

The motivational value of mobile-assisted vocabulary learning applications in English as First Additional Language

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ABSTRACT

The personal mobile device (PMD) has become endemic – young people all over the world are constantly interacting with their PMDs – either texting, listening to music, playing games or accessing the web, to name but a few. It is therefore no surprise that researchers and educators have been looking towards PMDs as possible tools for teaching and learning. Research has also revealed that language, and more specifically vocabulary teaching and learning is very suitable and accessible for the use of PMDs. However, the motivation and attitude of both teachers and learners towards the use of the PMD as learning tool cannot be ignored.

The purpose of this study was to determine the motivational value of mobile-assisted vocabulary learning for English First Additional Language (FAL) learners.

A mixed-method research design, underpinned by the ARCS Model of Motivational Design by Keller (1987) was used in the study. The four components of the ARCS Model, namely attention, relevance, confidence and satisfaction were used to explore the research questions. The participants in the study were fifty English FAL grade eight learners and their two teachers from a local high school in the North West Province of South Africa.

The research process entailed the following: First of all the learners were exposed to vocabulary learning applications in class for a period of two weeks. Secondly, the learners completed a questionnaire. The questionnaire consisted of three sections:

- Section A provided background information on mobile device usage and preferences.
- Section B focussed on the Textbook employing the ARCS categories.
- Section C focussed on the mobile applications employing the ARCS categories.

Thirdly, focus group discussions were held with learners and semi-structured interviews were conducted with the teachers. Finally, document analysis was also done.

Both qualitative and quantitative analyses of the obtained data was done. Pearson product moment correlations were conducted to determine the relationship between the four ARCS categories and Cronbach's alpha was calculated to ascertain the internal reliability of the scales. A paired *t*-test was also conducted to determine if the differences between the textbook and the applications are significant and effect sizes were calculated to determine practical significance.

The results indicate that learners' responded positively towards incorporating PMDs for vocabulary learning in EFAL. All of the components showed a significant difference in favour of the applications, with the attention and satisfaction components revealing a very high difference.

Furthermore, the use of mobile devices was shown to motivate learners to engage in vocabulary learning.

The results of the study have implications for teaching and learning. They suggest that our current generation of learners are ready to learn with their PMDs. Educators should consider the use of PMDs as supplementary tools for vocabulary teaching and learning in English FAL. This will however entail guidance to teachers on how to successfully select applications and incorporate PMDs as an integral part of their teaching.

KEY WORDS: English First Additional Language; Motivation, personal mobile device (PMD), vocabulary learning

OPSOMMING

Persoonlike mobiele toestelle (PMTs) word deur jongmense reg oor die wêreld gebruik— hulle stuur boodskappe, luister musiek, speel speletjies of kry daardeur toegang tot die web, om maar 'n paar gebruike te noem. Dit is daarom nie vreemd dat navorsers en onderwysers aan maniere dink om die PMT vir onderrigdoeleindes te gebruik nie. Navorsing het ook getoon dat die toestelle besonder geskik is vir die aanleer van taal, meer spesifiek woordeskat. Nogtans kan die houding van leerders en onderwysers teenoor die gebruik van die PMT as 'n onderrigtoestel nie buite rekening gelaat word nie.

Die doel van hierdie studie was om die motiveringswaarde vir die aanleer van Engels Eerste Addisionele Taal (EAL)-woordeskat met die hulp van selfone te ondersoek.

'n Gemengde metode-navorsingsontwerp, ondersteun deur die “ARCS Model of Motivational Design” (Keller, 1987) is gebruik. Die vier komponente van die ARCS model, naamlik aandag, relevansie, selfvertroue en tevredenheid is gebruik om die navorsingsvrae te ondersoek. Die deelnemers was vyftig Engels EAL graad agt-leerders en hulle twee onderwysers van 'n plaaslike hoërskool in die Noordwes-provinsie van Suid-Afrika.

Die navorsingsproses het die volgende behels: Die leerders is vir 'n tydperk van twee weke blootgestel aan mobiele toepassings vir die leer van woordeskat m.b.v. hulle selfone. Daarna het hulle 'n vraelys voltooi wat uit drie afdelings bestaan het:

- Afdeling A het inligting versamel oor selfoongebruik en voorkeure.
- Afdeling B het die handboek geëvalueer n.a.v. die ARCS-kategorieë.
- Afdeling C het die toepassings geëvalueer n.a.v. die ARCS-kategorieë.

Gedurende die volgende fase van die navorsing is fokusgroepbesprekings met leerders gevoer asook semi-gestruktureerde onderhoude met die onderwysers. Relevante dokumente is ook ontleed.

Die data is beide kwalitatief en kwantitatief ontleed. Pearson Produkmomentkorrelasies is uitgevoer om die verhouding tussen die ARCS-kategorieë te bepaal. Cronbach alpha is bereken om die interne betroubaarheid van die skale te verseker. 'n Gepaarde t-toets is ook uitgevoer om te bepaal of die verskille tussen die handboek en die mobiele toepassings beduidend is. Effekgrootte is ook bereken om die praktiese beduidenheid te bepaal.

Die resultate toon dat leerlinge positief is teenoor die gebruik van PMTs vir die aanleer van woordeskat in Engels EAT. Al die komponente het 'n betekenisvolle verskil getoon ten gunste

van die mobiele toepassings. Die aandag- en tevredenheidskategorieë het die beduidendste verskil getoon ten gunste van die mobiele toepassings. Resultate het ook getoon dat leerders gemotiveer word om woordeskat te leer wanneer 'n PMT gebruik word.

Die resultate het implikasies vir onderrig en leer. Die resultate toon beslis dat die huidige generasie leerders gereed is om m.b.v. mobiele tegnologie te leer. Onderwysers moet dit daarom ernstig oorweeg om PMTs as bykomende onderriginstrumente te gebruik. Dit sal egter behels dat onderwysers leiding moet ontvang oor hoe om die mobiele toepassings suksesvol in hul onderrig te integreer asook watter riglyne gevolg kan word vir die kies van geskikte mobiele toepassings.

SLEUTLEWOORDE: Engels Eerste Addisionele Taal; Motivering; persoonlike mobiele toestel (PMT), leer van woordeskat

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CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

1.1 Introduction

The aim of this chapter is to give the necessary background so that the research topic *The motivational value of mobile-assisted vocabulary learning applications for English First Additional Language learners* can be contextualized. In addition, the formulated research questions as well as the hypotheses are formulated. This is followed by an explanation of the research methodology that was applied during the empirical investigation. To conclude the chapter, a brief overview of the other chapters of the study is provided.

1.2 Problem statement and motivation

The use of personal mobile devices (PMDs) amongst teenagers for social as well as instructional purposes is increasing world-wide (Kilfoil, 2015). Learners are often seen holding a mobile device – either texting, listening to music or accessing the web. It seems as if their PMDs have become extensions of themselves. The focus of this study is to explore if the use of mobile-assisted vocabulary learning applications will motivate English FAL learners. It is therefore important to look at the key elements which form the rationale behind this study.

Africa, which had a mobile penetration rate of only 5% in the 1990s, is now the second largest and fastest growing mobile phone market in the world, with a penetration rate of over 60% and climbing (Briggs, 2014). This increasing accessibility and affordability of mobile phones have embedded it as the most affordable means of basic communication and technology across the whole socio-economic spectrum. In South Africa, adolescents and young people have been identified as the first adopters of mobile technology with 72% of 15 to 24 year-old youths reported as “having a cell phone” in a 2007 national survey conducted by The Kaiser Family Foundation and the South African Broadcasting Corporation (SABC). Furthermore, smart phones are issued with a wide variety of applications, many of which can be downloaded for free (The Kaiser Family Foundation, 2007:6).

It is compulsory for all learners in South African schools to take a First Additional Language (FAL) in addition to the Home Language (DoBE, 2011). The fact that it is not optional, like other subjects that can be chosen according to interest or aptitude, often leads to learners not being interested or motivated to learn the FAL. The fact that motivation plays a very important role in teaching and learning, has been proven in a broad spectrum of studies (Pintrich & Schunk, 2002). Furthermore, modern learners easily lose interest when studying solely from a textbook. In addition, textbooks become outdated within a short period of time in a virtual environment where the latest information

is available at the press of a button. Furthermore, many of the English Language textbooks prescribed in a South African context do not offer the possibility of interactive participation or the visual stimulus of a PMD screen, which learners have become so accustomed to. In an attempt to enhance the learning experience, mobile-assisted learning seems to be getting ever increasing support world-wide (Kiernan & Aizawa, 2004; Motteram & Sharma, 2009).

Learners constantly interact with their phones to such an extent that many of them feel incomplete without their phones (Kilfoil, 2015). At the same time, educators persistently strive to develop best practices to optimize learning and teaching both inside and outside the classroom. The combination of PMDs and best practices in teaching and learning can enhance the learning process, while providing the context for life-long learning (Kilfoil, 2015). A diverse range of research on PMDs in English Language teaching and learning has been done worldwide (Mendez, 2007). The most noteworthy of these, mostly originating from countries like Taiwan, Japan, South-Korea and other Asian countries are discussed in the literature review which is to follow in Chapter Two.

The ARCS Model of Motivational Design (the acronym referring to attention, relevance, confidence and satisfaction) has been considered by Feng and Tuan, (2005) as a “systematic and easy-to-apply model for designing motivational instruction”. According to Huett, Kalinowski, Moller, Huett (2006) and Keller (2007), the ARCS model has been used in many research settings, including the traditional classroom, assisted instruction, blended learning environments and online education. Despite the fact that ARCS has been incorporated in many studies on these different levels, according to Huett *et al.* (2008), there is a lack of research that incorporates ARCS in mobile-assisted language learning. This model will serve as the guiding theoretical framework for this study.

Like with any innovative idea, it is important to engage the different role players in order to validate the possible outcome to prevent a situation where time and money is wasted on a concept which has no future. This study aims to determine how both learners and educators experience the motivational value of the PMDs in the teaching and learning of English vocabulary.

1.3 Literature review

In less than a decade, mobile technology has spread to the furthest corners of the planet. Of the estimated 7 billion people on Earth, 6 billion now have access to a working mobile phone (Briggs, 2014). Africa, which had a mobile penetration rate of only 5% in the 1990s, is now the second largest and fastest growing mobile phone market in the world, with a penetration rate of over 60% and climbing (Briggs, 2014). In a South African study conducted by the Bureau of Market Research in collaboration with The College of Economic and Management Sciences (CEMS)

amongst Gauteng learners, the research results indicate that approximately 88.4% of Gauteng learners personally own a cell phone while 8.9% access cell phones via family or friends, leaving just 2.7% with no cell phone access. 64.7% of learners questioned indicated that they could not live without a cell phone (UNISA, 2012).

The term “mobility” can be defined as moving without boundaries or time constraints (Oxford Advanced Learner’s Dictionary). The penetration of mobile phones into our lives has resulted in the change of our lifestyles as well as our learning styles. As confirmed by the survey results of the UNISA study referred to in the previous paragraph, for teenagers living in the digital 21st century their daily communication, entertainment and socialization are, to a great extent, governed by their mobile phones. The rapid evolvement of mobile and wireless technologies is also instrumental in the development of a whole new learning environment with multiple possibilities. Subsequently, since 2007, the focus in many Information and Communications Technology (ICT) fields has shifted to mobile technologies, especially to mobile phones and other personal mobile devices (PMDs). While it is still a relatively young field, a significant body of research of almost 600 works related to MALL (mobile assisted language learning) has been conducted world-wide between 1994 and 2012. In the earlier studies, MALL focused on five mobile technologies, namely pocket electronic dictionaries, personal digital assistants (PDAs), MP3 players and tablet PCs (Burstion, 2015). However, given the rapid development of PMDs, recent studies focus mainly on tablets and mobile phones, since the functions initially performed by different devices have all been incorporated into one single PMD device – either through the software or available applications that can be downloaded onto the device.

Educational mobility through the use of mobile devices would mean that learners can access content at any time from any location (Kukulska-Hulme, 2009; Stockwell, 2010). Traditional ideas of classroom-based learning are embracing the modern idea of ‘24/7-anywhere-anytime’ learning which is accessed and managed in part or in whole by the learners themselves, primarily on mobile devices (Kiernan & Aizawa, 2004; Motteram & Sharma, 2009). This notion has automatically sparked the interest of many researchers towards mobile-assisted language learning (Hsu, 2012; Kennedy & Levy, 2008; Stockwell 2008, 2010). Accordingly, English education in the 21st century needs to adapt to this change in order to maximise learner potential. In other words, English education needs to find ways to integrate technology into a learning context (Chu, 2011).

Vocabulary is an important domain of learning a second language since meaningful communication cannot take place without access to a wide range of words. Almost all researchers would agree that limited word knowledge in second language (in this study referred to as First Additional Language (FAL) can limit learners’ receptive understanding and productive communication (Ko & Goranson, 2014). However, there are many constraints or challenges faced

by teachers when teaching FAL vocabulary (Nation, 2008). One way to overcome constraints in English additional language learning, specifically vocabulary learning, is to encourage independent learning in- and outside the classroom, for example, using mobile-assisted vocabulary learning apps (Kim & Kwon, 2012; Miles & Kwon, 2008). A few studies have demonstrated that mobile-assisted vocabulary learning is gaining momentum in second language vocabulary learning (Koole, 2009; Stockwell, 2010). This addresses the primary research question of this study, namely if the learners involved in this study are motivated to learn English vocabulary by using their PMDs and utilizing apps for this purpose. More attention to world-wide studies is given in Chapter Two.

In the absence of sufficient challenge and mental stimulation, learners are at risk of entering the affective state of boredom (Acee, Kim, Kim, Chu, Kim, Cho and Wicker, 2010; Csikszentmihalyi & Csikszentmihalyi, 1988). Boredom is closely associated with a reduced motivation to learn, a lack of concentration, and task irrelevant thinking (Pekrun, Goetz, Daniels, Stupnisky & Perry, 2010). This condition is common when learning is passive and abstract (Larson & Richards, 1991). This study wants to determine the learners' attitude towards mobile-assisted vocabulary learning applications and whether they perceive these learning apps to offer motivational value that can keep them from getting bored and losing interest when learning vocabulary.

It is vital to the language learning process that the learning tools which are implemented actually meet the specific needs and interests of specific groups of learners. According to Vygotsky (1978), a learner's knowledge is transformed in the presence of a sufficiently demanding task and the support and guidance of a more knowledgeable instructor. In recognition of these variables, Keller (1987) developed the ARCS model in an effort to measure and ultimately help to increase the motivational appeal of teaching tools. ARCS is an acronym which represents four underlying dimensions of motivation; including (A)ttention, (R)elevance, (C)onfidence, and (S)atisfaction (cf. Chapter 2). The model is based on the expectancy-value theory of motivation, which assumes that learner motivation is optimal when they experience feelings of success in tasks and when they feel that the skills they are learning are valuable (Weiner, 1974).

Taking into account the brief review of the different key elements of this study, namely the access to mobile technology in general, the rapid development of mobile-assisted language learning and its growing popularity as well as potential benefits of mobile devices and apps in vocabulary learning, the purpose of this study is to explore the motivational value of mobile-assisted vocabulary learning for English Additional Language learners through the following research questions:

- To what extent are the learners satisfied with the prescribed textbooks as a learning tool?
- What are the learners' attitudes towards using mobile-assisted vocabulary learning applications as a supplementary learning tool?
- What are the teachers' attitudes towards using mobile-assisted vocabulary learning applications as a supplementary teaching tool?
- How do learners perceive the mobile-assisted vocabulary learning applications in terms of motivational value in comparison to the prescribed textbooks?

1.4 Purpose of the study

The purpose of the study is to:

- Determine to what extent the learners are satisfied with the prescribed textbooks as a learning tool.
- Determine the learners' attitudes towards using mobile-assisted vocabulary learning applications as a supplementary learning tool.
- Determine what the teachers' attitudes are towards using mobile-assisted vocabulary learning applications as a supplementary teaching tool.
- Determine how learners perceive the mobile-assisted vocabulary learning applications in terms of motivational value in comparison to the prescribed textbooks.
- Formulate guidelines for mobile-assisted vocabulary learning applications as supplemental learning or teaching tools to prescribed textbooks.

1.5 Hypotheses

The following hypotheses were formulated for this study:

H₀: The motivational value of mobile-assisted vocabulary learning applications is not perceived positively by English First Additional Language learners.

H₁: The motivational value of mobile-assisted vocabulary learning applications is perceived positively by English First Additional Language learners.

1.6 Research design and methodology

The following components are relevant to the research design and methodology

1.6.1 Literature review

To trace relevant and recent sources for purposes of the literature review, the data reference bases EBSCOHost, RSAT, SABINET and NEXUS were utilised to search for the following key

terms: Applications, English First Additional Language (FAL) (cf. Chapter 2), mobile devices, Mobile Assisted Language Learning (MALL), motivation and vocabulary.

1.6.2 Empirical investigation

1.6.2.1 Research paradigm

All scientific research is conducted by viewing one's research material in a specific way. This way of viewing or assumptions about the world is the research paradigm (De Vos, 2011; Firestone, 1987). The roots of quantitative and qualitative approaches extend into different philosophical research paradigms, namely that of respectively post positivism and constructivism (Creswell, 2003). The difference in philosophical paradigms raised the question whether the research problem of this study should be addressed exclusively by a single research approach or by both approaches.

The research problem and accompanying research questions are of a multifaceted nature. For this reason both quantitative and qualitative approaches are selected for this study. The combination of research approaches led to the adoption of a pragmatic position to conduct the research (Creswell, 2003). Pragmatism has been considered the best philosophical foundation for justifying the combination of different methods within one study (Maree, 2007:263). Pragmatists believe that the truth is "what works" best for understanding a particular research problem. A major argument of *pragmatism* is that quantitative and qualitative methods are compatible. Thus a pragmatic approach offers a practical, "middle ground" orientation in relation to the post positivism paradigm of quantitative research and interpretivism which is the paradigm of qualitative research (Johnson & Onwuegbuzie, 2004). According to Creswell (2003), "...pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as to different forms of data collection and analysis."

1.6.2.2 Research approach

The nature and complexity of the research problem and research questions, called for both a quantitative as well as a qualitative research approach.

Quantitative research aims to objectively measure variables in some numerical way (Firestone, 1987, Maree, 2007, Leedy & Ormrod, 2005). Description, explanation and prediction are the most common research objectives in quantitative research. The nature of observation in quantitative research is an attempt to study behaviour under controlled conditions. Variables are measured with structured and validated measuring instruments to collect data, which is analysed by means of statistical computer programmes. These programmes determine statistical relationships between variables where after a quantitative report is compiled which includes different numbers,

calculations and results of statistical importance in order to accept or reject the stated hypotheses (Johnson & Christensen, 2010, Leedy & Ormrod, 2005).

Qualitative research aims to obtain, analyse and understand rich descriptive data pertaining to a specific subject or context (Maree, 2007). This research approach is concerned with understanding the processes and the social and cultural contexts which underlie behavioural patterns. Qualitative approaches focus on phenomena that occur in natural settings as well as studying these phenomena in all their complexity (Leedy & Ormrod, 2005). Strauss and Corbin (1990) claim that qualitative methods can be used to better understand any phenomenon about which little is yet known. This approach is ideal to address the questions on attitudes, perceptions and behaviours in this study. Qualitative research is not simply the analysis of a few open-ended questions and quotes from transcripts, but is directed at thorough analysis of the data.

In the present study, a quantitative approach is similarly suitable as numerical data about the motivational value of the textbook as well as the mobile applications were obtained from a sample of a population, in this case two grade eight English FAL classes from a school in the North West Province of South Africa. This numerical data was statistically analysed to determine and compare the motivational value of the two constructs. A qualitative approach however is also applicable as narrative data in the form of document analysis, semi-structured interviews and focus group discussions were obtained about learner as well as teacher attitudes towards using mobile-assisted vocabulary learning applications as a supplementary learning tool.

As both a quantitative and a qualitative approach are needed in this study, a mixed method research design was adopted.

1.6.2.3 Research design

The mixed method research design draws from the strengths of quantitative and qualitative approaches. According to Maree (2007), the combination results in richer and more reliable research results. The combination also ensured that findings are not a single reflection of a specific method and enable the attainment of broader and more in-depth results to avoid insubstantial evidence (Denzin & Lincoln, 2005).

The purpose of the mixed method design in the context of this study is to collect numerical data about the motivational value of mobile-based vocabulary learning applications (quantitative), as well as to collect descriptive/narrative data from learners and teachers about their attitudes and experience of mobile-assisted vocabulary learning and teaching for English First Additional Language (qualitative). This increases the research's validity by the convergence of the results from the different methods as mixed methods research is regarded as a form of triangulation (Rocco, Bliss, Gallagher, Pérez and Prado, 2003).

Creswell and Clark (2011) have identified three procedural considerations that determine the choice of a specific mixed method research design, namely timing, weighting and mixing. In chapter 3 these design attributes as well as the research model (cf. Figure 3-2) are discussed in detail.

1.6.2.4 Sampling

Non-probability, purposive sampling was used to select the participants for this study. A population is the totality of persons with which the research problem is concerned (Maree, 2007:147). This study has two sets of participants: The first set is the grade eight English FAL learners at a secondary school in the North West Province. Time, cost and practical factors such as the programme of the school as well as internet access make it very difficult to include all grade eight learners at this school. Therefore, two classes were selected for the study. The second set of participants is the two English First Additional Language teachers responsible for the teaching of English FAL to the Grade eight participants in the study. The final number of participants is forty nine learners and two educators (cf. section 3.3.4 for a full discussion on the participants).

1.6.2.5 Data collection methods

As this study makes use of a convergent parallel mixed method research design, quantitative as well as qualitative methods are used for data collection.

- **Quantitative methods**

“Quantitative data collection methods often employ measuring instruments” (De Vos, 2011:171). The measuring instrument that is used in this study is a questionnaire. For a complete discussion of the quantitative methods, refer to section 3.3.5.1.

Questionnaires: The questionnaire for this study was designed according to the Instructional Materials Motivation Survey (IMMS; Keller, 1987). This survey was developed to quantify learners’ perceptions towards teaching tools in accordance with the ARCS model. To reduce redundancy, a reduced version of the 36-item IMMS (Loorbach, 2013; Loorbach, Peters, Karreman & Steehouder, 2014) was implemented. The reduced IMMS (RIMMS) is constructed with a Likert-style scale with response options ranging from 1 (very untrue) to 5 (very true), equating to a total range of 3-15 for each measure and a range of 12-50 for a total score which is equated with the motivational value of the instrument. The original survey has been used extensively and important research properties include validity and reliability (Alpha = .93). Cronbach alpha coefficients were also calculated for this study.

- **Qualitative methods**

Qualitative data was collected in addition to the quantitative data. It consisted of documents analysis, focus group discussions and semi-structured interviews. The qualitative methods are discussed in detail in section 3.3.5.2.

Document analysis: Document analysis is a systematic procedure for reviewing or evaluating documents, both printed and electronic (computer-based and Internet-transmitted) material. Document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge (Corbin & Strauss, 2008). The following documents were collected for analysis in this study:

- The *Curriculum Assessment Policy Statements* (CAPS) document.
- The prescribed textbook for English FAL grade 8.
- White Paper on e-Education: Transforming Learning and Teaching through Information and Communication Technologies (ICTs).

Focus group discussions: For this study two focus group interviews were conducted with English First Additional Language learners from grade eight in the general education and training phase of the chosen high school in the North West Province. Each group had six members. The focus group discussions enabled the researcher to record and gather data on learners' attitude and experience with the mobile-assisted vocabulary learning applications as well as their perceptions on the motivational value of the learning apps in comparison to the textbook.

Semi-structured interviews: In this study, the recorded semi-structured interviews were conducted with the two teachers responsible for the teaching of English First Additional Language for the two grade eight classes participating in the study. Data on the teachers' attitude and experience with mobile-assisted vocabulary learning as a supplementary tool was gathered in this way.

1.6.2.6 Data analysis

Questionnaires: The grade eight learners from the two participating classes completed the Reduced Instructional Materials Motivation Survey (RIMMS) in class at the end of the two week time during which they had engaged with the vocabulary learning applications on their PMDs. They completed the questions on the questionnaire itself. The researcher was present to clarify any uncertainties.

Documents: The researcher collected the prescribed textbook from the school and downloaded the departmental documents, namely the CAPS document as well as the e-learning policy of the Department of Education from the internet.

Focus group discussions: Focus group discussions were held with the two groups from the two grade eight classes that were taking part in the research at the end of the two week period during which they had engaged with the vocabulary learning applications on their PMDs. Learners randomly volunteered to take part in the discussions. The discussions were guided by six questions the researcher had decided upon beforehand and consequently the two discussions followed the same pattern, although the comments from the participants were different. The discussions took place in the classroom at a time convenient for all participants. The discussions were recorded for data analysis purposes.

Semi-structured interviews: The two teachers responsible for teaching English at FAL level to the two participating classes were interviewed. The two teachers were interviewed separately in the office of the Head of Department (HOD) at a convenient time. The researcher beforehand decided upon a guiding schedule with predetermined questions that was the same for both interviews and the interviews were recorded for data analysis purposes.

1.6.2.7 Data analysis

Data analysis was done on the quantitative and qualitative data gathered in this study.

- **Quantitative analysis**

Questionnaires: Pearson product moment correlations were conducted to determine the relationship between the four ARCS categories. Cronbach's alpha was calculated to show the internal reliability of the scales. A paired t-test was conducted to determine if the differences between the two learning tools, namely the textbook and the mobile applications are significant with regards to Keller's (1987) ARCS categories. Effect sizes (r and d) were calculated to determine the magnitude of the differences as well as the correlations.

The gathered data from the questionnaire were statistically converted by means of the STATISTICA (StatSoft, 2006) and SAS (SAS, 2011) computer software programmes to obtain related scores for the purpose of quantitative interpretation. A three-stage statistical procedure was followed.

- The initial stage involved the calculation of the Cronbach alpha coefficient to determine the reliability of the various subsections of the questionnaire.
- Secondly, the statistical procedure involved the use of descriptive statistics such as frequencies, means, ranking and standard deviation scores to represent a particular statistical position of recorded responses.

- The final stage of the statistical procedure involved the calculation of the practical significance (effect size) of differences. Practical significance provides an indication if the difference is large enough to have an effect in practice (*d*-value).

- **Qualitative analysis**

Document analysis, focus group interviews and semi-structured interviews: The data from the semi-structured interviews, focus group interviews and the documents were analysed by means of content analysis. “Content analysis is an inductive and iterative process where we look for similarities and differences in text that would corroborate or disconfirm theory” (Maree, 2007:101). A qualitative content analysis involves the following procedures:

- Recording of data by means of note taking and audio recording of responses.
- Responses from the interviews and focus groups were transcribed verbatim.
- The responses were analysed by making use of the coding process.

Coding is a process by means of which large quantities of data are broken up into smaller segments (Maree, 2007). The aim of coding is to look for trends and patterns that reappear in a single interview, focus group interview or among various interviews and focus group interviews. Corresponding statements of participants are for example grouped under one code, and the aspects that are out of the ordinary also come to the fore in the process. The coding process consists of three coding steps namely open coding, axial coding and selective coding (De Vos, 2011).

The coding process enabled the researcher to identify trends and patterns, and themes then emerged. Next, thematic relationships were determined and this lead to the development of a framework of thematic ideas. The analysis of all data is described in detail in section 3.3.7.

1.7 Ethical Considerations

An application for ethical clearance was lodged with the North West University (NWU) and approved (NWU-00484-15-S2). The following rules applied:

Written permission to partake in the study was obtained from the learners as well as their parents. The right to privacy is upheld: The identity of the learners, teachers and the school will not be revealed and results are regarded as confidential and have not influenced the learners’ results on their school reports. Examples of the letters containing the research information and permission to the school principal (cf. Appendix A), the parents (cf. Appendix B), the learners (cf. Appendix C) as well as the educators (cf. Appendix D) have been included.

1.8 Chapter overview

This dissertation is organised in five chapters. The first chapter serves to contextualise the study by giving a short literature background and explaining the problem statement and the motivation for the study. It also provides a summary of the main activities pertaining to the study.

Chapter Two reflects on the research background and gives a review of literature relevant to the research topic. Keller's ARCS model of motivational design (attention, relevance, confidence, satisfaction) which serves as the guiding theoretical framework is discussed together with motivation, mobile-assisted language learning (MALL) and vocabulary.

Chapter Three focusses on the research methodology and design of the study. It gives a clear and detailed description of the research paradigm, quantitative and qualitative approaches, design, the participants, data collection methods, instruments used as well as the data analysis procedures and the reliability and validity of the procedures.

In Chapter Four the collected data are presented and research results are discussed.

Chapter Five provides a summary of the study as well as the conclusions, limitations and recommendations for further research.

1.9 Summary

Vocabulary is one of the essential building blocks of a language. The learners of today constantly interact with their PMDs. If learners were motivated to learn vocabulary through mobile-assisted applications, it could have a positive influence on their vocabulary acquisition. This study aims to produce new insight and evidence as to how PMDs can become a part of English FAL teaching and learning as a supplementary learning tool. This chapter focused on the research problem and purpose of the study. A brief overview of the research methodology was given. The research is supported by the literature review of the theoretical framework as well as motivation, vocabulary learning and PMDs in Chapter Two.

CHAPTER 2 REVIEW OF LITERATURE

2.1 Introduction

In order to position the current study on the motivational value of mobile assisted vocabulary learning applications, the work that has been done in the related areas of research should be explored. This review of literature has four major sections. The review starts with a section on the theoretical framework which underpins the study. The second section looks at motivation in general as well as motivation in language learning. The theme of the next section is vocabulary. Related areas, like teaching and learning vocabulary, vocabulary knowledge as well as vocabulary learning and technology are explored. The focus of the final section is on Mobile Assisted Language Learning. This section looks at the development in MALL research, the development of mobile devices in general as well as studies relevant to motivation in mobile learning and specifically mobile vocabulary learning.

2.2 Theoretical framework

2.2.1 Expectancy-value theory

The term “motivation”, as derived from the Latin verb *movere* (to move) has many definitions and there is much disagreement over its precise nature (Pintrich & Schunk, 2002). A general definition as offered by the above mentioned authors which incorporates the elements considered by most researchers to be central to motivation is: “Motivation is the process whereby goal-directed activity is instigated and sustained” (Pintrich & Schunk, 2002: 5). A wide variety of motivational theories have been developed by different researchers in an effort to explain people’s choice of tasks to achieve in, their perseverance, enthusiasm in carrying them out and then of course their performance in the chosen tasks (Eccles, Wigfield & Schiefele, 1998; Pintrich & Schunk, 1996). One of the motivation models most used in research to determine academic performance in teaching situations is the Expectancy-Value theory. Atkinson developed the original theory from which the expectancy-value model of achievement motivation by Eccles and Wigfield (Eccles *et al.*, 1989; Wigfield, 1994; Wigfield & Eccles, 1992, 2000), referred to in this study, originates.

According to the expectancy-value model, the two most important predictors of achievement behaviour are expectancy and task value (Eccles *et al.*, 1983). On a practical level, expectancy constructs will render answers to questions related to ability, for example, “Am I able to do this task?” (Eccles *et al.*, 1998). Value constructs on the other hand would refer to the response from learners when asked “Why should I do this task?” (Eccles, *et al.* 1998). Responses could refer to interest, belief in the importance of the topic for the future as well as cost. Both expectancies and values are anticipated to directly influence achievement choices. The expectancy and task values

are internal and cognitive beliefs held by the individual. Achievement behaviour on the other hand represents the observable actions a learner will engage in to achieve the desired outcomes.

Bandura also included expectancy as a construct in his well-known theories on self-efficacy (1997). He differentiated between the individual's belief that he or she can accomplish a task (efficacy expectation) and the belief that a specific action will lead to a given outcome (outcome expectancies). In the expectancy-value model however, the focus is more on the individual's expectations for success.

The first predictor for expectancy is directly influenced by beliefs regarding personal goals, the ability to complete a task successfully and perceived difficulty of the task (Eccles *et al.*, 1983; Wigfield & Eccles, 1992; Pintrich & Schunk, 2002). Personal goals refer to what individuals are striving for in different domains of their lives. The belief regarding ability to complete a task successfully is anchored in a positive self-schema. Self-schema refers to the perception the person has about him- or herself. Goals can be shaped by self-schema. In the case of the current study, for example, a learner who is confident when using a PMD (positive self-schema) may set personal goals to achieve when engaging with the PMD in a learning situation.

Another component which influences expectancies is the perception of task demands. This may include concern from learners regarding the perceived difficulty of a task as well as other features like how interesting it will be (Eccles *et al.*, 1989; Wigfield, 1994; Wigfield & Eccles, 1992). In the case of the current study, if learners expect the vocabulary learning activities on the PMD to be difficult, they will have less confidence and may be less motivated to engage. On the other hand, if they perceive it as interesting, it will capture their attention and they will engage in the activities.

The expectancy for success is often future orientated and related to achievement behaviour which can be summarized as three general outcomes, namely actual performance or achievement, persistent cognitive engagement and involvement as well as choice of behaviour (Eccles *et al.*, 1989; Wigfield, 1994; Wigfield & Eccles, 1992). Achievement refers to student performance. Performance on the PMD is not the focus of this study. Cognitive engagement, however, is important and refers to how mentally involved learners are in the vocabulary learning applications on their PMDs. Persistence is also important as it gives an indication of the period that their attention will be held by the application as well as the level of motivation they will experience to complete the activities they engage in on their PMDs. Choice of behaviour could play a crucial role in the engagement with a PMD as a supplementary learning tool - will learners choose to use the apps voluntarily at home as well? Such choices could point towards the start of a culture of independent and life-long learning.

The second predictor of achievement behaviour in the expectancy-value theory is achievement or task values. Task values can be influenced by affective memories. Affective memories are activated when learners are about to engage in an activity and refer to prior positive or negative experiences which lead to related associations (Eccles *et al.*, 1989; Wigfield, 1994; Wigfield & Eccles, 1992). When it comes to learner perceptions on mobile-assisted vocabulary learning in this study, a prior positive experience with engagement with a PMD will activate the same positive emotions when the learner has to engage with the PMD for vocabulary learning purposes. This will enhance his confidence and lead to satisfaction. In the same way if a learner had a prior positive fulfilling experience regarding vocabulary learning, it could lead to higher value and interest and a consequent high level of engagement and finally, good performance.

Eccles *et al.* (1983) defined different components of achievement values: attainment value (importance), intrinsic value, usefulness of a task (utility value) as well as cost. Attainment value has to do with the importance of performing well at a task, for example will the learner be able to use the vocabulary app on the PMD successfully. Intrinsic value on the other hand has to do with the satisfaction and pleasure derived from a task – will the learner be motivated if he enjoys the engagement with the learning app on the PMD? Utility value addresses the issue of how relevant the task is to the learner – for example, will his marks or reading comprehension improve? The cost component addresses the matter of how participation in one activity, for example engagement on a PMD to learn vocabulary, limits access to other activities, for example working from the textbook or engaging with friends (Wigfield & Eccles, 1992). The achievement value which a task holds for an individual is determined by all four of these task value components. This attainment value in combination with the expectancy beliefs is considered the main influence on learner motivation in a learning situation (Wigfield & Eccles, 1992). As the aim of the current study is to determine the motivational value of mobile-assisted vocabulary learning, this theory offers a firm theoretical basis.

2.2.2 ARCS model of motivation

The ARCS motivational design model by Keller (1987), which underpins this study is grounded in the expectancy-value theory of Eccles and Wigfield (1992). Keller (1979) believed that external conditions could successfully be constructed to facilitate and increase learner motivation. He explored two specific matters. Firstly, he endeavoured to determine whether it was possible to synthesize the many concepts and theories of human motivation into a simple and meaningful model. Secondly, the aim was to determine if it was possible to develop a systematic (as opposed to intuitive) approach to motivational instructional design (Keller, 1987). The view Keller (1979) held was that the expectancy-value theory assumed people will be motivated to engage in an activity that they perceive to be of value to themselves and which they will experience as satisfactory (the value aspect), as well as the fact that they expect to be successful (the

expectancy aspect). Through assimilating several learning theories, with the expectancy-value theory standing central, he developed the ARCS (Attention, Relevance, Confidence and Satisfaction) motivational model of instructional design (Keller, 1984; 1987).

In the original model, Keller (1979, 1983) expanded the two elements of *value* and *expectancy* into four: The *value* category was subdivided into *interest* and *relevance*. The *expectancy* category remained, but a fourth category, *outcomes*, was added. During the transition from the original model to the current ARCS model, the four categories were renamed to strengthen the central features of each and to create a useful acronym (Keller, 1987).

There are two major parts to the model. The first is a set of categories representing the components of motivation, which, as explained, are a result of a synthesis of the research on human motivation. The second part of the model is a systematic design process to assist teachers in creating motivational enhancements appropriate for a given group of learners (Keller & Kopp, 1987) as well as for computer assisted instruction (Keller & Suzuki, 1987). The focus of this study is only on the first component, namely the four conditions of motivation as observed in mobile-assisted vocabulary learning applications for English FAL in relation to the textbook.

The ARCS model defines four major conditions that have to be met for learners to become and remain motivated. Attention refers to the extent to which learners' curiosity is aroused and sustained. Relevance refers to learners' perception that the instruction is related to personal needs or goals. Confidence describes learners' perceived likelihood of achieving success through personal control. Satisfaction refers, amongst others, to the combination of extrinsic rewards and intrinsic motivation (Keller, 1983; Keller, 1987). Figure 2-1 illustrates the influence of these four attributes on learner motivation, as well as the nature of the relationship.

Figure 2-1: The ARCS model of achievement motivation



(Chandrana, 2010)

Each of the four conditions incorporates a variety of psychological research areas and has also been divided into subcategories and strategies for incorporation in teaching situations (Keller, 1979, 1983; Keller & Kopp, 1987; Keller & Suzuki, 1987). All of these strategies will not be utilized all the time, but they offer valuable insight into the variety of options available when incorporating the ARCS model in teaching and learning activities. An account of each of the four major components is now provided, starting with attention.

Attention refers to whether or not a learner's interest is captured and preserved during a learning activity. According to Ratey (2001), attention is more than just noticing incoming stimuli. It entails processes like filtering out perceptions, balancing multiple perceptions and attaching emotional significance to these perceptions (Thorne & Thomas, 2009).

A distinction is also made between *passive* and *active* attention. *Passive* attention is the process over which little control can be exerted like loud sounds. *Active* attention on the other hand refers to processes that are controlled by active decision, and is the result of a choice to pay attention or concentrate. This type of attention requires effort from the learner (Gaddes, 1994). It can be fairly easy to gain attention. The real challenge, however, is to sustain attention throughout the period of instruction.

The first attention strategy as portrayed in Table 2-1 is *perceptual arousal*, as paying attention can be regarded as the first step in the learning process (Thorne & Thomas, 2009). This links to the conceptual framework for understanding the attention process as provided by Levine (in Thorne & Thomas, 2009). According to this framework, *alertness* is the initial step in the attention process and what happens to learners when they are required to pay attention. Zuckerman (1971) suggests that the teacher should address the sensation-seeking needs of learners, which should not be too difficult when involving a PMD to arouse their alertness. Studies by Hunt (1965) and Kagan (1972) found that learners experience pleasure from activities that offer some level of surprise. Learning that is boring or repetitive will cause teachers to lose the attention of their learners (Kopp, 1982). A study by Perry (2003) found that learners were excited and consequently highly motivated to use mobile technology in their learning. This motivation is further enhanced by the perceived fun factor of a PMD. This study explores whether the textbook or a vocabulary learning app on a PMD allows perceptual arousal as a new and exciting way to learn vocabulary. Methods to enhance attention can include active participation by engaging with a vocabulary app on a PMD.

Table 2-1: ARCS Attention component

Attention	
A1	Perceptual arousal and surprise
A2	Concreteness
A3	Variability and surprise
A4	Humour
A5	Inquiry arousal
A6	Participation

Adapted from Keller (2007:4)

The second attention strategy is *concreteness*. This strategy can refer to two different dimensions of attention when applied to vocabulary learning with a PMD: On the first level, learners who engage on their PMDs will receive concrete instructions from the teacher as to where to access the app, how to download it as well as its functioning. On the other hand, showing the relationship between the vocabulary activities on their PMDs as well as the textbook and the real life situations where the acquired knowledge can be applied, also contributes to the concreteness of the activity.

The third suggested attention strategy is *variability*. Variety plays an important role when learning material is introduced as well as reinforced. By varying the method of instruction between textbook and learning app, learner attention can be sustained. This variation should also take into consideration the attention span of learners when engaging on their PMDs. Thorne and Thomas (2009) call this *focal maintenance*. This is also called *duration of attention*. Here the use of the app can play a supportive role to lengthen the attention span by offering variability between learner-teacher and learner-PMD interaction.

The fourth suggested attention strategy is *humour*. Choosing PMD applications with game-like or competitive qualities can provide opportunities for humorous engagement with learning vocabulary. This links closely with the fifth strategy, namely *inquiry arousal*. By challenging learners to find similar vocabulary apps as the ones suggested by the teacher, inquiry can be aroused which will lead to sustained attention. Inquiry arousal also refers to the ability of the textbook or PMD activity to stimulate the curiosity of the learner by offering questions and problems to solve.

The last suggested strategy to holding the attention of modern day language learners is *participation*, a category extremely suitable for the incorporation of PMDs – when the learner can

engage in vocabulary learning games and applications on his or her own PMD, they will most probably be engaged and will focus their attention on the activity to a greater extent than on an activity in the textbook, where the presentation is always the same.

Relevance according to Keller, refers to “...the learners’ perception of personal need satisfaction in relation to the instruction, or whether a highly desired goal is perceived to be related to the instructional activity” (Keller, 2008: 177) as well as “it is also necessary for learners to perceive the instructional requirements to be consistent with their goals, compatible with their learning styles and connected to their past experiences” (Keller & Suzuki, 2004: 231). Both these explanations for the inclusion of relevance in the model refer to the *relevance* of goals. In many other works, relevance is interpreted primarily in terms of content (Kember, *et al*, 2008).

Experience is mentioned as the first relevance strategy (cf. Table 2-2). Against the background of this study, it should appeal to learners if they realize their engagement with a vocabulary learning app on their PMD builds on their existing skills of interacting with a PMD. The analogy between the subject material in the textbook and the app also addresses previous experience. The interest learners show for engaging with their PMDs, can play an important role to emphasize the relevance of vocabulary learning activities on their PMDs. Another component of relevance for both the textbook and the app is to determine if the presentation of the content is offered in a way that is familiar and easily understandable, given learners’ prior experience.

Table 2-2: ARCS Relevance component

Relevance	
R1	Goal orientation Experience
R2	Motive matching Present worth
R3	Future usefulness
R4	Need matching
R5	Choice

Adapted from Keller (2007:4)

To present worth is mentioned as the second relevance strategy. This strategy aims at explicitly stating the intrinsic value of learning the specific content, in this case vocabulary through the textbook or the vocabulary learning app. The usefulness of a wide English vocabulary (i.e., size and depth) as well as the availability of information through the app may be emphasized. This connects closely with the third motivational relevance strategy, namely *future usefulness*.

Teachers endeavour to convince learners that an activity is relevant to future usefulness as well as showing them that it builds on their existing experience.

Need matching is the fourth relevance strategy. It suggests that relevance can be achieved through the way something is taught, thus focusing on the process rather than the outcome the teacher hopes to achieve (Keller, 1987). This should be very applicable for learners when they engage with a PMD. Through the interaction with a learning app, their needs and preference for engagement with a mobile device may be met and a feeling of relevance may be perceived (Farley, H *et al.*, 2015).

Choice is the final relevance strategy for discussion. A vocabulary learning app offers the opportunity of an alternative supplementary learning method. Learners may be motivated to learn vocabulary through their PMDs as they constantly engage with their PMDs anyway.

Confidence is the motivation variable which addresses the need for a learner to have a sense of self-worth and refers to learners' perception of whether or not they will be successful at the activity. Differences in confidence can, according to Keller (1987), influence a learner's persistence and accomplishment. Successful people often attribute their success to ability and effort instead of luck or difficulty (Weiner, 1974; Dweck, 1986). Successful people also involve themselves in the activity and enjoy it, regardless of possible mistakes. Confidence can be developed by offering positive learning experiences to learners (Godwin-Jones, 2009). In the case of this study, the purpose is to determine whether the use of the textbook / PMDs for vocabulary learning has a positive effect on learners' confidence: Is the learner able to do the activity on his or her PMD?

The first confidence strategy to obtain this outcome is *learning requirements* (cf. Table 2-3). Whether engaging with the textbook or the app, the learner must know what the learning goals are. Self-evaluation is also an important aspect of this strategy and the vocabulary learning apps, which offer ample opportunities for self-evaluation and repetition, are ideal for this purpose.

Table 2-3: ARCS Confidence component

Confidence	
C1	Learning requirements
C2	Difficulty
C3	Expectations
C4	Attributions
C5	Self-Confidence

Adapted from Keller (2007:4)

The second and third strategy to ensure confidence in learners is *difficulty* and *expectations*. The two are closely related as both focus on the learner's ability to accomplish the desired tasks successfully. As learners are already familiar with certain technology, learning apps that are based on the same design enhances the confidence of learners when engaging with their PMDs. The textbook as well as the vocabulary learning app should offer material in an increasing level of difficulty to ensure that learners feel that they will be able to achieve what is expected from them. Given the fact that learners constantly engage with their PMDs, it should not be too difficult for the teacher to instil confidence, especially if learners are allowed to take it step by step. When referring to the textbook – can the learner confidently find the required information in the textbook?

Learning success can also be linked to personal effort and ability when engaging with the textbook or choosing an application for vocabulary learning. Fear of failure may be considerably reduced when learners feel that they have control over their own learning. These attributes are underpinned by the fourth and fifth confidence strategies, namely *attributions* and *self-confidence*. If learner success is attributed to effort, learners will more likely experience self-confidence.

Satisfaction is the final dimension of Keller's ARCS model. According to Keller (2000:2), "If the learners are attentive, interested in the content, and moderately challenged, then they will be motivated to learn". Keller argues that motivation will be short-lived in the absence of learner satisfaction. Satisfaction with the textbook is directly addressed in one of the research questions and is therefore an important category in relation to this study.

The first strategy to accomplish satisfaction is *reinforcement* (cf. Table 2-4). The teacher should encourage and support the learner to engage in the learning activities, in the case of this study the learning of vocabulary using an app on his / her PMD or with the textbook. Another very positive aspect is to allow a learner who has mastered the activity to support and assist a struggling learner.

Table 2-4: ARCS Satisfaction component

Satisfaction	
S1	Reinforcement
S2	Extrinsic and intrinsic rewards
S3	Positive outcomes
S4	Negative influences
S5	Scheduling

Adapted from Keller (2007:4)

Extrinsic and intrinsic rewards is the second strategy to ensure satisfaction. This can be well-applied when learners have completed their normal textbook activities and are then rewarded with time to engage with the vocabulary learning apps on their PMDs. An example of extrinsic rewards in the context of this study is the bonus points or rewards offered when certain levels in the app have been reached.

The third satisfaction strategy refers to *positive outcomes*. Research results have shown that mobile learning gives learners and teachers a sense of satisfaction, especially when the technology was easy to use, helpful and relevant to their learning (Chin & Chen, 2013). Verbal praise can be given for class activities completed successfully in the textbook or on the PMD. Personal attention by the teacher in this regard is crucial, as well as informative and helpful feedback. Reasons given by learners on what increased their motivation when learning with a PMD, was the convenience of accessing material where- and whenever they wanted, the concise and easy-to-understand layout of the apps as well as the negative attributes of the textbook such as the weight and “wordiness” that was not a factor when engaging on a PMD (Nihalani & Mayrath, 2010).

The fourth strategy warns against *negative influences*. Here it is very important, in the context of this study, not to threaten learners as a means of obtaining performance. The teacher should, for example, not threaten the learners that if they do not complete the work in the textbook, they will not be allowed to learn with the vocabulary app on their PMDs. In the same way, learners should be motivated through positive attention to engage with the app when the opportunity is there, instead of practicing negative surveillance to check if they are not busy with something else.

The final satisfaction strategy is *scheduling*. Whenever learners are engaged in a new activity, in the case of this study learning vocabulary on a PMD, enough and regular opportunities should be afforded for reinforcement. The teacher should determine and vary this schedule to support the learners. This will not only build confidence, but will also give a feeling of satisfaction with the learning progress that is being achieved.

Through its ability to capture attention, promote relevance, improve confidence and increase satisfaction, mobile learning seems to have the potential to contribute extensively to learner motivation (Mac Cullum, 2010).

A selection of studies, of which the aim was to examine the effectiveness of the ARCS motivational model, were considered by the researcher. The attention component was addressed in a study by Arnone and Small (1995) who held the opinion that the ARCS model could provide teachers with a way to arouse and sustain curiosity for the use of computer-based learning. The relationship of the construct of curiosity to each of the ARCS components, as well as its

motivational value, was examined. Although typically curiosity is linked to the attention component, the study was able to point out that every component of ARCS contributed to the successful arousal and sustaining of curiosity (Arnone & Small, 1995:8) as well as an enhancement in the intrinsic motivation for learning.

A study by Thaer and Thaer (2016) aimed at examining the effect of the ARCS model on the Achievement Motivation (AM) of grade ten learners. Two groups studied the same module with the use of two different methods, an ARCS model and a traditional model. The results showed that there were significant differences regarding attention between the two groups due to the implemented ARCS motivational model. The group where ARCS was implemented showed a definite increase in attention. This builds on the findings by Laszlo and Kupritz (2003) that strategies to maintain interest and curiosity are essential for an effective learning process.

In a study focussing on the confidence component, Huett (2006) found that the performance of undergraduate learners in terms of learner confidence improved through the utilization of the ARCS motivational model. Song and Keller (1999) developed CAI (Computer Assisted Instruction) in accordance with the ARCS model. This led to higher motivationally-adaptive effectiveness and achievement, efficiency as well as overall motivation, perceived motivation and motivation to continue. Both learner motivation and achievement in a science research project increased significantly when the ARCS motivational model (Feng & Tuan, 2005) was employed. In a study with a slightly different aim but which still points at the motivational value of ARCS, Malik (2014) found that the ARCS model offered support to organizations to overcome dropout, low passing percentage and motivational problems of distance learners. In a study conducted by Astleitner and Lintner (2004), ARCS-strategies led to positive effects on different motivational indicators of self-regulated learning compared with a text without any motivational features.

The above selection of studies indicates that the ARCS model has been used in many research settings, including the traditional classroom, assisted instruction, blended learning environments and online education. There is still a lack of studies that incorporate ARCS into mobile-assisted language learning, and this is what will be done in the current study. Furthermore, the focus of the mentioned studies in all cases was on the increase in motivation when the ARCS model of instructional design was used compared to traditional methods. In this study however, the ARCS categories will be used to determine their value when comparing two constructs, namely the textbook and the mobile application on a PMD. Due to the fact that the ARCS model is above all a motivational model, the concept of motivation will be explored in the next section.

2.3 Motivation

2.3.1 Defining motivation

Motivation is a very wide field which includes numerous different theories that all endeavour to address the essence of motivation. Early perspectives viewed motivation inseparable from inner powers like instinct, traits and will (Pintrich & Schunk, 2002). Words like “self-efficacy” (Bandura, 1997), “intrinsic *versus* extrinsic” (Deci & Ryan, 2006), “self-determination” (Deci & Ryan, 2010) and “expectancy” (Vroom, 1994) are only a few of the words associated with the many different theories. Modern cognitive views suggest that the thoughts, beliefs and emotions of individuals all influence motivation (Pintrich & Schunk, 2002). A concept that emerges in most of these theories is the recognition of internal and external dimensions of motivation. Intrinsic motivation has been outlined as referring to the individual’s preparedness to engage in an activity for no other reason than pleasure, curiosity or interest (Shroff & Vogel, 2009). Extrinsic motivation on the other hand depends on external rewards and encouragement (Hidi, 2000; Rovai *et al.*, 2007).

Pintrich and Schunk (2002) offer a general definition for motivation which they believe captures most of the crucial elements of motivation as considered by researchers, namely

Motivation is the process whereby goal-directed activity is instigated and sustained (Pintrich & Schunk, 2002:5).

Most of the words in this definition are laden with meaning. The fact that motivation is described as a “process” focusses on the fact that motivation is not a product. A process cannot always be viewed simplistically as having a beginning and an end - rather it is a series of choices, action and desires. The next word of importance is “goal-directed”. This means that the individual has something in mind that he or she is striving towards. Motivation furthermore requires some form of “action”, be it mental or physical. In a learning situation the actions will be directed towards accomplishing the desired goal. The last two meaningful words are “instigated” and “sustained”, indicating that motivation starts with some form of commitment that must then be kept up until the goal has been attained. Dörnyei and Skehan (2003: 614) assert that motivation is “responsible for why people decide to do something, how long they are willing to sustain the activity, and how hard they are going to pursue it”. This is a viewpoint that connects motivation to teaching and learning. Keller (1979) did a comprehensive study of motivational literature and identified a number of common motivational factors which were then developed into the ARCS model, as discussed in section 2.2.2 of this study. These four categories, namely attention, relevance, confidence and satisfaction, or components of them can be recognized in other theories and studies on motivation in education.

2.3.2 Motivation in teaching and learning

Motivation of learners is an important component of successful teaching and learning. According to Schunk (1991), motivation can influence what, when and how we learn. Schunk (1991) furthermore reiterates that motivation plays a reciprocal role when it comes to learning and performance: If a learner is motivated to learn, he will most likely perform well. On the other hand, if a learner performs well, he will be motivated to learn. Motivated learners are more likely to succeed in their learning compared to learners with low levels of motivation and are therefore more likely to disengage (Alderman, 1999). Furthermore, learners who are motivated to learn, regularly experience that when they have started and taste success, they are intrinsically motivated (Meece, 1991).

Intrinsic and extrinsic motivation are no longer believed to be opposed to each other as was suggested by the self-determination theory and Harter (1981). Both intrinsic and extrinsic motivation are expected to influence the way in which learners approach their work. If a learner works hard to be the number one in his or her class, the driving force is considered to be extrinsic motivation. If a learner however finds the work so interesting that he or she willingly engages with it, the learner is seen as intrinsically motivated (Green & Sulbaran, 2006). Learners who are intrinsically motivated are likely to be more independent in their learning patterns and are likely to study new information on their own. These learners often experience a sense of satisfaction and are motivated to engage with the learning material even more (Schunk, Pintrich & Meece, 2008).

Learning environment is another factor that should be taken into consideration where motivation is concerned. According to Keller (1979), external conditions can be successfully constructed to facilitate and increase learner motivation. A motivational learning environment is a place where learners feel respected, mutually connected, intellectually challenged, and perceive to be learning something of personal relevance and value (Csikszentmihalyi & Csikszentmihalyi, 1988; Keller, 1987; Wlodkowski, 2003). A learner-centred learning environment is also more likely to ensure the motivation of learners (Vovides, Sanchez-Alonso, Mitropoulou & Nickmans, 2007).

One way of viewing motivation in teaching and learning is referred to as “indexes of motivation” (Pintrich & Schunk, 2002). These indexes pertain to the behavioural indicators of learners. The first such indicator is *choice of task* or *interest*. What learners choose to do when they are free to express their own desires, is where their actual interests lie. The next indicator is *effort*. Learning is not always easy and the level of motivation can be observed through the effort a learner is prepared to expend in order to reach the set goal. This indicator becomes more relevant as the difficulty of the task increases. Corno and Mandinach (1983) distinguished between physical and cognitive effort for different types of tasks. The third indicator is *persistence* or time spent on a task. The presence of persistence when difficulties are encountered is an even stronger indicator

of learner motivation. The final indicator, namely *achievement*, can be seen as the culmination of the previous indicators: If a learner is interested in a task, he will exert effort and be persistent in his quest towards achieving his goal (Pintrich & Schrauben, 1992). Interestingly enough, Brophy (1983) concluded that although the *choice* of activity exerted by learners is often expected to be an indicator towards motivation, it will not prove useful, as few teaching situations really offer that many choices to the learner.

The question which should be addressed next is why motivation in learning and teaching is regarded as so important. One of the reasons is that motivation has very definite effects on learners' learning and behaviour. Five of these effects are now referred to. The first effect of motivation is that it determines the specific goals toward which learners strive (Pintrich et al., 1993). Thus, it affects the choices learners make. The second effect is that motivation increases the amount of effort and energy that learners expend in activities directly related to their needs and goals (Csikszentmihalyi & Nakamura, 1989; Pintrich et al., 1993). It determines whether they pursue a task enthusiastically or apathetically. The third effect of motivation is that learners are more likely to begin a task they actually *want* to do as well as continue working at it until they've completed it, even if they experience temporary frustration and setbacks (Larson, 2000; Wigfield, 1994). A fourth effect of motivation on learner behaviour is that motivation affects cognitive processes and engagement in activities.

This process leads learners to understand the relevance of motivation in their own lives (Pintrich & Schunk, 2002). The last effect of learner motivation is that it often enhances performance. This is in direct response to the other effects just identified - goal-directed behaviour, effort and energy, initiation and persistence and cognitive processing. It is therefore not strange to observe that learners who are most motivated to learn and excel in classroom activities tend to be the highest achievers (Schiefele, Krapp, & Winteler, 1992; Walberg & Uguroglu, 1980).

Motivation in language learning specifically has also been explored and in many instances correlates with the above discussion of learner motivation in general. However, a new dimension is added as the acquisition of a first additional language (FAL) requires significant and sustained effort (Stevick, 1989) as the different learning activities, namely listening, speaking, reading and writing are inter-related and build on each other. For this reason, motivation is considered to be an essential and causal factor of language learning (Wlodkowski, 1985). Where second language (in this study referred to as FAL) learning is concerned, Gardner and Lambert (1972) explained FAL motivation in terms of three psychological concepts namely desire, effort and attitude. FAL learning motivation refers to the FAL learner's desire to learn the language, the effort that the learner puts into the learning, and/or their attitude towards learning the first additional language.

The current study aims to determine the motivational value of mobile-assisted vocabulary learning for English FAL learners. It is therefore clear that motivation is an important concept in this study. The mobile component is also added which will lead to other motivational factors being activated. The first motivational aspect relevant to mobile learning is perceived playfulness. A number of studies have examined the effect of perceived playfulness and the positive effect it has on the attitude towards mobile learning (Wang, Wu & Wang, 2009). The results show that motivation and enjoyment are strongly related. These findings suggest that when mobile learning is perceived as enjoyable, learners will be motivated and have a positive attitude. The enjoyment of the learning activity is relevant to the current study as enjoyment has a direct influence on attitude towards the activity.

The second motivational factor relevant to mobile learning in particular is perceived control. Stylianou and Jackson (2007) found that if learners feel that they are in control, their level of comfort with technology will be higher and this may lead to a higher use of different applications (Morahan-Martin & Schumacher, 2007). The relevance of these findings pertain to the last research question of the current study, namely learner perceptions of the mobile-assisted vocabulary learning application in terms of motivational value – these perceptions may include the feeling of control when engaging with mobile apps.

Another motivational factor relevant for mobile learning is previous experience and the time a learner has engaged with the technology and applications. Learners who have engaged with mobile technology before will be more confident than learners who have never engaged with technology (Hasan, 2003). Learner experience with mobile learning has also been shown to influence their perception on the level of effort needed when engaging in mobile learning activities (Wang *et al.*, 2009). Theng (2009) also found that learners with prior experience in using mobile devices will perceive mobile learning apps as easy to use and this confidence will motivate them as they anticipate that they will experience satisfaction when completing the activity. The above findings are pertinent when it comes to the current research as questions on learner usage habits regarding PMDs as well as type of applications used can, against the background of these studies, be expected to influence the confidence and satisfaction levels when the learners engage with the mobile vocabulary learning apps on their PMDs. In turn, this will influence their attitude and motivation towards using the apps.

The above information is thus relevant to the motivation of learners and their reaction towards certain stimuli. The teacher, however, can also play an important motivational role in the teaching and learning process. This represents a whole new field of study, but this section on motivation will be incomplete without a few general comments on teachers and their role in motivation, specifically related to the current study on motivation in mobile learning as well as teacher attitudes towards mobile vocabulary learning applications.

Teachers can affect learner motivation in many ways. The first way a teacher can positively influence learner motivation is through proper planning (Pintrich & Schunk, 2002). This is specifically applicable when a new activity like using PMDs and mobile applications are explored - the teacher must be well prepared and know exactly when and where and how the activity will fit into the other learning activities. When learners perceive the usefulness and relevance of an activity and observe confidence from the teacher, they will be motivated to engage in the activity. A second important influence on motivation in a teaching situation is teacher-student interaction. One way of achieving this is through feedback on performance – in the case of this study discussing the satisfaction and achievement in the mobile-assisted vocabulary learning activities. A third and equally important influence on the motivation of learners by the teacher lies in teacher self-efficacy (Pintrich & Schunk, 2002). If the teachers believe in their own abilities, learners will experience confidence to perform tasks and expect to be successful. In this study this may prove problematic, as many teachers are inexperienced in using mobile apps for learning. This may lead to a lack of confidence resulting in a negative attitude towards the mobile-assisted learning activities.

All of the above information pertaining to motivation in the different learning environments emphasizes the important role of motivation in teaching and learning. Motivation is responsible for why learners choose to learn something, how long they are willing to continue and how hard they are prepared to work on it (Dornyei, 2001:9). The relevance of the current study lies in the attempt to determine the motivational value of mobile-assisted vocabulary learning in the context of a rural school in the North West Province of South African. The next section explores vocabulary.

2.4 Vocabulary

2.4.1 Defining vocabulary

Vocabulary can be broadly defined as knowledge of words and their meaning (Hanson & Padua, 2011). However, several aspects complicate this definition, for example the fact that words come in different formats – in print and oral. Printed vocabulary includes words that we recognize - sometimes from their context - and use in reading and writing. Oral vocabulary refers to the words that we use in listening and speaking. Another classification that has been recognized by scholars is between receptive and productive vocabulary. Receptive vocabulary refers to the words we understand through reading and listening and is usually a large number of words. Productive vocabulary, on the other hand, refers to a smaller number of words we use to communicate through writing and speaking (Lehr, Osborn & Hiebert, 2004). For the purpose of this study, vocabulary is defined as knowledge of words and word meanings in all four of the above mentioned versions – printed, oral, receptive and productive.

One of the core requirements of vocabulary in the context of this study, is that learners need certain kinds of words to be able to access the learning material applicable to their level a school. Textbooks often guide teachers in this regard and in South African schools, textbooks are designed according to the CAPS document (DoE, 2011) which guides language learning and provide teachers with explicit teaching and learning activities for language, the next section will focus on vocabulary acquisition as addressed in the CAPS policy document.

2.4.2 Vocabulary in CAPS

The four basic skills in language learning, as identified in the CAPS document (DoE, 2011), are Listening, Speaking, Reading and Writing. According to the CAPS Document (DoE, 2011), the instructional time allocated for First Additional Language in the Senior Phase (Grade 7-9) is 8 hours in a total of 54 hours available during a two week teaching cycle. Table 2-5 below indicates the language skills that are to be taught in FAL in South African schools as well as the suggested time allocation for each component.

Table 2-5: Language skills and time allocation for FAL

	SKILL	TIME ALLOCATION PER TWO-WEEK CYCLE
1	Listening and Speaking	2 hours
2	Reading and Viewing	3 hours 30 minutes (1 hour 45 minutes each for comprehension and literary texts)
3	Writing and Presenting	3 hours 30 minutes
4	Language Structures and Conventions	1 hour

Currently, as can be deduced from the time allocation as well as discussions with the teachers, much emphasis English FAL in South African schools is placed on the teaching of reading and viewing, as well as writing and presenting. This can be understood against the background of the importance of reading comprehension which is needed for successful studying and writing which is essential for communication on many levels. However, the figurative “cement” needed to master any of these four components is vocabulary. In this regard, Wilkins (1972) claimed that communication is possible without grammar, but not without vocabulary. Huckin, Haynes and Coady (1993) indicated that reading ability and vocabulary knowledge are two of the most important components of performance in a second language.

The CAPS document (DoE, 2011) provides extensive overviews of content as well as teaching plans for all four of the skills. The references to vocabulary in the document are as follows (DoE, 2011):

- Under the heading ‘Types of Listening and Speaking Texts’ (DoE, 2011:24) it is indicated that during unprepared speech learner should “use appropriate and effective vocabulary”.
- In the section on post-reading activities (DoE, 2011:27) the document states that “the text should be exploited for grammar and vocabulary learning”.
- The section on INTENSIVE READING states that the learner will “build vocabulary through word-attack skills and exposure” (DoE, 2011:33).
- Under 3.1.4 LANGUAGE STRUCTURES AND CONVENTIONS it is stated that “Learners also need a wide vocabulary, which is perhaps the single most important factor enabling a person to communicate well. A wide vocabulary is essential for all the language skills, but especially for reading and writing. The most effective way for learners to improve their grammar and increase their vocabulary is by reading intensively inside and outside of the classroom” (DoE, 2011:49).

These references to vocabulary recognize the importance of vocabulary learning. However, no practical guidelines are provided as to how a teacher should explicitly teach vocabulary in FAL. Teaching according to themes is suggested to make it possible to recycle vocabulary in meaningful contexts (DoE, 2011:55).

However, vocabulary entails more than knowledge of words and the use thereof in meaningful contexts, additional aspects of vocabulary need to be considered. According to Nagy and Scott (2000) learners require incremental vocabulary knowledge, meaning multiple exposure to a word in different contexts before it is “known”.

2.4.3 Vocabulary knowledge

Vocabulary knowledge is multidimensional as words can have different functions, multiple meanings and can connect to other words in different ways (Nagy & Scott, 2000). Knowledge of a word furthermore includes knowledge of the *meaning* of the word. This includes concepts and associations. The *form* of a word also entails several levels of understanding as it involves spelling, pronunciation and word parts. The third component of word knowledge involves the *use* of the word which includes a sensitivity towards nuance as well as social and cultural appropriateness of a word (Johnson & Pearson, 1984; Nation, 2001).

In addition, Qian (1998) identified vocabulary breadth and depth as two dimensions crucial in vocabulary knowledge. This classification was confirmed by other researchers such as Read

(2000), Wolter (2001) and Vermeer (2001), who have agreed to this classification of vocabulary knowledge.

Breadth of vocabulary knowledge refers to the size of a person's vocabulary knowledge (i.e., the number of words). Determining the breadth of vocabulary is not an easy task. Nation (2006) suggested that vocabulary knowledge of 8000 to 9000 word families is needed to enable wide reading. According to Hirsch (2003) and Sedita, (2005) learners should understand at least 90% of the words in a text, to adequately understand what they read (Hirsch, 2003; Sedita, 2005). Other researchers (Graves, 2006; Lehr, Osborn & Hiebert, 2004) suggest that learners should acquire 2000 to 3500 new words a year and should know the meaning of approximately 50 000 words by the time they reach grade 12 (Graves, 2006; Lehr, Osborn, and Hiebert, 2004). Vocabulary is of utmost importance, because poor vocabulary leads to misunderstanding of content and poor reading comprehension (Lin, 2002; Segler, Pain & Sorace, 2002).

Depth of vocabulary refers to in-depth knowledge of aspects like spelling, pronunciation and meaning, which add to the level of understanding of a word, necessary within different contexts. In some situations only basic knowledge will allow the learner to perform sufficiently, whereas other situations may require precise and detailed understanding of a word (Maartens, 2014).

To distinguish further between the different aspects of vocabulary knowledge, Cronbach (1942) as well as Richards (1976) developed frameworks of vocabulary knowledge. Nation (1990) used the work of Richards to tabulate a set of questions which reflect on four aspects specifically relevant to the vocabulary knowledge of FAL learners, namely

- i. Form: oral and written;
- ii. Position: grammatical pattern and collocations;
- iii. Function: frequency and appropriateness;
- iv. Meaning: concept and association.

This classification added valuable knowledge of and about words and is regarded as accessible to role players such as FAL teachers and learners (Qian, 1998). Several other researchers also explored this wide field of depth of vocabulary on first and second language level. Quin (1998) however regarded all the approaches as complementary and incorporated them in his attempt to define vocabulary knowledge by identifying four dimensions which are all intrinsically connected. These dimensions are:

- i. Vocabulary size: the number of words of which the learner has some superficial knowledge;

- ii. depth of vocabulary knowledge: this includes all lexical features such as phonemic, graphemic, morphemic, syntactic, collocational, semantic and phraseological properties, also register and frequency;
- iii. lexical organisation: the storage, connection and representation of words in the mental lexicon of the student;
- iv. automaticity of receptive and productive knowledge: the supporting processes to access word knowledge through encoding and decoding and semantic structures from the mental lexicon of the student.

These attempts at defining word knowledge and the suggestion of different dimensions prove that word knowledge entails more than just the recalling of meaning and that various aspects are related to this concept (Maartens, 2014). All of the above attempts at determining the exact nature of the concept of vocabulary offers proof of the importance of vocabulary teaching and learning activities.

2.4.4 Vocabulary teaching and learning

Vocabulary is an essential part of mastering a second language (in this study referred to as FAL) (Schmitt, 2008). However, as De Groot (2006) asserts, the best way of engaging with the vocabulary learning process remains unclear due to the wide variety of factors that must be considered.

There are different perspectives when it comes to the complicated process of vocabulary learning. One way is by viewing vocabulary acquisition as either intentional or incidental. Intentional vocabulary learning implies that learners put in the necessary mental effort and memorize words until they know their meanings (Koren, 1999). On the other hand, incidental vocabulary acquisition refers to vocabulary learning that takes place without specific intention and as a by-product of another action (Gass & Selinker, 2001) for example when reading a passage or listening to the radio.

The accepted importance of vocabulary in communication and learning situations has led to a diverse selection of teaching approaches to ensure sufficient vocabulary acquisition in first additional language (FAL). Earlier strategies focused on incidental vocabulary acquisition. In the 1940's, the audio-lingual teaching methods included limited vocabulary teaching (Coady, 1993). The assumption here was that increased exposure to the FAL would automatically lead to an increase in vocabulary. In the 1970's, the communicative approach with the focus on teaching language mainly through discourse was popular, again neglecting vocabulary learning (Coady, 1993). With the communicative approach, the assumption is that learners acquire vocabulary instinctively during learning and communicative processes (Coady, 1993). This approach however was actually intended for first language acquisition and cannot necessarily be applied to

FAL. A solution for effective vocabulary teaching and learning is still to be found and remains the focus of a lot of studies (Ellis, 2009). Various strategies, methods and suggestions as to how to increase the vocabulary knowledge of language learners have subsequently been explored (Pikulski & Templeton, 2004).

Nation (2001) explored intentional vocabulary learning through vocabulary learning strategies, which can be defined as the set of techniques or learning which students claim to use in order to discover the meaning of a new word, to retain the knowledge of newly-learned words, or to expand their knowledge of the English vocabulary (Intaraprasert, 2004:9). Nation (2001:217) provided the following components that should be included in vocabulary learning strategies:

- i. It must involve choice, that is, there should be several strategies to choose from;
- ii. It must be complex, that is, the learning process entails several steps;
- iii. It requires knowledge and benefits from training
- iv. It Increases the efficiency of vocabulary learning and vocabulary use.

In the South African context, a successful vocabulary learning strategy is still to be identified. Against the background of our weak academic performance (Spaull, 2013), the report by Becker (1977) should be regarded as important. He linked the importance of vocabulary size to the academic achievement of disadvantaged learners. He subsequently proposed that inadequate vocabulary was the primary cause of academic failure of learners in adverse contexts in grades 3 through to grade 12. His findings are substantiated in a more recent study by Nel and Müller (2010).

Vocabulary knowledge has long been associated with performance in reading comprehension. Unfortunately it seems as if this crucial component of vocabulary is still neglected in the policy documents of the South African Department of Education. The current study attempts to find a way to support vocabulary learning by suggesting vocabulary learning through an app on the PMD as supplementary tool in comparison to learning from the prescribed textbook only. If the current study yields results which indicate a positive learner and teacher attitude towards using mobile-assisted vocabulary applications as a supplementary learning tool, the study could prove relevant for increasing the vocabulary of learners in a pleasant and enjoyable way.

2.5 Mobile assisted language learning (MALL)

2.5.1 Defining MALL

Mobile devices play a central role in the life of learners. In South-Africa, the mobile penetration rate is 133% (Fripp, 2014), a penetration rate of well over 100% due to multiple subscriptions. Mobile access has changed the lifestyle of millions of people, giving them access to, amongst

others, communication, entertainment and education. The unique features of the mobile phone, also referred to as a personal mobile device (PMD), combined with the high penetration rate renders it suitable as a possible tool that can be used in education.

The characteristics of the PMD has led to, amongst others, the development of mobile learning (Thompson, 2013). The concept of mobile learning has been defined in several ways. Most of the definitions focus on the technological design features of the PMD. A widely accepted definition for mobile learning is “using mobile technologies to facilitate learning” (Hwang, 2011:E65). O'Malley *et al.* (2003) in their definition refer to any type of learning that takes place when the learner is not at a fixed location. The cardinal aspect of mobile learning which separates it from any previous form of learning is that learning is no longer confined by location and time (Mac Cullum, 2011). Anywhere and anytime learning is made possible by the portability of mobile devices (Chen, Hsieh & Kinshuk, 2005; Peters, 2009). The focus of several studies has been on how mobile learning can be used to support learners when they are removed from the classroom environment (for example Garrett & Jackson, 2006). Some of these studies have focussed on specific learning areas, for example the acquisition of a second language (Chinnery, 2006; Thornton & Houser, 2005). This subarea of mobile learning (mLearning) where mobile technologies are used exclusively for language learning is defined as Mobile Assisted Language Learning (MALL) by Kukulska-Hulme and Shield (2008).

A clear shift away from other technology, for example PCs, iPods or tablets towards the preferred use of mobile phones (PMDs) by learners is reported by Solemani, Ismail and Mustaffa (2014). Mobile technology has the potential to provide new as well as more learning opportunities. As it is, most learning environments already incorporate some kind of technology to assist teaching and learning (Harasim, 2000).

2.5.2 Developments in MALL research

The concept of MALL (mobile assisted language learning) was preceded by CALL (computer assisted language learning). Stockwell (2007) analysed publications on CALL from 2001 – 2011 and reported that vocabulary, together with grammar, was the preferred focus of CALL activities. Meta-analyses on MALL were conducted by Duman, Orhon and Gedik (2015), Wu *et al.* (2012), Baran (2014) and Burston (2015) for the period 2000 to 2015. These studies offer an important reference base for the research in the current study on the motivational value of mobile assisted vocabulary learning applications. The studies offer vast amounts of information but four results from these studies provide interesting information that pertain to the current study, namely the topic of language learning research; which technology is used in MALL studies, what methodologies are employed in MALL studies and what the overall results show about MALL in general.

The geographical distribution of MALL study locations is identified clearly as Asia-oriented: the majority of studies took place in the East Asian (respectively Taiwan, Japan, China), in Western Asian (Iran) and South/east Asian (India, Malaysia; Singapore) countries, followed by Turkey, USA, and the UK (Bozdoğan, 2015). There is a definite opportunity for South African studies with the focus on language - and vocabulary learning through mobile devices. This fact provides some perspective on the relevance of topic for the current study.

The results from the meta-analyses on MALL by Duman *et al.* (2015) on technological tools used in the MALL studies show that twenty-nine studies (41%) used mobile phones. The use of PDAs (Personal Digital Assistants) has decreased as mobile phones have become more sophisticated and PMDs have in recent studies completely replaced PDAs in MALL studies (Burstson, 2015). Against the South African background of a very high level of mobile penetration through all levels of society (cf. Chapter 1), the PMD has been chosen for research in this study.

The research approach used most in MALL studies was quantitative research (48%). The next most popular was mixed-method studies, being used in 25% of the studies. This finding is regarded as important as these studies combine the quantitative and qualitative methods to yield solutions for educational problems and issues (Duman, *et al.* 2015). Johnson and Onwuegbuzie (2004) also state that there has been a recent tendency toward the use of mixed studies in the field of educational technology, which is also evident in MALL studies.

Limitations of the studies were also reported. The biggest limitations pertain to the generalization of results due to sample size and short time of research. A lack of theoretically grounded work was also expressed. Physical properties of PMDs, like small screen size and keypads, as well as technical issues like connectivity were indicated as barriers. In studies where teachers were involved, they indicated that they stayed away from educational use of PMDs as they did not possess the necessary skills to integrate mobile devices into their teaching (Bozdoğan, 2015).

Regarding the commonly investigated topics, the outcome of these analyses show that vocabulary is by far the most popular skill to address via MALL (Wu *et al.* (2012; Duman, Orhon & Gedik, 2014; Burstson, 2015). A study by Demir and Basol (2013) found that studies in Turkey between 2002 and 2010 focussed on learner attitude towards technology as well. This confirms that since the earliest stages of the use of technology in language learning, vocabulary as well as learner perceptions, received attention.

A comprehensive number of studies on the perceptions and attitudes towards MALL were reviewed. The research results portray an overall positive picture on learning second languages via PMDs at all levels. The focus of vocabulary learning was varied, for example the effect of mobile learning (Agca & Özdemir, 2013; Liu *et al.*, 2014), retention of learning material (Alemi,

Sarab & Lari, 2012), positive attitudes of primary school learners towards mobile learning (Sandberg, Maris & de Geus, 2011; Wong & Looi, 2010), SMS use (Alemi, Sarab & Lari, 2012) and mobile dictionary integration into the classroom (Rahimi & Miri, 2014). The focus of the current study is on the motivational value of mobile-assisted vocabulary learning applications according to the ARCS motivational design model. Two constructs, namely the textbook and the mobile-app are compared regarding satisfaction, attitude and perceptions in terms of motivational value.

2.5.3 Development in mobile devices

The launch of the Apple iPhone in 2007 can be seen as a turning point in the development of mobile devices. Its success led competitors to create equally capable devices – Apple iPhone, Android devices and Windows Phone 7 have actually transformed phones into PMDs that can also make phone calls (Godwin-Jones, 2011). New generation smartphones have 3G or 4G connectivity, fast Wi-Fi, huge built in storage capacity and many superb extras like high-resolution cameras, voice recognition, recorders and GPS, to name but a few. These features all contribute to the multi-sensory experience needed for effective and exciting language learning. The mixture of different media and ways in which information is provided, leads to mobile devices becoming increasingly popular. The learner is also not exposed to public failure and can attempt an activity on his PMD as many times as preferred. Furthermore, the game-like features make using apps fun and activities can be done in short time-frames between other activities in any setting.

The most important positive factor of mobile learning is regarded by many researchers as the possibility of learning activities that can be undertaken at any place and at any time (Chen & Hsu, 2008; Hwang & Tsai, 2011). Klopfer and Squire (2008) define five characteristics of mobile devices which make them extremely suitable learning devices: portability, social interactivity, context sensitivity, connectivity and individuality.

Portability refers to the fact that the PMD can be taken to any location and can be moved whenever desired and is therefore a tool for ubiquitous learning. This is in part a result of the size and weight of the device which makes it suitable for the learner to take it along where ever he or she goes. Trinder (2005) supports this concept by stating that more emphasis should be placed on mobile devices and the availability of free Wi-Fi connections that are getting more accessible every year.

Social interactivity means that information can be exchanged between devices and learners can cooperate with one another if desired. PMDs makes collaborative learning possible. That is, different learners are able exchange their knowledge, skills and attitudes through interaction. Collaborative learning helps the learners to support, motivate and evaluate each other to achieve substantial amounts of learning. This property is almost absent in other kinds of learning (Trinder,

2005). What is important, here, is the communication between the learners, as an important factor in language learning is the interaction in the target language (Yang, 2005).

Context sensitivity suggests that both real and virtual information can be collected. Very basically, it refers to the surrounding where the PMDs is used (Klopfer & Squire, 2008). With regards to the study of PMD use for vocabulary learning, it implies that the device can be used in an infinite number of locations - in the classroom, outside the classroom but still on the school grounds, as well as any other location where the learner chooses to take the device. This offers many opportunity for different types of activities, initiated by either the learner, classmates or the teacher.

Connectivity indicates that the PMD can connect to the internet as well as with other devices to access information. This is important when engaging with applications which, once downloaded, can be used off-line and learning can continue even if the learner does not have access to the internet at any given moment (Kim *et al.*, 2013).

Individuality means that accessing material on a PMD can be learner specific, according to personal need. This implies that every learner can have a tailor-made learner experience suitable for his / her exact needs and level of understanding. This could prevent possible boredom (when activities are too easy) or anxiety (when activities are too advanced) (Klopfer & Squire, 2008).

Applications refer to software and mobile applications that are being developed at an extremely fast rate. This software supports the learning potential of the continuously evolving hardware and open up an endless variety of material suitable for educational purposes. In May 2013, the number of apps downloaded from the iTunes App store alone reached 50 billion, and there is a wealth of language apps available (Rosell-Aguillar, 2014). Godwin-Jones (2011) has compiled a resource list of applications that can be used for language, and specifically vocabulary learning to assist teachers and learners in selecting suitable learning apps. Many of these applications can simply be downloaded for free from the Apple iStore or Android Play store. Although these learning applications do not directly link with the content, format or methods used by the prescribed textbooks, they can be used successfully as a supplementary tool for vocabulary learning, as vocabulary knowledge need not be limited to specific content or contexts. For this study, applications suitable for vocabulary learning were downloaded and introduced to learners as will be explained in Chapter Three on Methodology.

2.6 The Relationship between motivation, vocabulary learning and MALL

2.6.1 Vocabulary learning and technology

Since the development of technology, vocabulary can be learnt in two ways, namely with technology or without technology (Zhang, Song & Burston, 2011). Traditional methods without technology include learners learning vocabulary through indirect and direct exposure to words in a variety of language contexts. For example, learners can learn vocabulary indirectly when they engage in conversations with others, through reading aloud, and through independent reading (Armbruster, Lehr, & Osborn, 2001). There are numerous studies on learning vocabulary by means of computer mediated communications (CMC) technologies (e.g. Jones & Joiner, 2003; Tsoua, Wang & Li, 2002; Yeh & Wang, 2003). These technologies preceded mobile devices but the results of these studies already demonstrate that vocabulary learning with computers can be more effective than using traditional methods (Tsoua, Wang & Li, 2002) or using traditional tools like dictionaries (Lu & Ng, 1998) or vocabulary lists (Nakata, 2008).

As technology developed, the next logical step was to engage the new mobile technology in language and vocabulary learning. Findings of these studies indicate that vocabulary learning via mobile devices and other smart phones is more effective than learning via traditional settings and methods because the distributed or spaced presentation and repetition of lexical items that accompanies mobile-based learning is more effective than the massed repetition that accompanies traditional book-based, self-regulated vocabulary learning (Nation, 2001; Thornton & Houser, 2005; Zhang *et al.*, 2011). The studies on vocabulary learning which were explored are divided into two groups – the first group focusses on the concept and method used for mobile vocabulary learning (cf. 2.6.2) and the second group represents studies that are mainly concerned with the motivational aspect of mobile vocabulary learning (cf. 2.6.3).

2.6.2 Empirical studies on vocabulary learning with mobile applications

The focus of the studies on vocabulary learning through a PMD are varied - some are interested in vocabulary retention, others in performance compared to other methods of learning, and some on motivation. In a study, *Learning on the move: Vocabulary Study via email and Mobile phone SMS*, by Thornton and Houser (2001), six target words per week were sent for four weeks via SMS to university learners. Compared to learners studying the same words on paper or via PC, the SMS lessons resulted in significantly greater learning.

The same two researchers undertook another study in 2005 in which they used mobile phones to teach English at a Japanese university, comparing web-based with SMS-based learning. The results indicated that learners who learned by SMS remembered over twice the number of vocabulary words as the learners who learned through the web-interface. The conclusion was that the SMS-based lessons had been more effective because they were delivered as push

media, rather than passive email messages. This motivated the learners to rehearse more frequently which resulted in better retention of the material.

Sending e-mail or SMS to learners is a common way of learning new vocabulary based on the lessons covered in the classroom. In their study, Kennedy and Levy (2008) gave the learners the option to receive messages covering known words in new contexts through SMS to their mobile phones amounting to nine or ten messages per week. The results indicated that the messages were very helpful for learning vocabulary. In a similar study, Thornton and Houser (2005) sent short mini-lessons for learning vocabulary through e-mail to mobile phones of the learners three times a day. They used new words in multiple contexts for the learners to infer the meaning. The results showed an improved range of scores on post-tests which were very positive.

There are also other known strategies for learning vocabulary via mobile phones. Learners can be provided with some tailored vocabulary practices based on activities performed in the classroom. They are then asked to complete them on their mobile phones and send them back to their teachers. Learning vocabulary can also be accompanied by pictorial annotations shown on learners' mobile devices for better understanding of new words. In a study conducted by Chen and Hsu (2008) learners were provided with verbal as well as pictorial annotations for learning English vocabulary. Results of a post-test showed that the pictorial annotations assisted learners with lower verbal and higher visual ability to retain vocabulary.

Chen, Hsieh and Kinshuk (2008) undertook a study using SMS and MMS messages for the study of English vocabulary. The experiment was conducted among 160 learners from the Industrial Technology Education Department in Kaohsiung. The learners were divided into four groups of 40 learners each, based on a pre-measurement of their short term memory (STM) capacity for their verbal and visual learning capabilities. The study addressed particularly the issue of content adaptation for four different cognitive types of learners. In the experiment, all participants received the same 24 questions, divided equally into the four types of annotations: words only, words with written annotation, words with pictorial annotation and words with both written and pictorial annotations. The results showed that providing learning content with pictorial annotation in a mobile language learning environment helps learners with lower verbal and higher visual ability, while the provision of learning content with both written and pictorial annotation helps learners with high verbal and visual ability.

Several other studies (Clarke, Keing, Lam & McNaught 2008; Lu, 2008; Cavus & Ibrahim, 2009) also used the concept of sending vocabulary via SMS and testing the progress in comparison to a control group using traditional methods of vocabulary learning (e.g., printed lists that have to be memorized from textbooks and class tests written in class). The attitudes of learners taking part in this research were studied. The studies yielded the following results: The study by Clarke *et al.*

(2008) showed that 84% of the participants found the use of mobile phones for vocabulary learning positive, 83% indicated that they enjoyed it, however, none indicated a willingness to use the system if they had to pay for it. The respondents in the study by Cavus and Ibrahim (2009) indicated a very high level of approval, enjoyment and satisfaction with the possibility of learning with the help of mobile phones. In the study by Chen and Li (2010), 94% of participants showed vocabulary gains compared to the 67% of non-mobile phone users.

A study by Choi and Joeng (2010) investigated the effect of long message service (LMS) instead of short message service (SMS). In the study LMS vocabulary lessons with teacher-learner communication were offered via interactive messages. The lessons proved to be more effective than using paper materials. In a slightly different variation to the previously described studies, in a Canadian study by Ally, Tin and Woodburn (2011) involving French Second Language (L2) learners, mobile phones were used to access web-based grammar and vocabulary lessons. The content also included self-tests that could be taken to measure progress. Participants indicated that they found the lessons useful and wanted more lessons in this online format.

Alemi, Sarab and Lari (2012) conducted a study using a mobile phone-based SMS vocabulary programme for English second language learners in Iran. Twenty-eight university learners received ten words and an example sentence twice a week via SMS. The control group studied the same words using a dictionary. The SMS group showed significantly better vocabulary retention in a delayed post-test.

In all of the above mentioned studies vocabulary was sent in different forms to learners via SMS. Some used word lists, others mini-lessons and in one study pictures was added to see if it would influence vocabulary retention. Another study compared the effect of SMS and LMS messages. All of the studies compared the mobile method with the traditional method of learning from a book or paper list to determine the effect of mobile vocabulary learning. With regard to vocabulary learning, all studies reported better retention, higher test scores and improved vocabulary when using the mobile vocabulary learning method. Pertaining to learner perceptions, increased motivation, positive attitude, enjoyment and satisfaction with the mobile vocabulary learning method was reported.

Some negative aspects were also revealed through the SMS studies. Begum (2011) did a case study to determine the potential of sending SMSs on mobile phones as a language learning tool in an English Second Language class in Bangladesh. Except for the positive attitude of participants, problems regarding cost, small screen size and lack of teacher training came to the fore. A study by Wang and Smith (2013) yielded similar results, namely that unless mobile-assisted learning tasks are compulsory and monitored or graded as a course work, learners are reluctant to be engaged in such tasks. Therefore, these researchers claim that if MALL activities

are to be integrated into the course, it should either be a core requirement to be graded or enjoyable, user-friendly activities that do not demand too much time and effort. Another issue raised was the learner hesitancy to use mobile devices for educational purposes that are generally perceived as personal and private.

With regard to the current study, the method of sending SMSs was not considered. Mobile vocabulary applications are regarded as a more novel and exciting concept and also avoids repeating research that has already been done in many different contexts. Another difference is that in the majority of the above studies the function of mobile vocabulary learning is to utilize the mobility of the PMD to access information anytime and anywhere and to determine learner reaction to this method. This is not the main purpose of the current study - the focus of the current study is specifically on mobile applications and their motivational value as a supplementary vocabulary learning tool. As such the studies cannot be compared regarding content, however, when it comes to the next section on motivation, more similarities may be recognized.

2.6.3 Empirical studies on motivation in mobile language and vocabulary learning

Lu (2008) interviewed learners at the end of a seven week period of mobile vocabulary learning. The information gained through interviews showed that generally learners had positive attitudes towards mobile vocabulary learning and liked to continue learning vocabulary with the aid of mobile devices.

Chang, Yan and Tseng (2012) conducted a study to determine whether convenience, as one of the features of mobile learning, influence learners' attitude towards using a PMD for learning English. During the research period of two weeks learners were introduced to the learning application, they engaged with it freely for two weeks and then completed a questionnaire. Results revealed that perceived ease of use of the mobile device positively affects the attitude towards use, intention to continue using this method of learning as well as perceived usefulness.

Another study incorporating the ARCS motivation questionnaire to determine learner motivation and performance by using a mobile learning tool in a situational English vocabulary learning environment was done by Huang and Shadiev (2014). The results show that the learning motivation and performance of learners using the PMD were superior to those using the traditional learning tool. Significant differences were recorded for two of the ARCS components of motivation, namely attention and satisfaction.

Research by Azar and Nasiri (2014) had two objectives: to compare the effect of PMD based audio textbooks with traditional delivery methods on the listening comprehension of Iranian EFL learners and also to determine the attitude of these Iranian EFL learners towards MALL. The results showed that the group receiving instructions through PMD performed better than the

control group. Regarding the attitude of the participants, they experienced the use of a PMD for listening activities interesting and more effective than the traditional method. They also referred to the ease of access, portability and ubiquitous features as motivating factors.

A study by Huang *et al.* (2016) developed a five-step vocabulary learning strategy and a mobile learning tool in a situational English vocabulary learning environment. The aim of the study was to assess the effect on motivation and performance when utilizing the mobile learning tool (utilized by the experimental group) in comparison to the traditional learning tools (utilized by the control group) when learners were given identical vocabulary. The results yielded significant differences in the attention and satisfaction dimensions between the experimental and control groups. Regarding attention, the experimental group indicated that they were more distracted than the control group who were inside the classroom without hindrances. Regarding satisfaction, the experimental group experienced the mobile learning tool as easy to use and they found mobile learning interesting and enjoyable.

Several researchers have also explored the attitude and motivation of learners when game-based apps are used for vocabulary and language learning. Liu and Chu (2010) conducted a study to determine how language learning with ubiquitous games influence achievement and motivation when learning English. The learning activities were designed according to the ARCS motivational model. During the study, tests, a survey, and interviews were conducted with the learners. The results of the learning outcomes and learning motivation revealed that incorporating ubiquitous games into the English learning process could achieve better learning outcomes and motivation than using non-gaming methods as well as a positive relationship between learning outcomes and motivation.

Mitchell and Saville-Smith (2004) argue that computer games are engaging and seductive, assuming a well-designed game which motivates the player to continue using rewards and feedback. Schwabe and Göth (2005) describe the design and analysis of a hide-and-seek mobile game exploring the opportunities to support learning through an orientation game in a university setting. Their evaluation shows that features such as map-navigation and “hunting and hiding” lead to excitement and fun. The game success is based on the motivating design of the game itself.

Sandberg *et al.* (2011) conducted a research project where primary school learners used a game-base application in a real-life situation. Afterwards the attitude of the teachers as well as the learners’ motivation were evaluated. The parents were also engaged to assess the motivation of their children to play the game at home. Regarding the research results pertaining to the learners, the study showed that the mobile application motivated learners to use it despite certain limitations. Furthermore, the results indicated that the children can learn just as well outside of

the classroom, in their spare time, as at school. This is an interesting finding in itself. It suggests that formal learning at school can be complemented by non- and informal learning (Sharples, 2000).

Although the teachers had a positive attitude towards the use of technology, two of them expressed a lack of confidence in their own level of proficiency in handling the computer or a smartphone. Sandberg *et al.* (2011) argue that teacher confidence, as well as acceptance of non-formal and informal learning cannot be taken for granted. Teachers have to get used to the idea that the school is not the sole source of learning and they have to be willing to acknowledge the value of non-formal and informal learning.

The results relevant to motivational aspects in the above studies are overwhelmingly positive: positive attitudes from learners, enhanced motivation, enjoyment and interest are reported in all of the studies. In the studies which utilize the ARCS motivational design model, the two components which represent the biggest differences when compared to traditional vocabulary learning methods are attention and satisfaction. Lack of confidence is reported amongst teachers in one of the studies where teacher attitudes were also evaluated.

Motivation is a complex concept which impacts on all human behaviour and activities, including teaching and learning. The ARCS motivational design model by Keller (1987) identifies four categories which impacts on motivation, namely attention, relevance, confidence and satisfaction. These categories are utilized to determine the motivational value of mobile-assisted learning in the current study. Mobile-assisted vocabulary learning is the subject matter to be explored in this study. This use of mobile technology for teaching and learning has become a reality with the development of MALL and the rapid improvement of devices as well as applications. PMDs are regarded as effective tools for delivering language learning materials to learners (Thornton & Houser, 2005). However, the attitude of role players such as teachers and learners have to be determined to ensure successful implementation.

The majority of reviewed studies have only used SMSs to determine the effect of mobile vocabulary learning. This study, which uses mobile applications as a means to support vocabulary learning in general as well as enhance the motivational value of mobile vocabulary learning, aims to fill this gap in the literature. Furthermore, the four categories of the ARCS motivational design model will be used to assess the motivational value of these mobile applications in comparison to the textbook. The study furthermore aims to fill the gap which exists in the field of mobile vocabulary learning within a specific school in the North West Province.

2.7 Summary

In this chapter an overview of the theoretical framework as well as the three main concepts represented in this study was given. The principles of the expectancy-value theory form the basis for the ARCS motivational design model which is used as grounding theory for this study. Motivation, vocabulary learning and mobile assisted language learning are the three inter-related components of the research topic, namely the motivational value of mobile-assisted vocabulary learning applications for English FAL learners. Motivation in general as well as motivation in teaching and learning was discussed. Different components of vocabulary as well as the processes involved in teaching and learning were explored. Finally, mobile assisted language learning (MALL) was defined and the development in this field was discussed as well as the implications for vocabulary learning. In conclusion an attempt was made to explain the relationship between the different components by referring to relevant studies.

In Chapter Three the research methodology of this empirical study is discussed.

CHAPTER 3 RESEARCH METHODOLOGY AND DESIGN

3.1 Introduction

The research methodology and design are important for any study as it structures the content and supports the specific research paradigm of the study (Hofstee, 2015:110). The purpose of this chapter is to explain the research methodology and design used in this study to gather information and draw conclusions about the motivational value of learning English vocabulary by using mobile supported applications as experienced by learners.

This chapter provides the outline for the empirical research process of a systematic and focussed investigation according to the following topics: research paradigm, research approach, research design, sampling, data collection methods, data collection procedures and the analyses of the data as well as the quality assurance and the ethical considerations regarding this study.

3.2 Literature review

The function of a literature review is to find and describe theoretical perspectives and previous research findings regarding the topic of research (Leedy & Ormrod, 2005:64). The literature review process began with identifying keywords linked to the topic of research. These identified keywords are *English FAL*, *mobile learning*, *motivation* and *vocabulary learning*. As suggested by De Vos (2011:139), all available standard reference sources such as the internet, journal articles, scholarly books, abstracts and indexes, computer-accessible databases, research reports and peer-reviewed articles were searched according to the identified keywords.

The NWU library offers a powerful search platform through the electronic interface Onesearch which automatically searches through many databases such as EBSCHO Host, RSAT, SABINET and NEXUS, to name but a few. In addition, Google Scholar database, as well as the catalogue of the NWU library was also consulted. The reference lists of relevant articles were also thoroughly searched for additional relevant information pertaining to the identified themes. The research process furthermore entails focussed reading and sifting through all the information to obtain the maximum amount of information relevant to the current study. This approach is supported by Leedy and Ormrod (2005:65) who suggest that the researcher should endeavour to cover an extensive scope of the literature on the topic being researched.

Once an extensive amount of literature pertaining to the topic had been studied, the next step was to critically evaluate and integrate all information, methods and conclusions. Research findings indicate that since the emergence of technologies in the classroom, the shift from other technologies like Personal Computers (PCs), laptops and Motion Picture Experts Group Layer-3

sound file (MP3) players towards Personal Mobile Devices (PMDs) has been taking place. This has led to a significant number of studies focussing on how to integrate PMDs into the classroom and adapting a new learning culture as educators all over the world recognise that the presence of a technological generation of learners cannot be ignored any more. Vocabulary being one of the key elements of successful FAL acquisition, a number of sources refer to comparative studies on vocabulary acquisition with and without the assistance of PMDs. The focus of a vast number of studies concerned with mobile learning is on the technical specifications of programmes to be used in the classroom. Research findings furthermore revealed a definite link between motivation and successful learning. Through the literature review the researcher recognized that no research project has up to this stage been done on the motivational value of mobile-assisted vocabulary learning at a South African school. The purpose of this study is to fill that gap.

3.3 Empirical investigation

3.3.1 Research paradigm

All scientific research is conducted from the specific perspective from which one's research material is viewed. At the commencement of a research project, the researcher needs to consider how she will learn and what she will learn through the course of the project (Firestone, 1987, De Vos, 2011). This way of viewing or assumptions about the world is the research paradigm (De Vos, 2011, Firestone, 1987) and is also referred to as "first principles" (Guba & Lincoln, 1994).

The research problem and accompanying research questions of this study are of a multifaceted nature. Pragmatism has been considered the best philosophical foundation for justifying the combination of different methods within one study (Maree, 2007:263).

Firstly, a major argument of *pragmatism* is that quantitative and qualitative methods are compatible. Thus, a pragmatic approach offers a practical, "middle ground" orientation in relation to the post positivism paradigm of quantitative research and interpretivism which is the paradigm of qualitative research (Johnson & Onwuegbuzie, 2004).

Secondly, according to Creswell (2003:12) "...pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as to different forms of data collection and analysis." Creswell (2003) furthermore deliberates that in a pragmatic paradigm, no method is specifically dominant, as the focus is not on the methods, but on the problem.

Finally, according to Creswell and Clark (2011), pragmatism is characterised by the practicality of what works best for the researcher regarding the data that has to be gathered. As a result of all these attributes, the pragmatic paradigm was chosen for this study which aims at determining the motivational value of mobile- assisted vocabulary learning for English FAL learners. Through

adopting the pragmatic paradigm for this study, the researcher was able to apply what was the best practical approach, namely introducing the participants to the mobile application and giving them the opportunity to engage with it in a normal class situation. Furthermore, this paradigm enabled different forms of data collection, namely questionnaires as well as interviews and discussions. The results gathered through these different methods could then all be analysed together according to the central issue, namely the research problem.

3.3.2 Research approach

The nature and complexity of the research problem and research questions, motivated the researcher to consider the suitability of either a quantitative or a qualitative research approach or a combination of both.

Quantitative research aims to objectively measure variables in some numerical way (Firestone, 1987; Maree, 2007; Leedy & Ormrod, 2005). Description, explanation and prediction are the most common research objectives in quantitative research. The nature of observation in quantitative research is an attempt to study behaviour under controlled conditions. Variables are measured with structured and validated measuring instruments to collect data, which is analysed by means of statistical computer programmes. These programmes determine statistical relationships between variables where after a quantitative report is compiled which includes different numbers, calculations and results of statistical importance in order to accept or reject the stated hypotheses (Johnson & Christensen, 2010; Leedy & Ormrod, 2005).

Qualitative research aims to obtain, analyse and understand rich descriptive data pertaining to a specific subject or context (Maree, 2007). This research approach is concerned with understanding the processes and the social and cultural contexts which underlie behavioural patterns. Qualitative approaches focus on phenomena that occur in natural settings as well as studying these phenomena in all their complexity (Leedy & Ormrod, 2005). Qualitative research is not simply the analysis of a few open-ended questions and quotes from transcripts, but is directed at thorough analysis of the data. Strauss and Corbin (1990) claim that qualitative methods can be used to better understand any phenomenon about which little is yet known. They can also be used to gain new perspectives on things about which much is already known, or to gain more in-depth information that may be difficult to convey quantitatively. For example, in the present study little is known about the motivational value of mobile-assisted vocabulary learning applications among Grade eight learners living in the North West Province of South Africa. The ability of qualitative data to more fully describe a phenomenon is an important consideration not only from the researcher's perspective, but from the reader's perspective as well. "If you want people to understand better than they otherwise might, provide them information in the form in which they usually experience it" (Lincoln & Guba, 1985:120).

As stated, the research problem of this study is multifaceted. It involved learners, their teachers, satisfaction with current learning material, the attitudes of both groups towards learning with a PMD as well as the motivational value and perception of the mobile-assisted vocabulary learning application. The textbook, as well as policy documents, namely the Curriculum and Assessment Policy Statement (CAPS) and the Policy Statement on e-learning regarding requirements from the DoE were also investigated. The presence of both numerical and descriptive data serves as an indicator that neither a purely quantitative nor a purely qualitative research approach was suitable.

From a pragmatic viewpoint, it is possible to use components from both a quantitative and a qualitative research approach in this study. This is called a mixed method research approach (Creswell, 2003:18; Leech & Onwuegbuzie, 2009:266). The definition of a mixed method approach given by Creswell and Clark (2011:5) relies on its core characteristics:

- Both quantitative (numeric) and qualitative data (text) are collected and analysed;
- the two forms of data are mixed;
- the procedures are combined into a specific research design.

Another criterion for selecting an approach is personal experience (Creswell, 2003). The mixed method approach may prove more time-consuming as both quantitative and qualitative data needed to be collected and analysed. The researcher, however, was convinced that this combination of qualitative and quantitative data would yield the best possible results. Furthermore, the researcher anticipated that the structure provided by the quantitative research and the flexibility of the qualitative research would complement each other.

3.3.3 Research design

According to Creswell and Clark (2011) a research design is a procedure for collecting, analysing, interpreting and reporting data in research studies. Deciding on a suitable research design is a crucial step in the research process, as it underlies the appropriate collection of data and the interpretation of the findings.

A wide range of mixed method research designs exist. However, as Creswell is generally considered to be a leading author in the field of mixed method research, for the purpose of this study the terminology of Creswell and Clark (2011) is used when referring to the mixed method design. For the research problem of this study, a mixed method approach grounded in the pragmatic paradigm was decided upon. A mixed method research design supports the approach. This design draws from the strengths of quantitative and qualitative approaches. According to Maree (2007:261), the combination results in richer and more reliable research results. The combination also ensures that findings are not a single reflection of a specific method and enables

the achievement of broader and more in-depth results to avoid insubstantial evidence (Denzin & Lincoln, 2005).

The specific design chosen for this study is the convergent parallel mixed method design. This design is also considered by Creswell and Clark (2011) as the most well-known mixed method design. The choice of this design was based on the way that the quantitative and qualitative strands of the study related to each other, as proposed by Creswell and Clark (2011). The typology of triangulation was the motivation for selecting a convergent parallel mixed method design. According to Greene, Caracelli and Graham (1989:259), "triangulation seeks convergence, corroboration and correspondence of results from the different methods". The convergent parallel design was initially called a triangulation design because the quantitative and qualitative methods were used to get triangulated results of a topic (Creswell & Clark, 2011:77; Rocco *et al.*, 2003:22, 23). This design is definitely suitable as both quantitative and qualitative data were collected during the same phase of the research process and then merged for an overall interpretation. Creswell and Clark (2011) identified four procedural considerations that determine the choice of a specific mixed method research design, namely level of interaction, timing, weighting and mixing of the strands.

- The level of interaction refers to the extent to which the quantitative strand and the qualitative stand are kept independent or interact with each other. In this study, there was an independent level of interaction. The quantitative and qualitative data collections were kept separate. The researcher only mixed the results of the two strands when conclusions were drawn and interpretations made at the end of the study.
- Timing indicates the temporal relationship between the qualitative and quantitative research components and describes the order in which the researcher collects, analyses and interprets the data sets. The timing can be concurrent, where the qualitative and quantitative data are collected at approximately the same time and analysis and interpretation do not happen until all data have been collected. Sequential timing involves collection and analysis in a sequence of phases. This study made use of concurrent timing as the data were collected from learners and teachers during the same two week period of time and not in different phases.
- The weighting of the qualitative and quantitative components refers to the relative importance or priority of the strands. The weighting of the qualitative and quantitative methods is equal in this study, as both components play an equally important role.
- The fourth procedural consideration is how the quantitative and qualitative methods were mixed. Mixing indicates the procedure for combining the different data sets. Creswell and Clark (2007) identify three strategies for mixing quantitative and qualitative data, namely merging, embedding and connecting the data sets. This study merged the two data sets

as part of the interpretation phase after the presentation, analysis and interpretation of the individual data sets. Merging was done as the quantitative and qualitative data concerning motivational value, attitude and vocabulary learning are closely linked.

A mixed methods research model for this study was developed as a conceptualisation of the research design and process. Figure 3-1 is a model of the convergent variant of the triangulation mixed methods research design.

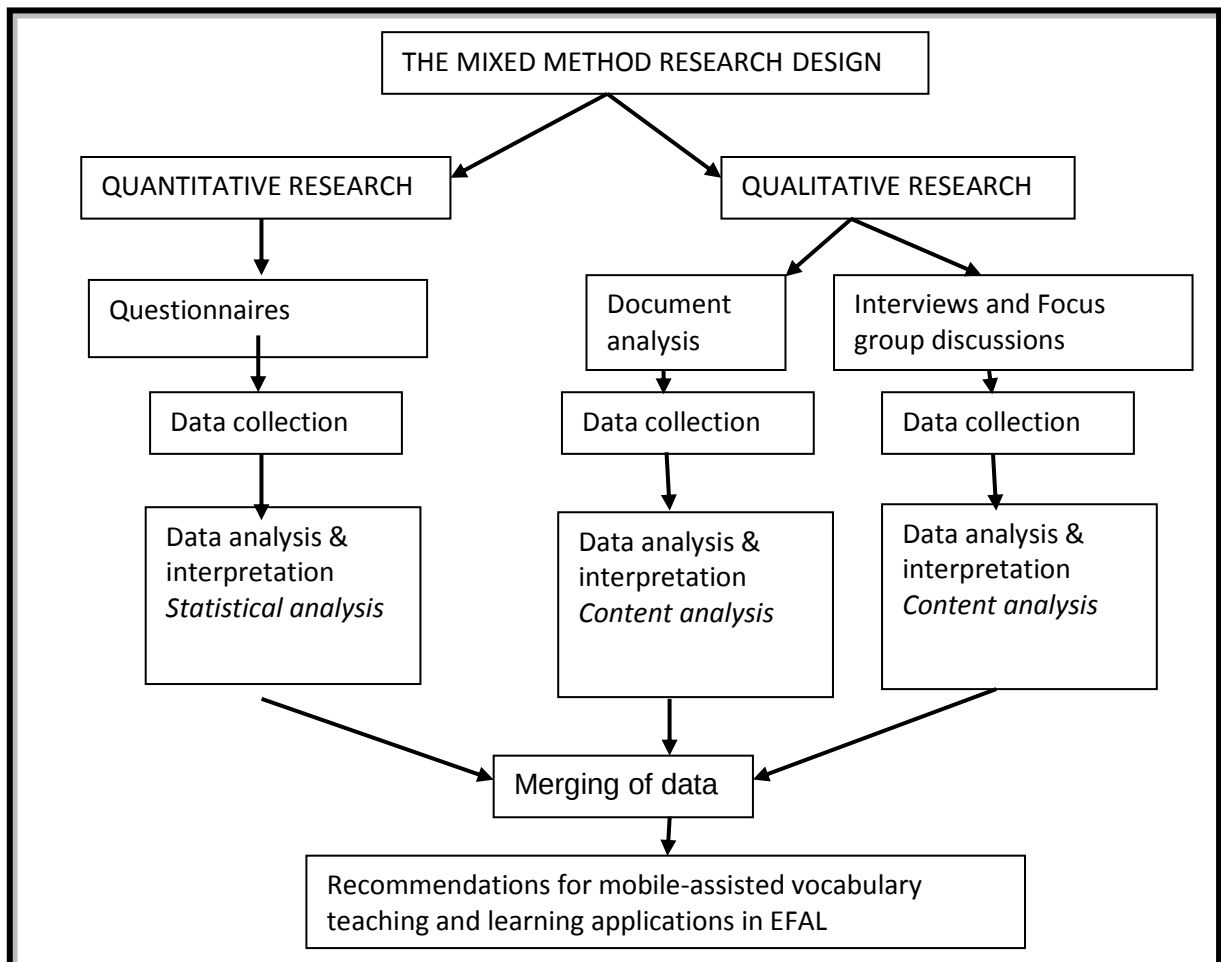


Figure 3-2: The mixed methods research model

3.3.4 Sampling

Sampling refers to the selection of participants from the total population with which the research problem is concerned (De Vos, 2011:223). The group of participants is much smaller than the population, but it is representative of the total population. According to Teddlie and Yu (2007:87), creativity and flexibility in the sampling design of mixed method research is important. For this research project, the researcher used purposive sampling and non-probability sampling.

Purposive sampling, according to Maree (2007:178), is used in situations where the sampling is done with a specific purpose in mind. In the case of this study, the research is about the attitude of Grade eight English FAL learners in a specific school towards mobile vocabulary applications. The researcher therefor only targeted learners who adhere to all the criteria.

There were two sets of participants in this study: The first set of participants were 49 Grade eight English First Additional Language (FAL) learners from a rural Afrikaans Medium ex-model C secondary school in the North West Province. This specific school was chosen as it is a convenient location for the researcher and is a good example of a well-organized ex-model C school in one of the many rural areas in South Africa where learners do not have exposure to English outside the classroom on a regular basis, except via the media and technology. The researcher decided to include Grade eight learners in the GET phase as they are the most junior and in their first year of their high school career which entails many possible changes in methods of learning. According to the enrolment statistics of the school, the total Grade eight English FAL population in the general education and training (GET) phase at the end of March 2016 was 132 (N=132).

The participants were not chosen individually but were members of two intact Grade eight classes in the school. These two intact classes were chosen to minimize disruption at the school for the duration of the research. Furthermore, the availability as well as the strength of the Wi-Fi signal had to be taken into account. The researcher also did not want the research to negatively influence the timetable or programme of the rest of the school. For practical reasons regarding communication and space, the two groups were handled separately during their individual English teaching periods, but the two groups were treated exactly the same regarding procedure followed, questionnaires completed and focus group interview questions.

The two classes consisted of 49 (N=49) participants. Summaries of the biographical data of the participants are depicted in Tables 3-1 and 3-2.

Table 3-1: Age of participants

Age	Number of participants	Percentage of participants
13	24	49.0%
14	22	45.0%
15	2	4.0%
16	1	2.0%

From Table 3-1 it can be concluded that the majority of participants were either 13 years old (24 participants) or 14 years old (22 participants). Only two of the 49 participants were 15 years old and only one was 16 years old. The average age of the participants was 13.6 years.

Table 3-2: Gender of participants

Gender	Number of participants	Percentage of participants
Male	27	56.3%
Female	21	43.7%
Unknown	1	

Table 3-2 indicates that there were more male (N=27) than female participants (N=21). One participant failed to indicate his / her gender.

The second set of participants were the English First Additional Language teachers (N=2) responsible for the teaching of the Grade 8 participants in the study. These specific teachers were identified on the grounds of their roles as language teachers in the GET phase and as such they are primarily responsible for the activities that are conducted in their classrooms. Both teachers were female. The one teacher was in her 20's and at the time of the study she was in her fourth year of teaching English at FAL level for the Grade 8 class. Her colleague is in her 40's and has 15 years of experience in the teaching of English FAL to different Grades in the GET as well as the FET phase.

3.3.5 Data collection methods

In this section, the quantitative and qualitative data collection methods are discussed.

3.3.5.1 Quantitative methods

Questionnaires were used in this study to collect the following numerical data:

- Data about the general mobile usage patterns of learners.
- Data about the general attitude of learners towards using a PMD as supplementary learning tool.
- Data about learners' perception regarding the motivational value of the prescribed textbook.
- Data about the learners' perception regarding the motivational value of the mobile-assisted vocabulary learning applications.

A questionnaire is an instrument that takes the form of a document with questions and/or statements designed to gather information appropriate for analysis (De Vos, 2011). With the

questionnaire, data was gathered from willing participants (learners) by presenting them with a series of questions to be answered.

A questionnaire, also referred to as a social survey, is a method to collect standardised data from a large number of people. Questionnaires in research are used to learn about people's behaviours, characteristics, attitudes and opinions (Leedy & Ormrod, 2005). When compiling a questionnaire, the researcher must give careful consideration to define what is going to be measured, as it will determine the type of questions and the scale that is used in order to obtain the required results. The sociologist Dr. Rensis Likert developed the so called Likert scale in 1932 in a bid to find a method to measure attitudes on a scale that could be compared to the scientific metric scale. A Likert scale is a non-comparative scaling technique and are unidimensional (only measuring a single trait). Participants indicate their level of agreement with a given statement by means of a scaled response. The scale commonly consists of a 5-point scale ranging from "Very untrue or disagree" on one end to "Very true" on the other side with "Neither agree nor disagree" in the middle. Each level on the scale has a numerical value or coding that is used in the analysis stage. Each specific question or "item" can also be analysed separately. However, several related items can also be grouped together for a summative score on a specific aspect. For this specific study a four point scale was used, ranging from "strongly agree" (1) to "strongly disagree" (4). The middle or "neutral" value was purposively omitted to prevent participants from constantly expressing a neutral opinion.

The questionnaire was divided into sections A, B and C. The first three questions of Section A were designed to access background information to confirm that the learners actually owned and carried mobile devices. Question 4 was designed to identify the mobile applications that learners are familiar with and the primary languages of those applications. Questions 5 and 8 were designed for the current study in order to gain necessary background information pertaining to the suitability of using a mobile application as a learning tool for prescribed textbook supplemental activities. Questions 9 and 10 were modified from Kent and Jones (2012) to gain an understanding of the learners' feelings towards using mobile devices rather than their actual use of mobile devices. Section B and C utilized the 36-item Instructional Materials Motivation Survey (IMMS; Keller, 1987) that was developed to quantify learners' perceptions towards teaching tools in accordance with the ARCS model. To reduce redundancy, a reduced version of the 36-item IMMS (Loorbach, 2013; Loorbach, *et al.*, 2014) was implemented. The reduced IMMS (RIMMS) is constructed with a Likert-style scale with response options ranging from 1 (strongly agree) to 4 (strongly disagree), equating to a total range of 3-15 for each measure and a range of 12-50 for a total score which is equated with the motivational value of the instrument.

Both sections B and C therefore consist of a set of 12 similar questions – for section B the questions pertain to the English FAL textbook, whilst the questions in section C focus on the

mobile application. These 24 questions were designed to measure the four categories of the ARCS motivational design by Keller, namely attention, relevance, confidence and satisfaction. At the end of each section two open-ended questions were added to enable learners to express their likes and dislikes regarding the two methods of learning English.

RIMMS is valid. Leedy and Ormrod (2005) explain validity of an instrument as the extent to which the instrument measures what it is supposed to measure. The questions of the RIMMS have validity as Section B of the questionnaire measures the motivational value of the EFAL textbook according to the ARCS categories and Section C measures the motivational value of the mobile-assisted vocabulary applications according to the ARCS categories. The researcher furthermore assumed that as learners voluntarily agreed to participate, all learners answered the questions about their attitude and motivation truthfully. The questionnaire can consequently be considered to have content and validity.

RIMMS is also reliable. Reliability can be explained as the consistency with which a measuring instrument gives a certain result when that which is being measured, has not changed (Leedy & Ormrod, 2005; Maree, 2007). The developers of RIMMS determined the internal reliability of the instrument. According to Maree (2007), this is “a measure of the degree of similarity as an indication of internal consistency”. The Cronbach alpha coefficient is used to determine internal reliability of measuring instruments based on the inter-item correlations and a value of > 0.5 is regarded as representing reliability. The Cronbach alpha coefficient for this study varies between 0.5 and 0.85, indicating sufficient reliability.

3.3.5.2 Qualitative methods

This section discusses the qualitative methods. This research incorporates three qualitative research methods to directly involve the learners and educators: The researcher conducted focus group discussions, semi-structured interviews and also did document analyses on the prescribed textbooks and other relevant material.

Focus group discussions: From writings and research studies on the topic (Barbour & Kritzing, 1999; Krueger & Casey, 2000) it is possible to establish a working definition of what constitutes a focus group as a group interview without the alternate question-answer sequence found in typical interview sessions. The hallmark of focus group interviews is the explicit use of group interaction as data to explore insights that would otherwise remain hidden. Typically, groups of between five and ten people gather together to voice their opinions and perceptions about a study topic in a non-threatening and comfortable environment. Interaction is based on a carefully planned series of discussion topics set up by the researcher who also acts as a moderator during the group interaction (Litosseliti, 2003). Participants are encouraged to talk to one another, ask questions, exchange anecdotes and comment on one another's experiences and points of view.

It provides an opportunity for very valuable reflection on what happened, how it made the participants feel and what the activity could lead to in the future. Although the researcher as moderator initiates the topics for discussion and thus exercises a certain control over what is to be discussed, s/he does not offer any viewpoints during the talk-in-process session.

Focus group interviews in this study were conducted with English First Additional Language learners from Grade 8 in the general education and training phase of the chosen high school in the North West Province. The purpose was to gather data regarding the learners' attitude and experiences with the mobile-assisted vocabulary learning applications as well as the textbook used in the English FAL course (cf. Appendix E).

Semi-structured interviews: Interviews yield a great deal of useful information and are good ways of accessing people's perceptions, meanings, definitions of situations, and constructions of reality (Leedy & Omrod, 2005). An interview is a verbal face-to-face interchange in which a researcher tries to elicit information from another person or participant (Burns, 2000). It is a two-person conversation initiated by the interviewer for the specific purpose of obtaining relevant information and for the researcher to focus on content specified by research objectives of systematic description, prediction or explanation (Cohen, Manion and Morrison., 2015).

This technique is used to collect qualitative data by setting up a situation (the interview) that allows a respondent the time and scope to talk about his/her opinions on a particular subject. The focus of the interview is decided by the researcher and there may be areas the researcher is interested in exploring. The objective is to understand the respondent's point of view rather than make generalizations about behaviour. It uses open-ended questions, some suggested by the researcher ("Tell me about...") and some arise naturally during the interview ("You said a moment ago...can you tell me more?"). The researcher tries to build a rapport with the respondent and the interview is like a conversation. Questions are asked when the interviewer feels it is appropriate to ask them. They may be prepared questions or questions that occur to the researcher during the interview. The wording of questions will not necessarily be the same for all respondents.

In this study semi-structured interviews were conducted with the teachers responsible for the teaching of English First Additional Language. The purpose was to obtain data on the teachers' attitude and experience with mobile-assisted vocabulary learning applications in their EFAL classes (cf. Appendix F). The semi-structured interviews allow for flexibility and freedom, because there are no strict one-answer questions (Lofland & Lofland, 1995).

Document analysis: Document analysis is a qualitative method that systematically analyses and evaluates documents to understand the document better so that empirical knowledge can be generated (Mouton, 2013). The documents can be both printed and electronic.

Different techniques can be used for analysing documents. According to De Vos (2011) content analysis can be done, whereby the frequency of elements within documents are quantified. Another technique is textual analysis where emphasis is more on interpreting the meaning of the document. Semiology is a technique that identifies words and images as signs that offer complex meanings beyond the surface of the text. Lastly, linguistic analysis can also be done. This technique explores the use and meaning of words and phrases in the document.

Document analysis is often, as in this study, used in combination with other qualitative research methods as a means of triangulation as described by Denzin (1970) as “the combination of methodologies in the study of the same phenomenon”. Atkinson and Coffey (1997) refer to documents as ‘social facts’, which are produced, shared and used in socially organized ways. Analyzing documents incorporates coding content into themes similar to how focus group or interview transcripts are analyzed. The following documents were collected for analysis in this study:

- The textbook used by the English FAL learners in this specific school.
- The CAPS document section on the requirements for the GET English First Additional Language with regard to vocabulary acquisition.
- White Paper on e-Education: Transforming Learning and Teaching through Information and Communication Technologies (ICTs).

These documents supplied the researcher with the necessary background knowledge regarding the three main aspects of the research question, namely the role and function of vocabulary learning as a part of the study of English First Additional Language Vocabulary learning (from the Textbook and CAPS document); the role of PMDs (White Paper on e-learning, 2004) as well as how this crucial part of language teaching and learning can be supported and enhanced through the supplemental use of mobile-assisted vocabulary learning applications offering motivational value to these activities.

3.3.6 Quality assurance of the study

3.3.6.1 Quantitative component of the study

According to Maree (2007), quality assurance for the quantitative component of the research refers to validity and reliability. In this study it was attempted to ensure the validity of the data collection process by using an existing questionnaire as basis for the tailor-made questionnaire for this study. In this way it was ensured that no vague or unclear questions were included as the questionnaire had already been used before.

Reliability: Although the results of this study cannot be generalized due to the limitation regarding the size of the population, an attempt was made to report as much information as possible

regarding the participants themselves as well as their responses. As explained in 3.3.5.1, the RIMMS questionnaire adapted for this study adheres to all the necessary attributes to qualify the results as valid and reliable.

3.3.6.2 Qualitative component of the study

Maree (2007) states that engaging in multiple methods of data collection, leads to trustworthiness. The trustworthiness of this study is therefore enhanced by the inclusion of semi-structured interviews, focus group interviews and document analysis. Creswell (2003) refers to it as triangulation whereby “different data sources are used to build a coherent justification for themes”. According to this researcher this is the first strategy that can check the accuracy of qualitative findings.

With application to this study, all three these methods were used to gather data about the attitudes and perceptions of learners and teachers towards the use of both the textbook as well as the mobile assisted learning applications. The semi-structured interviews and the focus group interviews were both used to gather data about the satisfaction with the prescribed textbook and to collect general comments about mobile-assisted vocabulary learning applications from the perspective of a teacher and a student. All discussions were recorded and the transcripts were filed and the research methods were also audited by a competent peer, as suggested by Creswell (2003).

In the case of the qualitative research done in this study, the researcher acted as the data gathering instrument. According to Maree (2012), in the case of a qualitative study the following issues of trustworthiness demand attention, namely credibility, transferability, dependability, confirmability as well as reliability and authenticity.

According to Lincoln and Guba (1985) credibility refers to an evaluation of whether or not the research findings represent a “credible” conceptual interpretation of the data drawn from the participants’ original data. Engagement with the data (recordings, notes and transcripts) was done intensively to demonstrate clear links between the data and interpretations. The use and indication of verbatim examples of participants’ responses reflect the range and tone of the gathered responses. After completion of the decoding process, the results were submitted to a senior colleague for an independent evaluation of the researcher’s documentation and interpretation of data.

Transferability indicates the extent to which the findings can be applied in other contexts or with other participants (Babbie & Mouton, 2001). The strategies for achieving transferability comprise of thorough descriptions and purposive sampling (Babbie & Mouton, 2001). To ensure thorough descriptions, detailed descriptions of data were provided. Purposive sampling was applied within

this study because of its propensity to maximise the variety of the information that can be obtained within a specific context (Babbie & Mouton, 2001).

Dependability refers to the assessment of the quality of the integrated processes of data collection, data analysis, and theory generation (Lincoln & Guba, 1985). Care was taken to ensure that the research process was logical, traceable, and clearly documented in a reflexive manner by giving a detailed account of the research process.

Confirmability constitutes the degree to which the researcher's own biases are excluded from the finding (Babbie & Mouton, 2001). An audit process was implemented by working forward as well as backward through the research process to ensure that the data and interpretations of the findings were not figments of imagination, but clearly derived, sound and confirmed findings. The intention during the interpretation process was not to generalise findings to a population, but to identify generic accepted principles and trends related to the research topic.

Reliability and authenticity: As indicated by Hofstee, (2015:132) the validity of a study is enhanced by transcribed versions of interviews and discussion groups. All discussions and interviews were recorded via a PMD voice recorder. These recordings were then transcribed verbatim. Counterpart evaluation was also done where a colleague listened to the recordings while reading the transcriptions to confirm the accuracy of the transcriptions. The observations that were made were jotted down on site in a note book and reflections were made every day after the interaction in the classroom. These field notes were added to the existing data in order to strengthen the triangulation process.

3.3.7 Preparations for the data collection procedure

The intention of this study is to determine the motivational value of mobile-assisted vocabulary learning for English FAL learners. In order to collect this data, the practical component of the study was to let the learners physically interact with mobile applications on their PMDs. For this purpose, the practical preparation for the data collection was to ensure that the educators were fully informed on what the research entailed and to organise adequate internet access as well as to identify suitable mobile applications to engage with.

The following procedures were followed in preparation for the data collection:

3.3.7.1 Contact with school as role player

It was important to the researcher to foster positive relationships with all parties involved in the research. From prior personal experience during her long teaching career, the researcher knew that teachers can often feel threatened and negative towards researchers coming from outside and setting demands without ample consideration of the staff the research relies on. After permission had been granted by the principal, the researcher hence met with the Head of the

English Department to obtain information on current teachers as well as the groups that would be the most suitable and convenient for the research from the school's perspective. After this enlightening meeting, the researcher met four times with the assigned teachers at a more informal level prior to the commencement of the study. This was done to foster trust and to make sure that they knew exactly what the research would entail so that they would not feel invaded upon or exposed.

Prior to the commencement of the actual research period, the researcher obtained the textbook from the teacher and familiarized herself with the layout of the book as well as the themes of the different units. This was done to gain insight into the level of learning as well as the type of vocabulary. This knowledge was important so that suitable applications could be identified for mobile vocabulary learning with the PMDs.

The time and dates of school visits were scheduled according to the participants' convenience, the school schedule, and the time the researcher was available. Due to the unrest situation on the university campus the researcher had the opportunity to visit the school for a consecutive period of two weeks without interruption. This was not envisaged during the planning stage but it created positive interaction between the researcher and the participants as a feeling of trust developed in a natural way. It also created a situation where valuable field notes could be gathered.

The researcher went to the two class groups for two consecutive weeks during the English periods. She attended the normal class. Learners were provided with free access cards to the internet of the school for use during the English periods. Support and assistance were given for the download of the specific app that was used. Learners were given the opportunity to use the app during and after the completion of their normal textbook activities. After a ten day period of exposure to the app, the quantitative and qualitative data was collected concurrently. The questionnaires were completed by the Grade eight participants in the study after the two week period of interaction with the textbook and the app at a time agreed upon by the teacher. The process was administered in their class group at the school. The English FAL classroom was used during the completion of the questionnaires as it was deemed a familiar space for the learners that they have come to associate with the learning of English and where the necessary seating and order arrangements are already in place.

On the same day, the researcher held focus group sessions with randomly selected learners (N=12) in two separate groups of six (N=6) each. Random selection was applied as the researcher did not aim to get the opinion of any specific participants based on eagerness, participation of ability, but rather expected to receive the views from the diverse group as a whole.

During the following afternoon interviews with the teachers were conducted to gain insight into their attitude towards using mobile-assisted vocabulary learning applications as a supplementary learning tool.

3.3.7.2 Internet connection

In order to access the internet so that learners could use an app on their PMDs, it was necessary to obtain data for the participants. Since it was a research project, it could not be expected that learners use their own data. Furthermore, if data was not supplied, some learners might not be able to participate. The researcher therefore negotiated with the supplier of the Wi-Fi network at the school. The supplier agreed to increase the capacity as well as supply 60 tickets to the value of 200 MB for each participant for use during the research.

3.3.7.3 Mobile application selection

It was important to select an appropriate application to use for vocabulary learning on the PMDs. For this purpose the researcher identified certain criteria for these applications.

The first criteria had to do with the connectivity and download procedures: The app had to be available for free download. The download size was also important and would ideally not exceed 50 MB. A bigger download size would not only affect the download speed but also the amount of data used. Another criteria regarding the download was that once the app has been downloaded, it could be accessed off-line. The second criteria was that these free apps had to be available from both Play store (Android) and i-store (Apple) as it was envisaged that the learners would have access to PMDs with either of the operating systems. A third criterion entailed that the selected apps had to have a user friendly design. A final criterion was that the content should link to the work being done in the textbook (i.e. CAPS aligned).

A total of fifteen apps which appeared to be suitable for the research and complied with the criteria, were selected and downloaded. The researcher then engaged with them over a period of time before the research period in order to evaluate their appropriateness. At the end of this process one primary app and two secondary apps were identified. The primary app was the one that would be used in the beginning of the research period and the secondary apps when learners were ready and interested to engage with more apps.

The primary app that was decided on is “**Johnny Grammar’s Word Challenge**” (version 3.2.6), a “Learn English” app by the British Council who create top English learning applications for learners of all ages. *Johnny Grammar’s Word Challenge* is a quiz for English learners to test common vocabulary, spelling and grammar that appear in everyday English. The player competes to beat the clock in trying to answer as many as possible questions in the 60 seconds of the quiz. Main features include:

- The download size of the app is only 18.58MB which makes it suitable for participants who do not have a lot of data available.
- It has three difficulty levels – Easy, medium, hard
- Content is divided into three categories – Vocabulary, Grammar, Spelling
- Ten topics are offered that include, amongst others, Food and Restaurants, Travel, Idioms and Hobbies
- Rewards in the form of badges are earned as the player progresses and these allow access to the next level.
- Feedback is given for the wrong answers so that the learners can learn from their mistakes.
- The player has the choice to play as guest or login via Facebook to compete with others if they choose to share their scores on the leader board.
- The design of the app is user friendly and has a fresh look which appeals to young people.

One of the secondary apps selected is “**English Vocabulary Game**” by the TFLAT-group. The download size of the game is only 9.20MB and it can be played offline and free. It consists of many mini games with eight levels to pass and the main focus is on vocabulary. Main features include:

- The sounds can be muted.
- The player has the option of using his/her native language for assistance.
- Audio files on the different themes can be downloaded for extra assistance with pronunciation.
- After recognizing a word, the spelling can be practised.
- Words can be spoken and read to check pronunciation.
- All new vocabulary can be added to a “Reminder” which will then display the word on the screen automatically at daily intervals.

“**Vocabulary Spelling City**” (version 1.9.8) is the third app that was selected. It is also a free Android-/I-phone app which provides eight learning activities and ten word lists. The download size is 49.02 MB. This app makes the study of any word list fun and efficient. The most popular activities are “Spelling Test Me”, “HangMouse” and the “Vocabulary Games”.

Features of “Spelling Test Me” include:

- Words are read out loud.
- Words are used in sentence context and repeated.
- Instant feedback.

Features of “Hang Mouse”:

- Traditional and familiar setting of classic game “Hangman”
- Cat chasing mouse also well-known concepts which excite learners.
- Vocabulary according to themes can be accessed before or after the game – the choice lies with the player.

Features of “Vocabulary Games”:

- “Hunger Games” proved to be very popular as learners were familiar with the books as well as the films.
- “Sounds Alike” also proved very popular because of the interactive nature of seeing, listening and speaking.
- After six vocabulary themes the player has to start paying to access further level which holds financial implications for the player.

Other activities within “Vocabulary Games” include “SpellingTeachMe”, “Sentence Unscramble” and “Word Unscramble”. In the paid Premium version Teachers can upload any amount of word lists which makes it extremely suitable to link directly with the Textbook. Even learner records and assignments can be added. These possibilities were investigated by the researcher as possibilities for the future but not applied in this study due to the financial implications for the learners.

During the selection process for suitable applications the researcher was struck by the vast amount of free applications available for PMDs addressing different language learning needs and especially vocabulary. The selection process however also proved very important to assess the suitability.

3.3.8 Data collection procedure

Pre-collection activities: The researcher went to the specific classes for two consecutive weeks during the English periods. She attended the normal class. Normal class activities were supplemented with PMD activities where learners engaged with mobile vocabulary learning applications. Learners were provided with free access cards to the internet of the school for use during the English periods. Support and assistance were given for the download of the specific applications that were to be used. Learners were given the opportunity to use the app during and after the completion of their normal textbook activities. After a ten day period of exposure to the app, the quantitative and qualitative data was collected concurrently.

Data collection was conducted in the following manner:

Questionnaires: The Grade eight learners (N=49) who agreed to take part in the study completed the RIMMS during a period that was scheduled after a ten day period of interaction with the mobile-assisted vocabulary learning applications. After the researcher explained the purpose and structure of the questionnaire, learners completed the three sections of the questionnaire. The researcher was available to clarify any queries from the learners. Section B and C each had two open-ended questions, but the rest of the responses used the 4-point Likert scale responses. Learners indicate their answers in the spaces provided on the questionnaire.

Focus group discussions: Focus group discussions were held with 12 participants in two separate groups. These participants were randomly selected from the group of participants. The time and venue were communicated with the willing participants. The size of the focus groups was six participants each. The size is appropriate for a focus group (Barbour, 2007; Maree, 2007; Leedy & Ormrod, 2005). The focus groups were held in no particular order and the venue was the classroom.

The researcher compiled a list of six questions to guide the discussions. The discussions were informal and all participants were encouraged to express their views. The role of the researcher was one of the listener and the guide to the next question to be discussed. Perceptions regarding the mobile app in comparison to the textbook and with reference to their motivational value formed the core of the discussions.

Semi-structured interviews: Two separate semi-structured interviews took place with the two teachers responsible for teaching English FAL to the Grade eight learners. The researcher scheduled the time and place after consultation with the participating teachers. The interviews took place in the office of the HOD at school. As was the case with the focus group discussions, the researcher compiled a list of six questions to be discussed with the educator. These questions guided the interview to produce information pertaining to the attitude, motivation and experience of the educator with mobile vocabulary learning apps. The aim was once again to gain insight into existing attitudes and perceptions.

Document analysis: Before initializing the interviews, the researcher found out which textbooks were prescribed for the teaching of English FAL at the specific school. A copy of the book was then obtained from the educator and after having studied the relevant content, returned at a later date. The other documents, namely the CAPS document as well as the departmental policy on e-education were retrieved electronically from the internet. The researcher also compiled field notes of observations during the visits to the school and the vocabulary app activities undertaken by the learners with their PMDs. This data was reflected upon after each visit.

3.3.9 Data analysis

This study made use of a mixed method research design. Thus both quantitative and qualitative data were gathered and so both quantitative and qualitative data analyses were done in this study (c.f. Figure 3-1):

3.3.9.1 Quantitative part of the study

Questionnaires: After the participants had completed the questionnaire, the answers to the multiple-choice answers were entered manually onto an MS Excell spreadsheet and double checked. The score was calculated for the two concepts that were evaluated according to the four ARCS categories, namely the EFAL Textbook and the Mobile Applications.

The gathered data from the questionnaire were statistically converted by means of the STATISTICA (StatSoft, 2006) and SAS (SAS, 2005) computer software programmes to obtain related scores for the purpose of quantitative interpretation. A three-stage statistical procedure was followed.

The initial stage involved the calculation of the Cronbach alpha coefficient to determine the reliability of the various subsections of the questionnaire (cf. section 3.3.6.2).

Secondly, the statistical procedure involved the use of descriptive statistics such as frequencies, means, ranking and standard deviation scores to represent a particular statistical position of recorded responses.

Thirdly, a dependent t-test (also called the paired t-test or paired-samples t-test) was computed to compare the means of two related groups to determine whether there is a statistically significant difference between these means. This indicates that the same participants are tested more than once. Thus, in the dependent t-test, "related groups" indicates that the same participants are present in both groups. The reason that it is possible to have the same participants in each group is because each participant has been measured on two occasions on the same dependent variable. In order to determine whether the differences were practically significant. Cohen's effect size d (Cohen, 1988). According to Maree (2007), practical significance provides an indication if the difference is large enough to have an effect in practice (d -value). Cohen uses the following scale for the d -values:

$d = |0.2|$ (small effect);
 $d = |0.5|$ (medium effect, noticeable with the naked eye), and
 $d \geq |0.8|$ (large effect, practically significant).

Gall (2001) states explicitly that the effect size as practical significance should be reported routinely in studies that are actually useful and have implications for practice. The effect size is independent of sample size and is a measure of practical significance. It refers to a large enough effect to be important in practice and is described for differences in means for the relationship in two-way frequency tables. (Ellis & Steyn, 2003). In the case of this study, the relationship refers to the two-way comparison of the two constructs, namely the textbook and the mobile application. A p -value of 0.05 and smaller is considered sufficient evidence that the result is statistically significant (Ellis & Steyn, 2003).

3.3.9.2 Qualitative part of the study

The data from the semi-structured interviews, focus group interviews and the documents, as well as the open ended questions on the questionnaires, were analysed by means of content analysis. “Content analysis is an inductive and iterative process where we look for similarities and differences in text that would corroborate or disconfirm theory” (Maree, 2007:101). It is also important that content analyses are done as objectively as possible (Maree, 2007). The steps suggested by Leedy and Ormrod (2005) were followed by the researcher:

Firstly, the body of material was collected. For this study it comprises of two focus group interviews, two semi-structured interviews and three excerpts from academic and policy documents. Data was recorded by means of note taking and audio recording of responses. These responses from the interviews and focus groups were then transcribed verbatim.

Secondly, the large quantities of data and responses were broken up into smaller segments. Maree (2007) refers to this process as coding. The aim of coding is to look for trends and patterns that reappear in a single interview, focus group interview or among various interviews and focus group interviews. Corresponding statements of participants are for example grouped under one code, and the aspects that are out of the ordinary also come to the fore in the process. The coding process consists of three coding steps (De Vos, 2011:412-413):

- a) **Open coding** is used to order large quantities of data into more manageable segments. By grouping segments together, an analysis can be made of the data.
- b) **Axial coding**, where the themes in the open coding are more sharply outlined and divided into larger categories. By implementing this set of procedures, the researcher can link data in more complex ways.
- c) **Selective coding** is the final coding procedure where the results of the first and second coding are re-evaluated and alterations are made where necessary.

The coding process enabled the researcher to identify trends and patterns, and themes then emerged. Once these were identified, the material was studied intensely to determine patterns, trends or themes. Statements from participants that corresponded were for instance grouped together under one code. In this way, aspects that are out of the ordinary also surface. The coding process thus enabled thematic relationships to be determined and this lead to the development of a framework of thematic ideas. Themes refer to patterns that can be recognized in the data and are directly linked to the research questions. In the case of this study, themes that had to be identified were related to learner satisfaction (or dissatisfaction) with the prescribed textbook; learner as well as teacher attitude towards mobile applications as a supplementary teaching tool and finally, the perceived motivational value of the mobile apps.

3.3.10 Ethical considerations

According to De Vos (2011) research should be based on mutual trust, acceptance, cooperation, promises and well-accepted conventions and expectations between all parties involved in a research project. For this research project the researcher considered responsibility towards the participants and responsibility towards the research discipline in general.

The participants in this study were school pupils and educators. The researcher adhered to the following ethical guidelines regarding humans:

- Firstly, harm was avoided. The aim of this study was not be to expose, stress or humiliate the school or learners and teachers who participated in the study. They were thoroughly informed beforehand about the potential impact of the study and they had the opportunity not to participate further if they did not want to.
- Secondly, participation in the study was strictly voluntary. No Grade 8 learner or teacher was forced to participate and it was made clear to them that not participating in the project would not affect any of their marks or disadvantage them in any way.
- Thirdly, learners, their parents and the teachers as well as the principal of the school gave informed consent for participation in this study. The researcher was transparent about the goal of the study, the expected duration of the data collection procedures, the possible

advantages, disadvantages as well as the credibility of the researcher (De Vos, 2011:117). See Appendix A for the parent informed consent form, Appendix B for the learner informed consent form, Appendix C for the non-disclosure form regarding the focus group interviews and the semi-structured interviews.

- Fourthly, the right to privacy of the participants was ensured. The information on the RIMMS was kept confidential and the identity of the school, as well as the participating teachers and learners was kept confidential. The research report does not reveal information about individuals which may be identifiable by the researcher or any other party.

The researcher also honoured her responsibility to the discipline of science and strived to be accurate and honest in the reporting of this research (De Vos, 2011:114).

The final ethical aspect is to note that ethical clearance was obtained from the North-West University ethical committee:

- Number: NWU-00484-15-S2;
- Approval date: 2015-11-26
- Expiry date: 2018-11-26 (cf. Appendix G).

3.4 The role of the researcher

The researcher collected the data by means of the analysis of relevant documents, questionnaires, semi-structured interviews and focus group interviews and Mehra (2002) emphasizes that the qualitative researcher should be aware of the fact that her relationship to the participants can evolve into a more social one with resultant influences on their behaviour and on the interpretation of the data. Because of the assumption that the researcher is inevitably an active participant in the study who perceives, experiences and understands the world around her from a particular position, her perceptions of and reactions to the participants will become part of the data for the study. Henning, Van Rensburg and Smith (2004:19) describe this type of researcher as a “co-creator of meaning”.

This study is grounded in the pragmatic paradigm and followed a mixed method design (cf. sections 3.3.1 and 3.3.2). As suggested by Johnson and Onwuegbuzie (2004), the role of the mixed method researcher is to acquire the knowledge needed to conduct both quantitative as well as qualitative research methods. The researcher also has the responsibility to mix the methods appropriately.

While conducting this mixed method study, the researcher used quantitative methods. These methods required the researcher to play an objective role. The researcher also employed qualitative methods where she was the measuring instrument, directly involved in the research procedures (Maree, 2007:80) in this case interviews and focus group discussions with participants. One of the challenges for the researcher was obviously to find a balance between the objectiveness of the quantitative methods and the subjectiveness of the qualitative methods.

Johnson and Onwuegbuzie (2004:21) state that in a mixed method study, the researcher has to identify the weaknesses of a method and overcome it by the strengths of another by being able to successfully use multiple methods. Throughout the research process the researcher was aware of this and attempted to use the different methods in such a way that they would provide stronger evidence for a conclusion. The role of the mixed-method researcher is amply described by Greene and Caracelli (1997) as the process to understand more fully, to generate deeper and broader insights and to develop important knowledge claims that respect a wider range of interests and perspectives.

3.5 Summary

The aim of this chapter was to discuss the research methodology for this study. A mixed method approach, grounded in the pragmatic paradigm was identified as the most suitable for this investigation. The empirical research process was then fully deliberated: The convergent parallel mixed method research design, the combination of quantitative as well as qualitative approaches, the selected data collection methods as well as the procedures and descriptions of the applicable data analyses. The ethical considerations as well as the role of the mixed-method researcher were also outlined in this chapter. Chapter Four reports in detail on the findings of this mixed-method study.

CHAPTER 4 PRESENTATION OF RESULTS AND DISCUSSION

4.1 Introduction

In the previous chapter the research process was reflected upon. The results emanating from the research are presented in Chapter Four. A detailed description of the results obtained through both the statistical analyses as well as the thematic analyses of the focus group discussions with the learners and the semi-structured interviews with the teachers will address the research questions as outlined in Chapter 1:

- To what extent are the learners satisfied with the prescribed textbooks as a learning tool?
- What are the learners' attitudes towards using mobile-assisted vocabulary learning applications as a supplementary learning tool?
- What are the teachers' attitudes towards using mobile-assisted vocabulary learning applications as a supplementary teaching tool?
- How do learners perceive the mobile-assisted vocabulary learning applications in terms of motivational value in comparison to the prescribed textbooks?

The following hypothesis are formulated for this study:

H₀: The motivational value of mobile-assisted vocabulary learning applications is not perceived positively by English First Additional Language learners.

H₁: The motivational value of mobile-assisted vocabulary learning applications is perceived positively by English First Additional Language learners.

Firstly, an overview of the background variables (Section A, Question 1-4) (cf. Appendix H) is given in order to give the reader an indication of the mobile use by the selected group of learners. This overview is followed by the research results presented according to the research questions. The researcher decided to report the results according to research questions and not according to research method as it assists in the merging of data as required by the mixed method research design (cf. Figure 3.1) For each research question, the available data is reported as follows: The results from the statistical analysis is presented first, followed by the results from the focus group discussions and semi-structured interviews. Where applicable and relevant, information from the document analysis is added to support the research objectives. The chapter concludes with a summary of the results.

4.2 Overview of background variables

This section will give an overview on general aspects of mobile use. Although all of this information does not directly address the research questions of this study, it gives the reader invaluable information on background variables regarding Grade eight learners' mobile access, frequency and purpose of use.

There are two background variables that were addressed for the purpose of this study:

- Mobile device ownership and usage patterns.
- Frequency and type of mobile applications accessed.

4.2.1 Mobile device ownership and usage patterns

A total of 47 participants (95.9%) indicated that they own their own personal mobile device (PMD). Only two participants (4.1%) indicated that they have to share a mobile device with another family member but also confirmed that they do have access to it when needed.

Data indicated that 41 participants (83.7%) carried their PMDs with them the whole day. The 16.3% (8 of the participants) who indicated that they did not have their PMDs with them constantly, indicated orally during the class activities that their parents did not allow them to bring their PMDs to school because they were afraid the device would be stolen or that they did not need it at school. These participants did bring their PMDs to school for the time of the research.

4.2.2 Frequency and type of mobile application accessed

The statement "I use mobile applications nearly every day" yielded important information on frequency of use. Of the participants, 65.3% (n=32) indicated that they did access and use mobile applications nearly every day, while the remaining 34.7% (17 participants) indicated that they only used mobile applications occasionally.

Question 4 of Section A is the first question in the questionnaire where participants could give open-ended answers. All learners (n=49) gave some information, however every participant did not list up to the possible five alternatives. The purpose of Question 4(a) was to gather information about the type of applications that are used regularly by the participants, whereas Question 4(c) deliberated upon the purpose of these applications as observed by the participants. At Question 4(b) learners had to indicate the main language that is used in the applications that they use. The answers by the learners led the researcher to identify certain detail on application usage patterns. In Table 4-1, the main applications are listed together with their purpose as observed by the learners, starting with the most popular.

Table 4-1: Mobile application usage and purpose

APPLICATION	PURPOSE
Apps for downloading and listening to music	Entertainment
WhatsApp / BBM / MXit / Facebook /Messenger	Communication
Games	Entertainment/Education

Two of the application categories indicated by the learners have to do with entertainment. Some learners indicated that they also use games for educational purposes. The only other purpose of mobile applications that is indicated by a large number of participants is communication. In Question 4(B) learners indicated that they use English in all of the applications except with those apps they use to communicate with their mother tongue friends. These applications that they use for communication in Afrikaans include WhatsApp, BBM, MXit, Facebook and Messenger. It can thus be deduced that the Grade 8 participants in this study see their PMDs as tools for entertainment and communication.

Important evidence has been collected through the above questions which influence the research directly. PMD ownership and regular use can be accepted as the norm, while frequency of engagement with applications is comprehensive. The major engagement of the learners is focused on communication and entertainment.

This information clearly indicates, as was also found in the literature review (cf. Chapter Two) that PMDs have very much become a natural extension of learners. As they also favour communication and entertainment activities on their PMDs the next logical step seems to engage learners in application-based PMD learning activities with an added entertainment aspect as it will be a natural and acceptable activity to the learners.

The results pertaining to the specific research questions are now discussed.

4.3 Learner satisfaction with the prescribed textbook as a learning tool

The first research question addresses learner satisfaction with the textbook. This question is addressed in both Section A and B of the questionnaire.

Question 7 and 8 of Section A address the matter of learner satisfaction with the textbook through a Likert scale with four options, ranging from Strongly Agree = 1 to Strongly Disagree = 4. Answers on the two statements are summarized in Table 4-2.

Table 4-2: Attitude towards the use of the textbook

Item on questionnaire	Percentage of participants who Strongly Agree or Agree
I am SATISFIED with learning English from only the textbook.	48.9%
I would like the teacher to supplement the textbook with other activities.	87.8%

The results of these two questions show that participants experienced a low level of satisfaction with learning from the textbook only. Satisfaction is one of the core elements in the ARCS model of motivational design (Keller, 2007) as discussed in Chapter 2.

According to the theory, learning activities that are experienced as satisfactory lead to intrinsic reinforcement as enjoyment of the learning activity is experienced. The opposite then also holds truth, namely that if learners do not enjoy the learning experience, they will not experience satisfaction. Lack of satisfaction is one of the factors that leads to learners not being motivated to learn. The learners express a very strong desire for the textbook to be supplemented by other activities. This is interpreted as pointing towards a desire to participate in an activity which provides satisfaction and will lead to motivation to learn, in this case, vocabulary.

Question 13 and 14 of Section B address the matter of learner satisfaction with the textbook through the open-ended method where learners write their own answers. Question 13 collects information on what learners LIKE about the textbook and Question 14 what they DISLIKE about the textbook. Open coding is used to order the data into manageable segments. Axial coding is then applied to more sharply outline and categorise the remarks under themes. The concepts in bold and brackets at the bottom of the table represent the themes that have been identified.

These results can be seen in Table 4-3.

Table 4-3: Satisfaction with the textbook

RESPONSES with regard to TEXTBOOK			
POSITIVE features of the CONTENT of the textbook as a learning tool (Question 13)	NEGATIVE features of the CONTENT of the textbook as learning tool (Question 14)	POSITIVE physical features of the textbook (Question 13)	NEGATIVE features of the textbook itself (Question 14)
1.1 Ordered structure 1.2 Lots of content and many exercises (Design, Content)	2.1 Explanations complicated and long-winding 2.2 Boring content 2.3 Structure: information difficult to find (Boredom, Complicated)	3.1 none given	4.1 heavy 4.2 big size 4.3 easily damaged and torn (Physical discomfort)

As can be seen from Table 4-3, the positive reaction to the textbook is limited to the content and design. However, this aspect is at the same time perceived as negative by other learners, practically cancelling it out as a contributory factor to learner satisfaction. Additional negative reactions to the content addresses the themes of boredom and complicated explanations. No positive reactions are expressed on the physical features of the book, whilst the negative attributes address the theme of physical discomfort when using the book. These responses in general indicate a low satisfaction with the textbook.

The fact that learners indicate boredom with the textbook only, is also indirectly addressed in one of the documents that forms part of the document analyses of this study. Chapter 3 “The Use of ICTs in Education”, of the White Paper on e-Education (Department of Education (DoE), 2004:19), contains policy statements that support this idea of novel teaching methods:

“... The policy intention is to focus on learning and teaching *for a new generation of young people who are growing up in a digital world and are comfortable with technology*. General Education and Training (GET) and Further Education and Training (FET) institutions must reflect these realities.

“Experience worldwide suggests that ICTs information and communications technology (ICTs), and therefore PMDs, play an important role in the *transformation of education* and

training. It can enhance educational reform by enabling teachers and learners *to move away from traditional approaches to teaching and learning...*”

This point in the policy document supports the idea of new teaching methods other than the textbook as well as the thesis statement of the current study on the expected value of mobile assisted vocabulary learning.

The results pertaining to the first research question seem to indicate that the learners are interested in receiving information and learning through other methods than only the prescribed textbook. The major reason for this lies in the fact that they get bored with just the print on paper in front of them, as indicated in the questionnaire.

4.3 The attitude of learners towards using mobile-assisted vocabulary learning applications as a supplementary learning tool

The second research question addresses learner attitude towards the use of PMDs to supplement the textbook as a learning tool. This question is addressed in a variety of ways: In both Section A and B of the questionnaire as well as in the Focus group interviews with groups of learners. The strong emphasis on this component of the study is motivated by the belief of the researcher that the role players, in this case the learners, have to be motivated in order for a learning approach to succeed.

Question 5 and 6 of Section A evaluate the matter of learner interest in and confidence with the learning apps through a Likert scale with four options, ranging from Strongly Agree = 1 to Strongly Disagree = 4. Learner reaction to the two statements are summarized in Table 4-4.

Table 4-4: Attitude towards the use of mobile applications

Item on questionnaire	Percentage of participants who Agree or Strongly Agree
I am INTERESTED in learning English using applications and websites.	91.8%
I am CONFIDENT that I can understand the contents of most commonly used English website and mobile applications.	91.8%

The final two questions in Section A of the questionnaire (Questions 9 and 10) link closely with the previous two questions, but were formulated to gain information regarding the attitude of the learners on the use of mobile-assisted vocabulary learning applications as a supplementary

learning tool. In this case the four categories on the Likert scale range from Good = 1 to Really not good = 4. Answers on the two questions are summarized in Table 4-5.

Table 4-5: The use of PMDs for educational purposed

Item on questionnaire	Percentage of participants who are positive
How do you feel about using your PMD for educational purposes in class?	89.8%
How do you feel about using your PMD for English self-study outside of class?	87.8%

The combined result of these four questions show that participants express a very high level of interest in learning English vocabulary by using learning apps, both inside and outside of the classroom. Their level of confidence when it comes to understanding the apps is equally high. Both these elements, namely interest and confidence can be found in the ARCS model of motivational design (Keller, 2007). This means that if learners are interested in a learning activity and are confident that they will understand the requirements, they will most probably be motivated to engage in that activity. In addition, both these elements can be understood against the background of the previous engagement and experience that learners have through interacting with their PMDs on a regular basis, as was revealed in section 4.2 above.

The second research question on attitude and interest in using mobile-assisted vocabulary learning applications as a supplementary learning tool is deliberated upon even more in Questions 13 and 14 of Section C of the questionnaire. Both are open-ended questions where learners indicated what they LIKE about the app (Question 13), as well as what they DO NOT LIKE about the app (Question 14). As was the case with the corresponding questions on the textbook, open coding is used to order the data into manageable segments and the responses are grouped together under relevant headings. Axial coding is then applied to more sharply outline and categorise the remarks under themes. The concepts in bold and brackets at the bottom of the table represent the themes that have been identified.

These results can be seen in Table 4-6.

Table 4-6: Satisfaction with mobile applications

Responses with regard to PMD and applications			
POSITIVE features of the PMD and application as a learning tool (Question 13)	NEGATIVE features of the PMD and application as a learning tool (Question 14)	POSITIVE physical features of the PMD (Question 13)	NEGATIVE Physical features of the PMD (Question 14)
1.1 App quick to access 1.2 App requires no writing 1.3 App is easy to understand 1.4 App activities can be repeated to improve performance 1.5 App supports learning (CONFIDENCE is created through ease of use) 1.6 Fun 1.7 “Cool” 1.8 exciting 1.9 Variety of activities (ATTENTION is held due to pleasure experienced) 1.10 App activities are relevant to English FAL (Familiarity is created through RELEVANCE of activities to learner experience) 1.11 Rewards / badges are offered 1.12 Different levels can be “unlocked” for individual progress (SATISFACTION)	Nothing mentioned	3.1 Portable 3.2 Light (Design)	4.1 “Nothing” (reply by majority of participants) 4.2 Short battery life 4.3 Wi-Fi connection interrupted (Technical issues)

When the results are analysed, it is evident that the positive attributes of the PMD and applications as regarded by the learners outweigh the negative by far. Learners indicated no negative elements with regard to the app as a learning tool. With regard to the physical features of the PMD, they mentioned only technical issues. However, these matters are commonplace challenges faced by all users of technology, whether for educational, communicative or recreational engagements. Positive physical features of the PMD all link to the design. The themes that crystalize from the positive features of the PMD apps include confidence, attention, relevance and satisfaction. Once again these themes directly relate to the four categories of the ARCS Model of motivational design (Keller, 2007).

The second research question is also addressed in the focus group discussions. The discussions were held with two groups of learners, each consisting of six learners. The different discussion points are now mentioned together with the responses from the learners.

4.3.1 Experience in the use of PMDs for learning purposes

The first question focussed on obtaining information on previous learning experiences with applications on a PMD. As the second research question focusses on satisfaction and attitude towards the use of the PMD and apps for learning purposes, it is important to have a sound understanding of prior experiences by the participants. Participants overwhelmingly stated that they had never used PMDs for learning purposes. This is supported by the following quotations:

“No teacher.” (Participant 1, focus group 1)

“No never.” (Participant 1, focus group 2)

“No, just a little to focus my eyes.” (Participant 3, focus group 2)

Only two participants indicated with confidence that they had used the PMD for activities other than entertainment.

“... for practicing my brain” (Participant 2, focus group 1)

“...to help me focus my brain” (Participant 3, focus group 1)

These reactions correspond and confirm the information obtained in Question 4(c) of Section A (cf. Table 4.1) that they have never used their PMDs for learning purposes.

4.3.2 Reasons for not using a PMD as learning tool

The next point in the focus group discussion is a natural follow-up on the previous question and aims at gaining insight into the reasons given by learners for not using PMDs for learning purposes. The following quotations indicate the response from learners:

"You cannot learn with a phone" (Participant 1, focus group 1)

"You don't know what to learn because you do not have the apps." (Participant 2, focus group 1)

"It wasn't necessary to learn from my phone." (Participant 6, focus group 1)

"...if you've wiped your phone you CAN lose a program..." (Participant 3, focus group 2)

"...the app can install a virus on your phone..." (Participant 3, focus group 1)

"...you have to install or reinstall the app and sometimes you don't have space on your phone." (Participant 3, focus group 2)

"... it is hard to trust the content of some apps..." (Participant 4, focus group 1)

"Sometimes the apps are not well-made..." (Participant 3, focus group 1)

"Sometimes the apps are not accurate." (Participant 5, focus group 2)

The reaction to this point is much more elaborate than for the previous point and the reasons given by the learners address issues of ignorance, technical obstacles and the reality that they are unsure which apps can be trusted to supply correct academic information. All of these responses can be thematically categorized under headings such as ignorance, inexperience and unfamiliarity. It is important to note that none of the reasons provided can be linked to a lack of interest or motivation.

4.3.3 The use of applications in class to enhance English vocabulary

After obtaining information on the previous experience of learners in using mobile applications for learning on their own, the third discussion point is aimed at gaining information on the possible previous use of PMDs in the teaching situation in class. The answers indicate that the only experience participants have with learning English Vocabulary on a PMD is linked to using a dictionary or reading. The following answers support this:

"Sometimes I read books on my grandma's i-pad." (Participant 2, focus group 1)

"I mostly just [consult] books when I need to improve something [like vocabulary]." (Participant 4, focus group 1)

"[I use] the dictionary on my phone to look up words." (Participant 1, focus group 1)

"If I ... don't have a dictionary, I then just go on my phone and search." (Participant 2, focus group 2).

Once again, it is important to note that these answers do not in any way indicate a negative attitude towards using mobile-assisted vocabulary learning applications as a supplementary tool. It simply once again points towards ignorance and to the fact that teachers do not integrate mobile-assisted applications into their language lessons.

4.3.4 Positive experiences with vocabulary learning apps

Question 4 of the focus-group discussion is the first question on the attitude of learners towards using mobile-assisted vocabulary learning applications as a supplementary tool. The question pertains to the positive aspects of their experience with the learning applications as done during the research period. The following quotations reveal some of their responses:

"It is very easy, it is like a game." (Participant 2, focus group 1)

"You don't need to write anything out." (Participant 2, focus group 2)

"The words are given to you, you just have to check which one is the correct one." (Participant 3, focus group 2).

The aspect of **satisfaction** with the **effortlessness** of engagement can be recognized in these answers.

Another positive experience mentions the **indirect way of learning** which brings satisfaction and is a result of the **confidence of learners** when using their PMDs which they constantly engage with:

"... you can use [a PMD] that is usually used for playing and [now] brings you joy to learn." (Participant 6, focus group 1)

"You can do it on your phone, so it's fun." (Participant 2, focus group 1)

"You don't feel like you are learning something." (Participant 3, focus group 1).

Participants 1 and 3 (Group 1) experience the **mobility and format** as positive:

"You can sit anywhere and do it..." (Participant 1, focus group 1)

"... you don't have to open a textbook" (Participant 3, focus group 1)

"...you don't need a book." (Participant 2, focus group 2)

Technical issues are also raised:

"You can be off-line" (Participant 6, focus group 1)

"You don't have to use your data the whole time." (Participant 2, focus group 1)

"... [the app] is very cheap and not too big." (Participant 3 and 4, focus group 1)

These answers can be condensed under the themes of satisfaction, confidence and mobility.

4.3.5 Negative experiences with vocabulary learning apps engaged with

This part of the discussion offers a natural follow-up on the previous question. This time the aim is to gather data on the negative aspects of using mobile-assisted vocabulary learning applications as a supplementary tool as experienced by the learners. The following quotations express the negative experiences.

Technical issues are mentioned:

"... [the downloading process] is long and hard" (Participant 2, focus group 1)

"Your phone goes flat faster" (Participant 4, focus group 2)

"The phone sometimes freezes" (Participant 3, focus group 2)

Learners also referred to issues affecting their **attention**:

"I find it hard to concentrate, because you have other things you usually do on the phone."
(Participant 3, focus group 1)

"...you find it hard to concentrate – especially if someone is texting you or messages or notifications come through ..." (Participant 1, focus group 1)

Issues relating to **losing interest**:

"I would like more rewards." (Participant 6, focus group 1)

"You get bored" (Participant 3, focus group 1)

"After you have finished it's not fun anymore." (Participant 4, focus group 2)

These technical aspects mentioned are, like previously mentioned, general frustrations experienced by all users of technology and cannot per se be linked to vocabulary apps. The fact that some learners find it difficult to focus, can be attributed to the novelty of the experience.

Regarding the answers relating to interest, it must be noted that they refer to a *loss* of interest. This occurs when a certain level in the game has been reached and learners want a new challenge. This challenge can be offered by a next level or new application. It does not indicate a lack of interest in using apps on a PMD for vocabulary learning.

4.3.6 The desire or not to use English vocabulary apps regularly

The final question during the focus-group discussions is aimed at acquiring information on the future use of apps on PMDs as a supplementary way of addressing vocabulary learning. The overwhelming reaction from all participants express a desire and strong motivation to continue with this method of learning. They express themselves in phrases like:

"Yes, yes, yes!" (All participants, focus group 2)

"Please ma'am, can we always do it?" (Participant 4, focus group 2)

"Yes, for fun." (Participant 2, focus group 1)

"Yes, but not for points [marks]." (Participant 3, focus group 1)

Other positive reactions once again address **practical design** issues:

"Our school bags will not be so heavy" (Participant 1, focus group 2)

"The phone is light and you always have it with you." (Participant 2, focus group 2).

The aspect of **confidence** also comes to the fore once again:

"It is quick... [we are] very quick on our phones." (Participant 3, focus group 2).

The overall positive attitude of learners towards the use of PMDs as a supplementary learning and teaching tool renders crucial information with regard to how institutions should incorporate ICTs and PMDs. The following extracts were taken from the White-paper on e-learning (DoE, 2004: 14), one of the documents analysed by the researcher. Clear reference is made here to the positive contribution ICTs (in this case PMDs) can make to:

- (using ICTs to) ...*"extend and enrich educational experiences"*... *"supplement normal processes and resources"*... *"support new ways of teaching and learning"*.

The document furthermore states that:

- "... the use of ICTs for learning encourages *learner-centred learning*... (and) *active inquiry-based learning*." (DoE, 2004:15)

The following extract from the White-paper on e-education offers valuable insight in the current generation of learners – a new breed of students coined as “digital natives” by Prensky (2001:1) – who have constant access to digital technology and are confident and innovative in the use of their PMDs. This supports the research purpose of engaging mobile applications as supplemental learning tools as well as the research results that learners are confident and motivated to use mobile applications.

“These learners... who are critical and life-long learners....will *invent new ways* of using ICTs ... “(DoE, 2004:15).

Four different research methods were used to gather information related to the second research question. All the results offer the same outcome, namely that learners have an extremely positive attitude towards using learning applications on PMDs as supplementary learning tool. These results are furthermore supported by the official policy of the Department of Basic Education.

4.4 The attitude of teachers’ towards using mobile-assisted vocabulary learning applications as a supplementary learning tool

The third research question addresses the second group of participants, namely the teachers. The question seeks to obtain information on the attitude of the relevant teachers towards the use of PMDs to supplement the textbook as a learning tool. The first medium through which this information was obtained is the semi-structured interview.

Two interviews were conducted, one with each of the two teachers responsible for teaching the two classes taking part in the research. The researcher identified seven questions to guide the discussion.

The first three questions during the interview were aimed at getting information on general background matters and how the teachers observe the current state of teaching regarding the challenges they experience with vocabulary learning and how they perceive the textbook. These are necessary to place their attitudes on mobile-assisted vocabulary learning applications into perspective. This is followed by four questions directly linked to the research question.

The second source used to substantiate the research question is through the analysis of the Curriculum Assessment Policy Statement (CAPS) (Department of Basic Education (DoBE), 2012) as well as the prescribed textbook to provide the necessary background information to their challenges, attitudes and opinions. In addition, the twelve year old, but most recent White-paper on e-education that was published in the Government Gazette (DoE, 2004), was also consulted

to determine what exactly is prescribed regarding e-education – in the case of this study learning via applications on a PMD.

The different interview discussion points are now discussed and viewpoints are enhanced by reference to the appropriate documents.

4.4.1 The biggest challenges experienced in teaching English FAL

Both teachers indicate that their challenges revolve around reading and comprehension abilities as well as the lack of sufficient teaching time to pay attention to the different aspects that must be taught according to the CAPS document (DoBE, 2012). This is supported by the following quotations:

"... the learners' reading skills, reading abilities and spelling." (Educator 1)

"There are too many components and activities for too little time."(Educator 2)

"There is very little, if any time, to focus on vocabulary" (Educator 2)

"Learners struggle to understand if they do not know the meaning of certain words."
(Educator 1)

This observation confirms world-wide, and especially South African concerns on the lack of reading skills of learners (Hlaethwa, 2013).

The CAPS document packages the teaching of the English FAL curriculum according to certain skills. In Table 4-7 these skills, as well as the time in hours suggested for each per two-week cycle, are shown.

Table 4-7: Time-allocation per skill according to the CAPS document

	Skill	Time allocated in two-week cycle
1	Listening and Speaking	2 hours
2	Reading and Viewing	3 hours 30 95 minutes each for comprehension and literary texts
3	Writing and Presenting	3 hours 30
4	Language Structures and Conventions	1 hour

From the Table 4-7 it can be deduced that no specific time has been set aside for vocabulary acquisition. In the exemplary teaching plans provided as part of the CAPS document, vocabulary is referred to under the fourth skill, *Language Structures and Conventions*, where it is mentioned as "Vocabulary in Context" (DoBE, 2012:57). However, as can be seen in the table above,

Language Structures and Conventions, under which vocabulary resorts, has been allocated only one hour out of the total of ten hours. This time-allocation confirms that it is definitely a contributing factor to the challenges as experienced by the teachers.

4.4.2 Interventions in place to curb and repair the lack of vocabulary

The opinion of the teacher is that the curriculum does not offer support for the remediation of the lack of vocabulary, mainly due to time constraints created by the amount of time allocated to the teaching of languages (cf. Table 4-7) as well as the many components that must be taught. This is supported by the following quotations:

“Our curriculum doesn’t encourage or leave enough time for us to ... do spelling tests...”
(Educator 1)

“There is no time for extra reading and vocabulary explanation... we just have time for the prescribed works, and then also often just questions with answers.” (Educator 2)

One of the teachers endeavours to actively address the problem by focussing on vocabulary once a week:

“... usually on a Friday... I give out ... like a vocabulary list and then ask certain [random] learners to come and write a (certain) word on the board.”

She adds:

“So that’s basically all help... the only way I can help them with vocabulary and spelling.”
(Educator 1)

Educator 2 tries to incorporate vocabulary in an integrated way by focussing learner attention on specific words and expressions as she continues with the lesson. She however admits that it is not always successful:

“Not all learners realize the importance of learning new words and do not make notes of words they do not know.”

In doing so, the teachers are trying to comply with the prescriptions of the CAPS policy document. The CAPS document (DoBE, 2012:51–53) contains a table of language structures and conventions that learners are expected to learn during the processes of listening, speaking, reading and writing. Under the heading “Vocabulary Development” (DoBE, 2012:53) the following detail is mentioned (amongst others):

- Synonyms, antonyms, homonyms, homophones, alliteration (consonance and assonance), one word for a phrase
- Figures of speech (simile, metaphor, personification, oxymoron, metonymy, onomatopoeia, hyperbole, contrast, irony, sarcasm, anti-climax, symbol, euphemism, litotes, paradox, pun, understatement, synecdoche)
- Idiomatic expressions/idioms/proverbs/riddles
- Borrowed, inherited, new words (neologism), and etymology (origin of words)
- Ambiguity, cliché, redundant, tautology, slang, jargon, accent, stereotype, prejudice, bias, offensive language and sexist language, amongst others.

Some of these categories correspond to categories found in the mobile applications, for example, *Johnny Grammar* used in the class as a supplementary learning tool. These mobile-assisted vocabulary learning applications can thus offer assistance in the vocabulary learning process and serve as a supplementary learning tool alongside the textbook.

The concern of the teachers regarding the importance of vocabulary acquisition is explicitly echoed by the CAPS document in the following paragraph on Language Structures and Conventions (DoBE, 2012:48):

“The skills of listening, speaking, reading and writing cannot be put into practice without a sound knowledge of language structures and practice in using it. Learners **also need a wide vocabulary, which is perhaps the single most important factor enabling a person to communicate well. A wide vocabulary is essential for all language skills, especially for reading and writing.** The most effective way for learners to improve their grammar and increase their vocabulary is by reading intensively inside and outside of the classroom.”

In this document, reading is offered as the most effective way to attain a wide vocabulary. The CAPS document (DoBE, 2012) undoubtedly puts a high premium on vocabulary as an integral part of successful language usage, but as experienced by the teachers, insufficient time is available in class for the necessary teaching and learning of this crucial skill. Reading will always play a crucial role in language acquisition. However, if the PMD is utilized as a supplementary learning and teaching tool, it offers an extra opportunity for learners to acquire the much needed “single most important factor enabling a person to communicate well” (DoBE, 2012: 48).

Point 2.4 in the White-paper on e-education (DoE, 2004:14) states:

- “e-Education views ICTs as a resource for *reorganising schooling ...*”

Accessing information and apps on PMDs can contribute to the reorganization of schooling as learners will be able to access learning material, for example, vocabulary learning apps, independently and according to individual needs and ability, leaving the much needed time to the educator to focus on teaching new concepts.

4.4.3 Discussions on the prescribed textbook

This interview question aims at determining the level of satisfaction of the teachers with the prescribed textbook and the contribution it makes to vocabulary acquisition. The teachers indicate that the school uses Textbook A, specifically compiled for English First Additional Language Learners in Grade 8.

The first educator indicates that she has a positive connection with the book. This is supported by the following quotation:

“I like (the book), especially in accordance with CAPS, it helps with CAPS and is aligned with CAPS.” (Educator 1)

This is confirmed by the document analysis on the textbook done by the researcher. The analysis revealed that the structure of all eighteen chapters is exactly the same and the different chapters are colour coded to assist when navigating through the book. This may also contribute to the comment shared by some learners (cf. Table 4-3) that the design of the book is perceived as structured and easily accessible.

However, the second educator would prefer a textbook with a different structure to simplify learning. This is supported by the following quotations:

“There is lots of information in (the book), but no place where the learner can see e.g. all the grammar rules in one place. A vocabulary list according to themes or chapters could also be a good idea.” (Educator 2)

It therefore becomes clear that individuals have different opinions and preferences when it comes to structure and layout of, in this case, learning materials.

Other comments by the teachers concern the content and attention given (or not given) to specific aspects:

“I (also) feel that not enough attention is given to grammar...” (Educator 1)

“...the book concentrates more on scenarios and real life situations, while I think the FAL for Grade 8 and 9 needs to concentrate on language, vocabulary and grammar...and not on drama and poetry... there is lots of literature in the book as well.” (Educator 1)

“There is lots of information in it but no place where the learner can see e.g. all the grammar rules in one place. A vocabulary list according to themes or chapters could also be a good idea.” (Educator 2)

“The themes of the chapters are relevant, but the learners are not ‘a master’ of the theme and vocabulary when they are done. Little repetition or application is done.” (Educator 2)

The document analyses done by the researcher also revealed that the chapters each have a theme around which all activities on the four main skills (Listening and Speaking; Reading and Viewing; Writing and Presenting and Language structure and conventions) are structured according to the time allocation in the CAPS (DoBE, 2012:12).

With specific reference to vocabulary, the section for Language structures and conventions at the beginning of each chapter indicates what language structures will be done and there is a sub-heading “Vocabulary in context”. In each chapter in the margin there are three to four “Glossary” blocks with words and their meaning. The average number of twelve words per chapter/theme is given. No links to websites with more words / information / dictionaries are supplied. The mobile-assisted vocabulary applications can once again be utilized here to offer the opportunity to the learner to access supplementary vocabulary and even be able to hear the word being pronounced correctly, seeing the correct spelling and having access to the meaning.

It can hence be concluded that the teachers are satisfied with some aspects of the textbook. Both refer to the structure – the fact that the textbook follows the requirements and guidelines set out by the CAPS document (DoBE, 2012). The need for more time and attention to be given to the acquisition of language skills such as language, grammar and vocabulary is expressed. All of these can be addressed by the vocabulary learning apps that can be accessed on a PMD.

4.4.4 Mobile-assisted learning methods, with specific reference to use prior to the research

The fourth interview question introduces the third research question, namely what the attitude of the teachers is towards using mobile-assisted vocabulary learning applications as a supplementary teaching tool. This question however will first focus on gaining information on prior use of PMDs in class.

Neither of the teachers have engaged in using the PMDs in class for learning purposes, but for different reasons:

"I have never used mobile-assisted vocabulary learning applications in class."
(Educator 1 and 2)

In reaction to a question on why they have never used the technology available, the following quotations support their reactions:

"... no particular reason... (laughs) I have never thought of the idea of using mobiles ..." (Educator 1)

Educator 1 does however point out that she has asked learners to use their PMDs to look up words:

"the only mobile thing that I've used in class before was last year when I only had two or three dictionaries in class... so I asked learners to use their cell phones for dictionaries...but that's all, never for grammar or language teaching."

Educator 2:

"Oh no, never! They will just be busy on the internet or texting each other. And the school policy is also against cell phones in class... in any case, I will not know what to let them do on their phones."

It seems that the first educator does not have any reasons or pre-conceived negative or positive ideas about using PMDs for vocabulary learning due to previous experiences. It is more a matter of never contemplating the idea of using it, except as a dictionary, and that because of a lack of printed material (in this case dictionaries) available to fulfil the existing needs for vocabulary acquisition and the teaching of spelling.

Educator two seems to have a negative attitude towards the use of PMDs in class, although it is only a perception, she has never tried it. Part of her reaction is also due to ignorance – she admits that she does not know any apps to use with the learners.

4.4.5 Teacher attitude towards the use of mobile assisted vocabulary learning applications after research was conducted

The next part of the interview is a follow-up on question 4.5.4 and aims at getting direct responses to address research question three, concerning the teacher's attitude towards using mobile

assisted vocabulary learning applications as a supplementary teaching tool after the research was done in class.

Their reactions are portrayed in the following quotations:

“Okay – at first I was not for it, because ... we are dealing with ‘screenagers’ and I was scared that if I bring in mobile phones that I will lose the learners’ attention and participation and that it won’t be a learning environments anymore and that learners will see it as a ‘play class’. (Educator 1)

“... but after the research you’ve done in my class, I’m starting to like the idea of bringing mobile phones and technology to help learning... to make it fun for the learners to learn ... possibilities exist with the mobile phone.” (Educator 1)

“I am really surprised ... I did not expect the learners to become so engaged and be so interested.” (Educator 2)

These reactions indicate that both the teachers experienced the interaction of the learners with the apps as positive. Both also acknowledge the possible benefits of the use of PMDs to enhance vocabulary learning.

The current question explores the attitude of teachers towards the use of PMDs as supplementary teaching tools. As observed in the research, the learning process becomes more learner-centred and encourages active inquiry-based learning when a PMD and apps are used for vocabulary learning. This corresponds with the following statement in the policy document on the use of ICTs in Education (DoE, 2004:19):

(3.6) *“[the use of ICTS require] ... a change in teaching and learning methodology ...”*

4.4.6 Observations made by the teachers during the class

The teachers, as the persons more familiar with the members of their classes, are then asked about specific observations they made during the engagement of learners with their PMDs:

“I saw ... especially one of the boys in my class ... one of our inclusive learners ... he participated in the Johnny Grammar app ... it’s usually a challenge for me to encourage him to listen and to participate.” (Educator 1)

“And he was one of the first ... to get all 21 medals.” (Educator 1)

“A group of boys who are usually always busy with something else, were very focussed and competed to get the most medals” (Educator 2)

“...were excited and showed each other how to access other parts of the vocabulary game.” (Educator 2)

“... through last week, ... learners came to me with the demarcation (for the test) and asked me where in the Johnny Grammar App they could find adverbs and the other test work – so it encourages the learners to learn.” (Educator 2)

These observations address behaviour of normally non-interested learners’ performance while engaging with the app as well as motivation. It can be concluded that the teachers observed a positive attitude amongst learners and that they were motivated and engaged – the learners were eager to learn in this way.

4.4.7 Final opinions on the attitude of the teacher towards using PMDs for vocabulary learning

Both teachers expressed positive opinions on using mobile-assisted vocabulary learning apps as a supplementary learning tool:

“To be honest – I would definitely in future (try and incorporate mobile apps in my own teaching), but I am still a bit scared or rather cautious for a class not to have any structure ... because I am new to it, like when I taught for the first time in 2014 I was unsure about lessons preparation and my presenting in class ...” (Educator 1)

“I think I am going to test some apps at home and encourage the learners to use them also at home for vocabulary building. Perhaps my own children can help me with it (laughing).” (Educator 2)

“... it’s only going to take me once or twice to get used to it, so I think with the proper guide lines I will definitely try it in my class.” (Educator 1)

It is clear that neither of the teachers are familiar with this new teaching concept. However, both have a positive attitude and intention to explore the possibilities it offers after observing the learners in their own classes.

4.5 Learner perception of the motivational value of the mobile-assisted vocabulary learning applications in comparison to the prescribed textbook.

The fourth research question, how learners perceive the motivational value of the mobile-assisted vocabulary learning applications in comparison to the motivational value of the prescribed textbook, is addressed in the main parts of Section B and Section C.

The RIMMS questionnaire in Section B addresses the research question on learner motivation with the prescribed textbook whilst the RIMMS questionnaire in Section C addressed learner motivation regarding the mobile-assisted vocabulary learning applications as a supplementary learning tool. The questions were designed to focus on the four categories of the ARCS theory (Keller, 2007). Three questions on each category were asked in random order.

Table 4.7 shows the four categories of the ARCS theory (Keller, 2007), namely Attention, Relevance, Confidence and Satisfaction as applicable to the two constructs, namely the textbook (B) and the PMD app (C) as evaluated by the learners.

Table 4-8: Difference between learners perception of the motivational value of the textbook (B) versus the mobile phone application (C)

Construct (Textbook)	n	Mean	STD	Construct (Application)	Mean	STD	Mean difference	p-value	d-value
Attention B	49	2.19	0.54	Attention C	1.69	0.51	0.5	<0.05 *	0.9▼
Relevance B	49	2.07	0.48	Relevance C	1.78	0.44	0.29	<0.05	0.6
Confidence B	49	2.08	0.42	Confidence C	1.71	0.45	0.32	<0.05	0.88
Satisfaction B	49	2.4	0.77	Satisfaction C	1.60	0.52	0.8	<0.05	1.04

Legend:

n = Number of participants

mean = average of results on Lickert scale of 4 points

STD dev = standard deviation

* Statistically significant 0.05 level according to *t*-test for dependant group.

▼ Practically small significance (*d* = 0.2); medium (*d* = 0.5); large (*d* ≥ 0.8)

Before viewing results and coming to any conclusions, there are two important aspects that must be determined first, namely whether the results of this study can be regarded as statistically significant as well as whether the study results have any practical significance.

In the case of this study, the *t*-test is done. The *mean* in the table refers to the average response after all the responses have been taken into consideration, whereas the *mean difference* indicates

the difference between the means of the two constructs, namely the textbook and the mobile application.

The paired *t*-test was conducted on the two different constructs that are used in the study to assure the **statistical significance** of the results. A *p*-value of 0.05 and smaller is considered sufficient evidence that the result is statistically significant (Ellis & Steyn, 2003). As can be seen from the table, the results obtained for this study fall into that category.

It is also to determine whether the findings have any *practical significance*. Sample size can have an influence on statistical significance: in small samples, like in the current study, relatively big differences may emerge as statistically insignificant. This has been overcome by calculating an **effect size**. This is a standardized, scale free measure of the magnitude of the difference of correlation being tested and is not affected by the size of the sample (Maree, 2007). Cohen's *effect size d* was used to determine if there was a practically significant difference between the means of the constructs of the textbook and that of the mobile applications. According to Cohen (1988), the following effect sizes should be noticed:

$d = 0.2$ represents a small effect

$d = 0.5$ denotes a medium effect and

$d = 0.8$ and higher a large effect.

These values should however not be handled as strict cut-off values since for example 0.48 may be in the region of 0.5 and should be considered as such (Cohen, 1988). As can be seen from Table 4.7, the effect sizes in three instances were above 0.8, indicating a large practical significance.

The results from section B and C will now be deliberated in more detail. The four ARCS categories, namely Attention, Relevance, Confidence and Satisfaction were each evaluated in three questions per section.

4.5.1 Category 1: Attention

Participants are asked three questions pertaining to the way their attention is captured. Question 2 refers to the quality of the medium, whereas Question 5 seeks information on the arrangement of information. Question 9 addresses the variety regarding exercises, illustrations and graphics. As can be deduced from the table above, the mean for the app is 1.69 and for the textbook 2.19, portraying a mean difference of 0.5 in favour of the app. This indicates that the learners feel that their attention is captured more by the app than by the book. There could be several reasons for the aroused attention of the learners when engaging with the app on the PMD in comparison to

the textbook: It is a novel activity stimulating curiosity and leading to an eagerness to solve the problems, in this case vocabulary questions. Variability is also important to keep learner attention and is probably stimulated by the range of activities and methods offered by the app. The *d*-value of 0.9 indicates that the outcome has a large practical significance.

4.5.2 Category 2: Relevance

The three questions on relevance focus on the following: Question 1 focusses on pre-knowledge, Question 7 on whether the content is worth knowing and Question 10 on whether the content divulged is observed as useful. For the app the mean value of 1.78 lies between “Strongly Agree” and “Agree”, whereas for the textbook the value of 2.07 lies between “Agree” and “Disagree”. At 0.29, the mean difference between the two mediums is considerably lower than that for the Attention Category, showing that learners do not experience a big difference between the relevance of the two constructs. A possible contributing factor to this result could be linked to familiarity: Learners react positively to relevance when the content is presented in an understandable way and some learners need more time to get used to the apps and how they work than others. The *d*-value of 0.6 is the only one of the four indicating a medium level of practical significance.

4.5.3 Category 3: Confidence

Question 3 relating to confidence collects information on comprehension of the content offered through the applicable construct, Question 8 enquires about the learner’s ability to complete the required tasks and Question 11 enquires about the level of organization of the information which leads to confident use of either the textbook or the app. The mean value of 1.71 for the app indicates that learners Strongly Agree or Agree that they can use the apps with confidence. The value of 2.08 for the book lies slightly below average, indicating that they are not always able to use the book with confidence. The mean difference is calculated at 0.32, indicating that learners are more confident when using the app than using the textbook. A possible explanation for these results in favour of the app could be found in the ease and effortlessness with which learners interact with their PMDs – they easily and quickly grasp the challenges that must be completed in the app to be successful and earn the trophies. They can also link their success to their personal effort while engaging with the app. The rendered *d*-value of 0.88 indicates a high level of practical significance.

4.5.4 Category 4: Satisfaction

Participants are asked three questions relating to the satisfaction with the two constructs: The first question (Question 4) refers to the enjoyment derived from the activity which would lead to continued engagement, the second question (Question 6) on enjoyment in general and the third question (Question 12) on pleasure derived from the design of the construct. At 1.60, the mean for the app has the highest level of the four constructs, showing a significant difference from the

mean of the textbook on 2.4, in its turn indicating the lowest value of the four components. This mean difference of 0.8 indicates learners experience a high degree of satisfaction with the app in comparison to the textbook. Possible reasons for this could be the intrinsic as well as the extrinsic satisfaction learners derive from engaging with the app: Intrinsically you are motivated by the fun and enjoyment of the PMD learning experience; extrinsically they receive immediate positive reinforcement and motivational feedback in the form of rewards as well as answers being supplied. They also have the opportunity to repeat the levels to increase their scores, if they want to. There is in other words no fear of penalties and bad marks and everybody can be successful. The *d*-value of 1.04 points towards the highest practical significance of the four categories of the ARCS model (Keller, 2007).

Some more information pertaining to motivation was also obtained from the focus group discussions.

“You get achievements [rewards and badges] if you accomplish something.” (Participant 5, focus group 1)

“It is nice to get badges and work against time.” (Participant 4, focus group 2)

“...I think it is fun to do it as a learning programme.” (Participant 3, focus group 2).

From the tabulated information in Tables 4.5 to 4.8 as well as the responses from the participants, it can be concluded that the majority of the participants who participated in the focus group interviews had little if any experience in using their PMDs as learning tools. However, once they had been introduced to the learning applications, they enjoyed it very much and were motivated to continue and had a very positive attitude towards engaging with the applications on their PMDs.

Despite one or two negative comments on the issue of **attention**, the learners are inquisitive and their attention is aroused by the challenges offered by the app. As far as **relevance** is concerned, they enjoy the familiarity to engage with their PMDs while actually learning and find it stimulating to have an objective and goal to achieve. They are even more motivated when they start to link the content of the app with the learning material in their textbooks and ask for guidance to access different aspects of their learning material. They experience **satisfaction** when getting it right and receiving rewards and are also mostly **confident** as they are familiar with their PMDs and can understand the criteria for the challenges in the app. Being successful by reaching different levels and receiving instant rewards e.g. in the form of badges boosts confidence and heightens motivation.

Motivation, together with vocabulary and PMDs, forms the core of the current study and is also recognized by the White Paper on e-Education (DoE, 2004:14) as one of the advantages and aims of e-learning which incorporates learning with a PMD.

(2.5) “ICTs, when successfully integrated into teaching and learning, can ensure the meaningful interaction of learners with information... It is further a *motivational tool* and enhance productivity.”

Learner reaction toward research question 4 when the motivational value of mobile-assisted vocabulary learning applications on PMDs was compared to the motivational value of the textbook yielded results that are overwhelmingly positive towards all four motivational categories, namely Attention, Relevance, Confidence and Satisfaction.

4.6 CONCLUSION

In this chapter the acquired research results were analysed, interpreted and deliberated upon. The data obtained through the different mixed-method research methods were analysed and merged to address one research question at a time. In this way it is possible to obtain a clear picture on the answers to the different research questions.

The first research questions addresses learner satisfaction with the prescribed textbook as a learning tool. The results of the responses indicate that participants are generally satisfied with the textbook. However, they also express a strong sense of boredom with the content and objection to the layout.

Research question two, concerned with the learners' attitude towards using mobile-assisted vocabulary learning applications as a supplementary learning tool, reveal inexperience in using a PMD as a learning tool. However, once introduced to the vocabulary learning apps, learners' attitudes towards using the PMD for learning purposes shows very positive responses: Not one of the participants do not want to continue using the app to learn vocabulary.

An important theme that can be detected from the answers, is that the learners experience the activity as fun and do not want it to contribute to their marks. The fun factor is strongly enhanced by the trophies and rewards given on completion of each level of the game. This may be due to the fact that many learners regularly play games on their PMDs and they see the vocabulary learning app as a game. The only factors leading to a negative attitude relate to technical issues. These are however common issues to the general use of PMDs and not related to the specific vocabulary learning activity.

Open-ended questions in the questionnaire, giving qualitative results, yield overwhelmingly positive reactions on the attributes of the engagement with PMDs as learning tools. The leading theme emerging here is by far the fun aspect (suggesting Satisfaction) and the rewards given. Confidence with the use of the applications, especially the ease of access and speed, also

features strongly. Learners also express a very positive attitude towards the support it gives for learning vocabulary (suggesting Relevance).

Research question three, concerned with the teachers' attitude towards using mobile assisted vocabulary learning applications as a supplementary teaching tool, is also addressed in the qualitative part of the study during the semi-structured interviews conducted with each of the teachers. They have never attempted to use PMDs in their teaching before the researcher visited their classes and also express a negative attitude towards the idea before the research was conducted in their classes. The main reason for this can be summarized as two themes, namely discipline and insecurity: They are afraid that the use of PMDs may lead to learners not paying attention and engaging in non-academic activities on their PMDs. Secondary to this, they also feel unsure because they themselves have little if any experience with using a PMD as a teaching tool. However, once they observe their learners engagement with the app on their PMDs and experience the enthusiasm and eagerness with which the learners access the activities, their attitude becomes more positive. An important part of their observation lies in the fact that they see learners who usually are unengaged in class and underperforming, become enthusiastic and interacting with the app, even at home and reporting their achievements the next day. Both teachers indicate that they will definitely aim to incorporate PMD activities for learning purposes in their classes in future. They do however also indicate that they will first get familiar with it before trying it out in class.

Research question four addresses the motivational value of the learning app compared to the textbook. In Section B and C of the questionnaires all categories of the ARCS model by Keller (2007), namely Attention, Relevance, Confidence and Satisfaction, are evaluated, first in connection with the textbook (Section B) and then for the PMD (Section C). Results are then compared for the two constructs. In all four of these motivation indicator categories, learners expressed a more positive attitude towards the use and motivational values of mobile-assisted vocabulary learning with their PMDs. Of the ARCS motivational design (Keller, 2007) categories, Satisfaction proves to be the most important to the learners, but all four of the ARCS categories receive positive attributes when the app is evaluated. It would thus seem as if they experience a high degree of satisfaction when accessing and learning vocabulary through mobile apps on their PMDs. The way the app held their attention is rated second highest as motivational factor by the learners. According to the results, the learners experience confidence when using the app, as can be deducted from the fact that the Confidence category is experienced as the third most motivational aspect of the learning app. This indicates that the learners are comfortable and self-assured when they use their PMDs, probably mainly because they are familiar with their PMDs as they interact with them constantly, even though mostly for entertainment and communication.

The Relevance category for the app is only slightly higher when compared to the textbook. This may be due to the fact that they are not yet familiar with the layout and the content of the app.

Based on the results, the hypothesis formulated for this study, namely that the motivational value of mobile-assisted vocabulary learning applications is perceived positively by English First Additional Language learners _(H1), can be accepted.

In the next and final chapter the findings are deliberated upon, conclusions are reached and the limitations of the study are considered. Recommendations are made regarding guidelines for the use of mobile-assisted learning applications as supplemental learning/teaching tools.

CHAPTER 5 CONCLUSION

5.1 Introduction

In this final chapter an overall summary of the research is presented. Firstly, a synopsis of the research, comprising of an outline of the theoretical conceptual framework of the study as well as a summary of the literature review is provided. Secondly, an overview of the results is presented. This is followed by an account of the practical significance of the study. In conclusion a discussion on the limitations of the study as well as recommendations for future research are provided.

The constant engagement of teenagers with their personal mobile devices (PMDs) as well as the lack of studies on the motivational value of PMDs for vocabulary learning by high school learners contextualized against the South African background is the motivation behind this study. In this study, the motivational value of access to English vocabulary via free downloadable applications on a PMD was investigated.

The teenagers of today, even by some referred to as “Screenagers”, grow up in an environment where connectedness has a very high priority in their lives as it enables them to communicate and be entertained. It is not learned behaviour – to them it is the only lifestyle they know. They easily lose interest if not stimulated by a variety of colour, sound and images. If these components are at their fingertips, as is the case with their PMDs, even better.

Motivation has long been recognised to play a crucial role in education and can be seen as a crucial factor in successful teaching and learning. Motivated learners show interest in activities, feel confident and also expend effort to succeed while also using self-regulatory strategies to learn (Pintrich & Schunk, 2002).

The importance of vocabulary learning has been recognized by many scholars. Vocabulary is central to English language teaching. Without sufficient vocabulary, learners cannot understand others or express their own ideas (Lessard-Clouston, 2013).

Several studies have already determined that m-learning (learning assisted by mobile technologies) can expose English FAL learners to learning content in an environment where they can do self-learning anytime and anywhere with the help of a mobile device or PMD (Thornton & Houser, 2004; 2005; Naismith Sharples and Ting, 2005; Chinnery 2006).

5.2 The purpose of this study

The purpose of this study was to determine whether learners are motivated to use their PMDs for vocabulary learning. Their attitude, as well as the attitudes of teachers regarding the use mobile assisted vocabulary applications as a supplementary learning tool formed the basis for the research of this study.

The concept of motivation has led to the development of several theories. One of the well-known theories on motivation is the expectancy-value theory (par. 2.2.1). The ARCS model of motivational design as developed by Keller (2007), which underpins this study, is grounded in the expectancy-value theory.

5.3 Literature review (par. 2.2.2).

In his model, Keller identifies four categories, namely Attention, Relevance, Confidence and Satisfaction as key conditions that need to be addressed in order for learners to become and remain motivated (cf. Fig. 2-1). Each of these four categories has been expanded into more detailed components for incorporation into teaching. These individual components are explored to obtain perspectives from other studies as well as for practical application in the current study. Several studies with the aim to determine the effectiveness of the ARCS motivational model are reflected upon (par. 2.2.2). With reference to the *attention* category, the major finding of studies was that learners experience pleasure and excitement when mobile technology is incorporated in the learning process. A study focussing on the relationship between curiosity (as a component of *attention*) and motivation revealed a general increase in motivational appeal and intrinsic motivation of learners when the ARCS model is applied. One study focussing on the *attention* component found that it was essential to maintain interest and curiosity for effective and sustained learning. The fact that mobile technology brings variation into the learning process, was also evaluated as a positive contribution towards the attention span of learners involved in studies. In the *satisfaction* and *relevance* categories, research found that both teacher and learners experienced satisfaction when the technology involved was easy to use, helpful and relevant to their learning. Studies that explored the effectiveness of the ARCS motivational value, all yielded results that point towards an increase in some aspects of motivation. Another study revealed higher levels of motivation towards self-regulated learning. A direct correlation between motivation and achievement was recorded from another study where ARCS was employed. Learner confidence was also shown to improve when the ARCS model was applied in a study on learner performance. The research settings of these studies were varied, but all of them showed improvement in motivation through at least one of the four components.

The next section of the literature review focussed on motivation. By exploring the definitions of motivation as formulated by several researchers, the definition by Pintrich and Schunk (2002:5) was decided upon for the purpose of this study (Par. 2.3.1). Motivation in teaching and learning was explored as motivation is a key determiner in educational success (Schunk, 2002). Concepts such as intrinsic and extrinsic motivation and learning environment were addressed. Interest, effort, persistence and achievement as indicators of learner motivation were explored. Attention was also afforded to looking at why motivation in teaching and learning is regarded as important. Research has revealed that motivation affects learner behaviour in a variety of ways. The specific motivational processes when first additional language (FAL) learning is concerned, were explored. The insight that was gained into motivation culminated into the section on motivation being concluded with information on motivational factors directly relevant to the current study, namely the motivational value of mobile-assisted vocabulary learning (Par.2.3.2). A section was also afforded to the role of the teacher in motivation.

The following section explored in the literature section was vocabulary. For the purpose of this study, vocabulary is defined as knowledge of words and word meanings in all four of the above mentioned versions – printed, oral, receptive and productive (par. 2.4.1). The multi-faceted components of vocabulary knowledge was explored and the crucial dimensions of vocabulary *depth* and *breadth*, as identified by Qian (1998), were deliberated upon (par. 2.4.2). Vocabulary stands central regarding the acquisition of a language as it influences all aspects of a language, including speaking, writing and comprehension. Vocabulary acquisition is seen as a complex process that must be explored from different angles. Vocabulary learning strategies by Nation (2001) and Schmitt (1997) were explored. The fact that vocabulary learning is such a complex matter offering diverse possibilities is precisely what motivated this research into vocabulary learning with the assistance of mobile-devices. Up to date more studies have been done in the field of learning vocabulary by means of computer mediated communications (CMC) technologies than studies considering the involvement of mobile devices and applications. This can be attributed to the fact that the latter is a more recent, but rapidly developing and very dynamic field in language teaching.

The reality that the current study is contextualized against a South African background, encouraged the inclusion of a section on the affordances of vocabulary teaching according to the CAPS policy document (DoE, 2011) (par. 2.4.4). This led to the conclusion that the lack of practical guidelines for teachers regarding vocabulary learning might lead to neglecting this important component of language acquisition.

Section 2.5 of the literature study explored Mobile Assisted Language Learning (MALL) and the influence it exerts on language learning, and vocabulary learning specifically. Defining MALL, as well as tracing the development of MALL as a relatively novel concept was done in the beginning of this section. Meta-analyses on MALL rendered valuable information on language learning research as well as the methodologies used in MALL studies (par. 2.5.2). The key features of mobile devices (PMDs) as contributing factors to motivation was also looked into. Of these, portability, interactivity, connectivity and individuality have been found to contribute most to the popularity of such devices as learning tools.

Two categories of studies pertaining to MALL were explored, namely vocabulary learning through mobile applications (par. 2.6.2) and motivation in mobile language and vocabulary learning (par. 2.6.3). The focus of studies on mobile vocabulary learning was found to be varied, the majority focussing on vocabulary retention, performance and motivation. The most popular method used in the accessed studies was sending vocabulary activities in various formats to learners via short message service (sms). The findings of these studies are summarized briefly.

The studies rendered positive results with regard to mobile learning: All the studies focussing on vocabulary retention showed a higher level of retention for the learners who accessed the learning material on their PMDs. Significantly greater learning was also reported. The results from studies including visual material to accompany the vocabulary all showed larger retention than when only the text was offered. However, this retention was not re-evaluated after a long period of time. This might influence the results. Studies interested in performance all rendered results showing higher scores for learners who received their learning material via PMD compared to the traditional paper method. The fact that the vocabulary was often delivered via push messages and at regular intervals are suggested to be one of the reasons for the improved performance. In one study, the perceived convenience of the use of mobile devices as a learning tool was shown to be a motivational factor for continued use.

A general positive attitude towards mobile vocabulary learning was expressed by learners involved in studies on the motivational value of mobile vocabulary learning. The aim of these studies was to compare the motivational value of mobile learning tools with traditional learning tools. Results show that especially the Attention and Satisfaction components of the ARCS model were addressed when mobile tools were used. Results also reported perceived usefulness, enjoyment, acceptance and increase involvement with the learning process. These reactions from learners led to higher levels of motivation to engage in vocabulary learning via PMD. Studies using game-based applications on mobile devices yielded results pointing towards the increased confidence levels of learners due to the familiarity of interaction with such devices. These studies also focussed on the value of the motivational design of these game where motivation is obtained

through the excitement that is created as well as the rewards that are offered and the challenge to access a next level of the learning game. The negative aspects that were reported, pertained to technical issues (e.g. connectivity or screen size) cost or lack of teacher experience. It can thus be concluded that the overall positive results of these studies is an indication of the potential and effectiveness of the use of mobile phones in vocabulary learning.

5.4 Summary of results

This dissertation set out to determine the motivational value of mobile-assisted vocabulary learning for English First Additional Language (FAL). In the first chapter of this study, four research questions were formulated in address this statement. These research questions are as follows:

- 1) To what extent are the learners satisfied with the prescribed textbook as a learning tool?
- 2) What are the learners' attitudes towards using mobile-assisted vocabulary learning applications as a supplementary learning tool?
- 3) What are the teachers' attitudes towards using mobile-assisted vocabulary learning applications as a supplementary learning tool?
- 4) How do learners perceive the mobile-assisted vocabulary learning applications in terms of motivational value in comparison to the prescribed textbook?

The biographical information indicated that 95.9% of all participants own a PMD, whilst the remaining two participants had access to a PMD on a regular basis. 83.7% of the learners who own a PMD carry the device with them the whole time (par. 4.2.1). This information is important for the purpose of the study as it shows that no learner was excluded from the research. It furthermore confirms the written reports that owning a PMD is commonplace amongst the current generation of learners (Kilfoil, 2015). The purpose of applications that are used most represents only two categories, namely entertainment and communication (cf. Table 4-1). This supplied the researcher with important background information on learner experience (or lack of experience in this case) on the use of PMDs as learning tools. A very high percentage of almost 90% indicated that they would like the textbook to be supplemented with other activities (cf. Table 4-2). This is a positive indicator towards the use of a PMD to supplement vocabulary learning activities.

The four research questions were answered by participants after a period of engagement with the vocabulary learning application. This is important to take into account when assessing reactions, as it reveals attitudes and perceptions after practical usage and not only on perceived opinions without real exposure and experience.

The first research question addressed learner satisfaction with the prescribed textbook as learning tool. The results pertaining to this question indicate that learner satisfaction with the textbook is below 50%. Only a limited number of practical reasons were mentioned for the low satisfaction level with the textbook. This may be due to the fact that they see the textbook as an integral part of the learning processes at school and have come to accept the fact that their complaints will not lead to, for example, the textbook being taken away. Negative responses towards the textbook that were mentioned pertain to the complexity of as well as boredom experienced with the content and the way it is presented. The physical features of the book is also regarded as negative. Positive features that were mentioned include the ordered structure and complete content. No positives were mentioned regarding the physical features of the book (cf. Table 4-3).

The results relevant to the first research question on learner satisfaction with the textbook indicate that learners perceive the learning process as boring when the textbook is the only learning material and would prefer that the book be supplemented with alternative teaching tools and methods. This offers the opportunity to add the PMD and mobile applications to enhance the learning experience.

The second research question on learners' attitude towards the use of mobile-assisted vocabulary learning applications as a supplementary learning tool yielded overwhelmingly positive results. Results from the questions pertaining to their attitude towards learning English through applications and websites reveal a percentage of above 90% for both interest in and confidence levels. (cf. Table 4-4). This is supported by the reaction of almost 90% of the questions on their feeling about using their PMDs for educational purposes both in- and outside the classroom (cf. Table 4-5). This reaction correlates with the opinions expressed during the focus group discussions and express a definite desire from the learners to access vocabulary learning apps both inside and outside the classroom. This positive reaction is of great importance considering the fact that some studies from abroad indicate a negative attitude of learners towards using their personal devices as learning tools.

The question on learner attitude is also explored in an open-ended section of the questionnaire where learners can write their own responses on what they regard as the positive and negative features of the PMD as learning tool. The positive features mentioned outweigh the negative features by far (cf. Table 4-6).

The results relevant to the second research question on learner attitude towards using mobile-assisted vocabulary learning applications as a supplementary tool reveal a very strong positive desire. This is regarded by the researcher as a definite and strong indication towards the

relevance of finding new learning and teaching materials to instil learner satisfaction. However, the novelty factor of the educational use of their PMDs cannot be ignored as a factor influencing their attitude and attention positively.

Research question three also addresses attitude, but here the attitude of the teachers towards the use of mobile-assisted vocabulary learning apps as a supplementary learning tool is addressed. The first three questions addressed challenges experienced with vocabulary learning, interventions in place to curb these challenges as well as their level of satisfaction with the textbook. Their opinion on the textbook was more positive than that of the learners based on the fact that it was aligned to the CAPS document. However, the absence of structured vocabulary learning activities was mentioned as a negative aspect (par. 4.5.3). Despite the fact that neither of the two teachers have prior knowledge or experience with a PMD as learning tool, they expressed a positive attitude after the research had been completed (par. 4.5.5). This positive attitude was enhanced by observations that were made during the engagement of learners with their PMDs (par. 4.5.6). Prior to the research, especially the one teacher was sceptical about the influence the use of PMDs could have on discipline and order in her class (par. 4.5.4).

The result relevant to the third research question on teacher attitude towards mobile-assisted vocabulary learning applications as a supplementary teaching tool reveal their frustration with finding strategies to address vocabulary learning. A factor that cannot be ignored regarding their attitudes is the fact that they themselves feel unsure and vulnerable due to their lack of knowledge, training and experience with mobile vocabulary learning applications.

The fourth research question addressed learner perceptions regarding the motivational value of the mobile-assisted vocabulary learning applications in comparison to the textbook. The four components of the ARCS model of Motivational Design were evaluated for the mobile app and for the textbook.

The first motivational category which is addressed is attention (par. 4.6.1). For this category the mean difference between the textbook and the app is 0.5, which reveals that the learners feel that their attention is held better by the app than by the textbook. This could be attributed to the novelty of the experience which arouses their curiosity and creates expectation. The fact that it provides variety and counters the boredom of the textbook, as expressed by them, is an important finding. The *d*-value of 0.9 is an important indication of the high level of practical significance when it comes to the implementation of mobile learning apps for vocabulary learning.

The second category addressed is relevance (par. 4.6.2). This category yielded a much lower mean difference as well as a medium level of practical significance. Thus, it can be concluded

that the relevance factor offers few motivational challenges for learners with regard to the textbook. The small differences could be attributed to the novelty of the learning experience with the PMD. This outcome could change in favour of the PMD after a longer period of exposure.

The third category investigated is confidence (par... 4.6.3). Confidence levels when using the app are high amongst learners. This can be attributed to their familiarity when engaging with their PMDs, as well as the ease of access and the instant feeling of success that is experienced. The *d*-value of 0.88 indicates a high level of practical significance for the outcome of this category.

The results pertaining to the fourth category, namely satisfaction, rendered the highest mean difference, indicating that this category is where the learners experience the greatest difference between the textbook and the app (par. 4.6.4). They definitely enjoy their engagement with vocabulary applications on their PMDs. Possible explanations for these results are the motivation that they experience when successfully completing a task and receiving a reward. These results address the very important concepts of intrinsic as well as extrinsic motivation. The highest level of practical significance (*d*-value 1.04) is portrayed by these results on satisfaction.

Overall the research results indicate a positive attitude towards the mobile-assisted vocabulary learning applications as well as a positive perception of the motivational value of such apps. The H_1 hypothesis, as formulated in Chapter 1, namely that the motivational value of mobile-assisted vocabulary learning applications, is perceived positively by English First Additional Language learners, can be accepted as true for this study. It is recommended that the use of PMDs as a supplementary teaching tool should be considered by teachers within the South African context.

5.5 Guidelines for mobile-assisted vocabulary learning applications

The final purpose of this study is to formulate guidelines for mobile-assisted vocabulary learning applications as supplemental learning/teaching tool to prescribed textbooks (cf. Chapter 1, p.5). This purpose is supported by the aims of the DoE as expressed in the White Paper on e-Education (DoE, 2004) in which the intention to integrate technology into schools and to provide learners with professional support services and platforms for learning are expressed. As this is still a new and developing field in South African language teaching the following basic guidelines relate to the issues that teachers, developers and schools need to consider when implementing mobile learning.

Classroom management techniques: The teacher is responsible for determining the rules regarding the use of PMDs in the classroom. This will avoid unnecessary conflict and ensure that

everybody understands the conditions of use. Basic techniques like standing behind the learners when they are engaging with their PMDs will enable the teacher to see the screens and exert better control.

Technical requirements: Initially choose applications that are easy and practical to use. An example would be to choose apps that are available without charge, the download size must not be too big and learners must be able to use it if they are offline. The instructions must also be user friendly and easy to follow. This will minimize frustration and instil confidence and foster a positive attitude towards the concept of mobile learning activities.

Learner preparedness: Wang and Higgins (2006) pointed out that technological, pedagogical and psychological barriers could all limit the use of PMDs for language learning activities. The teacher will have to monitor each class carefully as it may take longer than expected to integrate mobile vocabulary learning applications in a sustainable manner. Classes will differ from each other in their acceptance of learning vocabulary on their PMDs and the teacher has to be flexible in offering this new supplementary learning opportunity. The self-directedness of learners should be built step by step in order to avoid negative experiences which may lead to a negative attitude and de-motivation.

App integration: The teacher must be well-prepared and sure how he/she wishes to engage the PMD as supplementary learning tool. A sensible integration with the learning material and themes from the textbook must be contemplated. It is unlikely that the textbooks used for English FAL in South Africa will any time soon be supplemented with online activities and vocabulary learning opportunities which will motivate learners. The teacher will therefore have to find suitable apps. This should not discourage the teacher, however. According to the researcher there is no need to identify a whole list of apps initially: A small start with one suitable app at a time is all that is needed to get the process going. In this way learners will also not be overwhelmed and will retain their confidence. The ultimate goal is to motivate learners towards individual and independent vocabulary learning.

Balance: When guidelines are discussed, it is of utmost importance that the role of PMDs in any learning, and therefore also in vocabulary learning, should not be exaggerated. It should only fulfil the role as supplementary tool used to motivate learners by offering an alternative to constant engagement with the textbook. Technology is not the solution to all the challenges encountered in learning and the teacher is still in the centre.

Time: The teacher will also have to consider the time spent on the PMD as well as the timing of the integration. A random access to the PMD without clear instructions and outcomes will lead to

the general fear of most teachers that learners will engage in other activities on their PMDs and disciplined learning will be forfeited.

Versatility: One of the key features offered by a PMD is the multitude of different activities it can be used for. They can run apps and software, record audio and video, send and receive email and texts — functionalities that can easily be channelled into the classroom.

Learner expertise: In most cases the learners are more comfortable and knowledgeable about the functioning of a PMD than most teachers. Teachers should accept and actively seek the support and advice from learners as this can give them a feeling of confidence which in turn will stimulate motivation.

The above guidelines offer assistance to teachers, researcher and schools interested in the implementation of mobile learning activities.

5.6 Limitations of the study

The study being discussed offers several positive findings about the motivational value of mobile-assisted vocabulary learning applications for English FAL learners. However, the limitations of the study cannot be ignored.

The first limitation is the fact that the results of the study cannot be generalized due to the specific context in which the study was conducted as well as the chosen design for the study. The study is only representative of a small group of learners in a rural South African context and cannot be generalised, neither for the South African school population nor within the international context. However, interesting trends as well as similarities with other studies in other parts of the world have emerged (cf. Chapter 2).

A second limitation of this study is the number of participants taking part in the study. Only 49 learners and two teachers were involved. Two of the available grade 8 English FAL classes and two of the three educators were used. This was due to practical arrangements concerning both the school programme as well as the Wi-Fi connection. Nevertheless, this number of learners represent 37% of the entire Grade eight population. This is regarded as a large enough sample to obtain reliable results.

A third limitation of this study is that one of the components of the qualitative part of the mixed-method design was based on focus group discussions. Twelve participants took part in these focus group discussions. The findings and themes identified through these discussions were based on the comment and attitudes of the six learners in each discussion group. It is fair to say

that the findings would have been more accurate if all 49 learners had taken part in the focus group discussions. However, there was a lot of consensus in the focus group discussions and there were no strong opinions expressed contrary to the research results. This is a good indication that even if a larger group of participants had taken part, the results would likely still be the same. The quantitative part of the research, of which the results correspond to those of the qualitative results, however, was done by all of the participants.

A fourth limitation is that the interaction with the mobile vocabulary applications and the subsequent gathering of the data took place within a two week timeframe. When one considers the time learners spend in the English FAL class, two weeks is a very short period. Once again however, the practical implications for the school had to be taken into consideration and the two weeks was the only viable option for the researcher.

To summarize – although the study is not without limitations, the methods followed resulted in significant findings that are of considerable value to understanding mobile vocabulary learning from a South African perspective.

5.7 Recommendations for future research

The integration of mobile devices into the English FAL classroom is definitely not going to solve all challenges experienced with vocabulary learning instantly. However, the positive results of the study give a strong indication of the possibilities that can be explored in future research:

It could be of value to conduct this research over a longer period of time and at different schools in South Africa to determine if the results will be the same. The longer period of time will ensure that the positive reaction was not just a result of the novelty that will wear off and the different schools will bring perspective as to the availability of PMDs as well as internet connections in different locations.

Professional development and training should be designed for teachers who are already in the system as well as for education students and should specifically focus on PMD integration into the English FAL classes.

Interesting results could be obtained if learners were exposed to a series of different applications in order to determine which type of apps are the most beneficial for the vocabulary learning process.

In summary, as the integration of mobile vocabulary learning activities is a field that has not received a lot of attention in South Africa yet, there are many opportunities for further research.

5.8 Conclusion

In 2001, Marc Prensky warned us, "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach." He continued to describe how these "digital natives" are being exposed to more gadgets and technology than was ever thought possible. This is having a profound effect on the ways in which children learn. They are more engaged in learning when using the latest technological gadgets, because it is what they are most used to interacting with. Our students don't just want mobile learning, they need it (Wylie, 2015).

Lisa Nielsen, the author of *The Innovative Educator blog* states: "When the world inside schools looks so different from the world outside of schools, what are we really preparing students for? When we ban, rather than embrace, real-world technologies, we leave students (1) ill-equipped to know how to harness the power of technology for learning, (2) unprepared to develop a respectable digital footprint and, (3), without adequate knowledge to safely navigate the social web." (Nielsen, 2015).

Informed opinions like these support the fact that mobile technology is here to stay and its power has to be harnessed for educational purposes. This study revealed that the acceptance of mobile-assisted learning application by teachers will have to be addressed, as it is typically the teacher who is responsible to drive (or inhibit) the teaching methods used in their classes. If teachers are not prepared to integrate mobile technology for learning purposes, the adoption of mobile learning will not succeed. Motivation plays a crucial role in achievement in teaching and learning and this study has determined that mobile-assisted vocabulary learning has motivational value and can offer support in addressing the challenges regarding vocabulary learning. The learners involved in the study perceived mobile-assisted vocabulary learning in English FAL classes positively and they indicated that they would welcome mobile-assisted learning apps to supplement the textbook.

The possibilities afforded by mobile integration into the classroom through the use of PMDs is like the proverbial pearl inside the oyster: It might take some effort to open it up, but once you have succeeded, a beautiful jewel, which will provide you with great pleasure, awaits.

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ANNEXURES

Annexure A: Parental consent form

Private Bag X6001, Potchefstroom
South Africa 2520
Tel: 018 299-1111/2222
Web: <http://www.nwu.ac.za>



School of Human and Social Sciences for Education

Tel: 018-2852639
Email: carisma.nel@nwu.ac.za

1 September 2015

Dear Grade 8 or 9 parents

Consent form to be completed by eighth and ninth grade English FAL parents INFORMATION AND CONSENT

Please provide the following personal information (for coding purposes only):

Name and surname: _____

The following information is provided so that you can make an informed decision about your child's voluntary participation or not.

1. Title of project: Motivational value of mobile-assisted vocabulary for English First Additional Language learners.

2. Contact details of Project Head:

Name and surname: Prof. C. Nel
Contact number: (018) 2852639
Email: carisma.nel@nwu.ac.za

Researcher

Name and surname: Me Marianne Mathee
Contact number: 0845173263
E-mail: marianne.mathee@nwu.ac.za

3. Purpose of this project

The aim of the study is to (determine):

1. To what extent the learners are satisfied with the prescribed textbook as a learning tool;
2. What the learners' attitudes are towards using mobile-assisted vocabulary learning applications as a supplementary learning tool;
3. What the teachers' attitudes are towards using mobile-assisted vocabulary learning applications as a supplementary teaching tool; and
4. How learners perceive the mobile-assisted vocabulary learning applications in terms of motivational value in comparison to the prescribed textbooks;

5. Formulate guidelines for mobile-assisted vocabulary learning applications as supplemental learning/teaching tool to prescribed textbooks.

4. Requirements of participants

As a participant in this project, your child will be required to complete three questionnaires regarding a) his/her current mobile-application activities; b) his/her English text book and c) a mobile application he/she will be introduced to. He/she may also be required to take part in a focus group discussion regarding the above-mentioned topics. All the activities will be done during normal school hours during a time decided upon by the teacher, learners and researcher.

5. Please note:

- Participation in this project is completely voluntary and no pressure will be placed on the learner to take part.
- The learner may withdraw from this study at any time, without any consequences.
- By agreeing that your child participates in the project, you are also giving consent for the data that will be generated, to be used by the researcher for scientific purposes, with the stipulation that it will be confidential and that **your child's name will not be linked** to any of the data.

By placing your signature below, you declare that your child may participate in this project voluntarily. You also declare that you are fully informed of the purpose of the project and give permission that:

Information given by your child in the form of questionnaire responses and focus group discussions on mobile-assisted vocabulary learning in English First Additional Language may be used for research purposes without identifying your child as an individual.

Signature of parent/caregiver

Date

Yours sincerely



Prof. Carisma Nel

Annexure B: Learners consent form



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South Africa 2520
Tel: 018 299-1111/2222
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School of Human and Social Sciences for Education

Tel: 018-2852639
Email: carisma.nel@nwu.ac.za

Dear Grade 8 or 9 learners

Assent form to be completed by eighth or ninth grade English FAL learners

The following information will be read and explained to you by your teacher/caregiver/parent.

Please provide the following personal information (for coding purposes only):

Name and surname: _____

The following information is provided so that you as a participant can make an informed decision about your voluntary participation or not.

1. Title of project: Motivational value of mobile-assisted vocabulary for English First Additional Language learners.

2. Contact details of Project Head:

Name and surname: Prof. C. Nel
Contact number: (018) 2852639
Email: carisma.nel@nwu.ac.za

Researcher

Name and surname: Me Marianne Mathee
Contact number: 0845173263
E-mail: marianne.mathee@nwu.ac.za

3. Purpose of this project

The aim of the study is to (determine):

6. To what extent the learners are satisfied with the prescribed textbook as a learning tool;
7. What the learners' attitudes are towards using mobile-assisted vocabulary learning applications as a supplementary learning tool;
8. What the teachers' attitudes are towards using mobile-assisted vocabulary learning applications as a supplementary teaching tool; and
9. How learners perceive the mobile-assisted vocabulary learning applications in terms of motivational value in comparison to the prescribed textbooks;

10. Formulate guidelines for mobile-assisted vocabulary learning applications as supplemental learning/teaching tool to prescribed textbooks.

4. Requirements of participants

As a participant in this project, you will be required to complete three questionnaires regarding a) your current mobile-application activities; b) your English text book and c) a mobile application you will be introduced to. You may also be required to take part in a focus group discussion regarding the above-mentioned topics. All the activities will be done during normal school hours during a time decided upon by the teacher, learners and researcher.

5. Please note:

- Participation in this project is completely voluntary and no pressure will be placed on you to take part.
- You may withdraw from this study at any time, without any consequences.
- By agreeing to take part in the project, you are also giving consent for the data that will be generated, to be used by the researcher for scientific purposes, with the stipulation that it will be confidential and that **your name will not be linked** to any of the data.

By placing your signature below, you declare that you are taking part in this project voluntarily. You also declare that you are fully informed of the purpose of the project and give permission that:

Information given by you in the form of questionnaire responses and focus group discussions on mobile-assisted vocabulary learning in English First Additional Language may be used for research purposes without identifying you as an individual.

Signature of participant

Date
Yours sincerely



Prof. Carisma Nel

Annexure C:

Interview/Focus Group Confidentiality (Non-Disclosure) Agreement

Private Bag X6001, Potchefstroom
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Tel: 018-2852639
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1 September 2015

Interview/Focus Group Confidentiality (Non-Disclosure) Agreement

Thank you for agreeing to participate in an interview/focus group to discuss mobile-assisted vocabulary learning for English First Additional Language. The ideas, opinions and attitudes shared are sensitive and should be shared only in this interview/focus group.

I, _____ hereby agree to maintain the confidentiality of information disclosed during the interview/focus group as follows:

- a) To hold in confidence any and all information about the opinions, experience and attitude of all participants which have been disclosed, or made available to you directly or indirectly, or information you otherwise received incident to your participation in this discussion.
- b) That any ideas, or suggestions contributed by you during the discussion, as well as any ideas, developments, or interventions conceived by you or others participating in the Focus Group, shall be held in confidence until the group sees fit to disseminate the information.
- c) That you, shall at all times hold in trust, keep confidential and not disclose to any third party or make any use of the Confidential Information beyond those activities that are part of the interview/focus group.
- e) All notes, reference materials, memoranda, documentation and records in any way incorporating or reflecting any of the Confidential Information shall belong exclusively to the undersigned or if the undersigned agrees to distribution.
- f) Also included as confidential is any participants Personally Identifiable Information ("PII"). PII shall mean a person's identity or information that might reasonably allow identification of the person. I shall at all times hold in trust, keep confidential and not disclose to any third party or make any use of the identity or PII of any Respondent involved in the interview/Focus Group.

g) That you, hereby give permission to the research study for an audio recording to be made of this session. That you understand a transcription of this tape may be used by the research project for research purposes only.

By submitting this form you will be entering a confidentiality agreement with:

Contact details of Project Head:

Name and surname: Prof. C. Nel

Contact number: (018) 2852639

Email: carisma.nel@nwu.ac.za

Researcher

Name and surname: Me Marianne Mathee

Contact number: 0845173263

E-mail: marianne.mathee@nwu.ac.za

Participant

Signature: _____

ANNEXURE D: Questionnaire

Mobile-Assisted Vocabulary Learning Questionnaire

Name : _____ Age: _____

Gender: Male/Female

Instructions: Please read the following survey carefully.

Answer the questions as best as you can.

Your answers will be kept confidential, but may be used for publication in future research.

Section A: Background

- | | |
|---|----------|
| 1. I own a mobile device. | Yes / No |
| 2. I carry my mobile device with me nearly every day. | Yes / No |
| 3. I use mobile applications nearly every day. | Yes / No |

4a) What mobile device applications do you use often? (List up to 5 applications)

- i) _____
- ii) _____
- iii) _____
- iv) _____
- v) _____
- vi) _____

4b) Circle the **main language** that is used in the application that you listed.

- i) English / Afrikaans / Other
- ii) English / Afrikaans / Other
- iii) English / Afrikaans / Other
- iv) English / Afrikaans / Other
- v) English / Afrikaans / Other

4c) List the **purpose** of the application (i.e. communication, education, entertainment) _____

- ii) _____
- iii) _____
- iv) _____
- v) _____

Indicate to what extent you agree or disagree with the following statements.

Clearly cross the block containing the number of your choice, e.g.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

5. I am interested in learning English using English applications and websites.

1	2	3	4
---	---	---	---

6. I am confident that I can understand the contents of most commonly-used English websites and mobile applications.

1	2	3	4
---	---	---	---

7. I am satisfied with learning English from only the textbook.

1	2	3	4
---	---	---	---

8. I would like the teacher to supplement the textbook with other activities.

1	2	3	4
---	---	---	---

How do you feel about the following aspects? Rate from really not good to really good.

1	2	3	4
Good	Neutral	Not good	Really not good

9. How do you feel about using your mobile device for educational purposes in class?

1	2	3	4
---	---	---	---

10. How do you feel about using your mobile device for English self-study outside of class?

1	2	3	4
---	---	---	---

Section B: IMMS Questionnaire: EFAL Textbook (ARCS Category)

Indicate to what extent you agree or disagree with the following statements related to your English First Additional Language textbook.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

1. It is clear to me how the content of the textbook is related to things I already know.

1	2	3	4
---	---	---	---

2. The quality of the textbook helped to hold my attention.

1	2	3	4
---	---	---	---

3. As I used this textbook, I was confident that I could understand the content.

1	2	3	4
---	---	---	---

4. I enjoyed working with this textbook so much that I think I will continue using it.

1	2	3	4
---	---	---	---

5. The way the information is arranged in the textbook helped keep my attention.

1	2	3	4
---	---	---	---

6. I really enjoyed working with this textbook.

1	2	3	4
---	---	---	---

7. The content and style of writing in this textbook conveys the impression that its contents are worth knowing.

1	2	3	4
---	---	---	---

8. After working with this textbook for a while, I was confident that I would be able to complete the required tasks.

1	2	3	4
---	---	---	---

9. The variety of reading passages, exercises, illustrations, etc. helped keep my attention on the lesson.

1	2	3	4
---	---	---	---

10. The content of this textbook will be useful to me.

1	2	3	4
---	---	---	---

11. The good organization of the text helped me be confident that I would learn the material.

1	2	3	4
---	---	---	---

12. It was a pleasure to work with such a well-designed textbook.

1	2	3	4
---	---	---	---

13. What did you like about using the textbook for learning English?

14. What did you dislike about using the textbook for learning English?

Section C: IMMS Questionnaire: Mobile Application (ARCS Category)

Indicate to what extent you agree or disagree with the following statements related to the mobile application you were introduced to in your English First Additional Language vocabulary lessons.

1	2	3	4
Strongly Agree	Agree	Disagree	Strongly Disagree

1. It is clear to me how the content of this app is related to things I already know.

1	2	3	4
---	---	---	---

2. The quality of the app helped to hold my attention.

1	2	3	4
---	---	---	---

3. As I used this app, I was confident that I could understand the content.

1	2	3	4
---	---	---	---

4. I enjoyed learning with this app so much that I think I will continue using it.

1	2	3	4
---	---	---	---

5. The way the information is arranged in the app helped keep my attention.

1	2	3	4
---	---	---	---

6. I really enjoyed working with this app.

1	2	3	4
---	---	---	---

7. The content and functions of this app convey the impression that its contents are worth knowing.

1	2	3	4
---	---	---	---

8. After working with this app for a while, I was confident that I would be able to use all its functions.

1	2	3	4
---	---	---	---

9. The variety of reading, options, graphics, etc., helped keep my attention on the lesson.

1	2	3	4
---	---	---	---

10. The content of this app will be useful to me.

1	2	3	4
---	---	---	---

11. The good organization of the application helped me be confident that I would learn the material.

1	2	3	4
---	---	---	---

12. It was a pleasure to use this app in the class.

1	2	3	4
---	---	---	---

13. What did you like about using the mobile application for learning English?

14. What did you dislike about using the mobile application for learning English?
