 Objective 3: Students' performance in vocabulary retention

This objective has been met, as indicated in the analysis of the findings of the pre and post-Memrise tests, and in comparison between the Memrise groups and control groups. The differentiation in results between the control groups reflect some improvement in the pre and post-period of the study, arguably expected in the course of the continuation of the traditional classroom learning. The change in performance was more marked in the Memrise group, indicative of the improvement potential of autonomous learning assisted by the smartphone app.

6.9 Objective 4: Understand Learners' Attitudes and Motivation toward Using Smartphone Applications for Vocabulary Learning

The meeting of this objective was indicated in the Pilot survey questionnaire, where the findings showed that a significant proportion of students had exchanged vocabulary enquiries and answers via their social media platforms, some had tried specific language apps and a few Memrise. Learning was expanding beyond the classroom and institution, and the usual television and radio traditional media without encouragement or guidance.

This research has shown the benefits of autonomous learning through the introduction to students of a dedicated vocabulary learning app in terms of developing strategies, increasing their vocabulary memory bank and assisting understanding. In the target groups, enthusiasm was shown for the learning tool, albeit to different degrees, and this was reflected in the test outcomes. The value of the app has been discussed in considerable detail in the last chapter and this has considerable implications for the use

of mobile learning in the developing technological plans and initiatives of the new Saudi educational framework.

6.10 Pedagogical Implications

The introduction of supportive autonomous learning by smartphone app, in the context of the preparation for, and execution of this study design has considerable implications for the role of the teacher in developing their own practices to promote learning. Essentially, the use of the app to gain advantage from its full range of functions needs to be taught. It confirms that autonomy is not necessarily inherent in a personality, but can be learned with the guidance of their teachers. The most direct implications which arise from the research are (i) the need to better raise awareness amongst the students on the use of the functions of the software and (ii) to encourage learning as a continuing activity outside of classroom, institutional and curriculum requirements and constraints.

The students showed some enthusiasm for Memrise, and indeed in the broader context of the pilot study, significant awareness was indicated of the educational value of social media interaction. This should be harnessed by learners and their teachers. Some students may find their own way, others need guidance to maximize strategies to make the best use of the opportunities available to them.

6.10.1 Teacher Training and Student Interaction

Students, it has been noted, tended to use only the most basic functions of the *Memrise* app rather than venturing into the more interactive, community of learning capacity of the software. This, it is suggested, either displays a cultural reticence on the part of learners to use the expansive community interaction facilities or simply reflects their lack of confidence in navigating the software. Whilst these potential conclusions were not

examined specifically in interview with the learners, a weakness in the research which was not anticipated in pre-study reflection, they are drawn from the author's knowledge of the personalities of the classes involved, which he has taught whilst in the Kingdom. The implication for teachers is the need to guide their learners in the utility of independent ways of learning, to enable them to expand upon strategies which will be of value for progression in the workplace.

It is in this context that teacher input is vital to make the best use of what is recognised by their charges as a valuable learning device. Students cannot learn on their own, they have to be taught. The findings and discussion are supported by the assessment of Masouleh and Jooneghani (2012) who assert that "*considering autonomous learning as an unbridled learning is as ludicrous as to assume that an infant can grow up with the help of his/her mother*" (p. 835).

6.10.2 Teacher Support for Learning Skills Development

The evidence of the limited, untutored use of the software capacities indicate that teachers should be integrally involved in supporting their students' autonomous learning, in all features the latter consider pertinent and beneficial to their progress. The relatively limited use of the app functions as noted in the findings, those which develop simply behaviourist-related skills, suggest that teachers should be more challengingly supportive, rather than simply presentational to expand strategies of enhancing learning. This would assist in the development of student focused, independent learning strategy development, one of the principle themes of this study. Nevertheless, professionals must be aware of the value of change of practice; simply because a method is 'new' and a 'good idea' will not affect the perceptions of seasoned teachers who have been molding young minds sometimes for decades.

The study findings have noted that the fact of smartphone educational software being a relatively novel way of supporting and advancing learning does not mean it has not yet reached the attention of students. There is simply a need for greater awareness of how to use it. Classroom teaching methods are already changing in Saudi Arabia through technology introduction. It is reasonable to draw the conclusion from students use of the mobile app that is a natural extension of opportunities to learn. This has clear implications for teaching and learning practices in the mutual embracing of student improvement.

Attention is therefore drawn to the significant and quantifiable difference the use of the smartphone *Memrise* app made to vocabulary learning test scores over those who used the traditional methods of classroom presentation and textbook. It is acknowledged that variables such as the continuing use by the *Memrise* group of other methods of learning including class lectures and textbook activities may impact on the assertion of a definitive relationship between vocabulary improvement as solely related to use of the App. This has been evident in the findings and discussion thereof whereby some student will prefer their familiar strategies of learning, matched by the use of checking online sources at time when additional, speedy, knowledge is required.

However the receipt of training in extra-institutional learning may be appreciated by students who must achieve their educational aims, and thereafter continue to develop learning skills in the workplace. Students who used the *Memrise* app showed this enthusiasm, albeit to different degrees, but based on their own levels of motivation and ability to navigate the faculties of the app. The change in learning practices is already evident from the use made of social media for occasional learning, which can be directed

to more focused activities where peers learn from each other through the intervention of their teacher. The teacher, in turn, trains a more rounded citizen.

6.10.3 Change in Traditional Practices in Teacher-Presentation

The onus now falls on the higher education institution management and individual authoritative tutor-presenters to adapt methodology and practices to fulfil demands of the government in the improvement of the vocabulary and language use of English as an economic imperative. The results and discussion indicate that educators must learn how to use and incorporate into learning the technological advantages of mobile software learning.

Cultural concerns over control of learning can, certainly in the early stages of embracing the *Memrise* software utilities, it is concluded, be ameliorated by an institution based learning community. A more structured approach to independent learning outside of the classroom may ameliorate concerns of distraction where teacher, or peer, organised activities and increase the ‘fun’ aspect of *Memrise* use referred to by some participants. Specific, gamified tasks or challenges, for example, may be developed by teachers and peers which reflect the type of puzzles young adults use on their smartphones to pass time or relieve boredom; a vocabulary based ‘snakes and ladders’. This, it has been noted by a proportion of the *Memrise* students in the findings, will satisfy the behaviourist learners.

Those of a more cognitivist, interactionist bent will potentially continue their exploration into the wider *Memrise* community. It was certainly recognised by two students that the basic functions were inadequate to satisfy their learning needs and thus they eschewed use of the app after a short period. The functions of the app need to be more effectively utilised to enhance its pedagogical value, perhaps through the setting of curriculum based

challenges, contextual use exercises and word games. Stimulation of the learner's imagination will logically increase the desire to use the app, increase incidental learning and promote contextual use.

6.11 Recommendations

The recommendations follow from the discussion of the findings in the last chapter and are guided by the conclusions herein on the meeting of the objectives of the study. The context of the research has been the traditional education framework of Saudi Arabian higher education system, and guided in the first instance by the studies conducted in different countries with diverse cultures of educational values and practices.

The consideration of, and reflection upon the recommendations must however apply to teachers and students in higher education, although it has been evident from the findings that the teaching of independent learning should perhaps start in colleges. They have broader implications for teachers beyond the Saudi context and indeed are not limited to universities. The old adage applies that people are never too young, or old, to learn new skills. The implication of the study will be presented to the review in 2020 of the Vision 2030 initiative progress specifically in relation to changes in educational practice. Mobile, independent learning is not incorporated in the government plans for advancing the Saudi education system or considered as a part of the technological programme currently being undertaken. It has been noted from this study that the rapid move toward concentrating learning in a technology based environment risk leaving behaviourist traditional learners behind, losing the benefit of their particular expertise wherever they may feel it lies.

In the planning of this study project it was considered appropriate for the purposes of investigating autonomy and motivation not to tutor the participants on the detailed operation of the app; it was considered that this would show the willingness and motivation of students to carry out their own ‘exploration’ of the app faculties. This may be considered a weakness, but it is a novel way of learning in Saudi Arabia, and it was considered appropriate to determine how able students were to adjust their learning to new tools and opportunities. It provides a basis for other researchers to consider developing beyond this limitation, but does not detract from the cogency of the proposals for teaching and learning changes. Indeed, the recommendations herein provide a building block not only for the advancement of learning based on the findings, but facilitates assessment of learning progress and outcomes following their implementation.

Proposals for change, and the embracing of mobile smartphone app supplemental learning through *Memrise*, start from two fundamental certainties. The first arises from this study, namely that some students had already discovered its value and were using it prior to the tests, and second, government initiatives demand the use of technology in education, potentially to the extent of replacing ‘paper’ learning by 2020. The suggestions are tentative but realistic, require considerable reflection but are practical;

- i. Teachers should understand that their students recognise value in using the smartphone app as an adjunct to the learning they gain in their limited time in the classroom; this is shown by the improved test outcomes which indicate that use of Memrise led to better performance indicative of improved accumulation and recall,
- ii. Teachers should perhaps receive training in the better communication of English vocabulary, and its lexical context, to their learners; the findings show that whilst

some students will be satisfied with memorisation, most crave greater awareness of its conversational use, often learning through watching television. The comments of two students that they found the basic activities of the app inadequate for achieving that need are suggestive of guidance to more advanced faculties provided, for example, in the community of learning facility,

- iii. they should place greater emphasis on its importance to the economic future of the students and the Kingdom, given that they have been told this often enough via government initiatives and statements. The findings show that motivation to learn is facilitated by teacher encouragement, improved outcomes and guidance from both teachers and peers, be it in the classroom or via social media,
- iv. Teachers have to be aware of how their students learn and to understand how they can be involved in satisfying their individual needs. Training in the use of mobile app learning can assist understanding of the benefits identified by their learners and enable students to expand their autonomous learning activities beyond the basic faculties,
- v. Students can be motivated to learn without dependence on the teacher, and to utilise *Memrise*, or indeed whatever app they prefer, to become more involved with fellow learners, either in the same class, institution, or indeed across the world. Although they were not specifically interviewed on the reasons for not utilising the faculties provided by the app, their embracing of technology and the ease of access to learning can be harnessed for their self-improvement through awareness of the opportunities,
- vi. A community of learning can be created by students, first with colleagues then with their wider peer group to more fully employ the opportunities for interactive learning which were not taken up when left to their own devices.

It may appear somewhat anomalous that in a study predicated upon the examination of student perceptions on mobile learning and the smartphone app should result in a range of suggested reforms which concentrate on the role of the teacher. The answer is simply that in the course of the research learners have shown considerable understanding that the classroom and textbooks are insufficient to their needs, and indeed somewhat frustrating in its limitations. The findings and discussion show that students are motivated to learn; they have their futures at stake.

It is the job of the teacher to facilitate their progress and this demands a change in the traditional attitudes of the authoritative presenter of knowledge. It is indeed arguable that this is surmised only on the basis of a negative in the study process, the fact that the students were not tutored on the operation of the app. This is not perceived as a weakness in the study process for reasons explained above and was intentional. This is a first study in a new environment and the value of the app in the promotion of autonomous learning through mobile technology is based on the value placed on its use by those who will use it, namely the students. It has provided an opportunity for Saudi teachers to consider how they can improve on their pedagogic responsibilities to their learners, given that their students have, at least broadly, given their approval to the process in this study

It is difficult to visualise any threat by autonomous learners to the cultural imperatives of the state. The Saudi government is already using technology to compete in the global environment and markets, and only by enhancing the quality of higher education can this progress be maintained. The participants in this study have, in their own way, shown how this can be achieved.

6.12 Limitations of the Study

Limitations of the research process have been commented upon at the stages they are deemed to have arisen in the study. Perhaps the most significant identified have (i) been the need to conduct the practical contact with student participants in Saudi Arabia from England, which made review of study needs problematic, and (ii) respect for the cultural parameters of Saudi education and society, essential to work within and honour. No doubt the second concern is appropriately universal, and therefore the most obvious limitation of the study is culturally based. The subject participants were, of course, based in Saudi Arabia, and the researcher, being male, was only permitted to conduct the enquiries with male subjects in the Imam University. Consideration was given to the effect of the apparent gender specific nature of the research and how it could potentially be overcome. This was not possible in the case of the single male researcher context, and some thought was given to seeking the assistance of a female colleague on the female campus. This was not deemed appropriate for several cultural reasons, not least being the need for significant interaction with that ‘assistant’ which would have been inappropriate, even in an academic setting. On a practical point, this study is conducted for the achievement of the PhD of the author and must be his work.

Practically and physically it was therefore not possible, in the Saudi context, to overcome this limitation, yet it would have undermined the validity of the study to simply make that excuse and move on. Thus considerable time was spent in research in the course of Literature Review preparation to ascertain whether others, elsewhere, found significant disparity between male and female students in their use of social media in learning, and indeed more generally. Evidence from previous surveys and studies conducted elsewhere in the world indicated no appreciable difference in the attitudes of female respondents to

smartphone use in education. It is not suggested that this finding overcomes completely the practicality of the limitation, but it does indicate that the results herein can be deemed applicable across the genders.

Cost limitations and institutional requirements of the University to which this work is to be presented for the PhD degree required the study to small in scale, particularly in the post test qualitative interview process. The investigation of the objectives would certainly have been improved by a broader study of the collective student body undertaking English as second language learning. This would have produced a more comprehensive set of findings and insight on which to base analysis of the value of the smartphone app as a support to learning.

Much reflection was given therefore to the conduct of the research methods and design to ensure, so far as was practically possible, that the study reflected the objectives within the parameters in which it could be conducted. Financial limitations were also apparent in the choice of statistical analysis methods which somewhat compromised clarity in presentation and understanding of the results. Expertise in the use of statistical analysis methods was beyond the expertise of this researcher, an English teacher at the subject university, and the learning undertaken to effect the required processes could not match those of qualified statisticians.

This limitation was exacerbated by the logistical difficulties of the research participants being based in Saudi Arabia whilst the researcher was in England undertaking study requirements. This was a particularly unavoidable fact of the research process, and limited time for its implementation which in turn impacted on the study design. This logistical

difficulty did require limitation on the numbers of topics examined and participants interviewed but given the safeguards outlined throughout the thesis, this does not undermine the quality of the results, analysis, discussion and conclusions. The author has noted previously that human error in the processes of data gathering by questionnaire and interview, have, with the benefit of hindsight, been noted in assessment of the information. They do not have a particularly significant impact on the findings, but, as must be the case with dedicated and diligent research, ways could have been reflected upon to correct the same. Clarification of answers, for example, or obtaining further input on opinions, was not possible due to logistical issues, but perhaps helped the researcher in avoiding an obsessive approach to the study process.

The ability to develop a more comprehensive plan of vocabulary testing over the restricted period of a three month semester across broader groups of students at different levels of learning was limited by the time constraints on presence at the university in Saudi Arabia and the academic obligations of the researcher in England. Although funding of the programme of study was provided by the Saudi government, this did not include the considerable expense of travel across the hemispheres. Efforts were made to resolve these problems through the use of Skype technology, but this has limited application. Whilst enabling the study design to be broadly utilised, it is not as satisfactory as the ability to adapt the research strategy to more comprehensive opportunities of data collection by presence in the same country as the participants.

With the benefit of hindsight in the method planning of the study and implementation of the process it would have been of value to conduct a delayed post-test analysis procedure. Although the test programme proved indicative of the value of the app to learning and retention, at least until the post-Memrise test, it would have been interesting to have been

able to examine the continuing use of smartphone learning, the development of skill and longer term benefit to learning. The cost, time and logistical factors however militated against this. The first two must be inherent in the conduct of most research programmes and the simple conclusion has to be that in the absence of a line being drawn to present results, the value of a potentially never-ending process is limited to the practical considerations of making change.

This resulted in a limitation on the numbers of participants from whom data could be collected and tested in the quantitative process, and the time available for qualitative interviews. Nevertheless, these inherent weaknesses in the study design were taken account of in the reflective process. Whilst they could not entirely be overcome, the key elements required in the pursuit of the objectives and aim were ameliorated by the targeting of testing to randomly chosen groups of app users across two classes at different levels of advancement, with a control group of students undertaking only traditional learning methods.

All of the students had achieved similar levels of qualification to reach this stage of their learning careers by acceptance at the university. It was not possible, for example, due to time and logistical limitations to investigate further variables regarding background or grades of achievement which may have furthered differentiation of the groups. Sampling of participants may be undertaken in different ways in the absence of distance and time restrictions.

The process undertaken does however provide a basis for improvement in further research projects whilst not substantially undermining the results herein insofar as they have met the objectives and produced a strong indication of value of mobile learning across the student body. In particular, in preparation for the conduct of the study, it was noted that

some researchers would identify particular subject groups based on grading, prior education achievement and other variables which facilitated opportunities for a broader comparison of types of participants based on achievement. This study simplified the process, and indeed to ensure a higher level of objectivity and applicability of the results and their replication, it was considered that a random allocation into participant groups suited the purpose, and was indeed carried out by the administration department of the university.

This study was focused specifically on the *Memrise* smartphone app, free to download and access, but with additional services which could only be used on payment. Given that this researcher could find no prior studies, despite extensive search, it appears there has been no prior examination into the value of apps in general in Saudi higher education. This provides a first step into provision of evidence of the value of the *Memrise* app to enhancing student vocabulary learning.

6.13 Future Research Suggestions and Proposals

The limitations outlined provide an informative guide to the conduct of further research on the phenomenon of smartphone learning in Saudi Arabia, to provide more targeted insight into the value of apps in supporting learning not simply of English vocabulary but of most higher education disciplines. It would also be hoped that such research projects will have fewer financial, logistical and PhD criteria focused limitations. Perhaps most obviously in the Saudi cultural context collaboration between male and female researchers will overcome more directly the gender limitations of data gathering to enable applicability of results to be more conclusively established for the general student body.

It was noted from the Literature Review of comparative research that time was not as practically constricted as was necessarily the case herein. The positive advantage that

future researchers will have to build upon these results will be enhanced by presence in the Kingdom, perhaps at the institution studied, and not dependent on timescales which are dictated by contact with participants through technology. This will enable more comprehensive quantitative testing and qualitative enquiry of the students.

The range of areas examined can be expanded to include more detailed enquiry into comparison of pre-app learning strategies and how these have developed following use of mobile learning through more expensive and focused interviews. Face-to-face contact with participants in the interview process proved valuable in observational study of student reactions and evaluation of answers. These are just some of the examples of limitations which can be ameliorated by presence at the site of the study for the research period.

It will also enable a much broader body of student participation in the study process, perhaps to the extent of the using, in the Imam University context, the whole pilot classes. Other apps may also be studied and comparisons drawn in terms of ease of utility, value to language learning, and range of functions based on analysis of the quantitative outcomes and qualitative views on value and motivation stimulation of other apps in other institutions and countries.

The study conducted herein provides a firm basis upon which to build future examinations of learning development technology. The methods used are common to social research methodologies, and thus respected, and have been conducted with considerable reflection and explanation for those who follow to determine its veracity and perhaps enhance their own methods of research and data collection to ascertain comparative results findings.

Participants in the study used *Memrise* in a manner which was based on their own relatively unguided wishes and explorations of its faculties which suited their own

learning purposes. To that end, it provides broadly comparative results to those of other studies but in a context of the Saudi educational framework. This of itself aids credibility of the findings, and indeed offers scope for study on the pedagogical context for instruction on the use of apps as a method of more formalised task setting and testing.

6.14 Contribution to Knowledge

Despite the acknowledgements of limitations in the preceding paragraphs, this study project has stimulated reflection on a method of supporting learning in the profoundly traditional educational framework of Saudi Arabia. It provides a sound basis for encouraging students to use their social devices to enhance learning. It was not undertaken in a vacuum of stasis where the future of learning is fixed and predictable, because the Kingdom has understood the need to change the way its subjects develop their own economic futures and that of the nation. Indeed the findings show that developing of the range of study tools will facilitate learning not only in the classroom but as a potential social activity. There is little in prior studies which enable curriculum based learning to be encouraged on that basis. Learning may be 'fun' but it is also socially and interactively beneficial.

It is easy to suggest that traditional methods of behaviourist teacher-presentation and textbook learning are now inadequate to meet society's needs for development because technology is the way of the future. Simply because something is relatively new and innovative does not make it better, and this study has shown that some students prefer to learn in the traditional manner, using books, pens, paper and memorisation. However the study does prove that the app provides a valued and effective learning tool for those who wish, and are able to, embrace the technology and the opportunities for this form of autonomous learning. It may not be appropriate for all learners, but its use should be

encouraged by reference to the improved outcomes it provides. There is nothing to suggest that traditional classroom learning will make students any less successful in their financial futures than those who embrace technology, but implications of contribution to the learning of the majority of users is now satisfied.

This research built on the classroom learning changes effected by the Saudi government initiatives by embracing learning as a constant activity, a lifestyle need, and seeking to utilise the most ubiquitous of personal organisational tools to that end, the smartphone and its app. It will never replace the established practices, be they culturally and traditionally based. This was not the purpose of the research. What has been achieved by the study is the provision of clear evidence that learning is not restricted to institutions, but has the potential to be a leisure and social activity, thus attractive to those who utilise the opportunities.

The study sought to examine the *Memrise* app in terms of how it may expand opportunities for learning, to support institutional education processes, and raise the performance of students. In the course of preparation and literature research, others have examined the use of smartphones in other nations. This study was undertaken in the somewhat restricted, guided learning framework of Saudi Arabia, and the purpose was therefore to determine how the smartphone app added value to learning practices. The study has shown that the value of autonomous learning using mobile technology can enhance outcomes and might facilitate learning development as part of the change of education practices in the Kingdom.

The results provide an effective insight into how the improvements in language education can be implemented beyond those envisioned by the classroom centred Vision 2030 initiative, which anticipates paper free institutions by 2020. The results do however serve

as a warning to such a vision. It is evident that not all learners are willing to embrace technology alone as a way of accumulating knowledge; everyone learns in different ways. The smartphone app is a valuable support to the learning of Saudi students, and much appreciated, but care must be taken not to prejudice undermine the achievement potential of traditional behaviourist learners. Whilst this has been evident in this study of the smartphone app support tool, it also reflects on the plans for technology as the base of classroom learning.

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Students' attitude toward the use of smartphones for English vocabulary learning
إتباع الطلاب حول استخدام الهواتف الذكية لتعلم مفردات اللغة الإنجليزية

بسم الله الرحمن الرحيم

السلام عليكم ورحمة الله وبركاته

Thank you for participating in our survey.

نشكرك للمشاركة في تعبئة الاستبيان.

Participants information sheet and consent form

ورقة المعلومات للمشاركة ونموذج الموافقة

عزيزي المشارك،

أنت مدعو للمشاركة في الدراسة البحثية من خلال المشاركة في هذا الاستبيان. قبل أن نقرر، من المهم أن تعلم أن هذا الدراسة حصلت على الموافقة الأخلاقية من جامعة ليفربول جون موريس لتنفيذ هذه الدراسة. كما نريد أن نوضح لك لماذا يتم عمل هذا البحث وماذا يشمل عليه. يرجى أخذ الوقت لقراءة المعلومات التالية. الرجاء الاتصال بي في حال كان هناك أي شيء غير واضح أو إذا كنت ترغب في مزيد من المعلومات فينبات التواصل في أسفل الصفحة. يرجى أخذ الوقت الكافي لتقرر ما إذا كنت ترغب في المشاركة في الاستبيان أو لا. مشاركتكم في هذا الاستبيان هو على أساس تطوعي.

ما هو الغرض من هذه الدراسة؟

تهدف هذه الدراسة إلى التعرف على فعالية استخدام الهواتف الذكية لتعلم مفردات اللغة الإنجليزية. من خلال إجراء هذه الدراسة، من المتوقع أن يكون هناك إسهامات مفيدة يمكن تقديمها في مجال تعلم المفردات. ومن المتوقع أن تضيق نتائج هذه الدراسة لمتعلمي اللغة الإنجليزية من ناحية فهم استخدام وتأثير الهواتف الذكية على تعلم مفردات اللغة الإنجليزية. استخدام الهواتف الذكية لتعلم المفردات قد توفر على المتعلمين الوقت الكثير وتضيف فرص وطرق جديدة للتعلم. في نهاية الدراسة، لا بد أن تزودنا النتائج البحثية ما إذا كانت الهواتف الذكية فعالة أو لا في تعلم مفردات اللغة.

هل يجب أن يشارك؟

مشاركتكم في هذه الدراسة تطوعية وبالتالي فالأمر يرجع إليكم في تحديد القرار. إذا وافقت على المشاركة، فسوف يطلب منك الموافقة على تعبئة الاستبيان في الصفحة القادمة. لا تزال حرية الانسحاب في أي وقت ودون إبداء أسباب وقرار الانسحاب لن يؤثر على حقوقك.

ماذا سيحدث لي إذا شاركت؟

مشاركتكم في هذا الاستبيان سوف تستغرق مايقارب 30 دقيقة. جميع الأسئلة تدور حول موضوع استخدام الهواتف الذكية لتعلم مفردات اللغة. سيتم تحليل جميع الإجابات ومقارن مع غيرها من البيانات التي تم جمعها للمعلومية، حتى بعد الانتهاء من تعبئة الاستبيان لك الحق في الانسحاب في أي وقت ودون إبداء أي سبب.

هل هناك أي مخاطر / فوائد المشاركة؟

لا توجد مخاطر معروفة أو متوقعة للمشاركة في هذه الدراسة.

هل سيتم حفظ بياناتي في الدراسة بشكل سري؟

لا يتطلب منك كتابة اسمك أو تاريخ ميلادك أو معلوماتك الشخصية. ولذلك، فإن كل البيانات مجهولة وستبقى سرية على جهاز كمبيوتر جامعة ليفربول جون موريس محمية باسم مستخدم وكلمة سر لا يعرفها إلا الباحث فقط.

وستبقى جميع المعلومات التي تم جمعها عنك أثناء البحث في سرية تامة. لن يتم الكشف عن أية معلومات تخصك لأحد.

أشكركم على مساعدتكم القيمة وتعاونكم هي محل تقدير كبير.

وحصلت هذه الدراسة على الموافقة الأخلاقية من لجنة أخلاقيات البحث في جامعة ليفربول جون موريس

بيانات التواصل:

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المشرف الدراسي : أماندا ميسون (دكتوره في تدريس اللغة الإنجليزية كلغة أجنبية).
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الهاتف: +441512313866

العنوان:
Liverpool Business School, Faculty of Business and Law, Liverpool John Moores University, Redmonds Building, Clarence Street,
Liverpool, L3 5UG, Unite

Dear Participant,

You are being invited to take part in a research study through participating in this questionnaire. Before you decide, it is important to understand that ethical approval has been received from Liverpool John Moores University to carry out this study. Also to understand why the research is being done and what it involves. Please take time to read the following information. Please contact me if there is anything that is not clear or if you would like more information and please take time to decide if you want to take part in the questionnaire or not. Your participation in this questionnaire is on voluntary basis.

What is the purpose of the study?

This study aims to investigate the effectiveness of using mobile phones for vocabulary learning. By conducting this study, it is anticipated that useful contributions might be provided in the field of vocabulary learning. The results of the study should also benefit second language learners in understanding the use and impact of mobile phones on vocabulary learning. The use of mobile phones for vocabulary learning might provide learners with greater opportunities for vocabulary learning. The results of this research should provide evidence whether or not mobile phones are effective tools for vocabulary learning.

Do I have to take part?

Your participation in this study is completely voluntary so it is up to you to decide whether or not to complete the questionnaire. If you do, you will be asked to fill this information sheet and agree to the consent form. You are still free to withdraw at any time and without giving a reason. A decision to withdraw will not affect your rights.

What will happen to me if I take part?

Your voluntary participation in this questionnaire will take 30 minutes of your time to be completed. All the questions will be based around the topic of using mobile phones for vocabulary learning. Then all answers will be analysed and compared to other data collected. However, even after completing the survey you are still free to withdraw at any time and without giving a reason.

Are there any risks / benefits involved?

There are no known or expected risks for involvement in this study.

Will my taking part in the study be kept confidential?

No personal information such as name, date of birth, etc, is required to be declared. Therefore, all data will remain anonymous and will be kept confidential on a Liverpool John Moores University computer that is protected with a user name and password known by the researcher only.

All information collected about you during the course of the research will be kept strictly confidential. Any information about you will not be disclosed to anyone.

Thank you for your valuable assistance and your co-operation are highly appreciated.

This study has received ethical approval from LJMU's Research Ethics Committee.

Contact details:

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Name of Supervisor: Dr. Amanda Mason (Senior Lecturer PhD, MA, BSc, TEFL Diploma)

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Address:

Liverpool Business School, Faculty of Business and Law, Liverpool John Moores University, Redmonds Building, Clarence Street, Liverpool, L3 5UG, Unite

Personal information معلومات شخصية

* 1. What is your student ID? ما هو رقمك الجامعي؟

* 2. What is your age? كم عمرك؟

- 18 to 24
 25 to 30
 31 to 35

* 3. What is your gender? ما هو نوع جنسك؟

- Female
 Male

* 4. What is your level at the university now? في أي مستوى دراسي الآن؟

- Level one المستوى الأول
 Level two المستوى الثاني
 Level three المستوى الثالث
 Level four المستوى الرابع

* 5. Which of the following coursebooks do you study in this academic year?

أي كتاب تدرس في هذا الفصل الدراسي؟

- Q skills for success listening and speaking 4
 Q skills for success listening and speaking 5

English background
معلومات عن اللغة الإنجليزية

* 6. How many years have you studied English? منذ متى وأنت تتعلم اللغة الإنجليزية?

- Less than 1 year أقل من سنة
- 1-3 years
- 4-6 years
- 7-9 year
- 10 or more years عشر سنوات أو أكثر

* 7. On average, how often per day (in hours) do you do any of the following?

معدل كم في الساعة تقوم بمايلي؟

	Never	less than 1/2 an hour	1/2 - 1 hour	1 - 2 hours	more than 2 hours
Watch TV shows in English to help you understand spoken English مشاهدة التلفاز باللغة الإنجليزية لمساعدتك على فهم اللغة	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listen to Pod casts to help you learn English الاستماع إلى المدونات الصوتية لمساعدتك على تعلم اللغة الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interact with English native speakers to help you learn English التواصل مع المتحدثين باللغة الإنجليزية لمساعدتك على تعلم اللغة الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in activities where English is practiced and/or spoken to help you improve your English المشاركة في الأنشطة التي تمارس فيها اللغة الإنجليزية المكتوبة والمنطوقة لمساعدتك على تحسين مستواك في اللغة الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	less than 1/2 an hour	1/2 - 1 hour	1 - 2 hours	more than 2 hours
<p>Read books in English other than your class books to help you learn English</p> <p>قراءة كتب باللغة الإنجليزية من غير مقرر تلك الدراسية لمساعدتك على تعلم اللغة الإنجليزية</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Go online and surf the web to learn English</p> <p>تصفح الإنترنت لتعلم اللغة الإنجليزية</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Play games online to learn English</p> <p>اللعبة عبر الإنترنت لتعلم اللغة الإنجليزية</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Use your laptop to access exercises online to learn English</p> <p>استخدام الكمبيوتر المحمول للوصول إلى التدريبات على الإنترنت لتعلم اللغة الإنجليزية</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Read the news/blogs online to improve your English</p> <p>قراءة الأخبار / والمدونات على الإنترنت لتحسين مستوى في اللغة الإنجليزية</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Use smartphones for English vocabulary learning</p> <p>استخدم الهاتف الذكي لتعلم مفردات اللغة الإنجليزية</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vocabulary Learning Strategies

طرق تعلم مفردات اللغة الإنجليزية

* 8. Below are a number of statements regarding different strategies for vocabulary learning. Please read each one and indicate to what extent do you agree or disagree with each statement.

في الأسفل عدد من الطرق المختلفة لتعلم المفردات. يرجى قراءة كل طريقة واختيار إلى أي مدى توافق أو لا توافق على كل طريقة

	Strongly Disagree لا أوافق بشدة	Disagree لا أوافق	Neutral محايد	Agree أوافق	Strongly Agree أوافق بشدة
1. I make vocabulary flashcards for new words so that I can memorize them. أنشى بطاقات مكتوبة فيها الكلمات الجديدة لكي أتمكن من حفظها	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I keep lists of new vocabulary words. أحتفظ بقائمة للكلمات الجديدة	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I go through my vocabulary list several times until I am sure I know all of the words on the list. أراجع قائمة الكلمات عدة مرات لكي أتمكن من معرفتها جميعاً	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I make vocabulary cards and take them with me wherever I go. أنشى بطاقات للكلمات وأحملها معي أينما ذهبت	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I make regular review of new words I have memorized. أراجع باستمرار الكلمات الجديدة لكي أتمكن من حفظها	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Repeating a new word aloud helps me to remember it. تكرار الكلمات الجديدة بصوت عال يساعدني على تذكرها	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When I am studying new words, I repeat them silently in my mind. عندما أذاكر الكلمات الجديدة أكررهما بصمت في ذهني	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree لا أوافق بشدة	Disagree لا أوافق	Neutral محايد	Agree أوافق	Strongly Agree أوافق بشدة
8. When I try to remember a word, I write it repeatedly. عندما أحاول تذكر كلمة , أعيد كتابتها عدة مرات	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I write both the new words and their translations repeatedly in order to remember them. لكي أتمكن من تذكر الكلمات الجديدة, أعيد كتابة الكلمة الجديدة مع معناها باللغة العربية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. To remember a new word, I put it into an English sentence. أضع الكلمة الجديدة في جملة لكي أتمكن من تذكرها	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I link a new word to an English word that sounds similar. أربط الكلمات الجديدة بكلمات تشابهها في الصوت	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I link a new word to another foreign language word I know to remember it. أربط الكلمة الجديدة بكلمة في اللغة العربية لكي يسهل علي تذكرها	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I associate words that look similar. أربط الكلمات المتشابهة مع بعضها لكي يسهل مراجعتها	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I create a mental image of the new word to help me remember it. أضع صورة في ذهني للكلمة الجديدة لكي يسهل تذكرها	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I learn words better when I put them in context (e.g., phrases, sentences). إذا كانت الكلمة في جملة فهذا يساعدني على تعلمها بشكل أفضل	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree لا أوافق بشدة	Disagree لا أوافق	Neutral محايد	Agree أوافق	Strongly Agree أوافق بشدة
<p>16. When I guess the meaning of a word, I try to understand what part of speech it is.</p> <p>عندما أحاول معرفة الكلمة أتذكر أي جزء من الكلام هي ((اسم, فعل, حرف</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>17. I like to use online dictionaries to look up new words.</p> <p>أفضل استخدام القواميس الإلكترونية عند البحث عن كلمات جديدة</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>18. I use smartphones to study new words.</p> <p>أستخدم الهاتف الذكي لتعلم الكلمات الجديدة</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Smartphones Ownership and Applications use

امتلاك الهواتف الذكية واستخدام التطبيقات

* 9. Do you have a smartphone? هل تمتلك هاتف ذكي

YES نعم

NO لا

* 10. What is your smartphone operation system? ما هو نوع مشغل هاتفك الذكي

Apple iOS

Android

Blackberry

Windows

Nokia

Other أخرى

* 11. Do you have internet access on your smartphone? هل يمكنك الدخول على الانترنت عن طريق هاتفك الذكي

YES

NO

* 12. On average, how often do you use your smartphone per day to

كم المعدل اليومي لاستخدام هاتفك الذكي لمالي

	Never	Less than 1/2 an hour	1/2 - 1 hour	1 - 2 hours	more than 2 hours
Check your email تحقق من بريدك الالكتروني	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surf the internet تصفح الانترنت	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Play games اللعبة	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listen to music الاستماع للموسيقى	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chat with friends محادثة الأصدقاء	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Send Text Messages إرسال الرسائل النصية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Read the news قراءة الأخبار	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn English Vocabulary تعلم مفردات اللغة الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 13. What is the application that you use for receiving messages on your smartphone? ما هو أكثر تطبيق

تستخدمه لاستقبال الرسائل على هاتفك الذكي

- Built-in SMS app برنامج الرسائل النصية الخاص بالجهاز
- Whatsapp واتساب
- Snapchat شات
- Line لاين
- Telegram تيلجرام
- Viber فايبر
- Blackberry messenger رسائل بلاكبيرى
- Other (please specify)

Smartphones for educational purposes

الهواتف الذكية لأغراض تعليمية

* 14. Have you used your smartphone for educational purposes? هل سبق أن استخدمت هاتفك الذكي لأغراض تعليمية؟

YES نعم

NO لا

* 15. Have you used smartphone applications for English learning? هل سبق أن استخدمت تطبيقات لتعلم اللغة الإنجليزية؟

YES

NO

If the answer is YES please mention what apps

إذا كانت الإجابة ب نعم أتمنى ذكر أي التطبيقات

* 16. Have you used smartphone applications for vocabulary learning? هل سبق أن استخدمت تطبيقات لتعلم مفردات اللغة الإنجليزية؟

YES

NO

إذا كانت الإجابة ب نعم أتمنى ذكر أي التطبيقات

If the answer is YES please mention what apps

Participants Attitude
 انطباع الطلاب

Students attitude toward smartphones uses for vocabulary learning
 انطباع الطلاب حول استخدام الأجهزة لتعلم المفردات

* 17. To what extent do you agree or disagree with the following statements.
 إلى أي مدى تتفق أو تختلف مع الجمل التالية

	Strongly Disagree لا أوافق بشدة	Disagree لا أوافق	Neutral محايد	Agree أوافق	Strongly Agree أوافق بشدة
I like to use smartphones to learn English vocabulary. أود أن استخدم الهواتف الذكية لتعلم مفردات اللغة الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphones are useful for learning English vocabulary. الهواتف الذكية مفيدة لتعلم المفردات الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is interesting to use smartphones to learn English vocabulary. من الممتع استخدام الهواتف الذكية لتعلم مفردات اللغة الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of smartphones to learn English language vocabulary is fun. استخدام الهواتف الذكية لتعلم مفردات اللغة الإنجليزية هي متعة	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is effective to use smartphones to learn English vocabulary. استخدام الهواتف الذكية فعال لتعلم مفردات اللغة الإنجليزية	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like the use of smartphones in learning English vocabulary because of the availability anytime, anywhere. أنا أحب استخدام الهواتف الذكية في تعلم المفردات الإنجليزية بسبب توفرها في أي وقت وأي مكان	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>


	Strongly Disagree لا أوافق بشدة	Disagree لا أوافق	Neutral محايد	Agree أوافق	Strongly Agree أوافق بشدة
<p>I like the use of smartphones for vocabulary learning because of instant feedback.</p> <p>أنا أحب استخدام الهواتف الذكية لتعلم المفردات بسبب ردود الفعل الفورية.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>I like the use of smartphones for vocabulary learning because of the features, such as color, graphic, games, animation, and layout.</p> <p>أنا أحب استخدام الهواتف الذكية لتعلم المفردات بسبب الميزات، مثل اللون، والرسوم البيانية، والألعاب.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>I hope English teachers will use smartphones to teach English vocabulary.</p> <p>أمل من مدرسي اللغة الإنجليزية استخدام الهواتف الذكية لتعليم مفردات اللغة الإنجليزية.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>I am willing to download free learning applications on my mobile phone to improve my vocabulary learning.</p> <p>أنا مستعد لتحميل تطبيقات مجانية تعليمية على هاتفي الذكي لتطويري في تعلم مفردات اللغة الإنجليزية.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>I am not willing to download paid applications on my mobile phone to improve vocabulary learning.</p> <p>أنا غير مستعد لتحميل تطبيقات مدفوعة تعليمية على هاتفي الذكي لتطويري في تعلم مفردات اللغة الإنجليزية.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>I do not like to use smartphones for vocabulary learning.</p> <p>أنا لا أحب أن أستخدم الهواتف الذكية لتعلم المفردات.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree لا أوافق بشدة	Disagree لا أوافق	Neutral محايد	Agree أوافق	Strongly Agree أوافق بشدة
<p>The use of smartphones for vocabulary learning is a waste of time.</p> <p>استخدام الهواتف الذكية لتعلم المفردات هو مضيعة للوقت.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>The use of smartphones for vocabulary learning is difficult.</p> <p>استخدام الهواتف الذكية لتعلم مفردات صعبة.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>The use of smartphones for vocabulary learning is boring.</p> <p>استخدام الهواتف الذكية لتعلم المفردات مملة.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B: AWL



VOCABULARY LIST AND CEFR CORRELATION

 The keywords of the **Oxford 3000™** have been carefully selected by a group of language experts and experienced teachers as the words which should receive priority in vocabulary study because of their importance and usefulness.


AWL The **Academic Word List** is the most principled and widely accepted list of academic words. Averil Coxhead gathered information from academic materials across the academic disciplines to create this word list.






The **Common European Framework of Reference for Languages (CEFR)** provides a basic description of what language learners have to do to use language effectively. The system contains 6 reference levels: **A1, A2, B1, B2, C1, C2**. CEFR leveling provided by the Word Family Framework, created by Richard West and published by the British Council. <http://www.learnenglish.org.uk/wff/>

UNIT 1


acknowledge (v.)  **AWL**, A2
address (v.)  B2
advance (v.)  B1
aspect (n.)  **AWL**, A1
assess (v.) **AWL**, A2
capable (adj.)  **AWL**, B2
contact (n.)  **AWL**, A1
criticism (n.)  B2
effective (adj.)  A1
ethical (adj.) **AWL**, C1
executive (n.)  A1
exemplify (v.), C2
expert (n.)  **AWL**, A2
favoritism (n.), C2
issue (n.)  **AWL**, A1
negotiate (v.), B1
outline (v.)  B1
perspective (n.)  **AWL**, B1
potential (n.)  **AWL**, A2
staff (n.)  C1
style (n.)  **AWL**, B1
title (n.)  A1








UNIT 2

anecdote (n.), C2
appropriate (adj.)  **AWL**, A1


associate (v.)  C1
bias (n.) **AWL**, B2
cautious (adj.), C1
chaos (n.), B2
conduct (v.)  **AWL**, A2
cycle (n.)  **AWL**, B1
embrace (v.), B2
enthusiasm (n.)  B1
inflexible (adj.) **AWL**, B2
investor (n.) **AWL**, B1
moderately (adv.), C2
morale (n.), C1
norm (n.) **AWL**, B2
open-minded (adj.), C1
point out (phr. v.), B2
recognize (v.)  A1
reward (n.)  B2
stifle (v.), C2
stimulating (adj.), B2
stumble upon (phr. v.), C1
trend (n.)  **AWL**, A2
turn out (phr. v.), A2

UNIT 3

assume (v.)  **AWL**, A1
barrier (n.)  B1
burden (n.), B1

carefree (adj.), C2
confusion (n.)  B1
contradiction (n.) **AWL**, B2
contribute (v.)  **AWL**, A2
frustration (n.), B2
guidance (n.), B1
in charge of (phr.), B1
initiation (n.) **AWL**, C2
isolation (n.) **AWL**, B2
marker (n.), C2
milestone (n.), C2
morally (adv.)  C1
pinpoint (v.), C2
resent (v.), C1
reverse (v.)  **AWL**, B1
run (v.)  A2
satisfaction (n.)  B1
sibling (n.), C1
transition (n.)  **AWL**, B1

UNIT 4

amateur (n.), C1
appreciation (n.) **AWL**, C1
apprentice (n.), C2
breed (n.)  B2
circulation (n.), B2
clone (v.), C2

convention (n.) 🔑 **AWL**, C2
development (n.) 🔑, B2
encounter (n.) 🔑 **AWL**, B1
expand (v.) 🔑 **AWL**, A2
gallery (n.), B1
generation (n.) 🔑 **AWL**, C1
identify with (phr.) 🔑, B2
marketing (n.) 🔑, B1
operation (n.) 🔑, A2
overseas (adv.) 🔑 **AWL**, C1
panel (n.) 🔑 **AWL**, B2
recall (v.) 🔑, A2
regard (v.) 🔑, A2
series (n.) 🔑 **AWL**, A1
take note of (phr.), C1
unique (adj.) 🔑 **AWL**, A2

UNIT 5

adverse (adj.), C1
alter (v.) 🔑 **AWL**, B1
artificial (adj.) 🔑, B2
commodity (n.) **AWL**, B2
compound (v.) **AWL**, C2
consist of (phr. v.) 🔑, A2
consume (v.) **AWL**, B1
consumer (n.) 🔑 **AWL**, A1
controversy (n.) **AWL**, B1
debate (n.) 🔑 **AWL**, A1
disturbing (adj.) 🔑, C1
ethics (n.) **AWL**, C1
hurdle (n.), C2
identical (adj.) **AWL**, B2
modification (n.) **AWL**, B2
optimal (adj.), C1
reaction (n.) 🔑 **AWL**, B1
significant (adj.) 🔑 **AWL**, A1
substantial (adj.) 🔑, A2
superfluous (adj.), C2
trait (n.), C1
ultimate (adj.) 🔑 **AWL**, B1

UNIT 6

advancement (n.), C2
attitude (n.) 🔑 **AWL**, A1
career path (n.), C1
climb the ladder (phr.), C2
commute (n.), C2
concept (n.) 🔑 **AWL**, A1
count on (phr. v.), B2
currently (adv.) 🔑, A2
dare (v.) 🔑, B1
devote (v.) 🔑 **AWL**, B1
face (v.) 🔑, C1
figure (v.) 🔑, B1
log (v.), C1
loyal (adj.) 🔑, C1
model (n.) 🔑, A2
particular (adj.) 🔑, A1
peer (n.), B1
point (n.) 🔑, A1
radically (adv.), C2
rigorous (adj.), C2
serve one well (phr.), C2
stable (adj.) 🔑 **AWL**, B1
stand out (phr. v.), B2
structure (n.) 🔑 **AWL**, A1

UNIT 7

ache (v.), B1
adhesive (n.), C2
adopt (v.) 🔑, A2
alert (adj.), C1
biological (adj.), B1
deprived (adj.), C1
exploit (v.) **AWL**, B1
face to face (phr.), B1
flammable (adj.), C1
in all probability (phr.), C2
inadvertent (adj.), C2
inconceivable (adj.) **AWL**, C2
interact (v.) **AWL**, B2

mandatory (adj.), C1
obvious (adj.) 🔑 **AWL**, A2
odds (n.) **AWL**, B2
reunion (n.), C1
synthetic (adj.), C2
unreliable (adj.) **AWL**, C2
vastly (adv.), C2

UNIT 8

ambition (n.) 🔑, B1
apex (n.), C2
beneficiary (n.) **AWL**, C2
brutal (adj.), C2
burnout (n.), B2
collapse (v.) 🔑 **AWL**, B1
conclude (v.) 🔑 **AWL**, A2
dominate (v.) 🔑 **AWL**, B1
era (n.) 🔑, B1
escalate (v.), C2
former (adj.) 🔑, A1
fundamental (adj.) 🔑 **AWL**, A2
funding (n.) **AWL**, B1
integral (adj.) **AWL**, C1
intensity (n.) **AWL**, B2
invest (v.) 🔑 **AWL**, B1
journalist (n.) 🔑, B1
modest (adj.), B1
obsession (n.), C2
reasonable (adj.) 🔑, A2
regret (v.) 🔑, B1
spectator (n.), C1
ultimately (adv.) 🔑 **AWL**, B1
vulnerable (adj.), B1

Appendix C: Vocabulary Tests (Q Skills 4) & (Q Skills 5)

Vocabulary Test (Q skills 4)

This is a vocabulary test to measure your English vocabulary. Don't use the Dictionary

Question #1 (2 points)

قادر على

- having the ability or qualities necessary to do something
- in or to another country
- exactly the same as something else
- unwilling to change

Question #2 (2 points)

A general change or development.

- مفهوم
- توجه
- بناء
- يفترض

Question #3 (2 points)

To put money, effort, time etc., into something good or useful

- مستقر
- يستثمر
- مطبق
- جانب

Question #4 (2 points)

The (ultimate) decision rests with the Public Health Service.

- يدبر
- نقاش
- يتفاعل
- نهائي

Question #5 (2 points)

Most applications came from (overseas).

- غير جدير بالثقة
- ما وراء البحار
- مفهوم
- مستهلك

Question #6 (2 points)

تعديل

- to organize and do something
- a small change made to something
- to eat or drink something
- a person or group who gains (usually money) as a result of something

Question #7 (2 points)

The company has an (initiation) ceremony for new staff members.

- ما وراء البحار
- غير الاتجاه
- مباشرة عمل
- فريدة من نوعها

Question #8 (2 points)

Only 27% of the paper we (consume) is recycled.

- يساهم
- يستهلك
- ينتقل
- يتفاعل

Question #9 (2 points)

أساسي

- a way in which something is done
- the way that you think, feel or behave toward someone or something
- important or basic
- cannot be depended on

Question #10 (2 points)

City employees cannot _____ to political campaigns.

- issue
- contribute
- potential
- funding

Question #11 (2 points)

Having an important effect or influence, especially on what will happen in the future

- issue
- acknowledge
- significant
- aspect

Question #12 (2 points)

يغير

- to make bigger in size
- to change, or to make someone or something change
- to make a judgment about someone or something
- an idea or basic principle

Question #13 (2 points)

A particular part or feature of a situation, idea, or problem

- investor
- assume
- aspect
- attitude

Question #14 (2 points)

The way that you think, feel or behave toward someone or something

- يزيد
- خبير
- انطباع
- يقيم

Question #15 (2 points)

A person or group who gains (usually money) as a result of something

- beneficiary

- cycle
- structure
- consume

Question #16 (2 points)

This is a (unique) opportunity to study these rare creatures.

- قادر على
- اتفاقية
- تواصل
- فريدة من نوعها

Question #17 (2 points)

The family (acknowledge) the need for change.

- يستثمر
- يضاعف
- خبير
- يعترف

Question #18 (2 points)

The possibility of happening or becoming something

- debate
- convention
- potential
- reaction

Question #19 (2 points)

_____ spending was down by 0.1% last month.

- consumer
- unreliable
- trend
- style

Question #20 (2 points)

The way the parts of something are put together or organized.

- significance
- conduct
- perspective
- structure

Question #21 (2 points)

To think something is true although you have no proof.

- expert
- capable
- assume
- contact

Question #22 (2 points)

The mall has a new _____ center.

- convention
- invest
- expert
- attitude

Question #23 (2 points)

We are _____ a survey of consumer attitudes towards organic food.

- conducting
- consuming
- contacting
- interacting

Question #24 (2 points)

What was Sami's _____ when you told him about the job?

- interact
- contact
- isolation
- reaction

Question #25 (2 points)

These twins are really (identical).

- مستهالك
- مناسب
- مطابق
- محتمل

Question #26 (2 points)

A person who puts money into a company to make a profit.

- يوسع
- واضح
- مناسب
- مستثمر

Question #27 (2 points)

مستقر

- easy to see, not subtle
- in the end
- an important topic that people discuss or argue about
- not likely to move, change or end

Question #28 (2 points)

An idea or basic principle

- concept
- bias
- assess
- appropriate

Question #29 (2 points)

This approach is too (inflexible) and too costly.

- أسلبي
- صلب
- واضح
- جيل

Question #30 (2 points)

They _____ that university students have a positive attitude

- expand

- convention
- conclude
- concept

Question #31 (2 points)

To make a judgment about someone or something.

- potential
- assess
- issu
- style

Question #32 (2 points)

خبير

- a series of events that always repeats in the same order
- something you do or say because of something that has happened
- a person with special knowledge, skill, or training in something
- to put money, effort, time etc., into something good or useful

Question #33 (2 points)

يوسع

- to make bigger in size
- the state of being separated from other people or being alone
- exactly the same as something else
- unwilling to change

Question #34 (2 points)

Sarah _____ well with other children in the class.

- concept
- interact
- generation
- syle

Question #35 (2 points)

The car's becoming very _____.

- reverse
- debate
- unreliable
- significance

Question #36 (2 points)

An important topic that people discuss or argue about.

- issue
- assess
- ethical
- aspect

Question #37 (2 points)

I (reversed) the car into a side road.

- يساهم
- يختم
- يوسع
- غير الاتجاه

Question #38 (2 points)

A way in which something is done.

- نمط
- غير الإتجاه
- اتفاقية
- دورة

Question #39 (2 points)

A number of books telling stories about the same characters

- سلسلة
- مستهلك
- ردة فعل
- كبير

Question #40 (2 points)

Because of its geographical (isolation), the area developed its own unique culture.

- انطباع
- اتجاه
- منظور
- انعزال

Question #41 (2 points)

A way of thinking about something

- نهائي
- واضح
- منظور
- ردة فعل

Question #42 (2 points)

Right for the particular situation.

- appropriate
- conclude
- unreliable
- invest

Question #43 (2 points)

جيل

- talk with other people
- a way of thinking about something
- all of the people born at about the same time
- something you do or say because of something that has happened

Question #44 (2 points)

College directors have called for more government _____.

- transition
- fundamental
- funding
- investor

Question #45 (2 points)

A change from one state or condition to another

- يتفاعل

- يقيم
- يدير
- ينتقل

Question #46 (2 points)

يضاعف

- talk with other people
- a person who gives to something
- make something worse
- a person who buys goods or uses services

Question #47 (2 points)

This washing machine has a 50-minute _____.

- stable
- reverse
- cycle
- style

Question #48 (2 points)

علاقة

- cannot be depended on
- a large meeting or conference
- a person that you know, especially somebody who can be helpful to you in your work
- a general change or development

Question #49 (2 points)

Easy to see, not subtle

- واضح
- ميادر
- يختتم
- عنيد

Question #50 (2 points)

A general discussion or disagreement about something

- نقاش
- ينتقل
- يتفاعل
- يوسّع

Vocabulary Test (Q skills 5)

This is a vocabulary test to measure your English vocabulary. Don't Use the Dictionary

Question #1 (2 points)

Like most of my (generation), I had never known a war.

- جيل
- منسب
- محتمل
- أفضلية

Question #2 (2 points)

Parents who want their children to be exposed to _____ groups travel to many different countries.

- site
- diverse
- guarantee
- networking

Question #3 (2 points)

Before you travel to France, you should (convert) your dollars to euros.

- ينفذ
- مورد
- كاف
- يحول

Question #4 (2 points)

بشائت

- raw materials such as wood or metal
- repeatedly and in the same way
- an area owned, or ruled by a person or a government
- a variety of things or experiences of a particular type

Question #5 (2 points)

generally; considering or including everything.

- diverse
- obvious
- overall
- perception

Question #6 (2 points)

an area owned, or ruled by a person or a government.

- تكيف
- برفض
- دقيق
- نطاق

Question #7 (2 points)

the special, normal, or proper activity of an organ or part; the kind of action or activity specific to a thing or person.

- commission
- conflicted
- incident
- function

Question #8 (2 points)

the state of continuing to live or exist.

- حافظ
- بقاء
- دعم
- يرفض

Question #9 (2 points)

We will have to _____ our visas before we are allowed in that country.

- adequate
- validate
- site
- grant

Question #10 (2 points)

something that you are trying hard to achieve, especially in business or politics.

- دوريا
- هدف
- هامشي
- واضح

Question #11 (2 points)

The prime minister discussed (conflicts) over wage settlements.

- تعارض
- تعديل
- تحول
- أفضالية

Question #12 (2 points)

to promise to do something or to promise that something will happen.

- تأثير
- شامل
- تعديل
- ضمان

Question #13 (2 points)

With all of the _____ available in the library, students can find enough information for their reports.

- adapt
- gender
- resource
- diverse

Question #14 (2 points)

To show something that was previously hidden.

- survival
- reveal
- impact
- utilize

Question #15 (2 points)

There is a (marginal) increase in the unemployment figures.

- لسلسي

- جيل
- نطاق
- هامشي

Question #16 (2 points)

مركب

- two or more elements that are chemically combined
- a sum of money given for a specific purpose
- involving the input or actions of audience members
- to make something start to happen.

Question #17 (2 points)

easily seen or understood.

- مركب
- تحول
- يعرض
- واضح

Question #18 (2 points)

without end or limits.

- غير محدود
- دقيق
- تكيف
- بثبات

Question #19 (2 points)

When the result of an experiment has an _____ on science, it influences scientific ideas and may change our perspectives.

- impact
- external
- objective
- resource

Question #20 (2 points)

حافز

- a state of being steady and unchanging
- something that encourages somebody to do something; a reward
- A money payment or other form of aid that the government gives to a person or organization.
- a sum of money given for a specific purpose

Question #21 (2 points)

يرفض

- a variety of things or experiences of a particular type
- to state officially that something is useful and of acceptable standard
- something that encourages somebody to do something; a reward
- to say that something is not true, or that you do not believe something

Question #22 (2 points)

The school has(evolved) its own style of teaching.

- يتحول
- منحة
- ينفذ

تطورت

Question #23 (2 points)

The process of getting back something lost, especially health, ability, possessions, etc.

- recovery
- infinite
- range
- interact

Question #24 (2 points)

دوريا

- to make something start to happen.
- a system of ideas or rules
- the production of something
- Once in awhile, sometimes, every so often

Question #25 (2 points)

تعديل

- to change in order to be more suitable for a new situation
- to change completely
- to change slightly
- to give a promise

Question #26 (2 points)

a set of ideas, rules, or beliefs from which something is developed, or on which decisions are based.

- أفضلية
- جبل
- الإطار
- تعديل

Question #27 (2 points)

Most people need some sense of (stability) and connection and a sense of routine.

- تطورت
- عمولة
- استقرار
- دعم

Question #28 (2 points)

Both weather and landscape play a part in how animals _____.

- consistently
- submit
- range
- adapt

Question #29 (2 points)

The Government set up a (commission) to investigate allegations of police violence.

- ينفذ
- ضمان
- تعديل
- عمولة

Question #30 (2 points)

منحة

- easily seen or understood
- involving the input or actions of audience members
- a sum of money given for a specific purpose
- an idea or basic principle

Question #31 (2 points)

يَتَحَوَّل

- change in nature, purpose, or function
- a system of ideas or rules
- without end or limits
- cannot be depended on

Question #32 (2 points)

occurrence of an event or situation.

- deny
- overall
- incident
- modify

Question #33 (2 points)

Many companies give (priority) to job applicants' work experience instead of their grades in college.

- محتمل أن
- أفضلية
- مناسب
- واضح

Question #34 (2 points)

The house is built on the _____ of a medieval prison.

- site
- survival
- range
- modify

Question #35 (2 points)

يُعَدُّ

- to give a promise
- to put money, effort, time etc., into something good or useful
- to state officially that something is useful and of acceptable standard
- to give a plan, piece of writing etc to someone in authority for them to consider or approve.

Question #36 (2 points)

This position calls for a wide _____ of work experience because it's a high level position with a lot of responsibilities.

- diverse
- domain
- impact
- range

Question #37 (2 points)

newly available oil might (potentially) create a drop in prices.

- بثبات
- محتمل أن
- ضمن

تعارض

Question #38 (2 points)

Farming is heavily (subsidized) by the government.

- دعم
 حافظ
 أفضلية
 منحة

Question #39 (2 points)

constantly; uniformly; without changing

- coordinatoe
 invariable
 diverse
 resource

Question #40 (2 points)

Jose's science project is more _____ than his colleague.

- overall
 interactive
 modify
 transform

Question #41 (2 points)

located outside.

- function
 external
 convert
 generation

Question #42 (2 points)

to completely change the appearance, form, or character of something or someone, especially in a way that improves it.

- نطاق
 منحة
 تحول
 يعرض

Question #43 (2 points)

classification by whether you are male or female.

- يعرض
 جنس
 منسق
 تأثير

Question #44 (2 points)

make use of

- نطاق
 تطورت
 استخدام
 ينفذ

Question #45 (2 points)

enough; sufficient.

- priority
- potentially
- external
- adequate

Question #46 (2 points)

a person's cognitive interpretation of events; the act of becoming aware through the senses.

- adapt
- perception
- validate
- accurate

Question #47 (2 points)

ينفذ

- to change in order to be more suitable for a new situation
- to make something start to happen.
- not part of a main or important group or situation
- repeatedly and in the same way

Question #48 (2 points)

Ted is doing a lot of _____ with fellow journalists because he wants to find a new job.

- adequate
- networking
- range
- objective

Question #49 (2 points)

They try to give _____, well-researched news reports.

- conflicted
- infinite
- adapt
- accurate

Question #50 (2 points)

To organize an activity so that the people involved in it work well together and achieve a good result.

- validate
- coordinate
- perception
- adequate

Appendix D: Interview Protocol

Themes	Key findings	Interview Qs	
Smartphone experience use	Participants' responses to their prior ownership and experience in using smartphones were positive. All participants own a smartphone and have sufficient experience in using and downloading smartphone applications.	*what kind of apps do you download and use on your smartphone? Give example. Why? * How do you often use that application on a daily basis? Why?	هل لديك تطبيقات على هاتفك اللذكي؟ مثال؟ لماذا ما هو أكثر تطبيق تستخدمه في اليوم؟ كم مره؟ لماذا؟
Smartphone application for vocabulary learning	Using <i>Memrise</i> application for vocabulary learning led to improve learners' vocabulary recognition since the post-test result in the experimental group outweigh those in the controlled.	* Have you used the <i>Memrise</i> application for vocabulary learning? How did you find it? *What features of the <i>Memrise</i> app do you like most? Why? What did you not like about the app? why? *how often did you use <i>Memrise</i> on a daily basis? Why? * Will you use <i>Memrise</i> in the future? Why? And for what? What did you wish to find in <i>Memrise</i> ?	هل سبق ان استخدمت تطبيق ميمرايس لتعلم مفردات اللغة الإنجليزية؟ كيف وجدت التطبيق؟ ماهي الخصائص اللي أعجبتك في التطبيق؟ لماذا؟ ماهي الخصائص اللي ما أعجبتك في التطبيق؟ لماذا؟ كم تستخدم التطبيق في اليوم؟ لماذا؟ كيف تستخدمه؟ لماذا؟ هل تنوي استخدام التطبيق في المستقبل؟ لماذا؟ وماذا ستستخدمه لأجله؟

			وش كان ودك يكون في التطبيق
	The majority of participants in the survey mentioned that they use smartphone applications when they try to learn new words. This result correlates with the post-test result as participants learning with smartphone application performed higher than those with the traditional method of pen and paper.	<p>* People have different ways of learning vocabulary, how do you usually approach it?</p> <p>* What approaches do you consider the most effective for learning new vocabulary?</p> <p>How much time do you normally devote to learning new vocabulary? And how often?</p> <p>* Do you review the vocabulary that you learned in previous chapters? How do you do that? How often?</p>	<p>الناس عندهم طرق مختلفة لتعلم المفردات. كيف طريقة تعاملك مع المفردات عادة؟ ماهي الطريقة الفعالة في وجهة نظرك لتعلم المفردات؟ كم الوقت اللي تمضيه عادة في تعلم المفردات الجديدة؟ كم مرة هل تراجع الكلمات اللي درستها في الوحدات السابقة في المنهج؟ كيف تراجعها؟ كم مرة كيف تقارن التعلم بالطرق التقليدية والجوال للمفردات؟</p>
Learners' attitude	The majority of participants %85 strongly agree with the statement that "Smartphones are useful for learning English vocabulary", whilst they disagree with the statement "using smartphones for vocabulary learning being a waste of time".	<p>* In the research result, the majority of students agreed or strongly agreed that smartphone application could help them to learn vocabulary, what do you think? Why? How do apps compare with more traditional methods?</p>	<p>في نتائج البحث, أغلبية الطلاب ذكروا أنهم يؤيدون فكرة أن الأجهزة الذكية تساعدهم في تعلم المفردات. ما رأيك؟ لماذا؟</p>

Learners' motivation	The majority of participants %75 were motivated in using smartphone application for vocabulary learning.	* Have you downloaded other vocabulary learning applications? If not, why? * How do find the smartphone application in supporting your vocabulary learning, give examples.	هل سبق أن حملت تطبيقات غير ميمرايس لتعلم المفردات؟ لماذا؟ لماذا لا كيف ترى تطبيقات الأجهزة الذكية في تطوير مفردات اللغة؟ عطني مثال
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Appendix E: Vocabulary Tests Information Sheet and Consent Form



Liverpool John Moores University

Liverpool Business School

Name of Researcher:

Abdulmajeed Almansour

Title of Research:

Exploring smartphone application for Enhancing Vocabulary Learning.

Dear Participant,

You are being invited to take part in a research study into the use of mobile devices for vocabulary learning. Before you decide to participate, it is important that you understand why the research is being done and what it involves. Please take time to read the following information. If there is anything that

is not clear, or if you would like more information, please feel free to contact me or my supervisor. Our contact details are provided at the end of this form.

What is the purpose of the study?

This study aims to investigate the effectiveness of using mobile devices for vocabulary learning. By conducting this study, it is anticipated that useful contributions might be provided in the field of vocabulary learning. The results of the study should also benefit second language learners in understanding the use and impact of mobile devices on vocabulary learning. The use of mobile devices for vocabulary learning might provide learners with greater opportunities for vocabulary learning. The results of this research should provide evidence whether or not mobile devices are really effective tools for vocabulary learning.

Do I have to take part?

Your participation in this study is entirely voluntary so it is up to you to decide whether or not to take part in it. If you do, you will be asked to sign a consent form. However, even after signing the consent form you are still free to withdraw at any time and without giving a reason.

What will happen to me if I take part?

You will be part of this experimental study. You will be asked by your teacher to study vocabulary using your mobile device. Your teacher will test you before and after the study to investigate any vocabulary learning.

Are there any risks / benefits involved?

There are no known or expected risks or benefits for involvement in this study.

Will my taking part in the study be kept confidential?

No personal information such as name, date of birth, etc, is required to be declared. Therefore, all data will remain anonymous and will be kept confidential on a Liverpool John Moores University computer that is protected with a user name and password known by the researcher only.

All information collected about you during the course of the research will be kept **strictly confidential**.

Any information about you will not be disclosed to anyone.

This study has received ethical approval from LJMU's Research Ethics Committee with reference 15/LBS/007 on the 7th of July 2015. Thank you for your valuable assistance and your co-operation is highly appreciated.

Contact details:

Name of Researcher: Abdulmajeed Almansour

Email: a.almansour@2014.ljmu.ac.uk

Phone: +966550951951

Name of Supervisor: Dr. Amanda Mason (Senior Lecturer PhD, MA, BSc, TEFL Diploma)

Email: A.Mason@ljmu.ac.uk

Phone: (0044) (0)151 231 3866

Address: Liverpool Business School, Faculty of Business and Law, Liverpool John Moores University, Redmonds Building, Clarence Street, Liverpool, United Kingdom,

L3 5UG.



Liverpool John Moores University

Participants Vocabulary Tests Consent Form

Exploring smartphone application for Enhancing Vocabulary Learning.

Name of Researcher and Faculty: Abdulmajeed Almansour (Faculty of Arts, Professional and Social Studies)

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	<input type="checkbox"/>
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	<input type="checkbox"/>
3. I consent to my tests being collected and analysed for the study above.	<input type="checkbox"/>
4. I agree to take part in the above study.	<input type="checkbox"/>

Name of Participants:

Date:

Signature:

Name of Researcher : Abdulmajeed

Date:

Signature:

Almanosur

Appendix F: Interview Information Sheet and Consent Form



Liverpool John Moores University

Title of Project (*Exploring smartphone application for Enhancing Vocabulary Learning*)

Researcher: Abdulmajeed Almansour

Faculty: Faculty of Arts professional and Social Studies.

You are being invited to take part in a research study. Before you decide it is important that you understand why the research is being done and what it involves. Please take time to read the following information. Ask us if there is anything that is not clear or if you would like more information. Take time to decide if you want to take part or not.

1. What is the purpose of the study?

This study aims to investigate the effectiveness of using smartphone application for vocabulary learning. By conducting this study, it is anticipated that useful contributions might be provided in the field of vocabulary learning. The results of the study should also benefit second language learners in understanding the use and impact of smartphone application on vocabulary learning. The use of smartphone application for vocabulary learning might provide learners with greater opportunities for

vocabulary learning. The results of this research should provide evidence whether or not smartphone application are effective tools for vocabulary learning.

2. Do I have to take part?

Your participation in this study is completely voluntary so it is up to you to decide whether or not to participate. If you do, you will be given this information sheet and asked to sign a consent form. You are still free to withdraw at any time and without giving a reason. A decision to withdraw will not affect your rights.

3. What will happen to me if I take part?

If you agree to participate in my research, I will conduct an interview with you at a time and location of your choice. The interview will involve questions about the experiment that you participated in. The questions will be around your use of smartphone application during the experiment. It should last about 30 minutes. With your permission, I will audiorecord and take notes during the interview. The recording is to accurately record the information you provide, and will be used for transcription purposes only. If you choose not to be audiorecorded, I will take notes instead. If you agree to be audiorecorded but feel uncomfortable at any time during the interview, I can turn off the recorder at your request. Or if you don't wish to continue, you can stop the interview at any time.

4. Are there any risks / benefits involved?

There are no known or expected risks or benefits for involvement in this study.

5. Will my taking part in the study be kept confidential?

Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used.

When the research is completed, I may save the recordings and notes for use in future research done by myself or others. I will retain these records for up to 5 years after the study is over. The same measures described above will be taken to protect confidentiality of this study data. Therefore, all data will remain anonymous and will be kept confidential on a Liverpool John Moores University computer that is protected with a user name and password known by the researcher only. All

information collected about you during the course of the research will be kept **strictly confidential**. Any information about you will not be disclosed to anyone.

This study has received ethical approval from LJMU's Research Ethics Committee with reference 15/LBS/007 on the 7th of July 2015.

Contact Details of Researcher:

Name of Researcher: Abdulmajeed Almansour

Email: a.almansour@2014.ljmu.ac.uk
Phone: (0044) (0) 777 680 0666

Contact Details of Academic Supervisor

Name of Supervisor: Dr. Amanda Mason (Senior Lecturer PhD, MA, BSc, TEFL Diploma)
Email: A.Mason@ljmu.ac.uk
Phone: (0044) (0)151 231 3866
Address: Liverpool Business School, Faculty of Business and Law, Liverpool John Moores University, Redmonds Building, Clarence Street, Liverpool, L3 5UG, United Kingdom.

If you have any concerns regarding your involvement in this research, please discuss these with the researcher in the first instance. If you wish to make a complaint, please contact researchethics@ljmu.ac.uk and your communication will be re-directed to an independent person as appropriate.



Liverpool John Moores University

Title of the study (*Exploring smartphone application for Enhancing Vocabulary Learning*)

Name of Researcher: *Abdulmajeed Almansour*

Business School, Faculty of arts professional and social studies

- I confirm that I have read and understand the information provided for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
- I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and that this will not affect my legal rights.
- I understand that any personal information collected during the study will be anonymised and remain confidential.

- I agree to take part in the *interview for this study*.
- I understand that the interview audio recorded and I am happy to proceed
- I understand that parts of our conversation may be used verbatim in future publications or presentations but that such quotes will be anonymised.

Name of Participant

Date

Signature

Name of Researcher: Abdulmajeed Almansour Date

Signature

Appendix G: Research Committee Ethical Approval

From: Williams, Mandy
Sent: 07 July 2015 15:25
To: Almansour, Abdulmajeed
Cc: Mason, Amanda
Subject: Ethical Approval
Importance: High

Dear Abdulmajeed

With reference to your application for Ethical approval

Appendix H: Gatekeeper Consent Form



LIVERPOOL JOHN MOORES UNIVERSITY GATEKEEPER CONSENT FORM Imam University

An Investigation into the Effectiveness of Mobile Devices on Students' Vocabulary Learning at Imam University

Name of Researcher and Faculty: Abdulmajeed Almansour (Faculty of Arts, Professional and Social Studies)

You are being invited to be a gatekeeper for the researcher in your university. Prior to your decision to accept, it is important that you understand why the research is being done and what it involves. Please take time to read the following information. Ask us if there is anything that is not clear or if you like more information.

The aim of this study is to investigate the use of mobile devices in a second language learning context among undergraduate students. More specifically, this study will focus on the effectiveness of using mobile devices in enhancing students' English vocabulary learning. This is part of a PhD study to develop strategies/ suggestions that will help to understand whether or not mobile devices could enhance English vocabulary learning.

It is up to you to decide whether or not to provide access. If you do, you will be given this information sheet and asked to sign a consent form. You are still free to withdraw at any time and without giving a reason. A decision to withdraw will not affect your rights/any future treatment/service you receive. Your participation in this study will be kept confidential. All information provided will be used only in the manner allowed by you.

I understand that my consent for this project will involve the participation of students who have are studying English at the first academic year in Imam University. Students will be divided into two groups. Both groups will receive the experiment into two phases. The first phase, participants in group A will be asked to study the vocabulary from the mobile devices and group B with pen and paper. This experiment is intended to investigate the influence of mobile devices on vocabulary learning. This process should take no longer than 2 months to complete.

The information provided by participants will be kept confidentially. Participants' data will be

I understand that I am free to ask any questions at any time. I am also free to withdraw students from participation in this study and discuss my concerns with the college committee members at English Department.

Lastly, I would like to assure you that this study has been reviewed and received ethics approval through the Office of Research Ethics at the Liverpool John Moores University (LJMU). However, the final decision about participation is yours. I would hope that the result of this study would benefit the University and its students. I look forward to your response and thank you in advance for your assistance in this project.

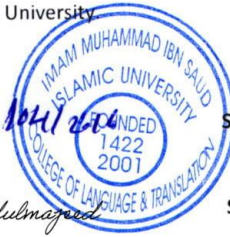
I, Dr. Mohammed Alahaydeb consent my students to participate in the study conducted by Abdulmajeed Almansour faculty of arts, Liverpool John Moores University with the supervision of Dr Amanda Mason, Business School, Liverpool John Moores University.

Name of the gatekeeper: Dr. Mohammed Alahaydeb

Date: 12/10/2014 Signature: 

Name of Researcher : Abdulmajeed Almanosur

Date: Abdulmajeed Signature: 



Contact Details of Researcher:
Abdulmajeed Almansour,
Liverpool John Moores University,
A.Almansour@2014.ljmu.ac.uk

Contact Details of Academic Supervisor:
Amanda Mason,
Senior Lecturer PhD, MA, BSc, TEFL Diploma
Liverpool John Moores University,
A.Mason@ljmu.ac.uk

Appendix I: Approval from the Dean of English Department

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
Al-Imam Muhammad Ibn Saud
Islamic University



المملكة العربية السعودية
وزارة التعليم العالي
جامعة الإمام محمد بن سعود الإسلامية
كلية اللغات والترجمة
مكتب العميد

COLLEGE OF LANGUAGES & TRANSLATION
DEAN'S OFFICE

الرقم : / ل ت التاريخ : ٧ / ٢ / ١٤٣٧ هـ المرفقات :

إلى من يهمه الأمر

السلام عليكم ورحمة الله وبركاته ،، ، أما بعد :

فأسأل الله لكم دوام التوفيق والسداد ، و أشير إلى طلب المعيد / عبدالمجيد بن عبد الله المنصور بقسم اللغة الانجليزية في كلية اللغات والترجمة بشأن الموافقة على قيامه برحلة علمية للمملكة العربية السعودية لجمع بعض البيانات لاستكمال بحث الدكتوراه بعنوان قياس فعالية استخدام التقنية في تطوير مفردات اللغة الإنجليزية لطلاب المستوى الأول. أفيدكم بأنه لآمانع من جمع البيانات و إجراء البحث في كلية اللغات والترجمة بجامعة الإمام محمد بن سعود الإسلامية وفق الفترة الزمنية التي طلبها لإنهاء الرحلة العلمية. والله يحفظكم ويرعاكم .. والسلام عليكم ورحمة الله وبركاته ..

عميد كلية اللغات والترجمة

د. محمد بن إبراهيم الأحيدب



Appendix J: Interview Transcript

The research: what kind of apps do you download and use on your smartphone?

Student 6: many applications like Twitter whatsapp Facebook and Instagram

The researcher: OK what is the most application that you use every day?

Student 6 : The most application that I use every day is whatsapp most of my day. we learn from WhatsApp English or any other language through WhatsApp. Actually there are some groups that I am in rolled in where we share videos and clips about learning English and sharing information with other students

The Researcher: how did you see the application?

Student 6: actually it was very very good and useful I have gained a lot of information and knowledge from this application. The idea of multiple choices to choose the correct word is very good feature

it's help me more. Before using memrise I could not speak good English I was hesitating when I speak I can't complete a full sentence now I can speak fluently I noticed the improvement even at home I speak with my family different than before using Memrise

The Researcher: OK how often do use the application?

Student 6: actually I use the application when I find a free time I take up my phone and open the application to revise previous words like this

The Researcher: how do you use the application?

Student 6: once I log into the application I find the course and all the vocabulary labeled with units so I started unit one and 234 on daily basis i learn vocabulary from each unit on order

The Researcher: do you plan to continue using the application in the future?

Student 6: yes of course

The Researcher: why

Student 6: The application help me in pronunciation and speaking I will never stop using the application I will continue using the application more.

The Researcher: you will use the application for what?

Student 6: I will use it mainly for speaking and listening as I mentioned it's supported me in how to pronounce the vocabulary and how to put them in context when I speak with others I remember the word and when can I use it.

The Researcher: what are things that you wish to be in the application

Student 6: I hope that the application is not only for vocabulary it's good to have other features such as improving writings and grammar skills by creating rules or blanks and multiple questions to be answered

The Researcher: people are different in learning vocabulary how do you approach vocabulary?

Student 6: Actually I don't like to use smart phones for learning vocabulary I like using books because it is consistent with big letters I can read it clearly I don't like to use anything but the book.

The Researcher: how do you normally learn new vocabulary?

Student 6: my method is taking notes on small paper I write new words and memorize it and then do spelling test

The Researcher: what do you think the most effective way in learning vocabulary?

Student 6: I find taking notes and memorizing the vocabulary with the meaning and sentences is a very useful technique.

The Researcher: how long do you spend learning new vocabulary?

Student 6: depends on how long is the word to learn it consists of more than 3 syllabus it takes me 15 minutes 30 minutes I write down the word and memorize it and try to pronounce it in the incorrect way.

The Researcher: How many times do you spend on learning vocabulary daily?

Student 6: there is no specific time I study new vocabulary until I think I have fully learned the words so I never forget.

The Researcher: do you revise previous words in the course book?

Student 6: yes, I put them in a small note and revise them until I master all the Vocabulary.

The Researcher: how do you compare learning the traditional way with a pen and paper or learning with the use of smartphone?

Student 6: in fact I don't like using smart phones it doesn't improve my English skills at all comparing with the traditional method I find the traditional method better using the book as it is clearly colored in the book with the definition and I use the smart phone in learning the Arabic meaning. Using smart phone for me is not helpful because I think it doesn't fit to me as I am having difficulty in reading from screens sometimes I might miss a letter in a word if I read it from the smart phone.

The Researcher: have you used any applications for vocabulary learning rather than Memrise?

Student 6: I use whatsapp for learning English vocabulary as I am in whatsapp group with

experienced students in English. we share information video and audio links related to language learning and vocabulary learning.

The Researcher: how do you see smart phone applications in improving vocabulary learning?

Student 6: I think there might be a benefit in using smart phone applications for vocabulary learning.

Appendix K: Interview Themes with participants responses.

Themes					
participants	Smartphone Applications Experience	Memrise Application Experience	Vocabulary Learning Strategies	Learners' Attitude	Learner's Motivation
1	I have social media applications and the most application I use on daily basis is Snapchat to view friends' daily snaps.	The memrise application is very easy and simple to use. I used Memrise and it helped me a lot after with vocabulary the application. I use the application now will continue using it.	I write down the difficult words with the meaning and search on google picture to connect the image with the word so the word stick in my mind with the picture. I like to write with pen and paper because in the phone	The applications actually help in learning vocabulary such as dictionaries and other smartphone apps and I use it to support in learning vocabulary.	I used application to support my learning but not all applications are helpful in learning vocabulary.

			<p>you might forget after 2 to 3 days unlike writing down the word you will know more the spelling.</p>		
2	<p>I have social media apps and games also online dictionary applications. The most apps that I use daily are <i>WhatsApp</i>, <i>Snapchat</i> and <i>Twitter</i>.</p>	<p>This is my first time using <i>memrise</i> actually I didn't continue using the app although it was very good, easy and organised.</p>	<p>I approach vocabulary through watching movies, reading books, speaking with friends and classmates. I find listening and reading are good sources of learning vocabulary.</p>	<p>It might help when you look for the meaning of new words like using smartphone application dictionaries, but memorizing with pen and paper helps to keep the word in your memory</p>	<p>If I would download those apps I might not use it. So I download what I think is useful for me such as electronic dictionaries. I try not to use my smartphone when studying as I get easily</p>

				longer than smartphones.	distracted and find myself in twitter or chatting in <i>whatsapp</i> . I follow a person on <i>twitter</i> to learn Spanish language he delivers lessons every week.
3	In <i>twitter</i> I follow an English teacher account and have learned a lot in vocabulary. For example he tweets a word with its	I liked most about the app the revision feature, when you make a mistake words appear again and again until you fully	. If you use pen and paper your concentration is much more than smartphone. Also things that you learn with pen and paper I find it	it is a new and enjoyable way of learning vocabulary that you keep learning without boring.	Learning from memrise encouraged me more and motivated me in learning vocabulary.

	different meanings and use it in context.	master the word.	stay longer than those with smartphones.		
4	I mainly have apps that is not related to education. The most apps that I have on my smartphone are social media apps such as <i>whatsapp</i> and <i>snapchat</i> because you follow your friends' life style. Most of my day is on <i>whatsapp</i> and <i>snapchat</i> .	It was a great app really I call it doctor or teacher. Many words I didn't know how to spell I improved after the app. It helped me how to pronounce, spell and use vocabulary. I open the app minimum between 6-10 times every day around 1-2 hours as I enjoyed using it. Before using	I first get the meaning of the word and then put it in a daily life context. I think understanding the meaning and then use it in a context helps in recalling the word in the future.	Yes absolutely support that smartphone applications enhance vocabulary learning.	I think not all apps are helpful in learning vocabulary. If apps will be like memrise I will use it as it helps you in revising the words many times and put them in context.

		<p>the app I don't check new words from the coursebook, but now with the app I always learn and revise them.</p> <p>I learned a lot from the app and will absolutely continue learning from the app.</p>			
5	<p>I have many applications like Twitter whatsapp Facebook and Instagram. The most application that I use</p>	<p>Actually it was very very good and useful I have gained a lot of information and knowledge from this application.</p>	<p>I write down all difficult words in the classroom at the end of the day I try to memorize it two time before bed and</p>	<p>When make a mistake in a word it doesn't appear immediately at the same time, rather it brings other</p>	<p>When I try to close the memrise app, my finger pushes me to learn new words and so on.</p>

	<p>every day is whatsapp most of my day. we learn from WhatsApp English or any other language through WhatsApp.</p>	<p>The idea of multiple choices to choose the correct word is very good feature it's help me more. Before using memrise I could not speak good English I was hesitating when I speak I can't complete a full sentence now I can speak fluently I noticed the improvement even at home I speak with my family different</p>	<p>in the morning. I prefer the traditional way of learning vocabulary because if you hold your smartphone you will be distracted easily and go to twitter and forget learning vocabulary.</p>	<p>words to learn and then bring the word that I didn't answer correctly.</p>	
--	---	--	--	---	--

		than before using Memrise.			
6	Actually there are some groups that I am in rolled in where we share videos and clips about learning English and sharing information with other students.	Actually I use the application when I find a free time I take up my phone and open the application to revise previous words like this. The application helped me in pronunciation and speaking I will never stop using the application I will continue using the application more. I will use it mainly for speaking and listening as I	You don't just learn vocabulary when you listen or read, you learn something new like reading a novel for instance which doesn't make you board.	I can write it and check the meaning quickly using smartphones app.	I was addicted in learning from memrise.

		<p>mentioned it's supported me in how to pronounce the vocabulary and how to put them in context when I speak with others I remember the word and when can I use it. I hope that the application is not only for vocabulary it's good to have other features such as improving writings and grammar skills by creating rules or blanks</p>			
--	--	--	--	--	--

		and multiple questions to be answered.			
7	I have social media apps such as snapchat and whatsapp. The most app is snapchat because I like to keep in touch with my friends.	The application helped me a lot in preparing for the exams. It was very easy to use. The vocabulary items were new to me which made me motivated to learn them. I used it for the course only. I think the app has helped me alot in learning from the application. It was not boring using the app like a game	I write the word first and then repeat it many times until I think I master the word which takes around 20 mins. I think writing the word is the best strategy for vocabulary learning. I revise the vocabulary at the end of each unit by answering questions related to vocabulary.	I agree because smartphones are available all the time whenever I find a new word.	I didn't use any application rather than memrise, but I plan to search for smartphone applications to learn other skills as I found it very easy and useful to use app to gain new vocabulary.

		unlike books which you feel board.	Actually, learning from smartphones as it is available all the time anytime anywhere. Also it is easier to reach the application whereas books and pen might not be available all the time.		
8	The most app I use is snapchat and whatsapp because you follow your friends daily life. In whatsapp there are	The best feature that helped me in learning is courses designed by the developer which offers not only words	Learning from smartphones is good but I prefer using listening and reading. You don't just learn vocabulary when you	I find it enjoyable and useful.	I could find apps for advanced learners designed and targeting Arabic learners.

	groups such as my classmate group where we share important news about our courses.	but statements.	listen or read, you learn something new like reading a novel for instance which doesn't make you board.		
9	I use social media apps such as snapchat whatsapp and other social media apps.	I didn't use the application very much because I thought most of the vocabulary I am aware of. I used Dulingo but it was boring because it focuses on the very easy words such as pronouns. I didn't like the	My way of acquiring new vocabulary is through listening as I learned English mainly through watching tv shows. Listening helps you to understand the pronunciation and usage of the word.	I agree but if you close the application there is nothing interesting that drags you back to learn unlike reading stories or listening or watching from TV shows.	I used Dulingo before but I try doing a course for a week and I quit. There is nothing that motivates me in continuing doing the course. I don't like to learn

		<p>repetition in</p> <p>memrise it</p> <p>makes you feel</p> <p>boring I wish I</p> <p>could skip. I</p> <p>aim to use</p> <p>memrise for</p> <p>another</p> <p>language which</p> <p>is French to</p> <p>assist me in the</p> <p>university</p> <p>module.</p>			<p>vocabulary</p> <p>in isolation.</p>
10	<p>The basic</p> <p>applications I</p> <p>have are social</p> <p>media apps.</p> <p>The most app I</p> <p>use is called</p> <p>Fantasy for</p> <p>football game</p> <p>which I use</p> <p>daily.</p>	<p>The memrise</p> <p>app was very</p> <p>helpful. The</p> <p>course we</p> <p>studied is very</p> <p>much related</p> <p>to our study.</p> <p>The interface</p> <p>of the</p> <p>application is</p> <p>very easy and</p>	<p>I learn the</p> <p>vocabulary</p> <p>mainly from</p> <p>the context. I</p> <p>don't sit and</p> <p>study specific</p> <p>words as I can</p> <p>get the</p> <p>meaning from</p> <p>the context. I</p> <p>think learning</p>	<p>I totally agree</p> <p>that</p> <p>smartphones</p> <p>could help in</p> <p>improving</p> <p>vocabulary</p> <p>but there is a</p> <p>problem who</p> <p>will provide</p> <p>students with</p>	<p>I don't have</p> <p>any</p> <p>educational</p> <p>apps</p> <p>because</p> <p>most apps</p> <p>are designed</p> <p>for</p> <p>beginners.</p>

		interesting to use.	from the application is great because we found sentences related to the word. Sometimes you can't put words in good context	credible apps such as me.	
11	I have social media apps mainly to check with news and follow friends lifestyle. The main apps for entertainment is instgram	The application was very useful and the amount of vocabulary has increased after using the app. It would be better if the application offers pronunciation. The design of the app is easy	I try to link the word with the Arabic meaning and find a logical link and it works with me. Some difficult words take time to be learned. The apps are very enjoyable such as memrise	I agree because you don't just learn but you learn and entertain.	I have not used any application before memrise but I think I have learned a lot from memrise and will continue learning from the application in the future

		<p>and simple.</p> <p>Most learning apps are difficult to use unlike memrise</p> <p>I use it as a game and challenge. I like to challenge myself and visit the app from time to time.</p>	<p>unlike the boring books because it offers a new way of learning</p>		
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