An investigation into the validity of mobile technologies as a support structure for first year students studying German as a foreign language in a South African context

by
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Declaration

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Abstract

The high penetration rate of mobile devices all over the world, and especially in South Africa, has significantly increased the relevance of Mobile Assisted Language Learning (MALL). The objective of this study is to ascertain the viability of incorporating MALL technology to enhance the language learning experience of South African university students who are studying a foreign language. The students enrolled for the beginners' German course at Stellenbosch University served as participants in this study, and surveys and interviews were used to establish their exposure to mobile devices, as well as their experiences in relation to the incorporation of Short Messages Service (SMS) into their German course. The results indicate that although the vast majority of students are mobile device owners, only a few students will embrace the idea of using these devices to improve their language skills without any incentive. Without constant motivation and encouragement to use mobile technologies, and the willingness from everybody involved in both teaching and learning a foreign language, mobile technology as a support structure cannot be implemented successfully.

Opsomming

Weens die hoë indringingsaanslag van mobiele toestelle regoor die wêreld, en so ook in Suid-Afrika, het die relevansie van Mobiele Ondersteuning vir Taal Onderrig (MOTO) aansienlik verhoog. Die uitkoms van die studie is om te bepaal wat die lewensvatbaarheid is, van die inkorporering van MOTO tegnologie om die taal aanleer ervaring van Suid-Afrikaanse studente wat `n vreemde taal aanleer te verhoog. Die studente wie geregistreer was vir die Duits beginners klas by die universiteit van Stellenbosch, het gedien as deelnemers aan die study. Opnames en onderhoude was gebruik om die studente se blootstelling ten opsigte van mobiele toestelle vas te stel, so ook hul ervaring van die inkorporering van kortboodskapdienste (SMSe) in die Duitse module. Die resultate toon dat alhoewel die meeste studente eienaars is van een of ander mobiele toestel, dat daar slegs `n paar studente is wat die konsep van die gebruik van hierdie toerusting vir die verbetering van taal vermoë, sonder enige insentief, aangryp. Sonder konstante motivering en aanmoediging om mobiele toestelle te gebruik, en die bereidheid van almal wie betrokke is in beide die leer en die onderrig van 'n vreemde taal, sal die implementering van mobiele tegnologie as 'n ondersteuningsmiddel nie suksesvol geskied nie.

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Chapter 1

Background and aim of study

1.1   Background to the study

In 2010, lecturers at the German department of Stellenbosch University were considering ways in which to improve the marks of their first year students in the German 178 course by incorporating possible useful new technologies into the course. The need for a support mechanism that would allow these students to have greater exposure to the German language was identified as one of the factors that could influence overall improvement in their results. The use of mobile assisted language learning (MALL) was seen as potentially beneficial, because students would be able to access learning content or study tips whenever and wherever they were. Since content would be sent to their cell phones, it would not only give them additional exposure to the language, but also allow students to interact more with the language, since it would be easily accessible. As Ros i Solé et al., (2010) states,

> so far, research into the changing lifestyles, identities and social practices of the language learners has mainly been situated in the target language country, in the experiences of residence abroad and in accounts of the immigrant language learner. Research into the personal and social journeys which language learners of 'foreign languages' take in and out of educational contexts in their own place of residency is still in its infancy

(Ros i Solé et al., 2010: 41)

Against this background, the aim of this study is to investigate the effect of incorporating mobile technology as a support mechanism for language learning.

1.2   The main aim of the study

To determine the validity of mobile technologies as a support structure for first year students studying German as a foreign language in a South African context.

1.3   Procedure followed

All the students who were registered for German 178 during the first semester were given the opportunity to take part in the study.

The empirical research for this study consists of two surveys and an interview conducted with the students after the project was finished.

1.3.1   The surveys

Two surveys were conducted during the study. The first one was to establish features of the students' mobile phones and their usage of their phones (Appendix A) and the second one was aimed at gathering feedback about the project (Appendix B). The second questionnaire included the following broad themes:

- The type of content students would like to receive
- How many SMSs students thought were sufficient
- What would influence students make to more use of mobile content

The total number of 152 students was defined as the target population. Questionnaires were handed out to the students after class, and those who were absent received the questionnaire via email. One hundred and twelve students wanted to take part in the study; which means that 74% of the class participated. The surveys were seen as supplying the primary research data, with secondary data obtained in the form of interviews.

1.3.2   The interviews

Interviews were conducted with nine students to get more extended feedback with regard to the use of mobile technologies (Appendix C).

1.4   Outline of remainder of thesis

1.4.1 Chapter 2:   Literature review

In this chapter the literature review is discussed. This serves as an introduction to mobile technologies, the approaches taken by some of the researchers who have implemented mobile learning projects and the theories that underlie work with mobile technologies. The chapter also considers the research projects conducted internationally and within South Africa, how the devices have been used in education, the uses of SMSs within education, the mobile learning experiences of students who have been part of some of the studies in other parts of the world, and the advantages and disadvantages of mobile learning.

1.4.2 Chapter 3:   Research Design and Methodology

This chapter discusses the research design and methodology followed for the research project, along with an outline of the steps taken to conduct the study.

1.4.3 Chapter 4:   Research results and discussion

The results of the two questionnaires as well as the interviews that were conducted are discussed in this chapter.

1.4.4 Chapter 5:   Recommendations and conclusion

In this chapter I refer back to some of the aspects discussed in the literature review in Chapter 2. I will also discuss some of the limitations the study had and certain recommendations will then be made.

Chapter 2

Literature Review

In trying to establish a case for why exactly learning with mobile technologies could be advantageous, Traxler (2007:8) stresses that "it allows... students to exploit small amounts of time and space for learning..."

2.1 What is meant by mobile, and why all the hype?

Mobile devices are an integral part of our everyday lives as these devices include a number of different electronic products, such as personal handheld devices (PDAs) like the Blackberry, cell phones, laptops, mini game consoles, media players, media recorders and personal navigation devices (GPS) (Farmer, 2008:19). Of all the handheld devices the most popular and widely owned handheld device is probably the mobile phone (Trinder, 2005: 7). According to Divitini et al (2002) one of the most successful technologies developed over the past couple of years would most definitely be the mobile phone, with ownership from 95% among Finnish students to about 91% among Irish youth (Hegarty, 2004). "Sales of handheld computers are expected to grow more than 40% between 2002 and 2004. PDAs and cell phones will outsell laptops and desktop computers combined by 2005 with the majority of companies switching to wireless networks by 2008." (Ellis 2003: 3). Currently, more cell phones are bought and owned than home computers (Wang et al., 2009: 677).

According to a report on My Broadband (2009) "South Africa has the third highest penetration of mobile subscriptions in Africa behind Reunion and Gabon... but did not feature in the top 10 when it came to overall Internet users".

South Africa showed a steady growth rate of 21.45% per year from 2003 to 2007/2008 in terms of compound mobile subscriber, and the mobile penetration rate was estimated at 97.54% in 2008. When it came to Internet penetration rates South Africa did not fare equally well. "According to the

report, the country has shown a compound Internet subscriber growth rate of 12.98% over the last five years and has only 3.22 million Internet users. This constitutes an Internet penetration rate of 6.59%, well below developed economies and lower than many developing economies" (My Broadband, 2009). Bearing these figures in mind, it would just make sense to focus on MALL in South Africa. Since cell phones have become a prevalent technology within society, instructional environments are now looking into incorporating them because of their size, the ease of use, innovative new features, and their portability (Koszalka and Ntloedibe-Kuswani, 2010).

The fact that content is accessible at any time makes the use of mobile devices an ideal addition to learning activities. In the educational sector, PDAs, cellular phones and other kinds of mobile devices have been heralded as the latest technologies that can be used to facilitate learning. The devices are a learning tool where learning content can be accessed or delivered anytime and anywhere. Features on a cell phone such as text messaging, audio/video communication and recording, image capturing, internet access and their recording/documentation/archiving abilities make information much more accessible (Farmer, 2008:19). According to Soloway (2001) it is the affordability and accessibility, of mobile technologies that makes it a convincing choice to use technology in classrooms.

Mobile devices are exceptionally well-liked amongst the youth, and also have a high penetration rate. Because of this, mobile communication has distinct advantages compared to computer mediated communication (CMC). According to Rau et al (2008) the mobile phone is already an established device amongst much of the language learning community, as opposed to the use of computers for language acquisition purposes. As desktop computers were often designated to a specific area, computer mediated communication was mostly used within the formal arenas of education. The communication between the instructor and learner was always marked by the physical distance between them. This distance has not been completely addressed by the use of mobile technologies. According to Rau et al. (2008), the educational experiments conducted by some researchers only implemented mobile communication

systems to manage activities instead of being integrated in the activity. One of the reasons mobile communications were only used to manage activities is that the classroom environment is seen as a formal arena where a distance between the instructor and the learner should be kept. With the learner taking on a more central role within the classroom nowadays, the direct implementation of mobile technologies within education is expected to bridge the gap between formal and informal education (Rau et al., 2008). With students always on the move, changing locations, moving in and out of buildings, the one item always at hand (or in-the-pocket) is the mobile phone, with access rates well beyond the typical study day (Cereijo-Roibas and Arnedillo-Sanchez, 2002).

The mobile phone is conveniently small, easily portable, and has the ability to receive text or voice messages from anywhere and at any time, which makes staying in close contact with friends, lecturers and people from all over the world that much more possible (Kiernan and Aizawa, 2004).

> *Their versatility and mobility meant people can use them in a diversity of settings, be they sitting in a classroom, eating in a café, walking around in a museum, exploring a field site, or playing a game in the streets. Compared with PCs and laptops, they are lighter, cheaper, easier to interact with while on the move, more legible in different light settings and can be easily placed back and forth in a person's clothing or bag.*

> (Roschelle J and Pea, R, 2002, in Rogers et al., 2010: 111)

Some of the more recent introductions of mobile communication into classrooms have been to elevate student motivation and promote teaching efficiency (Rau et al. 2008). Bearing in mind that most of the activities designed for mobile assisted language learning (MALL) are designed for mobile phones, and that mobile phones are now the communication tool of choice for many university and high school students, little attention has been given to provide learner support, in which learners are given the opportunity to interact with other learners about learning materials and other content through

the use of their mobile phones (Kiernan and Aizawa, 2004). This might be because not a lot of research has been done on the impact of using mobile communication technology to increase informal interaction and sharing learning materials (Rau et al., 2008)

2.2 What is mobile learning?

The use of language and the way it is taught is questioned every day by educators, researchers and language practitioners, and with new available technologies, new questions arise as to how email, SMS and mobile technologies can be used to help students learn a language. Computer Assisted Language Learning (CALL) and Mobile Assisted Language Learning (MALL) are concepts increasingly more attractive to educators within the education sector. And while MALL has become a commonly used term, scholars still struggle to agree upon a definition for 'mobile' and what it entails. This can be ascribed to the fact that,

> ...the field, that being mobile, is experiencing rapid evolution, and partly because of the ambiguity of "mobile"- does it relate to mobile technologies, or the more general notion of learner mobility? In fact both aspects are currently important; in addition, the mobility of content is often highlighted.

(Kukulska- Hulme 2009: 158).

The term 'mobile learning' clearly does not have a widely accepted definition. This is not only because the field is experiencing a rapid evolution, but also because of the ambiguity of the term 'mobile', since the term can either relate to mobile technologies, or to the more general notion of learner mobility. In fact both aspects are currently important, and in addition to this, the mobility of content is also often highlighted (Kukulska-Hulme, 2009). In the past, mobile learning has been defined by its mobility in terms of technology, while the focus has recently shifted from technology to the mobility it provides to its users in terms of location. According to Traxler (2005) "mobile learning can perhaps be defined as 'any educational provision where the sole or dominant

technologies are handheld or palmtop devices'". Wang et al., (2009) state that m-learning refers to the opportunity of receiving learning material anytime and anywhere, through the use of wireless internet and mobile devices, whether that device is a mobile phone, a personal digital assistant (PDA), a smart phone or a digital audio player.

The most common description of mobile learning is what the term says it is: learning through the use of mobile devices (Quinn 2000). According to Kukulska-Hulme and Shield (2008), although one can refer to any portable material as an m-learning device, such as books, audio-cassettes, audio CDs, and portable radios, usually the focus is on the latest and most recent devices such as mobile phones, smartphones, digital tablets, personal digital assistants (PDAs) and their peripherals.

More recent views of mobile learning concentrate on the learner rather than the technology and argue that there are dimensions other than technology that should be considered such as the personal, social and time and space dimensions (Vavoula et. al, 2005).

According to Brown (2010), mobile learning is the exploitation of ubiquitous handheld technologies, and with the incorporation of wireless and mobile phone networks it aims to facilitate support, enhance and also extend the reach of teaching and learning. E-learning made us realise that learning can take place anytime and anywhere. What Brown tries to state is that with the inclusion of mobile devices learning can become pervasive, all-the-time.

In her article she highlights the difference between mobile learning and e-learning, in which case mobile learning is described as being shorter in duration with the content being developed for instant use, and with the focus shifting more towards the capabilities that the device can hold, and not the device itself, as well as on the experience that learners can have, not the technology that is used (Brown, 2010). What should be kept in mind is that mobile learning is both a new concept, and one that has familiar connotations. Mobile learning is certainly concerned with learner mobility, in the sense that learners should be able to engage in educational activities without the

constraints of having to do so in a tightly delimited physical location, but it also has to do with the motivation of learning outside a classroom or in a variety of locations, whenever the opportunity arises (Kukulska-Hulme, 2005).

> *Thus mobile learning has a range of attributes that might contribute to its definition: "it can be spontaneous, personal, informal, authentic, situated, contextual, portable, and ubiquitous (available everywhere) and pervasive (so integrated with daily activities that it is hardly noticed). It draws our attention to mobility: not just the fact of mobility, but the effects of mobility, which might include new ways of dividing up one's time and crossing boundaries.*

<div align="right">(Kukulska-Hume, 2005:1 and 2009: 160).</div>

Mobile learning can take place in a variety of ways via mobile devices. These include performance support, mentoring, coaching, quizzes, tests, surveys and polls, podcasts, updates and alerts just to name a few (Brown, 2010). As long as the student has access to the learning material they need, irrespective of location, they will be engaged in m-learning.

Nowadays, learners almost always tend to move between the use of a cellular phone and a desktop computer. With synchronous texting that allows near-conversational levels that resembles an online chat forum, the immediacy, mobility and perpetual accessibility becomes an affordance (Kasesniemi and Rautianen, 2002). According to Kirschner (2002) what could be understood in terms of educational affordances is that,

> *Educational affordances can be defined as the relationship between the properties of an educational intervention and the characteristics of the learner that enable particular kinds of learning by him or her.*

<div align="right">(Kirschner 2002: 19).</div>

With this said, it is through the use of mobile technologies that a variety of educational affordances can be provided (Lai et al. 2007).

According to Virvou and Apelis (2005) using a mobile phone as a handheld computer can have many benefits. The benefits include

> device independence as well as more independence with respect to time and place in comparison with web-based education using standard PCs. Indeed, there are situations where students and instructors could use some spare time constructively to finish off their homework and lesson preparation, respectively.

(Virvou and Apelis, 2005: 54).

According to Brown and Campione, (1996) if the device is implemented successfully, it renders the opportunity of complementing and adding value to existing learning models like the social constructive theory of learning.

> The constructive learning model states that a learner has to act and reflect in an environment. Action could be a task of solving a problem and reflection could be abstracting from the derived solution and accumulating in one's experiential knowledge. Since ICT has become more personalized, mobile, user-centred and durable, it offers the possibility to support the social constructivist theory.

(Motiwalla, 2007: 583).

Adding to that, the fact that handheld devices are such highly individualized and collaborative communication tools means that they can be used as a computer which would give flexibility "in situations where no computer may be available such as in trains, buses and coaches while commuting, in long queues while waiting or when unexpected spare time comes up. In the fast pace of modern life such situations can be very frequent" (Virvou and Alepis, 2005: 54). What Brown and Campione, (1996) also state is that the use of a

wireless handheld device could never replace teachers or classrooms due to their limited knowledge domains, and "tutoring systems attempting this have never been successful" (Motiwalla, 2007: 585).

Since mobile assisted language learning (MALL) is derived from the principles of computer assisted language learning (CALL), it has the capability of providing English foreign language (EFL) learners with the same opportunities for independent and targeted reading practice and immediate corrective feedback as has been done through CALL (Arani, 2010). According to Arani (2010) the most feasible way to overcome many of the obstacles posed by learning English as a foreign language lies within the use of mobile technologies. He uses mobile technologies in conjunction with a blended learning approach to create the one element absent in an EFL setting which, according to him, is the target language culture. Through the use of mobile phones he creates wiki pages, blogs and chat rooms, but he does caution that "the needs of the students must be balanced with the outcomes expected by the institutions" (Arani, 2010: 43). As Shield and Kukulska-Hulme (2008) have pointed out one of the distinct differences between Computer Assisted Language Learning and Mobile Assisted Language Learning is that mobile technologies can fit into the mobile lifestyles of students through assisting them. Mobile devices are more personal and portable and enable new ways of learning by emphasizing continuity and spontaneity. Through receiving text messages, learning can be supported outside the classroom. What could be said especially in terms of the use of information and communication technologies (ICTs) is that they have improved learning, especially when it was coupled with more learner-centred instruction (Zhu and Kaplan, 2002).

According to an editorial on open and distance learning (Gaskell, 2007: 197), "m-learning aims to provide 'educational moments' through lifestyle integration anytime, anywhere, not just when away from one's desk, but also when actively moving around; for instance, performing household chores". Mobile learning gives those who use their mobile phones daily, and who are not part of the formal education system, the opportunity to learn. The environments that

mobile learning create can be online, distance, face-to-face, self-paced or calendar-based.

2.3 The main theories, approaches, and methods used when working with mobile learning

According to Lea et al. (2003) the currently preferred educational practices can be depicted as principally student centred. Learners are understood to have different priorities, preferences and approaches to learning, and different requirements for support. One of the main perspectives associated with mobile learning includes the cognitive perspective. The cognitive view has many different pedagogical manifestations, ranging from co-instruction with learners, knowledge construction through active participation, social construction of knowledge through group work, to applied, problem-based learning.

According to Kukulska-Hulme and Shield, (2008) there has been a clear divide in studies focusing on mobile technologies. Those that are content-based, focus more on the formal contexts of language learning, while the other studies focus more on the informal context, and are more related to the design of activities. According to Malliou et al. (2004) some of the theories that underlie the activities and development of projects being implemented are the collaborative, contextual, autonomous and experiential theories. The MOTFAL project is an example of this where all of the theories as mentioned above are incorporated. The project

> *is a joint initiative of educators, psychologists and pedagogical and technological experts to research the possibilities of using mobile platforms with internet access for educational purposes at school level. The partnership aims to develop, test and evaluate learning schemes that are implemented within a handheld learning environment.*

> (Malliou et al., 2004: 119).

The project makes use of collaborative learning to enhance student cooperation by means of communication and collaboration through the

project's platform. In collaborative learning, students work together in groups of two or more. In contextual learning students are motivated to make connections between what they learn and their real-life experiences, and within the project students can study the curricula in environments outside of the classroom. The project also provides the learners with various materials and resources, in conjunction with the opportunity to work collaboratively or alone, with the application of autonomous learning. Autonomous learning gives learners the opportunity to manage their own learning. With regards to experiential learning, students adopt a hands-on role within the learning that takes place through the activities which the project provides.

The section below is aimed at providing a better overview of experiential learning and constructivist learning, as these two approaches are the most prevalent amongst all the studies that were read.

2.3.1 Experiential Learning

"It is Dewey's 'learning by doing' theory that emphasizes the value of action while learning" (Lai et al. 2007: 326). The experiential learning theory emphasizes learning as a process where the creation of knowledge is made through a transformative experience (Kolb 1984). According to this theory optimal learning will occur when people are able to link their previous experiences to the new ones they would want to learn (Kolb 1984). Experiential learning, therefore, puts learners into different situations where knowledge would not just be abstract, but rather gives the learners the opportunity to encounter different contexts where they are brought into direct contact with the subject matter, and therefore link what they have experienced, to new concepts to be learnt (Lai et al, 2007). Of all the experiential learning theories that have been proposed, Kolb's experiential learning theory (ELT) has been the most influential. This is because Kolb's theory focuses primarily on linking new concepts that one wants to learn to the transformative reflection of one's own experiences. In support of experiential learning as a viable approach to mobile technologies, it was incorporated as a theme in the MOBIlearn project (MOBIlearn consortium 2003). "The MOBIlearn project aims to improve access to knowledge for selected target users, giving them

ubiquitous access to appropriate, contextualised and personalised learning objects, by linking to the internet via mobile connections and devices" (Murelli, 2004: 143). The key objective of the project is to improve knowledge through learning process that are both cost and time effective. One of the scenarios where the project was implemented for testing was within the Nottingham Castle Museum in the UK. The visitors of the museum were given handheld devices that would locate where in the museum you are and provide context-dependent content. What was found was that the visitors did use the device to get more information on the objects that they were viewing, while communicating with others about what they were looking at.

Experiential learning has, however, been questioned by some educators due to the lack of ensuring the awareness and focus of students when they are learning in different contexts (McMullan and Cahoon 1979; Miettinen 2000; Lai et al, 2007).

2.3.2 Constructivist Learning

"The constructivist learning model states that a learner has to act and reflect in an environment. Action could be a task of solving a problem and reflection could be abstracting from the derived solution and accumulating in one's experiential knowledge" (Motiwalla, 2007: 583). Within the constructivist paradigm, the learner, rather than the teacher, becomes the central role player. It is the learner who interacts with his or her environment and thus gains an understanding of its features and characteristics. Constructivism is an approach to teaching and learning based on the premise that cognition (learning) is the result of "mental construction." Constructivists believe that learning is affected by the beliefs and attitudes of students with regards to the context in which an idea is taught.

Conceptualisations and findings of solutions to problems are constructed by the individual, mastering autonomy and independence. To get a better idea of what constructivist learning is, it is useful to consider the stance of Collins et al. (1989) who argue that the essence of the constructivist approach is learners finding meaning through the activity that they are doing. Many studies

have shown that students create knowledge on top of that which they already know. Previous knowledge would thus act as a foundation for new knowledge. From this one can deduce that any opportunity to acquire new knowledge would act as a building block for a student's future knowledge.

"Assumptions of constructivism and of better understanding through an active process of creating hypotheses and building new forms have been emphasized by mainstream cognitive approaches to learning and teaching" (Mayes and De Freitas, 2007: 17). Previous studies have found that computer-mediated communication facilitates not only constructivist learning but also individualized learning (Abrami and Bures 1996, Muir-Herzig 2004). Several other studies also indicate that using computers in education helps students to become more self-reliant, and encourages peer coaching, facilitating collaboration in this way (Bakker, Gearhart and Herman 1990, Dwyer 1994). Rau et al. (2008) also point out that when computer-mediated communication is used, students feel less threatened to express their opinions due to reduced social cues, and thus are more inclined to seek help from the teacher and their peers.

Discoveries made by cognitive scientists shed light on the 'pushing' and persuasive effects of mobile learning on learner performance, which have been especially advantageous for the incorporation of SMSs into the language learning environment. In an experiment conducted in 1996, Caple (1996, cited in Wang et al., 2009) determined that intermittent instruction of small pieces of content and periodic practice lead to greater retention by students than large amounts of information and constant practice in a computer-assisted learning environment. "This reflects a growing body of work that indicates that small-scale learning interventions and 'spaced practice' allow for more efficient transfer of knowledge from short-term to long-term memory" (Wang et al., 2009: 676). The "spaced practice" and "small-scale intervention" that is referred to, is the "push" of SMSs with minimum content at scheduled intervals to get maximum retention.

According to Pintrich (1999) the learning process is characterised by an inseparable interplay between motivational and cognitive variables. Thus

learning should not be understood as a process that ends once a final assessment has been completed, but rather as an ongoing process. As new knowledge is created, and one moves up from a beginner to a novice learner, the learner's level of expertise and knowledge changes, along with the nature of learning itself.

> *Nevertheless, it is rather too simplistic to argue that constructivism has emerged directly from the cognitive perspective. In fact, in its emphasis on learning-by-doing, and the importance of feedback, it leans partly towards the behaviourist tradition. In its emphasis on authentic tasks, it takes much of the situativity position*
>
> (Collins et al. 1989, as cited in Mayes and De Freitas, 2007: 17).

Since accessibility and inclusion are some of the issues that have become a priority, the aim has now shifted to making learning facilities adaptive to individual needs (Dagger et al, 2005). The results from a study done by Clough et al. (2007), suggest that mobile devices are used extensively by enthusiasts in informal learning contexts, and that they use it in ways that correspond to the contextual, collaborative and constructivist learning philosophies identified by Patten et al. (2006). According to this study, the participants, who were all already comfortable with their phones, had minimized anxiety and usability problems and were all prepared to adapt the features of their mobile devices to suit and support their learning needs (Clough et al. 2007).

> *As learning has become more individualized, learner-centred, situated, collaborative, ubiquitous, and continuing, so has technology. Information communication technology (ICT) has similarly become more individualized, user-centred, mobile, networked, ubiquitous, and durable. These parallel progresses offer the possibility for mobile learning to support the social constructivist theory*
>
> (Motiwalla, 2007: 585)

The social-constructivist approach introduces the social dimension within learning, where collaboration and interaction with others is supported (Vygotsky, 1978). Sharples et al. (2007), describe the term "mobile" in mobile learning in terms of time, technology, physical domain, social domain and conceptual domain. They state that by introducing the social dimension of mobility, the focus is not only shifted to the learner, but all the infrastructures that interact with the learner during the learning process, such as the various social groups, family and classmates come into play (Petersen et al., 2008). According to Petersen et al. (2008) many scholars have agreed that the most effective way of learning is through collaboration with others in a context relevant to the learner rather than being isolated and having to work alone. Here the notion of community is very important for language learning, and can be defined as the feeling of belonging to a group, where the members matter to one another. It is through the introduction of the social dimension that a community is built.

Mobile technologies can turn public spaces into private spaces and private spaces into public spaces. It can bridge borders and merge spaces into one, because of the social approaches that have been adopted in language learning. Within these approaches the social lives of learners take on a central role in language learning. The formation of social relationships, the interaction with the social environment outside the educational environment, engaging with new cultural backgrounds, one's own personal goals and desires are all rooted deeply within the social-constructivist perspective. As a result researchers have changed their perception of a learner from a passive recipient to an active role player in the social and learning environment. Within such a view, learners experience language in the wider context of socialization instead of just as a set of linguistic rules that need to be acquired (Ros i Solé et al., 2010). According to O'Nuallain and Breinnan (2004), students learn more effectively through collaborating with each other. Collaboration can either be synchronous or asynchronous and could include talking in groups, increased motivation through discussion, e-mail, forums and texting on an SMS-enabled device.

The social-constructivist approach was decided on as theory for my study, because of the social dimension it introduces and also because it supports collaboration and interaction with others. Through using this approach the students participating in the study would get the opportunity to come into contact with the language outside of the classroom.

Now that the main theories and approaches have been examined, it would be useful to look at some of the studies and projects that have been conducted over the past couple of years.

2.4 Studies undertaken and projects done in the field of mobile technologies

According to Koszalka and Ntloedibe-Kuswani (2010) the research conducted on mobile technologies and their implementation in language learning is still in its infancy. "Little has been done to replicate current studies, synthesize the results of previous studies, or expand studies to investigate which features of these technologies are predictive of greater levels of interaction and knowledge development" (Koszalka and Ntloedibe-Kuswani, 2010: 151). There is clearly not enough evidence as to whether mobile learning (m-learning) does facilitate learning. Longitudinal research is needed to explore the core questions of student engagement especially when using mobile technologies. Overall the studies that have been done used convenience samples, which suggest that the results cannot be generalized. The viability of m-learning and whether it will be of equal importance all over the world has not been studied directly (Koszalka and Ntloedibe-Kuswani, 2010).

Some of the projects that have exploited the usefulness of mobile technologies include students taking photos of botanical garden specimens, solving mathematical problems and playing educational games. In one particular study, podcasts are provided at museums to give supplemental educational content and in another, children create digital stories with PDAs. In some studies languages are learnt through interactive mobile devices (Farmer, 2008).

Mobile learning has especially been useful for distance students. The ubiquitous nature of mobile phones amongst all the different people around the world, especially in economically disadvantaged areas, is growing. With technologies and learners simultaneously becoming more mobile, the accessibility of learning material though the use of mobile devices should definitely be looked at. Currently, sales in mobile phones surpass that of desktop computers. The growth of cell phone use within South Africa has had beneficial effects as it enhances access to tutors, aids in mathematics practice and learning, and distributes health care information to teens and young adults (Vosloo and Botha, 2009).

Although the growth in use and ownership of the devices has been seen all over the world, there still exists a dramatic divide between developed and developing nations in terms of the type of cell phone being bought, as well as the turnover rate of cell phones bought by a single user. Teachers see mobile phones as disruptive causing problems in the classrooms. Not only are the melodies announcing a call perceived as distractive but "learners have been caught using text messaging functions to communicate with each other during class time, and even attempting to cheat during tests" (Kiernan and Aizawa, 2004: 72).

2.4.1 International projects

In Southampton (JISC 2005) Mobile Assisted Language Learning (MALL) was used to encourage collaboration and co-construction of knowledge. The layout of the campus and the locations of different buildings were used to create a real-world problem. The learners then had to find information and share it with their peers in order to build up an overall understanding of the activity and the challenges it posed, and the solutions that could be implemented to solve a problem similar to it in the real-world (Kukulska-Hulme and Shield, 2008).

According to Perkins (2007), some of the countries in Africa where mobile projects have been introduced include Nigeria, Egypt, Gambia, Kenya, South Africa, Tanzania, and Uganda. In Nigeria the use of low cost mobile technologies was implemented to enhance the literacy rates among its citizens

(Perkins, 2007: 16). Another project is an in-service training programme for nurses in Gambia, aimed at increasing community involvement in malaria control (Perkins, 2007: 17), and in Kenya information communication technologies are used in library and information science education (Perkins, 2007: 18).

The MANOLO project incorporated the use of mobile devices for university field-work in subjects such as environmental sciences and archaeological sciences. According to Kukulska-Hulme (2009) the MANOLO project demonstrated the advantages of using handheld devices which include better use of limited time, improved communication and produced greater accuracy of data recordings (Kukulska-Hulme 2009: 160).

The MyArtSpace project, designed for school children, entailed the use of mobile phones with access to multimedia content within a museum, to better explore and capture their findings for later discussion (Kukulska-Hulme 2009: 160).

The MIT Scheller Teacher Education Program entailed creating augmented realities through a combination of real world experiences and information supplied by handheld devices, to better engage people through games (Kukulska-Hulme 2009: 161).

Frohberg et al. (2009) analyse different kinds of mobile learning projects in the most prominent mobile learning research literature. They examine 102 mobile learning projects and discuss the most common similarities, inconsistencies and differences. Six main factors were highlighted, with one core issue each. The six main factors were context, tools, control, communication, subject and object (or objective). The core issue with context was the relevancy of the environment and learning issue. An estimation of the distribution across the domain of mobile learning, suggests that there are hundreds of projects within an independent context, dozens within a physical context, about fifty in a formalized context, and very few in a socializing context. In terms of tools, the discussion was focussed on the pedagogic role that was implemented and how the usage of a mobile device as a tool to facilitate learning was perceived. The

overview of the tool's usage suggests that most of the projects that they reviewed were focused on interactions which lead to motivation where most of the control over situations and experiences within the learning process were in the hands of the teacher.

The minority of the projects used mobile devices as tools to reflect on data collection. In terms of the control factor, the issues that were examined when using mobile devices was whether there was a stringency of control that needed to be maintained, as well as on whom the responsibility for the learning process and the achievement of goals fell. Most of the projects reviewed had full teacher control, which meant students did not have the opportunity to show initiative or to take the learning process into their own hands. The minority of the projects reviewed had full learner control. The social settings of the projects were examined in the segment dedicated to communication. They found that 49 of the projects isolated learners within a specific learning environment, where the learners had to work mainly on their own, whilst at least 7 showed facilitating communication within a group. In terms of subject and object or objective being studied, most of the projects were geared towards novice learners, because it seems easier using mobile learning with learners who have limited knowledge than to teach experts. The same can be said with the objective of the projects where only a few were found to provide a level of learning higher than the provision of factual knowledge or comprehension.

2.4.2 The South African context

Viljoen et al. (2005) found that many people in South Africa possess a form of mobile technology, and that network infrastructures exist in even the most remote rural areas. As mentioned before, South Africa's mobile penetration rate was estimated at 97.54% in 2008, and was ranked third highest in Africa with regards to mobile subscriptions in 2008.

Having said that, it is important to note that, very few studies pertaining to the use of mobile technologies in education have been conducted in South Africa. According to Perkins, (2007) the studies that have been done in South Africa

are mostly policy initiatives and strategies to implement and promote information and communication technologies (ICTs) in higher education, collaborative partnerships that uses ICTs to enhance the quality of secondary education, and the feasibility of ICT diffusion and the use of ICTs amongst rural women. Others include the impact of the implementation of technology on in-service teacher education and the use of handheld devices for teachers' development in primary schools which was also done in Egypt (Perkins, 2007: 18). Many other studies are also mentioned in Perkins, (2007) with a good cross-section that have been done in different contexts, such as those conducted in the health sector, the training of teachers and nurses and those initiatives aimed at enhancing literacy in different parts of Africa.

The Dunia Moja Project was conducted in partnership with three universities: Makerere University in Uganda, Mweka College of African Wildlife Management in Tanzania, and the University of the Western Cape in South Africa. The project entails film and media courses which exploits technology convergence to expose students to practical skills and theoretical concepts. (Anon, 2007: 58, Perkins, 2007: 20).

Dr Math on MXit, an article written by Vosloo and Botha (2009), reports on students' use of their cell phones to access resources and tutorial help for mathematics. Students were given several kinds of math problems contextualized within a competition. The results from the study were seen as positive, although there were some risks that needed to be managed. These risks included cyber bullying, the effects of texting and the use of SMS language on the learners' spelling and formatting narratives, too much time spent on their MXit platform just chatting to others, and privacy and security issues. What the researchers wanted to emphasize, though, was that neither the cell phone nor computer could act as a standalone structure; but that a good design for learning as well as support services was needed.

These are obviously not all the projects or studies that have been done in South Africa, but from those that have been conducted, the findings suggest that not a lot has been done in terms of language learning. Some light has been shed on the benefits mobile learning can hold for students. Brown (2004)

indicated that at the University of Pretoria 99% of the distance learning students had access to cellular phones, but only 0.4% had internet access whether it was through their cellular phone or computer. This statistic shows that a lot of students can be reached through mobile phones, since almost 100% of them had a device. With that in mind, looking at the field of language learning with the help of mobile phones especially in South Africa, a country rich in language and culture, is imperative.

The next section of the literature review will look at how mobile technologies and devices have been implemented within the education sector, including the classroom environment, as well as problems which could be encountered.

2.5 Mobile devices in class and education

> *Finn and Vandenham (2004) argue that the time has come to move beyond the simplistic question of whether or not handhelds have a place in the classroom, and begin focusing on the more detailed questions concerning how this technology might affect teaching practice in the long term*

(Looi et al., 2009: 1120)

Kukulska-Hulme (2009) mentions some of the aspects that might influence learners when using mobile devices. These include ownership of the device, because the way the learner will use the tool will differ from when one is being borrowed, especially in terms of familiarity of the device. Similarly, whether the learner has one or two mobile devices plays a role, because a learner in possession of multiple devices is in a better position to overcome common problems, such as battery life and reliability.

According to Pinkwart et al., (2003) PDAs are a seen as the best and simplest solution to mobile applications, but as Savill-Smith and Kent (2003) advocate, the penetration of PDAs amongst the student population is lower than that of normal cell phones due to their purchase price being much higher than normal cell phones. Therefore, the use of PDAs as learning organisers does have problematic implications, such as accessibility and ease of use. The problem of

accessibility can be overcome if devices are issued to participating learners, as few learners have access to PDAs. In conjunction with this, the fact that many learners have never had access to PDAs may also mean that even if they are given one, they may not be able to use these devices comfortably.

According to Clough et al. (2007) PDAs and smart phones could be integrated rather successfully into the lives of learners who have prior experience with these devices. These users could operate the devices with familiarity and ease, and when confronted with the option of accessing information or learning activities on a mobile device, these learners could choose to use a mobile device, as opposed to any other learning tool.

In most of the studies that were researched, mobile phones were given to students with the help of either grants or sponsors (Stockwell 2008, Ros i Solé et al. 2010, Belanger 2005). When the same phone is provided to all participants activities are easier to design, as assurance is given that if it works on one phone, it will work on all of them. As soon as this is not achieved, and every student has a different phone, the design of activities becomes more difficult. Thus, making mobile phones available to all the language students would not be impossible but it would imply a number of logistical difficulties (Stockwell 2008: 268).

Alternative methods to using the internet for downloading content to mobile devices could include a plug-and-play approach. The reasons why alternative methods should be looked at are because some of the cell phones that the students own might not have internet access, and because downloading an application or content from the internet can be costly. It would then be necessary to develop tasks that can be downloaded to mobile phones either through plugging the phone into a computer, or through technologies such as micro SD cards, infrared, or Bluetooth, all of which are quite common on most handsets. There are of course logistical issues such as handset compatability which always plays an integral role, and if not taken into consideration could become a major stumbling block (Stockwell 2008). Another issue that Stockwell (2008) highlights, in terms of the compatibility of handsets is that as soon as ownership of cell phones becomes a necessity in terms of

assessment, "the dangers of introducing gaps between the haves and have nots on a personal level rather than an institutional one, becomes immediately obvious" (Stockwell 2008: 268). Therefore, if activities are to be implemented successfully, different types of handsets should not be a deciding factor, but rather how the activity is constructed.

In Ros i Solé et al. (2010), the use of MP3 players is not only incorporated to investigate the possibilities of these devices as recording devices, but to also investigate the learning habits and social practices with which the learners engage. What was found was that MP3 mobile technology gives students the opportunity to apply technology in their everyday lives. The device was used to rehearse a new language, as a way to become more confident when speaking it. Although most mobile devices have the ability to record and to be used as an MP3 player, not a lot of MALL activities make use of this affordance (Kukulska-Hulme and Shield, 2008). An example of where it has been used includes Duke University who supplied iPods to each of its new undergraduates in 2004 to use for listening and speaking activities when interacting with new material, especially language material. The goal was to broaden exposure to the newly acquired knowledge, and also to record and listen to classes when students wanted to recall topics discussed previously (Belanger 2005).

Fallahkhair et al. (2007), describe an interactive language learning service that combines mobile technologies and interactive television. According to them, the benefits associated with television are found in its ability to provide rich multimedia content that is authentic and immersive, and can be renewed constantly. This feature is lacking even in the most accessible mobile devices. Although mobile devices can provide a wide variety of personal activities and learning on-the-move, they are less powerful for enabling learning from authentic and immersive content. "Programmes such as news, soap operas and documentaries have the potential to enhance language learners' experience by showing the target language, culture and context of use" (Fallahkhair et al., 2007: 312)

The results from the study done by Wang et al. (2009), indicate that "performance expectancy, effort expectancy, social influence, perceived playfulness and self-management of learning were all significant determinants of behavioural intention to use m-learning" (Wang et al., 2009: 109). Performance expectancy was the strongest predictor of behavioural intention to use m-learning. Therefore, someone with lower performance expectancy would most likely not adopt m-learning in contrast to those with a high performance expectancy level. Effort expectancy had a significant influence on whether people intended to make use of mobile learning or not. If it was seen as too much effort to use m-learning, or to access content, one would not adopt this form of learning. Therefore, the user should think that using the m-learning system would be easy and convenient. According to Mazza et al. (2004) user-centred and scenario-based designs are ways of ensuring that a system is appropriate to the user and the context in which it is used. Such a system or project would then have to be interdisciplinary, unobtrusive, available, adaptable, useful, and suitable.

The study done by Rogers et al. (2010), looks at how mobile devices can facilitate sensemaking.

> *Sensemaking is central to many everyday learning and work activities, and would seem ideally suited to being augmented by mobile technologies. In an educational context, it is used to describe the social construction of knowledge through conversation and meta-level thinking; where students learn how to use the tools of a subject, such as science or mathematics, through switching between abstractions*
>
> (Schoenfeld, A. H., 1992; as cited in Rogers et al., 2010: 112

Since mobile technologies offer the potential to provide contextually relevant information when on a field trip, or when collecting data on a work site, and since they also create a vehicle for multiple conversations to take place, it was found to be able to facilitate switching between task-based activities and sensemaking activities (Rogers et al., 2010). According to Smyth (2004) a

mobile device can support reflection and collaboration, which would allow the students to build their own understanding of a topic. This, in turn, would encourage collaborative thinking.

As Kukulska-Hulme and Traxler (2007) state, there are three factors to consider in the design for learning to take place with mobile technologies, namely the design of content, activities and of communication.

In terms of the ability to view and interact with educational content Kukulska-Hulme and Traxler (2007) suggest that the designer of the "learning process", which is most commonly the teacher, should consider the following aspects:

- *Open-endedness*: *if students are expected to construct some of the content as part of their learning, this could be done in various locations and can be facilitated by mobile devices.*

- *Personalization: mobile devices can cater to individual needs enabling learners to receive, assemble and carry around personally useful resources.*

- *Time-critical nature: content updates may be more easily delivered to mobile devices when learners are highly mobile.*

- *Portability: content such as portfolios might be best developed on mobile devices and physically owned and carried around by learners.*

- *Measured delivery: mobile devices can make it easier when content needs to be accessed by learners little by little over a period of time.*

- *Aural medium: a personal listening device is often the best way to access it aural content.*

- *Prioritizing medium: when some content is made available for mobile devices, this can prioritize or reinforce it over other content, which may be a useful deliberate teaching strategy.*

- *Alternative medium: learners can appreciate having the option of mobile access to electronic learning materials and resources, even if they generally prefer desktop access.*

<div align="right">(Kukulska-Hulme and Traxler, 2007: 187)</div>

The second area to consider would be the design of learning activities. Naismith et al. (2004) have demonstrated that mobile technologies can relate to six different types of learning activities:

- *For behaviourist-type activity, the quick feedback or reinforcement element is facilitated by mobile devices.*

- *For constructivist activity, immersive experiences are provided by mobile investigations or games.*

- *For situated activity, learners can take a mobile device out into an authentic context, or use it to access information while moving around an environment in a specially equipped location such as a museum.*

- *For collaborative learning, mobile devices provide a handy additional means of communication and a portable means of electronic information sharing.*

- *For informal and lifelong learning, mobile devices accompany users in their everyday experiences and become a convenient source of information or means of communication that assists with learning, or records it on the go for future consultation.*

- *Support, or coordination of learning and resources, can be improved by the availability of mobile technologies at all times for monitoring progress, checking schedules and dates, reviewing and managing- activities that teachers and learners engage in at various times during the day.*

<div align="right">(Kukulska-Hulme and Traxler, 2007: 188).</div>

Research has also shown that at a more detailed level there are particular tasks that are well suited to mobile learning, e.g. activities that involve data collection, tests and quizzes, consolidation of learning, personal reflection and skills acquisition.

The last aspect of design for learning activities is often the most problematic, due to the concerns about the costs incurred by learners if communication and connectivity become additional financial burdens. Within this constraint, mobile and wireless devices can support:

- *Spontaneous communication and collaboration, e.g. one-to-one or one-to-many by texting on mobile phones, by sending a message to a forum or blog while travelling.*

- *Beaming of stored information from device to device;*

- *Portable sound-recording, voice-recording, photos and video clips that are used in communication*

(Kukulska-Hulme and Traxler, 2007: 188).

The next section will discuss the use of mobile technologies within a lesson, especially the types of content that can be produced to achieve certain outcomes.

2.6 The mobile lesson action plan

According to Kukulska-Hulme and Shield (2008) factors that should be kept in mind when designing activities are that learners:

- need time to learn how to use the new devices and software.

- use devices in unpredictable ways. Even though you give advice as to how the device should be used, learners do not necessarily follow this.

- do not use devices they consider intrusive.

Just like any other learning activity, teachers need to develop quizzes and learning content prior to conducting these activities (Lai, et al. 2007). As Kukulska-Hulme (2009: 159) states,

> *anyone who becomes involved in mobile learning will quickly notice that, at the present time, it really matters which devices learners are using*

Given the fact that technology is central to mobile learning activities, one should bear in mind that they should be developed in advance, and should be tested regularly on different devices. The design of mobile activities is critical when one wants to use it as a tool combined with other pedagogies to achieve certain learning outcomes. Activities or content for mobile devices should be delivered either in small chunks or in summarized notes, and should not be used to deliver large amounts of information. Students should rather use their laptops or desktops to view larger amounts of information (Koszalka and Ntloedibe-Kuswani, 2010). According to Kukulska-Hulme and Shield (2008) some of the possible MALL activities for low-tech, low cost mobile devices include recording audio or video, taking pictures, and downloading foreign language MP3 files to archive or listen to at a later stage.

With regards to SMSs and the content used, a study done by Kennedy and Levy (2008) found that students did not find SMSs that included words that have never been taught before particularly useful. Messages that amuse or arouse curiosity or had a combination of vocabulary knowledge and strategic thinking were some of the interesting and more enjoyable SMSs and content preferred by students.

In foreign language teaching, the introduction of new words can be carried out by sending pictures with accompanying phrases, or by sending the definitions of the more complicated words from a reading text in advance. After the text has been read, words can then be sent with which students can make sentences. These sentences can then be SMSed back to the teacher as proof that the students know how to use the new words. The same can be done to introduce new vocabulary items, by presenting them in short definitions and

examples. Therefore sending the appropriate content consistent with the course curriculum would not only constitute communication, but the content will be dealt with by students without the aid of a teacher (Kennedy and Levy, 2008).

According to Beckmann, (2010) four aspects should be kept in mind when designing mobile technologies. Firstly, a high-quality internet service provider should always be present, because without it mobile learning can be crippled. Secondly, mobile learning opportunities are created by the way the resources and technologies are socially coupled with mobile devices. Third a constant engagement with others despite geographical, cultural, or socio-political isolation is possible with mobile learning. Finally, even though it might look different from the outside, the lessons learnt from past technologies are clear: "effective learning comes from effective pedagogy" (Beckmann, 2010: 117).

In the following section the uses of SMSs are discussed specifically in terms of the education environment.

2.7 The uses of SMS

> *This simple, accessible technology alters the way in which individuals conduct their everyday lives. It has extensive implications for the cultures and societies in which it is used; it changes the nature of communication, and affects identities and relationships. It affects the development of social structures and economic activities, and has considerable bearing on its users' perceptions of themselves and their world*

> (Plant, 2001)

The SMS is seen as one of the most stable mobile technologies (Traxler, 2005). With the usage exceeding all expectations, the SMS has been called the "killer" application of mobile phones. The reasons for the growth in mobile devices comprise of the low cost nature, and the private use attained (Mitchell, Heppel, and Kadirire, 2002). The studies that have been conducted amongst student populations report that up to 80% of students send at least one SMS a

day (Divitini et al., 2002; Markett, Arnedillo Sánchez, Weber and Tangney, 2004). According to MobiThinking (2010) a survey was done by the International Telecommunication Unit (ITU) which estimates that 6.1 trillion messages will be sent worldwide in 2010, meaning that 200 000 text messages are sent every second. According to Qwasi (2010) "almost 5 billion text messages are sent/received each month in the US".

Some of the experiments where SMSs were used include texting students to inform them of schedule changes, notices, examination dates, marks, etc. and also where it was used to guide, prompt and support the students in learning (Garner, Francis and Wales, 2002). "A survey in Norway also showed that students considered SMSs as a proper tool for spreading information about lectures, schedules, etc." (Rau et al., 2008: 4).

The study done by Rau et al. (2008) found that communicating through SMS with the instructor alleviated the perceived pressure of feeling embarrassed when seeking help in learning. "When the student received an SMS from the instructor, he/she may feel being cared for, and a type of bonding with the instructor and classroom activities, was said to have been felt" (Rau et al. 2008: 11). What was also found was that an SMS might be a more effective tool for building bridges between learners and instructors than e-mails or an online forum, but that it is an inadequate tool with which to deliver rich content such as lecture notes or exercises. The fact that large amounts of information have to be sent as multiple SMSs can be an inconvenience to learners, and hence SMSs are more effective when small amounts of information are sent.

According to Cavus and Ibrahim (2007) "there have been applications in the teaching of literature for the use of SMS (text messaging) in education" (Cavus and Ibrahim 2007: 80). Anonova (2001) reports on a study where SMSs are used by secondary students as revision support, and Soloway at al., (1996) report on 1st year students at Kingston University in the UK who use it as a support structure in terms of time management. Kennedy and Levy (2008) report on a study where SMSs have been used to learn Italian for beginners. The study's findings suggest that the students found the overall experience positive, but that a substantial number of the participants felt dissatisfied with

the frequency of the messages they received. The data gathered also indicated that the best time for sending out messages is between 10am and 5pm, with the biggest preference expressed for a time between 10am and 1pm.

Another finding was that amongst the sample of messages that were evaluated, what "the students ranked as most interesting or enjoyable tended to coincide with those scoring lowest on usefulness by the teacher" (Kennedy and Levy, 2008: 327). The implication of this is that the most useful content would be ignored by the students due to lack of interest. With this said the solution would thus be to try and make the messages which contain the most useful content more interesting.

Thornton and Houser (2002) have developed several innovative projects using mobile phones to teach English at a Japanese university. One of these projects focused on providing vocabulary instruction via SMS. What they did was to text short mini-lessons to their students three times a day, sending them in discrete chunks so they would be easily readable on their phones' tiny screens. The content of the lessons contained the definition of at least five words per week that had been recycled from previous vocabulary and were then used in various contexts, including episodic stories. The students were then tested biweekly and compared to groups that received identical lessons via web and on paper. "The results indicated that the SMS students learnt twice the number of vocabulary words as that of the web students, and that the SMS students improved their scores by nearly twice as much as those who had received their lessons on paper" (Hayati, 2010: 56).

> The evidence so far suggests that SMS technology might improve effective vocabulary learning. Research shows unambiguously that spaced repetition in vocabulary learning results in more robust learning than massed repetition (Nation 2001: 76). In other words, repetitions undertaken across a period, usually at ever-increasing intervals, are a more effective way to learn and retain new words than sustained repetition during a single, continuous period. SMS messages sent at intervals to the students' mobile phones have the potential to meet this requirement

According to Traxler (2005), earlier work like that done by Stone et al. (2002), Garner et al. (2002) and Briggs and Stone (2002), all suggest that students would prefer SMS and e-mail as ways to receive up-to-date information, instead of websites or notice boards. According to their findings students will welcome SMS texts that are perceived as timely, appropriate and personalized. The studies done by the authors show that SMSs can be used to provide support, motivation and continuity. It can also be used to provide alerts and reminders, to deliver bite-size content, introductions, and revision tips, and to give study guidance when needed.

According to the study done by Kennedy and Levy (2005), regarding the SMS content, students' preferences were for messages on grammar, vocabulary, news, literature and administration, with grammar being the topic on which they primarily wanted to receive messages. In terms of messages being repeated, only a third found it useful, while two-thirds of the participants indicated that it took up additional space in their cell phones' memory since they did not delete many of the SMSs, and thus did not find the repetition of SMSs useful.

According to Roschell (2003) the research that has been done into mobile phone learning at this point appears to present somewhat of a paradox. On the one hand, there are teachers and researchers who are enthusiastic about using mobile technologies, believing that they provide a means for learners to study "anytime, anywhere" and that it will encourage more frequent and integral use of learning technologies with regards to the more occasional use generally associated with computer laboratories. Many see mobile learning as the next generation of learning, since it was also found that SMSs can be used to support and encourage students off campus through short bursts of information (Kukulska-Hulme, 2005).

On the other hand, and in contrast to the above, there are those who have a more pessimistic approach, pointing out the many factors that impede the introduction of m-learning into language learning environments. Wang and

Higgins (2006) for example give a detailed overview of the psychological and technical barriers to using mobile phones in classrooms. They argue, quite rightly, that acceptance of new technologies takes time, and all learners cannot be expected to feel comfortable with using new technologies at the same rate. It is also possible, as Dias (2002) points out, that learners may see mobile learning as an intrusion into their own personal space, which would limit the degree to which they would accept learning with their mobile phones. Pedagogically, as Kukulska-Hulme and Shield (2007) argue, activities that capitalize on mobility and portability, the very rationale for using mobile technologies, are not as commonplace as one might hope, and although the "anywhere" factor is often not an issue, the "anytime" part is. Learners are sent messages by email or SMS at either fixed times, or times that suit the teacher, which is a tendency that seems to defeat the purpose of using mobile technologies at all. The technical limitations have been widely cited, and include the size of the screen and the difficulties of inputting grammatically correct text (e.g., Thornton and Houser, 2002).

The above section highlights some of the uses of SMS within an educational environment, as well as some of the studies that have been conducted. In the following section the experience of the learner when using mobile technologies will be discussed.

2.8 The mobile learner experience

The two terms that are associated with mobile technologies, more specifically mobile learning, are the "anytime" and "anywhere" aspects. With the use of these two terms the dimensions of time and space are introduced (Petersen et al., 2008). This means that not only will the students be mobile in terms of movement in space, in other words their geographical location, but they will be able to move across multiple communities. With regards to time the students will be able to access resources at any time, even create more "free time" through effective time management. The fact that one does not need to stand still in front of a device has several benefits, such as utilizing spare time while travelling on buses to finish homework, or to prepare lessons (Virvou and Alepis, 2005; Wang et al., 2009).

Mobile phones are seen as fashion gadgets, expressions of identity and life tools. They not only make us lead our lives more effectively, but also shape the way in which we learn and live (Ros i Solé et al., 2010). Mobile phones enable children to interact with both the physical world and with digital information (Facer et al., 2004). According to the findings of Wang et al. (2009) making the user perceive that m-learning is playful and beneficial will make potential users keener on using it. According to previous researchers, when an individual encounters a challenge and that challenge is matched by their skills, a perceived playfulness is experienced (e.g., Csikszentmihalyi, 1975; Kiili, 2005; Woszczynski, Roth and Segars, 2002; Wang et al., 2009). If the challenge rendered by an m-learning system is significantly lower than the users' knowledge, the user may feel bored. In contrast to this, if the challenge is significantly greater than the users' knowledge level, he or she may become frustrated. Thus m-learning developers, game designers and educators can cooperate with each other to programme mobile game-based learning systems capable of "providing challenges that are closely matched to the users' knowledge level, as well as contents that can exactly fit the users' needs" (Wang et al., 2009: 111). The results also found that differences do exist between age and gender in the acceptance of mobile learning. Older people did not adopt mobile learning if it was perceived as being an effort; men were more influenced by their social environment when adopting mobile learning and women tended to be more self-managed in terms of the effects of learning (Wang et al., 2009).

According to Facer et al. (2004) the inclusion of games-based learning with mobile learning can deliver fruitful experiences. Where computer games were, in the past, seen as a distraction with an emphasis on fun and pleasure, they are now seen as having the potential of creating "powerful opportunities to learning not only through experiences, but to develop meta-level reflection on strategies for learning" (Facer et al. 2004: 400).

According to Rau et al., (2008: 4),

> SMS is considered of high social presence due to its informal
> nature and pervasive usage. It is widely used due to its mobility

and flexibility and becomes one of the most important bonding methods between the youth. The medium itself represents a certain level of immediacy. When the instructor communicates with the student with SMS, it is expected that the distance between the two parts will be shortened, resulting in better relationship and higher student motivation.

Although empirical studies are needed to support such an affirmation (Rau et al. 2008), the findings from a study done by Markett et al. (2006) also suggest that mobile communication can be used without increasing academic pressure on the student, and the use of SMSs within the classroom can enhance interactivity amongst students.

"Most studies done on how learning takes place are based on men's experiences in academic institutions" (Balasubramanian et al. 2010: 196), thus technology is perceived as male dominated, and is generally liked less by teenage girls. Not a lot of studies have been done on how specifically women learn and whether learning in non-formal environments take place differently. The two main features that mobile technologies have that specifically resonate with girls are their portability and communicative features. Due to their small size the device can easily be carried around, and since it facilitates interaction it makes using the devices non-threatening (Farmer, 2008).Therefore mobile devices can help girls to become more engaged with technology. The study by Balasubramanian et al. (2010) found that even the most marginalized women can learn effectively with mobile technologies. Here mobile phones were introduced as a learning as well as business tool. The study,

> *… demonstrates that the transition from silence to voice, from powerlessness to empowerment is possible in non-formal contexts, just as it is in formal contexts, and that technology offers a means to accelerate this process if the use of technology is placed in an appropriate social context.*

(Balasubramanian et al., 2010: 207).

The study by Beckmann (2010) found that the needs of postgraduate learners differ from those of undergraduate learners, as a high percentage of postgraduate learners seem to be distance learners. Here, being able to download extensive background material either text-based or in the form of audio podcasts on your mobile device play a vital role for students to construct their own understanding of complex issues. Unlike residence or on campus students, having access to a computer, or face-to-face interaction with a lecturer is not always possible, so to be able to access more resources through mobile devices, becomes a necessity.

The following two sections will review the perceived advantages of mobile learning and mobile technologies, followed by the disadvantages as set out in the literature.

2.9 The advantages of mobile technologies and mobile phones

Mobile technologies provide different features and functions that make the use of such a technology beneficial. Some of these features are instant recording functionalities for note taking, with extended sound and camera features. The use of mobile communications within the classroom has been found to enhance the accessibility and availability of information networks, to foster collaborative learning within classrooms, and to engage students in learning-related activities irrespective of the location (Liu, Wang, Liang, Chan and Yang 2002). The benefits of using these technologies have included better student retention, where students remember the learning material better, the support of differentiation of learning needs, and the inclusion of learners who would otherwise not have had the opportunity to participate (Kukulska-Hulme et al., 2005).

The study done by Attewell and Brewster (2004), found that m-learning developed greater confidence in learners. It made them focus more and for longer periods than traditional lessons would, and it lessened the formality of a lesson, which could be perceived as daunting to some learners. Instructionally the use of mobile technologies offers two advantages. It can effectively bring outside information such as community instructional resources and activities

into the classroom (Anderson, 2006; Stead, 2006) "bringing similar benefits to those that were seen when computer technologies were first integrated into classroom settings" (Koszalka and Ntloedibe-Kuswani, 2010: 139). Secondly, m-technologies can also provide new instructional activities and resources to learners and their communities, due to the portability and easy connectivity of mobile devices. What is emphasized here is the fact that the tool itself is not the source of information, but rather the provider of resources (Koszalka and Ntloedibe-Kuswani, 2010).

Mobile learning is to a certain extent inexpensive when compared to older traditional learning formats.

> *Within an education setting, using mobile phones as an interactive tool requires minimal technical and financial support: the majority of students possess the needed hardware and software and communication occurs via existing mobile networks, which are maintained independently by mobile service providers. Due to their small size and familiarity, mobile phones in the classroom can be unobtrusive require no technology training, and are not intimidating to most users.*

> (Markett et al., 2006: 282).

Through effective use, mobile devices can improve personalized learning by delivering the right materials to the right people at any given time. (Brown, 2010) A study by Stead, (2006) suggests that effective m-learning can motivate and engage learners, help in becoming more comfortable when engaging with others, assist in self-evaluating the learning progress, and also empower learners to take control of their learning through learning the latest and up to date information that is available; it can also prompt individuals to make quick responses or decisions, and increase the advantage of competitiveness in business and learning (Wang et al., 2009).

According to Traxler (2010) the mobile learning community has demonstrated, although not proven, that it can:

- *Enhance, extend and enrich the concept and activity of learning itself, beyond earlier conceptions of learning. This includes:*

  - *Contingent learning, where learners can react and respond to their environment and their changing experiences*

  - *Situated learning, where learning takes place in an environment that makes learning meaningful*

  - *Authentic learning, where meaningful learning tasks are related to immediate learning goals*

  - *Context aware learning, where learning is informed by the history, surroundings and environment of the learner*

  - *Augmented reality mobile learning, where learning builds on local context supplemented by an audio or video overlay*

  - *Personalised learning, where learning is customised for the learning of preferences, history and abilities of individual learners or groups of learners*

- *Take learning to individuals, communities and countries that were previously too remote or distant. This included addressing:*

  - *Geographical or spatial distance*

  - *Sparsity, connecting thinly spread and perhaps nomadic learners to create viable communities of learners*

  - *Infrastructural or technical barriers*

  - *Social exclusion*

  - *Physiological or cognitive differences*

  - *User security and connectivity*

Mobile devices open up new opportunities for independent investigations, practical fieldwork, professional updating and on-the-spot access to knowledge. These devices can also provide the mechanism needed for improved individual learner support and guidance since they can be used to deliver more efficient course administration and management (Kukulska-Hulme and Traxler, 2005).

2.10 Disadvantages of mobile phones

According to Farmer (2008) the use of mobile devices also faces challenges. Some of these challenges as listed by Sharples (2007, cited in Farmer 2008: 19) include:

- Limited cell phone coverage

- Bandwidth requirements

- Battery endurance

- Low-resolution images and poor sound quality

- Software application deployment

- Focusing on the equipment rather than on the learning

- Privacy and security breaches

- Need for teacher training to incorporate devices successfully and develop feasible activities

There are also specific limitations and concerns when designing activities especially classroom implementations for mobile phones. The development in handsets, networks, and mobile applications makes the implementation of educational materials on mobile phones high-risk (Mitchell et al., 2002). With the compatibility of handsets always being an issue, the development of content for a certain range of mobile devices becomes a major problem, since

those devices might become "old" within six months. Thus the use of the application or content that was created for a certain range of devices has a low likelihood of being reused within a year, and therefore the content will always seem to be a step behind. Modern phones include a number of exciting new features (such as photo and video capability), which has prompted movement away from traditional verbal communication, to visual forms of communication. Although the modern phones of today have these as new features, the phones being developed for tomorrow will most definitely have features we cannot even begin to imagine. In certain settings, such as foreign language learning, these functions are not particularly useful, as speaking and listening activities are of crucial importance in a communicative language classroom (Kiernan and Aizawa, 2004). The high cost of talking on a cell phone makes it practically impossible to use for the teaching of oral skills. Therefore pronunciation, communication strategies and intonation patterns by mobile phone may not be a viable option (Hayati, 2009).

The screen size of mobile phones is small, and the 160-character limit is another limitation when using SMSs. Costs and having cell phone "airtime" or credit is also a concern when sending SMSs. The mobile keypad is sufficient when short messages are typed, but as soon as students have to type full sentences in an SMS, it is time-consuming, and becomes a distraction not only for the person typing it, but also for other people around them (Markett et al. 2006). According to Mifsud (2002),

> teacher-student interaction is often punctuated by a raised hand and one can say that the teacher has a monopoly on social interaction. Student-student interaction is often expected to be limited to schoolwork. As such it appears that for example mobile telephones challenge this power that the teacher has over communication – easily seen in the students' sending of messages to each other, across the physical boundaries of the classroom, and without the "permission" of the teacher. The mobile technology thus assumes the role of "intruder" – the 'grammar' of school is challenged

When working with the device, children can become isolated from other learners, as they are listening and reading what is being displayed on the device, and they become distracted from what is happening around them, since working with mobile devices can create a distance from what is going on around you.

The use of students' personal devices for learning may appear to be natural but issues can arise over device ownership and control as Savill-Smith and Kent (2003) reports. As mentioned before, Wang and Higgins (2006) mention the acceptance of the new technology that takes time, and all learners not being expected to feel comfortable with using it at the same rate. The psychological, pedagogical, and technical barriers when using mobile phones within the classroom are also discussed within the article (Stockwell 2008). Dias (2002), as mentioned on page 35, discusses the intrusiveness of the use of mobile devices on learners' own personal space when used in an educational context.

Within Stockwell's study, (2008), what was found was that although the students owned a cell phone, and were rather confident that they had the necessary skills to work with the device, a lot of the students were both unwilling and reluctant to use their phones for educational purposes. The fact that students know how to use mobile technologies in their everyday life does not mean that they know how to use it when dealing with language learning (Stockwell 2008). "Thus, the success of m-learning may depend on whether or not users are willing to adopt the new technology that is different from what they have used in the past" (Wang et al., 2009: 1).

Some of the challenges that mobile technologies face have been highlighted above and include factors such as connectivity issues, small screens and keypads, short battery life, limited memory and disk space, and low display resolution. When accessing the internet, the user interface becomes complicated, and the graphics are sometimes limited. As mentioned these are just some of the challenges that mobile devices face.

In this chapter, the literature regarding mobile technologies was discussed and when looking at it one can definitely get an idea of where to language and the incorporation of technology and more specifically SMSs are heading. One definitely gain some insight as to what to include and what not to when undertaking a study like this for example the themes addressed in the initial survey conducted amongst the German 178 students were based largely on the issues that were highlighted in the literature study. Other ideas concerning the SMSs especially how and the way in which it should be set up, the focus and content that should be looked at and were seen as effective in other studies were also based on what was read from the literature study. As mentioned before the social-constructivist theory was decided on, since the students would become active role players in their learning environment and because they would have to collaborate with each other in case they did not understand something.

The following chapter will discuss the research design, followed by the research results.

Chapter 3

Research Design

The research component of this project aims to gather empirical as well as statistical data to investigate the viability of mobile technologies as a support structure for first year students studying German as a foreign language at a South African university. The research for the study included two different components. First surveys were done to establish the most common features of the cell phones that the participants owned, and a survey was also done at the end of the study to get feedback regarding the use of mobile technologies within the course. Secondly, interviews were conducted with the students who answered the riddles and quizzes to get better understanding of what they thought about incorporating mobile technologies within their studies and why they decided on answering the SMSs.

The surveys act as the primary research design. According to Hofstee (2006: 122), surveys are an excellent way to find out people's opinions, desires, and attitudes. Since people differ in their ability to answer open-ended questions, and since they are often difficult to analyse, open-ended questions were avoided within the first survey, but were included in the questionnaires to give insight into their deeper levels of understanding.

As the students attend mandatory classes during the week, a structured survey was seen as the logical choice to get most of their feedback, and to not take up too much of the class time.

3.1 Background to the choice of design

According to Babbie et al. (2001: 90) the choice of a research design depends largely on:

- The aim of the study

- The focus of the study

- The unit of analysis

- The time dimension

3.2 The aim of the study

The study aimed to evaluate the viability of mobile technologies when used as a support structure for first year students studying German as a foreign language at the University of Stellenbosch. It is explorative in that no such study has been done at the University before, but it is also evaluative, in that it seeks to determine whether mobile technologies are a viable option, and could also serve as the basis for further exploration. According to Babbie et al. (2001), "a large proportion of social research is conducted to explore a topic, or to provide a basic familiarity with that topic. This approach is typical when a researcher examines a new interest when the subject of study itself is relatively new" (2001:79)

3.3 The focus of the study

According to Babbie et al. (2001) most social scientists choose to do research on either one of the following three points:

- Characteristics

- Orientations

- Actions

This study focuses on characteristics. According to Babbie et al. (2001), research focusing on characteristics is concerned with "whether an intervention has been successful in terms of intended outcome and beneficial to the target group" (Babbie et al. 2001: 90). The intended outcomes for the project included the answering of the SMSs that had a question by at least 50% of the students who participated in the study, and also the use of the SMSs when doing their online exercises.

3.4 The unit of analysis

The unit of analysis are the objects, people or characteristics which researchers describe, study or explain. The data collected from such a unit describes only that unit, while when combined with similar data from similar units the data can provide a picture of the group to which the data belongs (Babbie et al. 2001: 84). There are several different units which can be analysed such as individuals, groups of people, social artefacts and organisations just to name a few. In this study, data were collected on the intervention, which could be explained as the successful implementation of mobile technologies, in such a way that it would lead to clearly identifiable outcomes and benefits.

3.5 The time dimension

The study can be described as a cross-sectional study. According to Babbie et al. (2001: 92) "exploratory and descriptive studies are often cross-sectional, because they are designed to study some phenomenon by taking a cross-section of it one at a time and analysing it carefully".

The data collection and the analysis were done in June 2010.

3.6 Additional research design

The primary research was supported by interviews conducted in August 2010 with some of the students.

3.7 Interviews

The interviews with the students aimed to identify what their thoughts were surrounding the incorporation of mobile technologies as support structure. The researcher is aware of the fact that representativeness cannot be assured, since only nine students were interviewed, but as the aim was to elaborate on the findings of the survey, it was deemed as sufficient.

3.8 Research methodology

3.8.1 Sample design for surveys

The target population is defined as the German 178 class at the University of Stellenbosch. The class consisted of 152 students all taught at the beginner's level. Students who take German 178 have never had any exposure to the German language before. A consent form that also acted as a participation form was handed out during class, and the students who were absent that day were emailed to ask whether they would participate in the study. The participation form was completed by 112 students, which means that 40 out of the class opted not to submit the form. An example of the form is attached as Appendix A.

3.8.2 Interviews

Interviews were conducted during August 2010 after the study had been completed with some of the students who answered the SMSs that had questions and also with some students who decided not to answer the SMSs. The results of the interviews are added in the discussion of the results of the final survey. To get an indication of the questions that were asked, a copy of the questionnaire is added as Appendix C.

3.8.3 Procedure for data collection

The primary data were collected by means of a survey. Two questionnaires were developed and handed out to the students. The two questionnaires also served as measuring instruments for the primary data. The first was handed out during class in March 2010, and the second was stapled at the back of the German exam in June 2010 as a way to ensure as many of the students' feedback as possible. Since some of the students were absent the day the first questionnaire was filled out in class, their email addresses were extracted from the University database and the questionnaires were sent to them.

A Yes – No format was decided on as in the view of the author from past experience that an open-ended question would not be answered with extra

information voluntarily unless absolutely necessary, and with a Likert scale ranging from one to five the likelihood of students only answering with threes are very high.

The first questionnaire (Appendix A) asked students to provide information about the cell phones that they had, and the second (Appendix B) to provide feedback concerning the study and the usage of SMS.

Altogether 112 students participated in the study.

No pre- or post-test was undertaken, as the objective of the study was not to investigate learner development.

Disadvantages such as costs and Internet accessibility were anticipated, which is why an SMS as mode of delivery was decided on, as students were not going to be asked to reply to the SMSs but rather to answer any of the questions that were sent out on the university's Webstudies platform.

3.8.3 SMS Design

An SMS would be sent to the students each day of the week, from Monday to Friday. The class schedules' of the students were structured in such a way that not all of the students had German every day therefore the SMSs were by default always sent between 10h00 and 13h00.

There were three types of SMSs sent to the students: a language tip, a riddle or a quiz. Since some of the lectures had themes that were carried out by all of them during that week, the SMS related to the sections or themes that were studied. The language tip contained either grammar or vocabulary content that was discussed during that week. The riddle and quiz were introduced to create a "fun" and social dimension to the study, to try and get students to interact more with each other.

The quiz entailed taking a photo of a 2-D Barcode which then would be decoded by the application that students were asked to download on their cell phones. The 2-D barcode would contain a clue which would direct the students to various locations and buildings on campus. This would act as a type of

"treasure hunt" where the students would have to move from clue to clue, and they would get the opportunity to converse with other students in the target language outside of the classroom. An example of how the barcode looks is given below.

The riddle either asked students to form words from letters that were given, or to try and figure out the conundrum, or at times it was just a basic riddle that needed to be answered. Examples of that which was sent is given below.

- Wie viele Worter kann man aus den folgenden Buchstabe machen? Sie mussen auch den Artikel von jedem Wort aufnehmen: 1) lhucsslfosegnrug;   2) reclaudhutfrherizendendend

- Manner mit Frauen, 2, Herumstehen mit nichts zu tun, Kleider in formalen, schwarz und weiz, Doch wenn sie sich bewegen beginnt sie ein Kampf. Was ist passiert?

The SMS gateway used in the project was the Grapevine Online SMS service. The system allows SMS text messages to be prepared in advance by using the scheduler and then to be sent to a large group of students via e-mail, across all networks, regardless of the carrier.

The project was conducted over a five-week period. In total 25 messages were sent to each student. A representative sample of the messages sent to students is given below.

- VerbKonjugation. Singular: Ich..-e (wohne); Sie..-en (wohnen); er, sie, es..-t (wohnt)… [etc]

- Was bin ich? Ich habe viele Augen,aber nicht sehen kann, und keinen Mund oder Nase, aber immer riechen. Nicht essen meinem Baum oder Sie werden, eine sehr seltene Todesfall.

- BC Quiz-Clue 2 Ich hange vor dem Ou Hoofgebou. Ich will die Welt mit Gesetzen andern.Welche Farbe bin ich?

3.8.4 Ethical considerations during data collection

To account for ethical considerations, the following steps were taken:

- Participation in the research was voluntary.

- Confidentiality was assured. Individual responses and personal information were not recorded.

3.8.5 Analysis of quantitative data

Statistical procedures were used to analyse the quantitative data generated from the questionnaires. Descriptive as well as inferential statistical procedures were included.

3.8.6 Analysis of qualitative data

The qualitative data generated from the questionnaires were analysed, and quotations were extracted to show certain tendencies.

3.8.7 Methodological and practical constraints

A number of methodological and practical constraints emerged:

- The Grapevine Online SMS service that was used had subscription costs, as well as costs related to each SMS that was sent out to the students. Sending an SMS a day, over a period of time to multiple recipients can become expensive, but luckily for this researcher, these costs were covered by the Department of Modern Foreign Languages at the University of Stellenbosch.

- The Online SMS service had to be synchronised with a Microsoft Outlook email account, which in the beginning presented problems because the researcher uses Windows Vista, which is not compatible with Grapevine Online SMS.

- The 2-D Barcode reader that was needed to read the barcodes used within the barcode quizzes, had compatibility issues with some of the mobile phones and a number of the students were reluctant to download the application, when asked either to download it again, or download an older version of the application which would be compatible with their cell phones.

- Students who changed their cell phone numbers during the study became a problem because the SMSs were sent to their old numbers. To change their details meant that the distribution list had to be updated frequently.

- Some of the students gave the wrong cell phone number, and the information was sent to someone else, which could become disruptive for that person.

- With regards to the interviews, it was very difficult to schedule suitable times especially with the students who answered the riddles or quizzes. Initially more than nine students were contacted for interviews, but only nine replied, therefore only their comments were included in the study.

- With regards to questionnaires and the responses to SMSs, since no incentives were given to students to answer any of these SMSs or questionnaires, a number of the students just simply did not complete the full questionnaire or answer the SMSs.

3.9 Presentation of data

In Chapter 4 the results of the questionnaires will be given. Numerical data will be given in the form of figures, and the qualitative data will be given in the discussion of the results in the form of either comments or quotations taken

from the interviews and questionnaires. Certain recommendations will also be included in the chapter, which could be of use in future studies pertaining to the use of mobile technologies for language learning.

Chapter 4:

Research results and discussion

4.1 Survey results

The survey data were analysed first. On the day the survey was handed out 45 students in total were absent and only 5 replied via email that they would like to participate. The total number of surveys received was 112 out of a possible 152 students. All of the participants indicated that they owned a cell phone. The return rate of the first survey is shown in Figure 1.
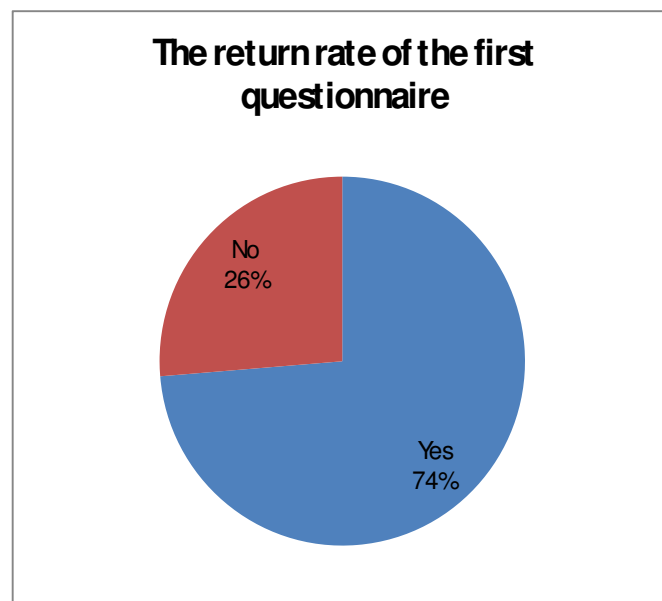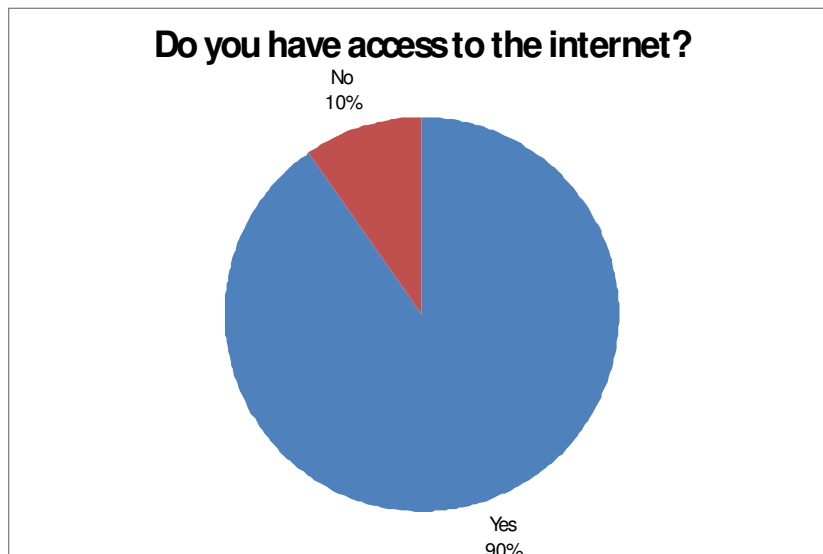

Figure 1: The return rate of the first questionnaire

Figure 2 shows that 10% (11) of the students indicated that their cell phones do not have access to the internet, with the remaining 90% (101) responding positively. Since so many students had internet access via their cell phones, the next step was to find out whether they access online information.

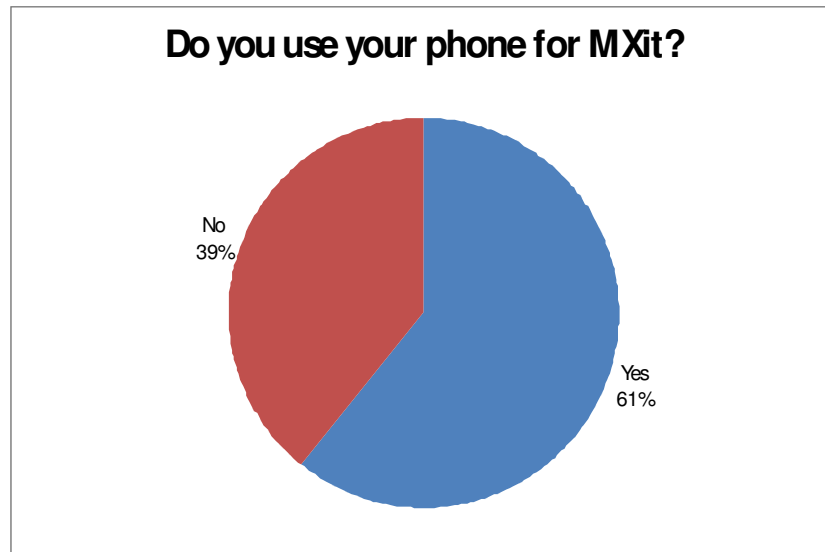**Figure 2: Student survey responses regarding cell phone internet access**

Hence, the second question on the survey asked whether they used the internet on their cell phone, and as shown in Figure 3, 82% (92) of the students indicated yes.
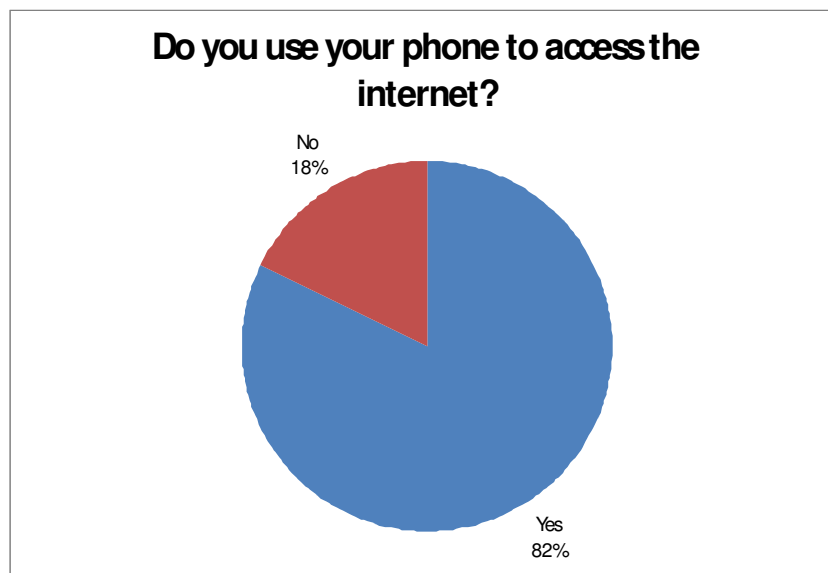
Figure 3: Student survey responses regarding the use of internet via cell phone

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The MXit application was seen, by the author, as a bigger platform to get information across, since the restriction of character limits would not apply, and thus the amount of information that could be sent would be much larger. The students were asked to indicate whether they had this application on their phone and whether they made use of it.

As Figure 4 shows 61% (68) of the students responded yes, with the remaining 39% (44) indicating no. Since not all of the students made use of the application it was not considered a practical option.
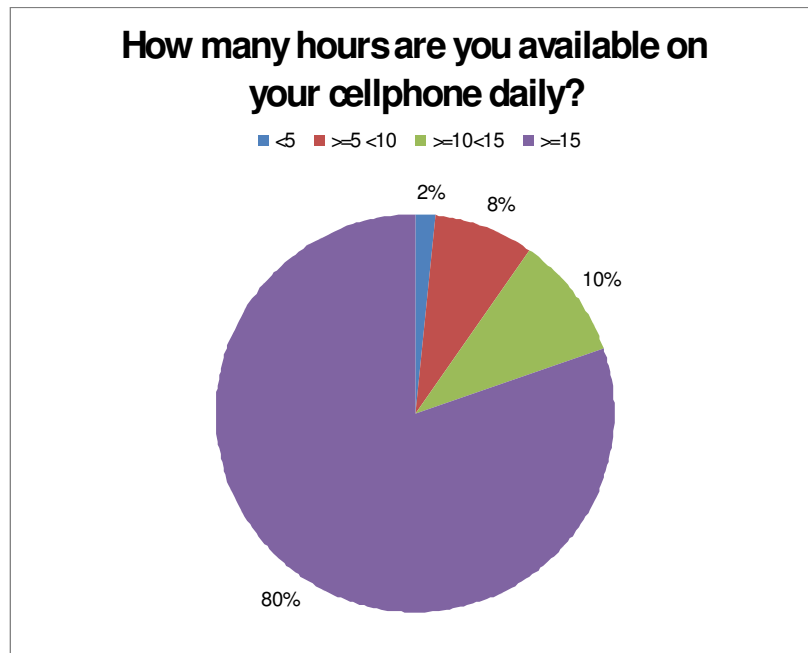

Figure 4: Student survey responses regarding the use of the MXit application on their cell phones

For the barcode quizzes to work the use of a camera was needed and the results are shown in Figure 5. Almost all of the students (95%; (106)) indicated that their cell phones do have cameras. The barcode quizzes were thus seen as an interesting addition to encourage collaborative activities.

Does your phone have a camera?

No
5%

Yes
95%
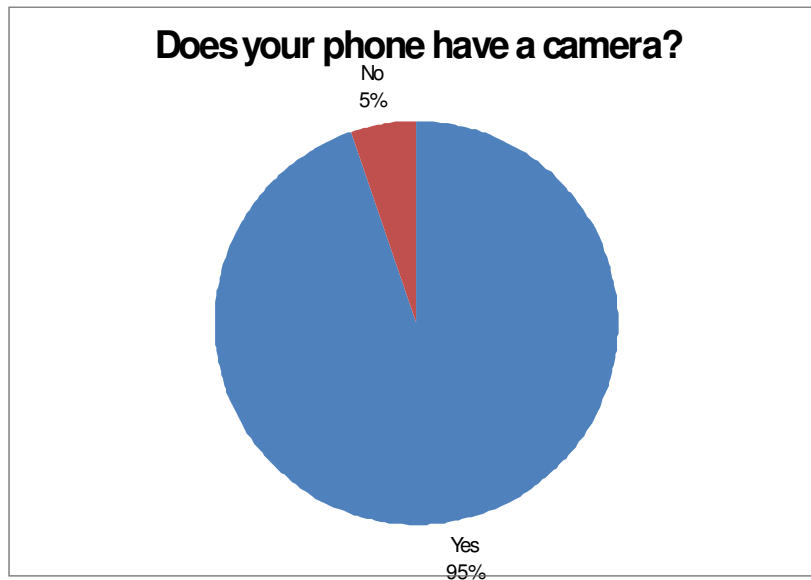
Figure 5: Student survey responses regarding whether their cell phones have a camera or not

The next question aimed to determine the number of hours in the day students had their phone with them and were available to either take a call, check their messages or go onto the internet. As Figure 6 shows of the 112 students, 80% (90) of the students indicated that they were available for more than 15 hours a day, with 10% (11), indicating that they were available for at least 10 to 15 hours daily. The remaining 10%, 8% (9) of the students indicated that they were available between 5 to 10 hours daily, and 2% (2) indicated less than 5 hours.

How many hours are you available on your cellphone daily?

■ <5   ■ >=5 <10   ■ >=10<15   ■ >=15

2%   8%

10%

80%

Figure 6: Student survey responses regarding the amount of hours they are available on their cell phones daily

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4.2 Questionnaire results

Figure 7 to Figure 24 are the results of the questionnaire conducted at the conclusion of the study. Since the questionnaire was distributed with the June exam paper, there was no control over whether the students would answer the questions or not, and if they did whether they would answer all of the questions. As a result a fluctuation in the number of answers to each question occurred. After the students finished their exam, they were asked to place the completed questionnaire in a separate box. This ensured anonymity and it gave students the freedom to write comments if they wanted. Handing in the forms at the end of their exam was an attempt to ensure that all the questionnaires of the students who wrote that day, 130 in total, would be returned. Of the forms that were returned, only 82 were filled in. A total of 24 questionnaires were filled in completely, whilst 58 students submitted partially completed forms and 48 forms were left blank. Figure 7 gives an indication of the return rate.

The return rate of the second questionnaire, with regards to how it was filled in

- Completely 18%
- Partially 45%
- Blank 37%
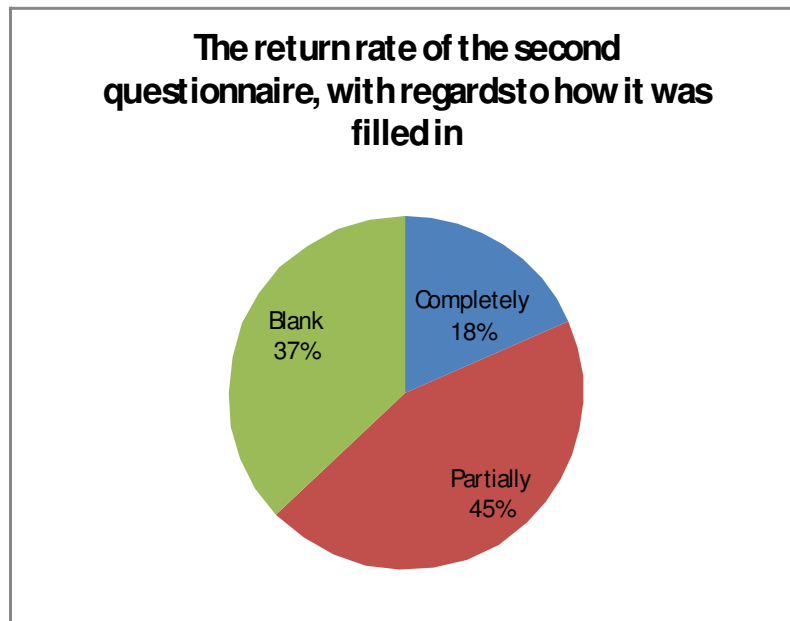
Figure 7: The return rate of the second questionnaire with regards to how it was filled in

4.2.1 Question 1

Question 1 asked whether the students answered the SMS that had a question at the end. The majority of students answered "no" as shown in Figure 8. The results indicate that 59 (72%) of the students said no, while the remaining 23 (28%) of the students answered yes.

Some of the comments from the questionnaire include:

"I mostly received them at a time when I was busy, so I forgot about it".

"I don't like the method of teaching, for me a worksheet is better".

"No, but I did read it, and it was interesting".

"The program that needed to be downloaded had difficulty downloading on my phone. It should rather be an application that is already existent".

*"It was not a necessity, so I didn't reply".*
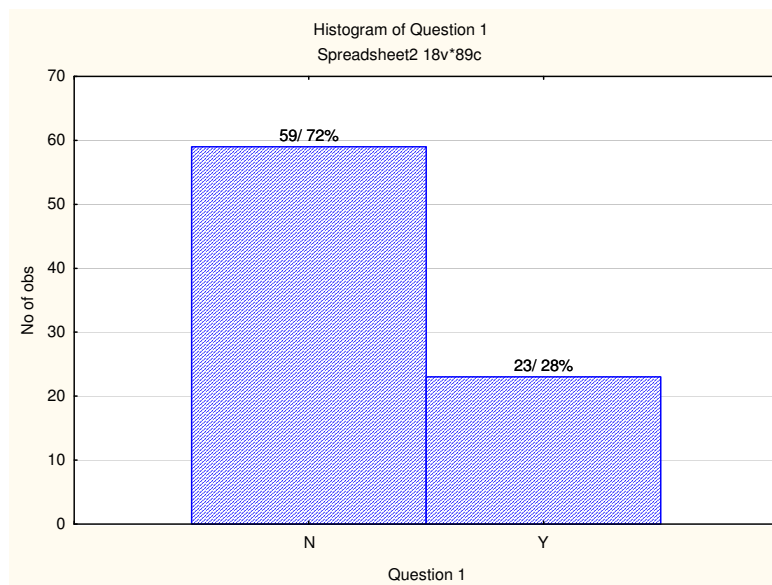
Figure 8: Student questionnaire response regarding whether they answered the riddles or quizzes

4.2.2 Question 2

Question 2 was aimed at ascertaining the usefulness of SMS. There were existing options from which students could choose, and a comments section was given, in the event that students found it useful for something which was not given as an option. The results of the question to whether the students found the SMS useful for grammar are shown in Figure 9. This question was answered by 72 students, of which 58 (82%) replied that they find SMSs useful in this regard, whilst the remaining 13 (19%) reported not finding it useful. The results for the usefulness of the SMS for homework are shown in Figure 10. The question was answered by 58 students in total, of which 37 (64%) students answered that they found the content of the SMS useful, with a further 21 (36%) responded negatively. These two questions indicate that the majority of students found SMSs useful for both the acquisition of grammar skills, as well as homework assistance.
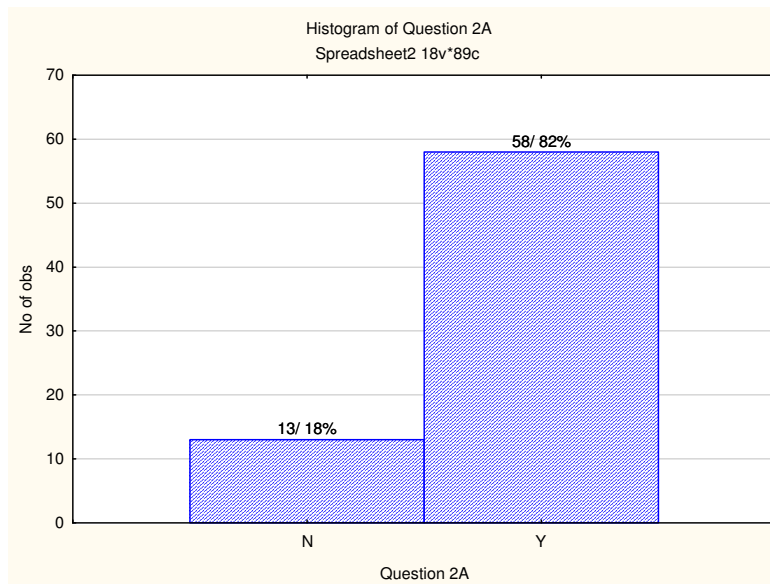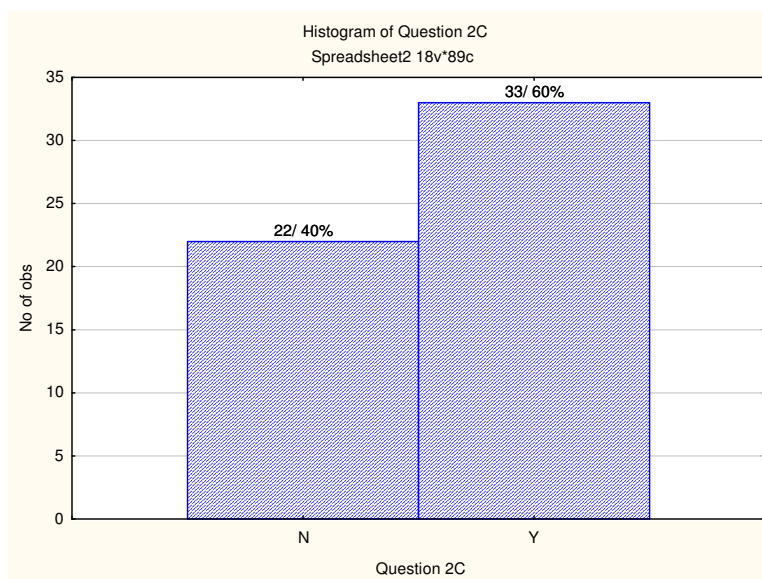

Figure 9: Student questionnaire responses regarding the usefulness of the SMS for grammar skills

Histogram of Question 2B
Spreadsheet2 18v*89c
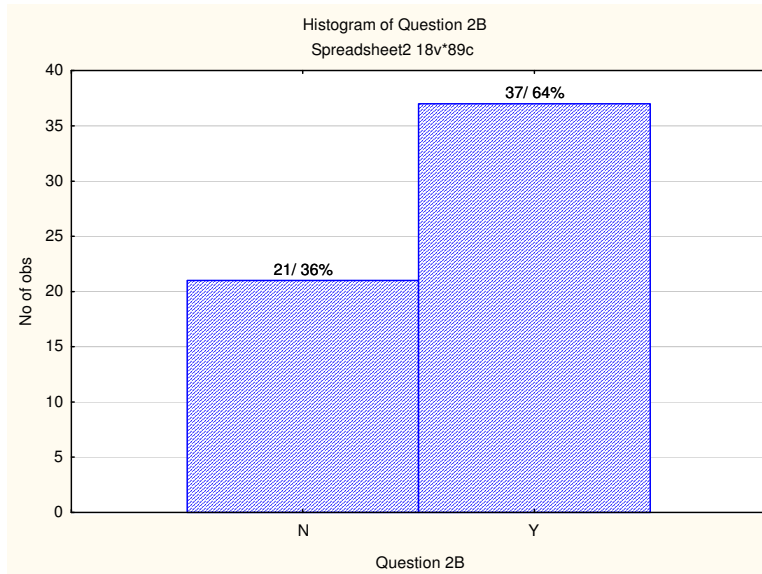
Figure 10: Student questionnaire responses regarding the usefulness of the SMS for homework

Figure 11 shows the results for the usefulness of the SMS content in order to complete the exercises on Webstudies. A total of 55 students answered this question, with 33 students (60%) indicating yes. Although there is not that much of a difference, the results still show that most of the students found the content useful for this purpose.

Histogram of Question 2C
Spreadsheet2 18v*89c

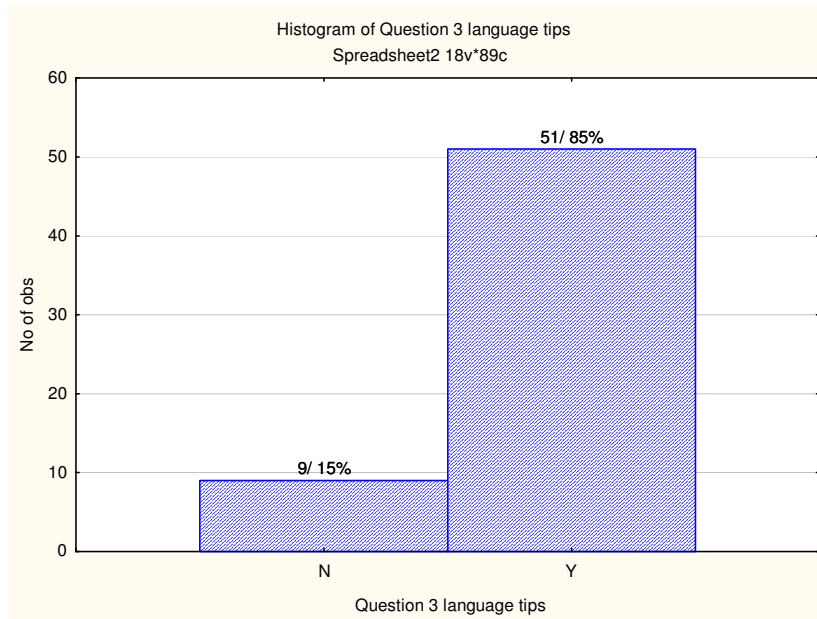**Figure 11: Student questionnaire responses regarding the usefulness of the SMS content for computer exercises**

4.2.3 Question 3

Question 3 asked the students about the type of content they would have preferred receiving. Here, a range of options were made available, and a comments section was included. The results for the different options are shown below. Figure 12 illustrates the results for grammar tips with 61 (88%) students answering they would like the content to include this, and 8 (12%) students indicating they would not. A total of 69 students gave their opinion to this as an option. One of the comments made on the questionnaire asked that suggestions or tips on basic literature to read at home should also be sent.

Histogram of Question 3 grammar tips
Spreadsheet2 18v*89c
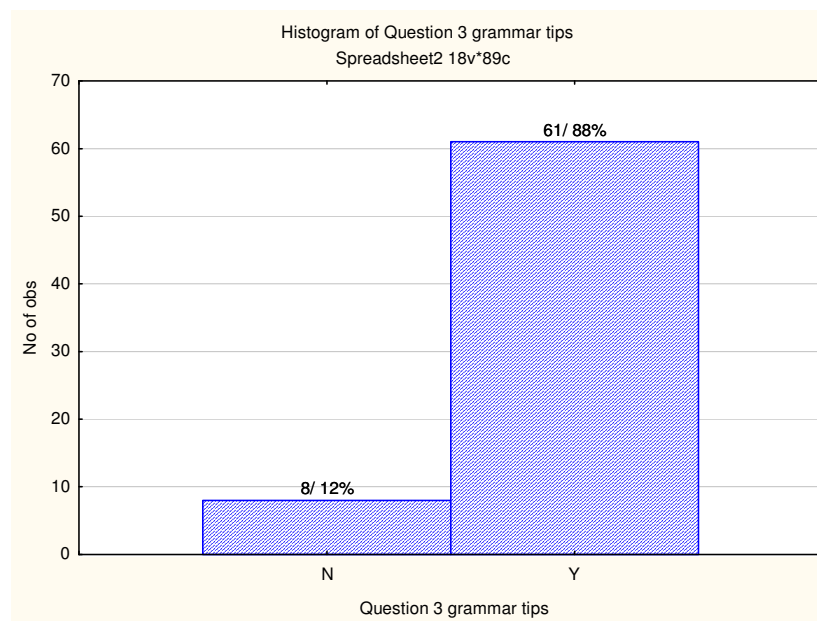
Figure 12: Student questionnaire responses for the option to receive grammar tips via SMS

Figure 13 illustrates the results for language tips with 51 (85%) students answering they would like the content to include this, and 9 (15%) students indicating they would not. A total of 60 students chose this as an option. This shows that the students who answered the questionnaire opt to receive both grammar and language tips, with the bigger percentage leaning towards grammar.
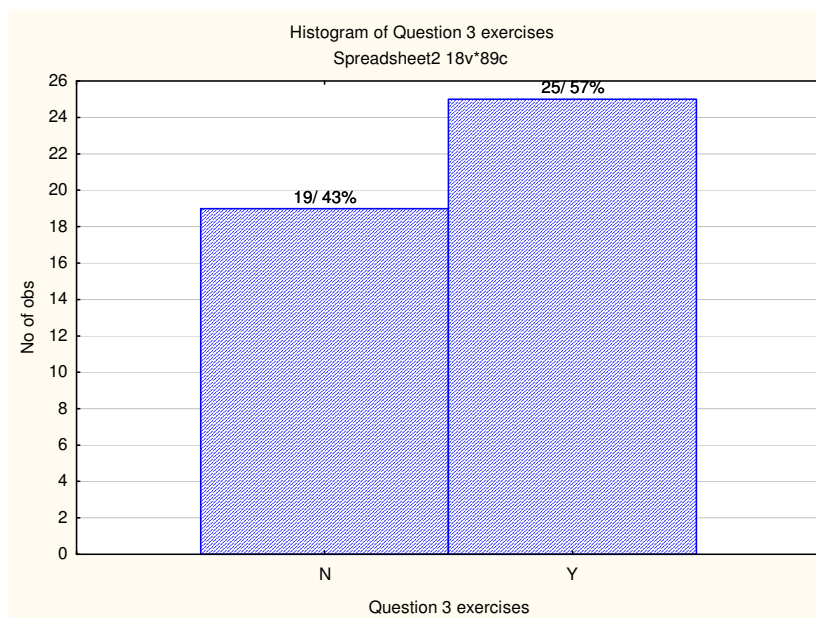
Figure 13: Student questionnaire responses for the option to
receive language tips via SMS

Figure 14 illustrates the results for the option of exercises being sent via SMS. A total of 44 students answered this of which 57% (25) opted for it as an option.

Figure 14: Student questionnaire responses for the option to
receive exercises via SMS

Figure 15 shows the results for the option of sending riddles via SMS. A total of 40 students answered this, with 57% (23) indicating that they did not find this useful. This shows that students would prefer exercises instead of riddles to be sent to their phones.
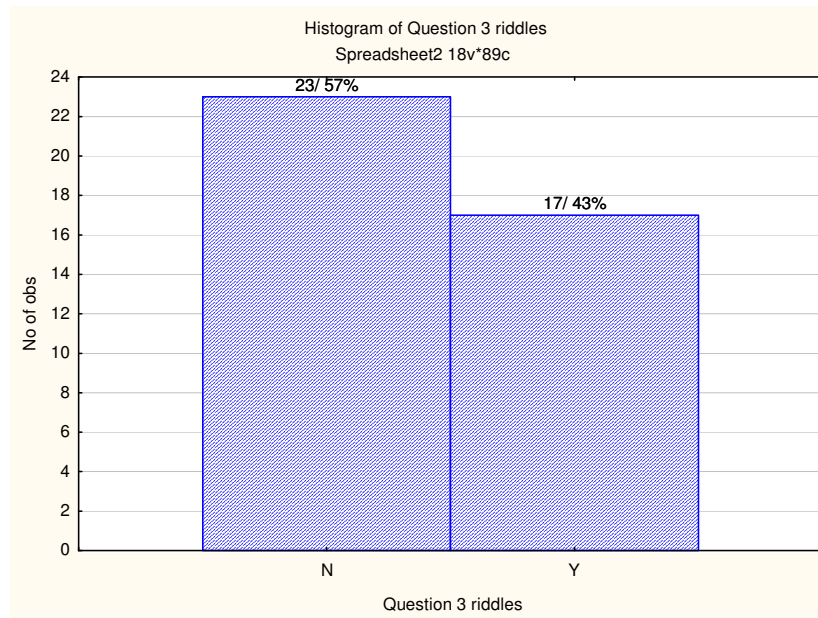

Figure 15: Student questionnaire responses for the option to receive riddles via SMS

Figure 16 illustrates the results for the option of more barcode quizzes being sent via SMS. A total of 47 students answered to this and 53% (25) of the students answered that they would like this.
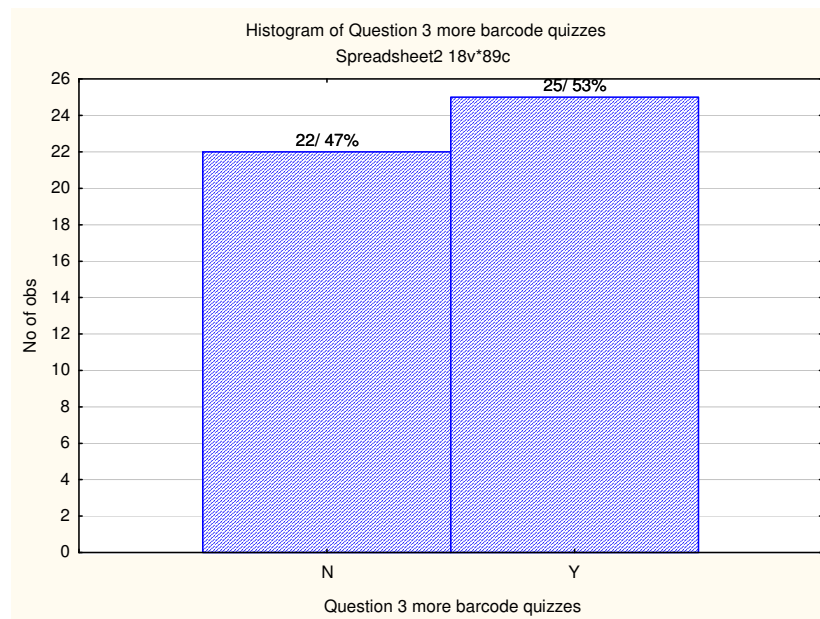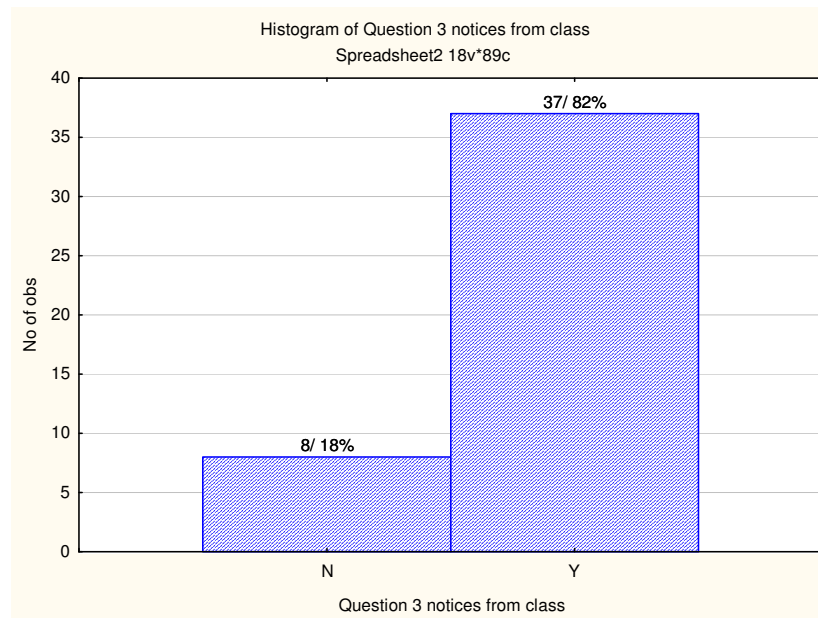

Figure 16: Student questionnaire responses for the option to receive barcode quizzes via SMS

Figure 17 shows the results for the option of sending notices from class via SMS. A total of 45 students answered this of which 82% (37) of the students answered that this is indeed a useful exercise.

Figure 17: Student questionnaire responses for the option to receive notices from class via SMS

The results show that while more students were positive towards the barcode quizzes, the difference between those who were positive and those who were negative are quite close. Therefore, the "fun" aspects which were the riddles and the barcode quizzes might not have fare very well with the students, it still was not that badly received. What was interesting, though, was the fact that although it was not all the students, more than 80% of them did want notices from class to be sent to their cell phones. Since everyone owned a cell phone, one would think that all the students would like to know in advance what was happening in class, and whether there were any changes within the schedule. With more than 80% of the students opting for this option, it would seem as a definite start in an option that should definitely be looked at in the future in terms of notices.

4.2.4 Question 4

Question 4 asked the students whether they referred back to the SMS when they studied for the exam. The majority of students answered in the negative as shown in Figure 18. The reason for this, as many of the students commented, was that they forgot about it. Since the SMSs stopped a week before they had to write their exam, a notice to remind them that they could use it, would probably have made a difference. Others commented that they deleted the SMSs they did not consider useful. A total number of 82 students answered the question. The results show that 52 (63%) of the students said that they did not refer back to any of the SMSs that were sent. One of the students commented,

> "Since the SMSs were sent in a different language it was confusing, especially when the grammar tips were separated, because then you got confused as to where the one thing started, and the other ended".
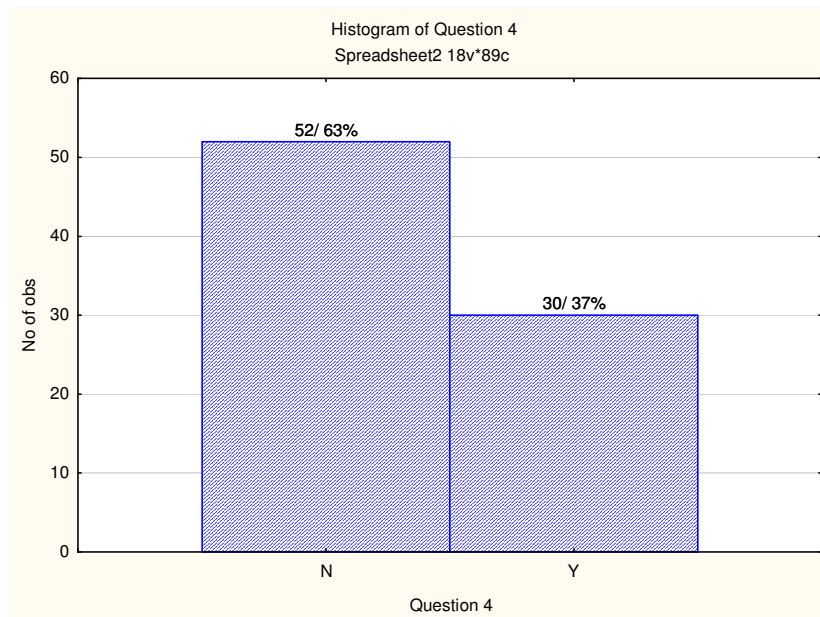
Figure 18: Student questionnaire responses to whether they referred back to the SMS when studying for the exam

4.2.5 Question 5

Question 5 asked whether five SMSs a week were enough for the students. Most of the students, 90% (74) affirmed that they thought that five SMS a week were enough. A total number of 82 students answered the question, and the results can be seen in Figure 19. What was interesting was that of the 8 students who answered no, 2 commented that it was not enough, with the remaining 6 saying that five were too many. Some of the comments on this question included:

"Too many actually, three times a week would be better".

"Five is too much".

"More would be appreciated".

"Twice daily, one before and one after class should be sent".

"I think it was sufficient".
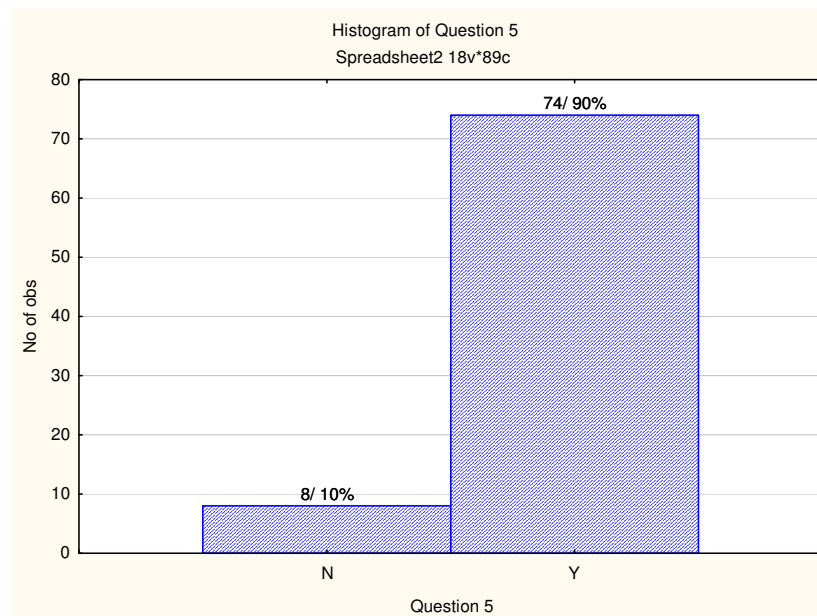
Figure 19: Student questionnaire responses to whether they thought five SMS were sufficient

4.2.6 Question 6

Question 6 asked whether students liked receiving an SMS daily. Seventy-nine students answered this question with 40 (51%) answering no, and 39 (49%) yes. In the interviews, students pointed out that most of them receive numerous SMSs every day, but they would prefer not to receive an SMS of an academic nature on a daily basis. As some of the students commented:

> "As soon as the SMS that you received had academic work constructed within it, and you received one of these SMSs daily, it won't be fun anymore."

> "Some of the SMSs weren't received straight after it was sent, so then some of us received it during class, which would then be disruptive".

The result of question 6 is shown in figure 20.
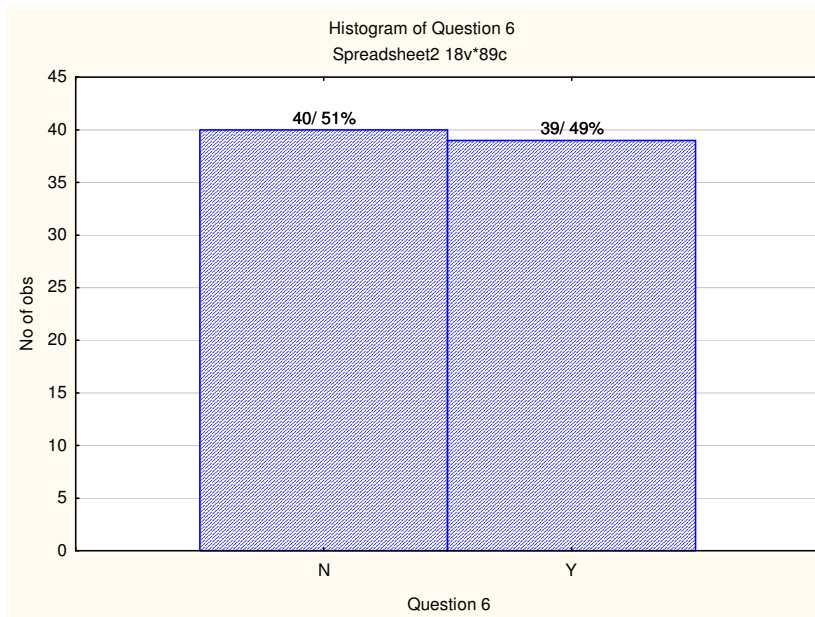
Figure 20: Student questionnaire responses to whether they liked receiving a SMS daily

4.2.7 Question 7

Question 7 asked whether they would have preferred replying via SMS instead of having to use Webstudies. The majority of students (49/ 60%), indicated yes. When asked why they would have preferred replying by SMS some of the students' comments were that it would have been easier to just reply when asked a question than to go back to a PC to type the answer. Some said it would have been more convenient especially with the barcode quizzes than to keep the answer till a later stage when you are at a PC. Students who said no commented that the cost of sending an SMS every time it had a question would have been too high, and would have used too much of their cell phone credit. The results for question 7 are shown in Figure 21. Some of the comments received included:

"It would be easier, and simpler".

"Replying with an SMS would be too expensive".
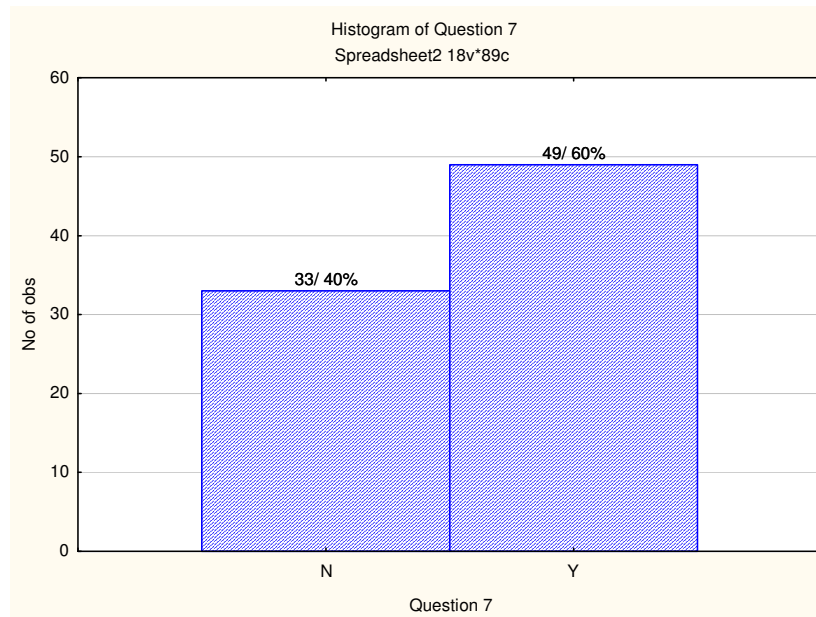
Figure 21: Student questionnaire responses to whether they would have preferred to reply via SMS

4.2.8 Question 8

Question 8 asked whether they preferred computer support to mobile support. A total number of 78 students answered this question of which 62 (78%) answered yes. When asked about their responses, the students commented on the restrictions of the mobile platform. Screen size was problematic as well as having to zoom in and out. With the SMS itself, the problem was that messages are limited to 160 characters. Their familiarity with a PC, especially being able to browse through a number of websites simultaneously, was one of the reasons why the students opted for computer assistance in preference to mobile support. The results for question 8 are shown in Figure 22. Some of the comments that were made include:

" From the computer I can print, and the screen is much bigger".

"Mobile content is much easier to access".
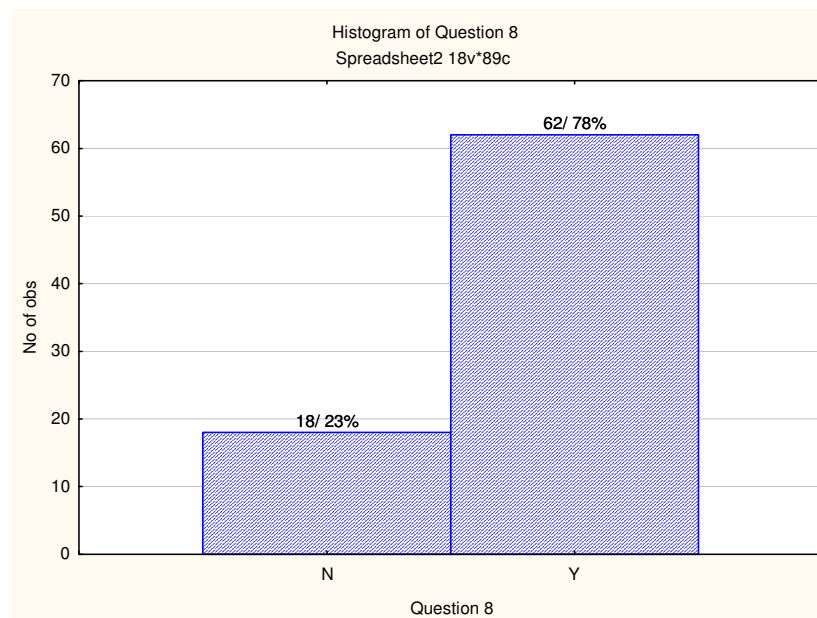
Figure 22: Student questionnaire responses to whether they preferred computer assistance to mobile assistance

4.2.9 Question 9

Question 9 asked whether the students would have done more if replying counted towards the mark they received at the end of the year. Since no incentives were given to students to participate in the study few of the students answered any of the SMSs that asked a question. As Figure 23 shows a total of 81 students answered this question and 75 (93%) of them answered that if answering the SMSs had counted for marks, they would have done more.
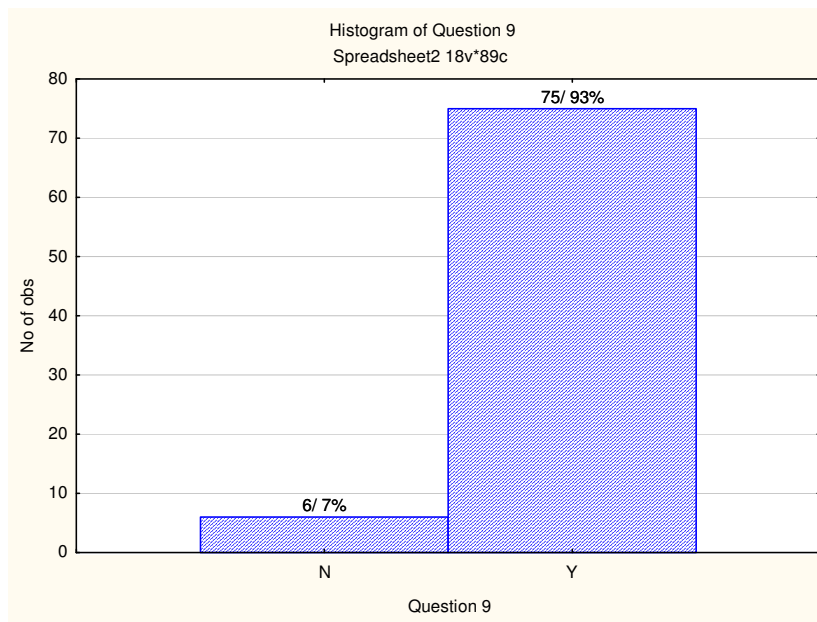
Figure 23: Student questionnaire responses to if replying did count to their overall mark, whether they would have done more or answered the SMS

4.2.10 Question 10

Question 10 asked whether students thought that incorporating mobile assistance into courses could be fun and should be considered by faculty as a form of learning support. Figure 24 illustrates the results for the question with 58 (73%) of the students answering they would indeed like it if SMSs were incorporated in the teaching modules. A total of 79 students answered the question. Some of the comments that were made included:

"It was a very useful mode of teaching".

"It could be useful, but it should be a choice, and not become compulsory".

"No, but I am just old fashioned".

"Delivery times should rather be scheduled to receive the SMS at the same time".
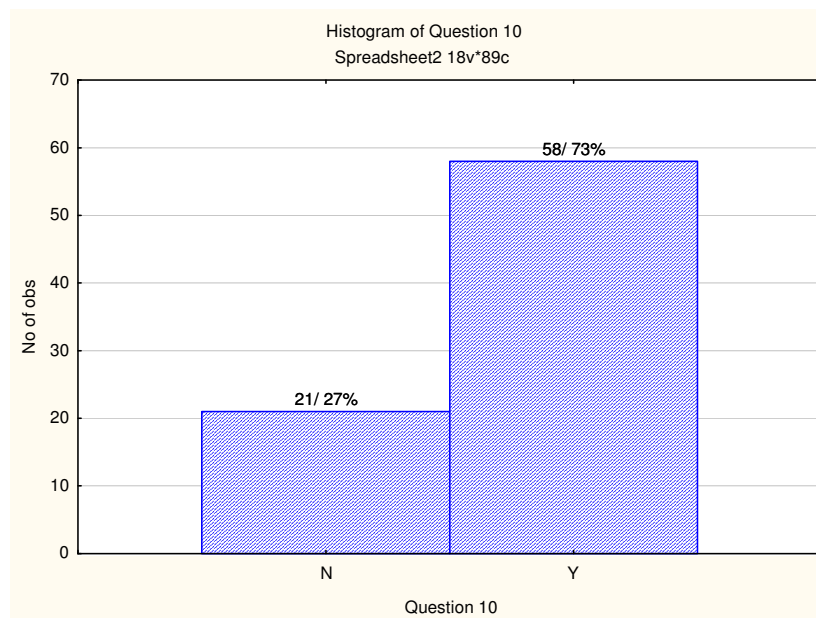
Figure 24: Student questionnaire responses to whether incorporating mobile assistance into courses could be fun, and should be looked into as a form of assistance

4.3 Evaluation

The students' usage of the SMS material was disappointing. In actual fact only 7 students answered the questions, even though 23 indicated on the questionnaires that they did. The enthusiasm of the students at the beginning slowly diminished possibly due to lack of interaction and feedback from other students. The impression that was given through the comments was that the students were positive towards the inclusion of mobile support material, but more should have been done to ensure interaction amongst them. Some of the comments that were received through feedback included:

"Dit was aangenaam om SMSe te ontvang".

"The tips were rather useful, especially with exercises".

"My phone was not working, but I went through some of the content on a friend's phone".

One of the assumptions at the beginning was that if SMSs were introduced this would act as a support medium by getting students to interact more with each other. However, as the results of the questionnaire show it was obvious that not a lot of students found the use of SMSs as exciting as I did. Thinking that the students might have used the SMSs more and more of them would have taken part in the study may well have been overly optimistic since only seven of the students responded to the SMSs that had a question, and only a few of them referred back to the SMSs when completing homework assignments, online quizzes or in preparation for the exam. Although mobile phones and PCs are widely used amongst students, the project was not a success in terms of having a high participation rate. The reasons for this could be, as some of the students commented, that they had difficulty downloading the application which was needed for the barcode quiz, and the SMS content tended to be cramped due to character limits. Other reasons given were the timing of the SMSs, and the fact that the students did not have a say about the type of content that would be received by them. Some of the other comments pertaining to the study included,

"It is not great to receive a German SMS, when you are waiting on a call or a reply from someone else. I'd prefer email".

"Om `n SMS in Duits te ontvag was vreemd. Die lees van so `n SMS was bietjie moeilik veral t.o.v. die skeiding tussen woorde".

"The SMSs can sometimes become unreliable when someone changes their number, or even phone, then the messages would be lost".

"Even without the SMSs I thought the system worked fine".

The aim of the study was to evaluate the viability of mobile technologies when used as a support structure for first year students studying German as a foreign language at the University of Stellenbosch. Overall the students indicated that a system like this could make learning interesting, and interactive, and that is was and could be useful and efficient when implemented correctly. Although the aim of the study was met, since overall, students indicated that the system could be useful and has potential, there were still some fascinating findings, and constraints that should be kept in mind whenever attempting to incorporate mobile technologies as a support structure for first year students studying German as a foreign language in the future. One of the outcomes would definitely have been more students answering the SMSs, which would have made for better results, but as it is the results also indicate an interesting phenomenon, that being the way students approach new material.

The final chapter will discuss some of the recommendations, and constraints that one might encounter when attempting a study like this.

Chapter 5

5.1 Recommendations and Conclusion

The final chapter will mostly discuss two different aspects. The first will be the recommendations or aspects that concern the stakeholders that being the lecturers and the students when implementing MALL and the second will discuss the aspects that should be kept in mind when implementing mobile technologies in a study. The chapter will than conclude with some final remarks.

> *Looking further ahead, mobile learning has the capacity to challenge much conventional practice. It challenges the need for buildings and campuses and makes us question the need for education to take place at fixed physical locations; it challenges the need for timetables and makes us question the need for synchrony; it challenges the need for lectures and seminars and makes us question the essence of face-to-face teaching and learning. Mobile learning can take education back out into the home, the workplace and the community. It is spontaneous, portable, personal, situated; it can be informal, unobtrusive, ubiquitous and disruptive*

(Kukulska-Hulme and Traxler, 2005: 42).

Some of the recommendations made by experts like Wang, Kukulska-Hulme, Traxler, Koszalka and Ntloedibe-Kuswani reflect certain shortcomings to MALL as a whole. Since the field is rather new there are still a lot to be learned and recommendations to be made with each project. The recommendations made in my own study, will reflect those made by some of the experts from their own studies.

According to a study done by Traxler (2005) for embedding mobile technologies in learning, any institution would require willingness, sensitivity, flexibility, structures and resources. What advices and also recommends is that

the stakeholders, i.e. the lecturers and learners, should all have these attributes and they should be reflected within their interactions with each other. These attributes cannot be lacking in any of the stakeholders or else it will not work. What should also be kept in mind is that the success of mobile learning depends largely on whether mobile technologies are accepted and seen as capable supporting infrastructures by both the students and the lecturers.

With this said without the motivation, participation and support of the lecturers and students a study will never be as effective or successful as when they are more involved. Catering for the different preferences of students is an important consideration. When students feel they are being considered in the learning process it will definitely make their participation in the study more. My study shows that students preferred to receive less than one SMS per day, and therefore, it should be considered in future changing the frequency to one SMS in two days, or even one SMS per week. It is also important to consider that a project like this cannot be conducted successfully without support. If the study, like the one I did, is going to be an add-on, or basically separate to the actual classes than the help of the lecturer is needed to ensure the participation of students. Since there was no reward system used within my study, and no real encouragement to stay involved the participation rate was tremendously affected and was very low. One has to find a way to make it attractive for students to use the material. According to Wang et al. (2009: 693),

> *a thorough orientation is needed to help students understand the scope and format of m-learning activities. Students need to get 'hooked' in the first class session, and they need continuous encouragement to stay involved. A reward system is necessary at the beginning but instructors should aim for students' self-motivation afterwards*.

Therefore the use of a reward system at the beginning to motivate them is recommended and could at a later stage be either taken away, or substituted.

Another aspect to consider when using mobile phones is the students' willingness to use it for learning. As Stockwell (2007) states it appears that

many learners seem reluctant to use their mobile phone for language learning. This is unlikely to be a reflection of a lack of confidence or competence with the mobile phone, but rather an indication of learners' unwillingness to use mobile phones for educational purposes as opposed to private ones. Simple ownership of a device and having the skills to use it does not necessarily imply that learners will actually use it. Thus if students are not willing to use their phones it will lead to participation difficulty but for those willing to use it the content should be made as appealing as possible for them to want to keep on using it, or at least have fun while using it.

When looking at content there are different aspects that should be kept in mind. Wang et al. (2009) suggest that m-learning is better suited for short activities and limited content, and should address the topics that students are keen on. Intensive reading and individualised feedback should not be demanded, but rather the activities ought to facilitate interaction between classmates. Some factors to look into are the delivery of video and audio streams since they can create a better context for learning. Audio interaction, especially under the teacher's guidance when practising speaking and listening abilities, would benefit language classes. The reason why this was not included in my study was firstly because the study was a type of pilot study, just to get a basic idea of the validity of mobile technologies, but also because it becomes costly, as soon as audio or video is implemented and the students are asked to download this material. Other factors such as the size of the content and how the content are to be downloaded would then come into play.

Obviously a lot of these problems will be eliminated if one were to have a sponsor, who could supply students with the same device. It would definitely be beneficial, especially when designing activities. Handset compatibility issues will be non-existing and you would only have to develop activities, applications and content for one phone, because if it were to work on the one device, whatever you designed will work on all the devices. Though, there are still some limitations when working or using SMSs.

Some of the problems that I encountered are mentioned on page 51 and page 52 but some problems that occurred specifically because of the use of SMSs as means of content delivery included:

- The fact that an SMS has a 160 character limit, becomes a problem when especially a foreign language is supported, because that what you want learners to take note of cannot now be put into an SMS type of language. Full sentences and 'whole' words are needed to avoid confusion.

- The other problem with regard to the character limit is since each character within an SMS becomes vital the content could get crammed, and the display of the message received could be confusing.

- The characters which are used to separate sentences can also become a problem, especially when grammar is sent because it influences where the different phrases or words and their examples start and end.

- The problem with regard to the input of the German alphabet characters, especially those that did not feature within the English alphabet, did not display correctly in an SMS.

According to Koszalka and Ntloedibe-Kuswani (2010) what is needed to provide better access to multiple types of resources for student learning and to better understand and develop support mechanisms is large scale multidisciplinary implementation projects, to investigate and inform educators about the utility of mobile technologies in teaching and learning. Other things that are needed are rigorous evaluative and research data collection methods, and investigation of teacher strategies that make the most of mobile technologies. More robust uses of cognitive learning measures, instructional strategies, observations, and interventions should also be employed in multiple contexts with different participant groups to further study the impacts of m-learning.

The main aim of my study was to evaluate the viability of mobile technologies when used as a support structure for first year students studying German as a

foreign language at the University of Stellenbosch and some of the objectives included students not only taking part in the study, but also using and answering the SMSs.

What was interesting from my study was that the students who replied to the SMSs were the students who did not need extra support. All of the students who answered the SMSs commented that they would make use of any support which would better and help their understanding of German. This relates to what Wang et al. (2009) stated within their article that someone with high performance expectancy would most likely adopt m-learning in contrast to those who have a lower performance expectancy level. With this said there were still limitations to my study. The limited time, technical support, and interactivity was not fully achieved due to the limitations of SMS technology, and since the participation rate was very low the results cannot be generalized. What is recommended for further research is:

- implementing the study over a longer period to get more tangible results that could be generalized for future use since the five weeks within which I conducted my study was not enough.
- close cooperation with lecturers to motivate students to participate more, and to get a better idea of the content that they see as most useful so that it could be incorporated into the project.
- some kind of incentive, especially if it effects the overall mark that the students receive at the end of the year, would make them want to participate more as the results of Question 9 indicates.
- having a sponsor to minimize the costs when implementing a project like this, because other than handset compatibility problems that one can face, there are still additional costs that need to be covered like the costs of SMSs.

One can definitely say that face-to-face learning can be improved, complemented and enhanced through the use of mobile devices. It can support communication, enhance engagement, and rather than being told by the teacher what should be learnt, the students are given the opportunity to create

content themselves. It can also support other technologies such as the interactive white board, and computers used for learning by responding to practical constraints and barriers. Whether it is in class or outside of a building, on a train, or on the bus, MALL is the way forward and should definitely be looked at in terms of language learning.

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Appendix A

Participant Consent Form

The use of mobile technologies as a support structure for first year students studying German as a foreign language in a South African context.

The aims of the study are to see

- whether incorporating technology would help with language learning

- whether students prefer the use of technology as support mechanism

- what kind of technology students prefer, whether it be mobile or on computer

By agreeing to the study, you would be agreeing to participate in this research willingly. Have been given full information regarding the aims of the study, and have had the opportunity to ask any questions about the study. That withdrawal from the study may happen at any time without giving a reason, and that it would not have an effect on your education. And that all the information provided will remain confidential and no information that identifies you will be made publicly available. That by signing you will be giving your consent to receive SMSs from the researcher as part of the study.

Name: ....

Date: ....

Student number: ………………………………………………………………………

Cell number: ………………………………………………………………………

Signed: ………………………………………………………………………

Please answer the following questions by either marking the right answer with an 'X' or by circling it.:

Do you own a cell phone	Yes	No
Do you have internet on your cell phone?	Yes	No
Do you use the internet on your cell phone?	Yes	No
Do you use MXit?	Yes	No
Does your phone have a camera?	Yes	No
How many hours a day would you say you have your phone with you?		

Thank you for your participation.

Appendix B

Mobile Study questionnaire

Thank you for your participation in the mobile study. To test the effectiveness of the study, we would like you to answer the following questions by either answering yes or no, and please feel free to write any comments.

	Question	**Yes**	**No**
1	Did you answer the SMSs? (if No, why not?) _____ _____	☐	☐
2	The SMS content was useful for: A. Grammar skills B. Homework C. Computer Exercises Comments: _____	☐ ☐ ☐	☐ ☐ ☐
3	What kind of content would you have preferred receiving? Grammar tips Language tips Exercises Riddles	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

	More Barcode quizzes	☐	☐
	Notices from class	☐	☐
	Other: (please list) _____		
4	Did you refer back to the SMSs when studying for your exam Comments: _____	☐	☐
5	Were five SMSs a week enough/ sufficient Comments: _____	☐	☐
6	Did you like receiving a SMS daily Comments: _____	☐	☐
7	Would you have preferred replying with an SMS to the SMSs that had a question, instead of going to a computer? Comments _____	☐	☐
8	Do you prefer computer assistance to mobile assistance? Comments	☐	☐

	_____		
9	If the study and answering the SMSs counted towards your marks would you have done more? Comments _____		
10	I think incorporating mobile assistance into courses could be fun, and should be looked into as a form of assistance. Comments _____ _____		

Appendix C

Semi structured interview questions

1. Why did you decide on taking part in the study, and why do you think others decided not to?

2. Have you ever used your mobile device or cell phone within any of your other classes?

3. What made you decide on sometimes answering the SMSs that were sent to you? Then again what do you think made others decide not to?

4. Obviously student participation is needed when working with mobile technologies, but what do you think would make the rate of answering SMSs higher?

5. Do you think students are prepared to use their cell phones for academic purposes or would it be seen as an intrusion of their personal space?

6. What did you find useful when participating in the study?

7. What do you think should be added or changed to make a system like this work better?

8. What kind of content would you like to be sent to you, or be accessible via your cell phone?

9. Some of the comments in the questionnaires indicated that using your mobile device should be optional, and that the content that is sent should differ from what is discussed in class. What do you think?

10. What do you think would suit students better. A SMS being sent randomly, SMSs being sent at scheduled times or a website that can be accessed via your mobile device?