

**Mobile technology strategies incorporated in teaching and learning  
activities to support English Home Language**

**by**

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**at the**

**UNIVERSITY OF PRETORIA**

**Supervisor: Dr Ronel Callaghan**

**March 2018**

## Declaration

I Golekane Mthelebofu declare that the dissertation/thesis, titled: **Mobile technology strategies incorporated in teaching and learning activities to support English Home Language**, which I hereby submit for the degree **MEd General** at the University of Pretoria, is my own work and has not previously been submitted by myself for a degree at this, or any other, tertiary institution.

.....

Golekane Mthelebofu

March 2018

# Ethical Clearance Certificate



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CLEARANCE NUMBER: **SM 16/11/05**

DEGREE AND PROJECT

MEd

Mobile technology strategies incorporated in teaching and learning activities to support English Home Language

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APPROVAL TO COMMENCE STUDY

22 March 2017

DATE OF CLEARANCE CERTIFICATE

29 March 2018

CHAIRPERSON OF ETHICS COMMITTEE: Prof Liesel Ebersöhn

A handwritten signature in black ink, appearing to read 'Liesel Ebersöhn', written over a horizontal line.

CC

Ms Bronwynne Swarts  
Dr Ronel Callaghan

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## Dedication

I dedicate this research to my father, John Mthelebofu, who passed away on the 17th of March 2016. My father was the person who encouraged me to apply for my Master's degree and who believed and knew that I would be accepted. He was always the person who gave me advice regarding life. Now that he is no longer here, I sometimes struggle to encourage myself. However, I *know* that he is my guardian angel and he will be with me for the rest of my life, even though I might not see him.

I will always love you, Daddy. I know you are in a better place now.

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- Dr Ronel Callaghan, my research supervisor, for her invaluable advice, guidance and inspiring motivation during difficult times throughout the research.
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- And last, but definitely not the least, to my mother, Patricia Mthelebofu, and my sisters, Reneilwe and Katlego Mthelebofu, thank you for your support over the years.

## Abstract

The purpose of this study was to investigate which mobile technology integration strategies are incorporated in activities to support English Home Language teaching and learning. This study is important because even though technology is used daily, inside and outside the classroom, it is not clear at which cognitive level these activities are being implemented. The study was conducted in two private secondary schools, as a comparative case study. Mobile technology-based activities in Grade 9 English Home Language classes were observed and analysed. Data were collected through semi-structured interviews with the principal, IT specialist and English Home Language teacher from each school, observations of activities, as well as focus group discussions with six learners from each school.

The conceptual framework combines the Substitution, Augmentation, Modification and Redefinition (SAMR) model with the revised Bloom's taxonomy. The eight observed activities were analysed and presented in the conceptual framework using the Activity Theory. Technology was integrated seamlessly in both English Home Language classrooms for communication, collaboration, presentations, investigations, analysis and research work. The two schools have similar supportive environments for implementation of technology in teaching, even though School B has a slight advantage in weekly community of practice sessions, training and technical support. The results indicate that activities in both schools were on the higher levels of conceptual framework, with a slightly higher approach identified in School B. In this study the results cannot be generalised as data were not collected over a long period of time, the number of activities observed was limited and the study was restricted to two schools only. However, it is evident that, in a supportive environment, technology can be very beneficial to, and even redefine, teaching and learning.

**Key Terms:** Activity Theory, English Home Language teaching, Mobile Technology, Revised Bloom's Taxonomy, Redefine, SAMR

# Language editor



## Certificate of Editing

To whom it may concern

This is to certify that the manuscript detailed below was edited by a English language academic editor.

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## List of abbreviations

ADHD	Attention-deficit hyperactivity disorder
ADvTECH	A company that contributes to education and resources
eMASE	Mobile assisted social e-learning
ICT	Information Communication Technology
ITSI	Information Technology School Innovation
LTE	Long Term Evolution
MEC	Member of Executive council
MT	Mobile technology
MQ	Main question
SAMR	Substitution, Augmentation, Modification and Redefinition
SQ	Secondary question
PSS	Performance system

## List of terms

Basic Substitution	Integrating technology on a lower, basic level.
Classroom activities	Activities that relate to teaching and learning in the classroom.
Cognition and Integration	Cognitive level according to the Bloom's Taxonomy and mobile technology integration level according to the SAMR model.
Electronic textbooks	Books available online/electronically.
Hard copy textbooks	Physical, paper-based books.
Integration Strategies	Strategies used in any shape or form to integrate mobile technology.
Mobile Technology	Technology that can be used anywhere and at any time. For example: smart phones laptops or e-readers.

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# 1. Chapter 1: Introduction

## 1.1. INTRODUCTION

This research examined the integration strategies that teachers and learners use in classroom activities using mobile technology (MT). Its focus was on evaluating whether, and to which degree, schools merely *substitute* hard copy textbooks with electronic textbooks under the guise of MT and whether, if at all, the technology was being used to its fullest educational potential. This chapter focuses on the background of the study, the problem statement, research questions, rationale, purpose and importance of the study. A brief literature overview of the resources used is included as well as the theoretical and conceptual frameworks of the study. The research design is briefly described, and the dissemination, delineation and ethical considerations are also discussed.

## 1.2. BACKGROUND

All over the world technology is used daily by businesses, individuals and, more recently, by schools. MT forms part of the technology sector and examples thereof include: smart phones, e-readers, laptops and tablets (Clarke & Svanaes, 2014) just to name a few. The increasing affordability of these mobile technological devices have resulted in more people owning them. They can also, and are in fact, currently being used for teaching and learning in schools and universities (Huda, Maseleno, Atmotiyoso, Siregar, Ahmad, Jasmi & Muhamad, 2018). Tablet devices have been introduced in schools to, amongst other things, substitute textbooks and bolster other learning activities. However, Nkula and Krauss (2014) have stated that schools sometimes only use Information Communication Technology (ICT) in a limited way. For example, ICT may be used to facilitate the acquisition of computer skills, but these devices possess multiple functionalities which can assist in the completion of a wide array of tasks in the school environment (Nkula & Krauss, 2014).

## 1.3. RESEARCH FOCUS

### 1.3.1. PROBLEM STATEMENT

In recent times schools have been trying to *limit*, or even in some cases *eliminate*, the use of hardcopy textbooks, paper handouts and other old resources that were used before while dealing with teaching and learning (Lee, Waxman, Wu, Michko, & Lin, 2013). The use of technology in the classroom is nothing new, however, it is becoming much more commonplace in teaching and learning environments. The use of MT towards replacing textbooks will help solve the problem of certain textbooks not being available in certain schools which, in turn, will assure that no learners are left behind on their educational journey. The problem remains that the technology may be available, but some schools still persist in using it as a substitution tool rather than a tool to execute other activities inside, and outside, the classroom ( Phiri, Foko, & Mahwai, 2014).

Nkula and Krauss (2014) noted that many schools, use ICTs in a very *restricted* manner even though they may have access to all the resources and infrastructure, often only focussing on the acquisition of ICT skills. Teachers may be afraid of using technology as they are comfortable and familiar with their traditional teaching practices and styles. Operating within this comfort zone can thus deter them from effectively integrating the technology (Phiri et al., 2014). For example, teaching English Home Language already poses its own inherent daily challenges. If one adds to these the added pressure of integrating MT into the subject, teachers may become overwhelmed and consequently less likely to integrate MT to its full potential. Furthermore, learners tend to model that which they have seen and experienced. If their teachers hardly ever use technology in class, they are less likely to use it themselves (Nishizaki, 2015).

In summary, the way teachers and learners integrate MT in the classroom needs to be investigated with regards to English Home Language. Also, what needs to be studied is, are there MT specific activities that are being incorporated in the subject most of the time, or is the technology just acting as an addition and not a change maker. The way in which the technology is managed and the support that the teachers and learners receive from the school needs to

be found out. Furthermore, the level of integration of the technology and the cognition level of these activities needs to be investigated.

### **1.3.2. RESEARCH QUESTION**

#### **Main Research Question**

**MQ** – How are mobile technology strategies incorporated in activities to support English Home Language teaching and learning?

#### **Secondary Research Questions**

**SQ1** – Which mobile technology-based activities do teachers incorporate in their teaching?

**SQ2** – How are these activities managed by the teacher and learners in the classroom?

**SQ3** – Which level of cognition and integration are the activities on?

### **1.3.1. RATIONALE**

The main impetus behind this research study was to compare two schools' MT integration strategies during classroom activities. MT can be used and integrated in many ways, and schools are no exception to this tenet. When doing research in schools, it is important to note exactly *how* they use this technology. Some researched articles indicate that certain schools use technology in a basic manner, and it is often that learners mirror what they see from their teachers, thus may result in them also only substituting the technology. Teaching and learning activities could thus readily fall back onto *traditional* practices as the integration of this technology as a *tool*, and not just as a distraction, requires additional research and planning. Integrating technology is viewed as a methodology of teaching whereby research and practice need to take place to fully *redefine* the use of the technology.

### **1.3.2. PURPOSE OF THE RESEARCH**

As aforementioned, the purpose of this research was to describe the teaching and learning activities observed in two private schools. Private schools were used instead of public schools as the focus of the study was not on *whether* the technology was being used at all, but rather *how* the technology was being used within classroom activities. The two schools in question were identified as educational facilities which had been using the technology for a significant period of time.

### **1.3.3. IMPORTANCE OF THE STUDY**

The importance of this study lies in that it can provide insight into how MT is being used in the English Home Language classroom. Even though only two private schools formed part of the research and, consequently, the findings cannot be generalised, an overview can still be obtained. English requires much reading and writing, and thus it would be very easy to simply substitute technology for electronic textbooks and other basic uses. However, this study shows that in teaching and learning activities there are many ways in which the technology can be used.

### **1.4. LITERATURE OVERVIEW**

A literature study was conducted focusing on technology and MT. As per Figure 2.1, the literature study commenced with a discussion of technology around the world, then it narrowed its focus to technology in South Africa. The review continued with a deliberation of MT in education followed by discussions in which South African projects on mobile learning and technology integration strategies were deliberated. Teaching with MT, as well as the roles which teachers and learners play in technology education, was also reviewed. Finally, the gaps that were found in this study were discussed. The extensive literature review is presented in Chapter 2.

## **1.5.THEORETICAL FRAMEWORKS**

### **1.5.1. SAMR MODEL**

The Substitution, Augmentation, Modification and Redefinition (SAMR) model (q.v. Figure 2.2) is a framework which allows for the analysis of activities that use technology in classrooms (Puentedura, 2013). The SAMR model indicates the sequences followed by educational technology as it proceeds with teaching and learning (Puentedura, 2014). In addition, the SAMR model provides information and methods on how technologies can possibly affect, or impact, teaching and learning in the classroom. The four levels, as represented by the SAMR model, will be described in detail in Chapter 2 (q.v. 2.9.1).

### **1.5.2. REVISED BLOOM'S TAXONOMY**

The revised version of the Bloom's Taxonomy (q.v. Table 2.1), as created by David Krathwohl (Anderson & Krathwohl, 2001), was the other theoretical framework employed in this study. The *knowledge dimension* in this model contains: factual knowledge, conceptual knowledge, procedural knowledge and meta-cognitive knowledge whilst the *cognitive process dimension* includes: remember, understand, apply, analyse, evaluate and create. This table is further discussed in Chapter 2 (q.v. 2.9.2).

## **1.6.COGNITION AND INTEGRATION**

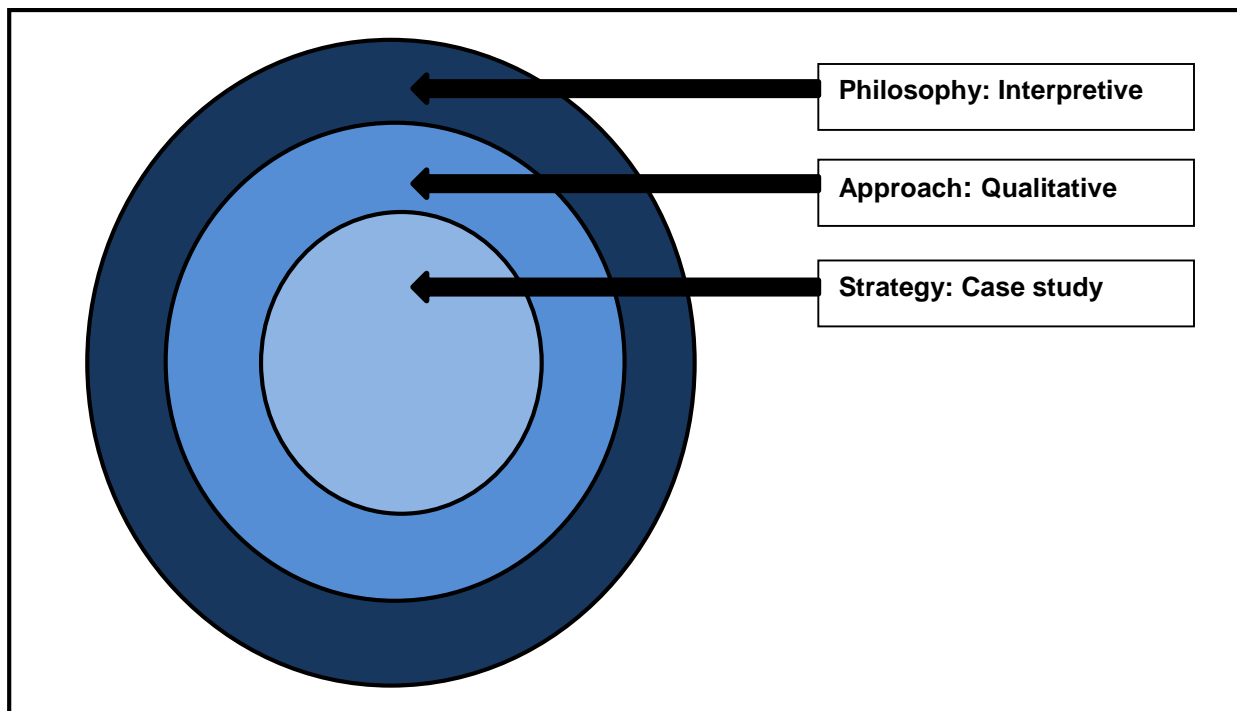
The cognition and integration table (q.v. 2.2), as used in this study, was created by combining the two theoretical frameworks. The Revised Bloom's Taxonomy is in the format of a table (with the knowledge dimension on the vertical axis and the cognitive process dimension on the horizontal axis). The SAMR model, with its four levels, was reduced to fit into the table to thus show *how* teaching and learning activities using technology were placed within the table. The activities were analysed based on their cognitive levels and technological integration. A detailed explanation of this framework can be found in Chapter 2 (q.v. 2.10).

## 1.7. CONCEPTUAL FRAMEWORK

The conceptual framework, as illustrated in Figure 2.3, is a visual representation of *how* and *why* this study was conducted. It indicates the SAMR model as the *integration element* and Bloom's Taxonomy as the *cognition element* of activities. These elements were determined based on a specific context of the situation, in a certain environment which was the schools and the support given to the participants and how they individually approached the situations. The conceptual framework is further explained in Chapter 2 (q.v. 2.11).

## 1.8. RESEARCH DESIGN

The research onion diagram, as per Figure 1.4, visually depicts the relationships of the cycles in this research design. The diagram indicates the general, broader view (the research paradigm) as the outside circle, then moves to the second circle (the research approach) and finally the last level, or innermost circle (the research strategy and core design).



**Figure 1.1: Research onion**

(Source adapted from: Saunders, Lewis & Thornhill, 2009)

The *research paradigm* used in this study is the interpretive paradigm which focuses on interpreting situations in their natural settings (Maree, 2007). The *research approach* used is the deductive, qualitative approach and is described as reasoning which moves from the more general space of a given concept to the specific space which tries to describe the concept in as much detail as possible. The *research strategy* employed in this investigation was a comparative case study. Case study research is the analysis of one or more cases (Polit & Hungler, 1983). This research strategy made use of different data collection methods, including: semi-structured interviews, observations and focus group interviews. The participants were principals, an IT specialist (School B), English teachers and learners. The sampling technique used in this research was purposive sampling. Private schools were chosen because knowledge exists that they use technology in their teaching and learning. The data analysis techniques used were themes and codes derived from the data collected. The activity theory was also used to analyse the activities which were observed by the researcher. The activity theory is used when one wishes to study the cognitive process of humans while they are completing certain activities (Zhang, 2014). The detailed representation and explanation of this diagram can be found in Chapter 3 (q.v. 3.2 and Figure 3.2).

### **1.9. DELINEATION OF THE RESEARCH**

This study was conducted in two schools. Schools are environments which are subject to many situations which one cannot control. On any given day changes could be made to the timetable or external factors, like official or departmental visits, could hinder data collection. This was also the case during data collection for this research. There was a visit from Umalusi which resulted in changes to the timetable and, consequently, no data were captured on that set date. On another occasion a photo day, which had not been communicated beforehand, resulted in no data being captured on that day.

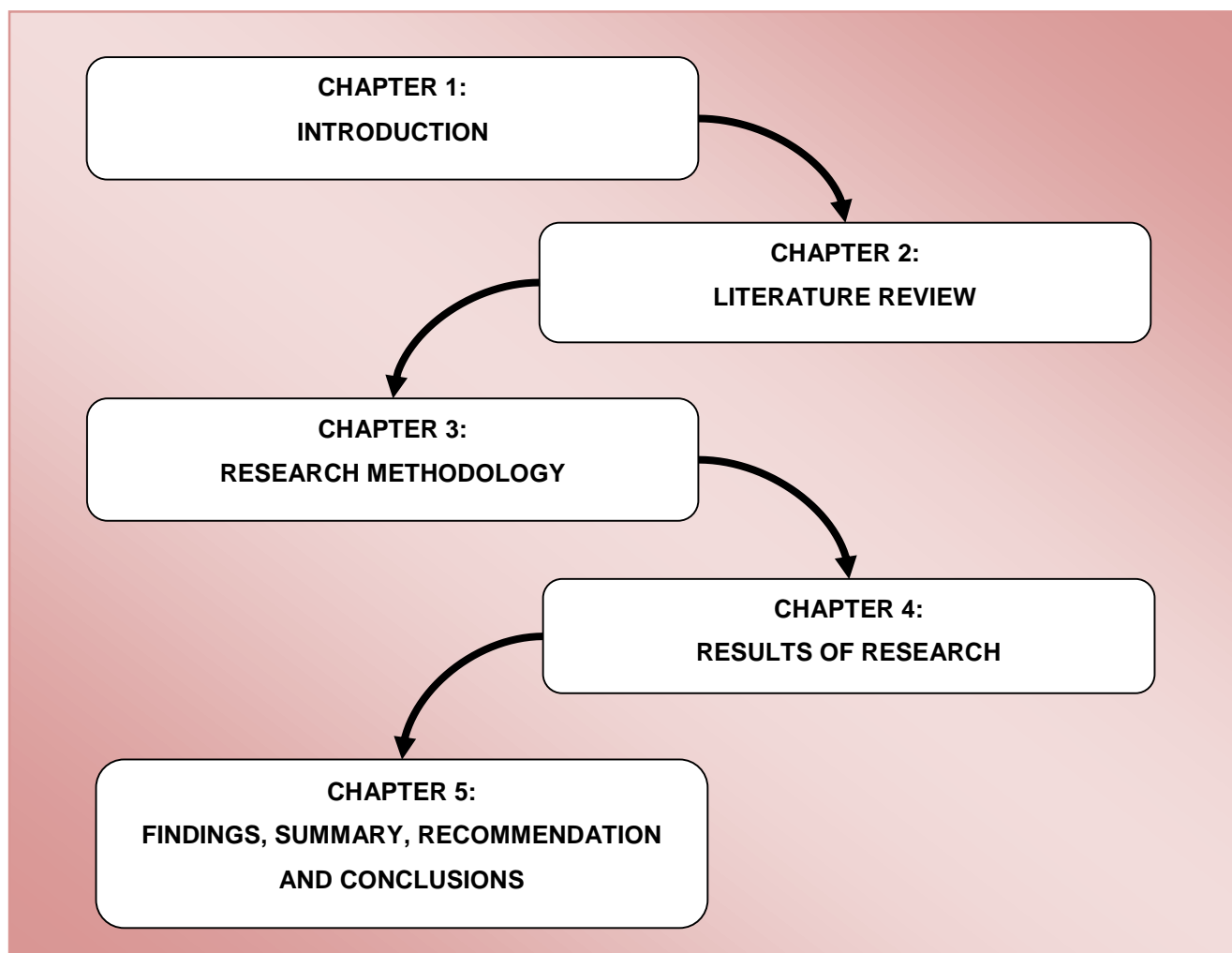
### **1.10. ETHICAL CONSIDERATIONS**

The University of Pretoria, the principals of the two schools gave their permission for the gathering of the data. Consent was also attained from two teachers and the IT specialist. Furthermore, the learners' parents gave permission. Assent was granted from the learners who



were present in the observed classes as well as the learners who participated in the focus groups. All participants were informed that their participation was voluntary and that they were free to withdraw at any time. In addition, the participants were assured that they would be safe when participating in the study and that all the information provided by them would be treated with the utmost confidentiality. The participants also received the assurance that no personal information obtained would be publicised. In this final study, all participants were assigned pseudonyms and only the researcher and supervisor know the identities of the participants. The gathered data will be held at the University of Pretoria for 15 years. A more detailed explanation of the ethical considerations can be found in Chapter 3 (q.v. 3.10).

### 1.11. CHAPTER OUTLINE



## Figure 1.2: Chapter outline

### Chapter 1: Introduction

This chapter focuses on the background of the study, the problem statement and the main and secondary research questions.

Other topics described in the introduction are:

- The reason why the study was conducted and the main purpose and importance of the study.
- A brief review of the literature. The complete literature study can be found in Chapter 2.
- A brief description of the theoretical frameworks, namely the SAMR model and the Revised Bloom's Taxonomy.
- The conceptual framework which was created by combining the two theoretical frameworks and,
- The delineations and ethical considerations governing this research.

### Chapter 2: Literature review

Chapter 2 contains an in-depth literature review. The review begins with a broad view of technology usage in education around the world. It then narrows its focus to the South African situation and the use of MT in different South African school projects.

Another focal point is teachers' and learners' roles in implementing the technology and strategies used. The teaching of English Home Language with technology is discussed as well as the gaps in the field of literature.

### Chapter 3: Research methodology

In Chapter 3 the research questions are once again discussed. The interpretive paradigm, qualitative approach and the case study strategy are discussed. Added to this is the population and sampling of the research are indicated and discussed. The data collection strategy, which included semi-structured interviews, observations and focus-group interviews is explained. The data analysis of methods for the data collected, the limitations, ethical considerations and trustworthiness of the research are discussed in detail.

#### **Chapter 4: Results of the research**

In Chapter 4 the results of the research are discussed. Each school is discussed separately. The participant and focus group interviews are presented in table format whilst the observations of classroom activities are presented in accordance with the activity theory. All the results are accompanied by explanations, figures and tables.

#### **Chapter 5: Findings, summary, exceptions and conclusions**

In Chapter 5 the findings and results are discussed. The schools' data are compared in order to ascertain similarities and differences. A summary of the whole study is provided and final conclusions, as to whether the research questions were answered, are drawn. A recommendation for further research is also made.

### **1.12. CONCLUSION**

The focus of this chapter was to explain *what* the research is about, and which integration strategies were used with MT in teaching and learning. The basic outline of the research is also included in this chapter. In addition, reasons for the research to be conducted as well as research questions pertaining to the research were included. The background to the research, as well as the chosen theoretical and conceptual models, were explained and a basic literature review was conducted. The chapter briefly explained how the research data were obtained and also gave a short overview of the ethical considerations governing the study. In the next chapter a detailed literature review, which looks at what different authors have to say about the topic or related topics, will be presented. The gaps identified in the literature will also be considered.

## **2. Chapter 2: Literature study**

### **2.1.INTRODUCTION**

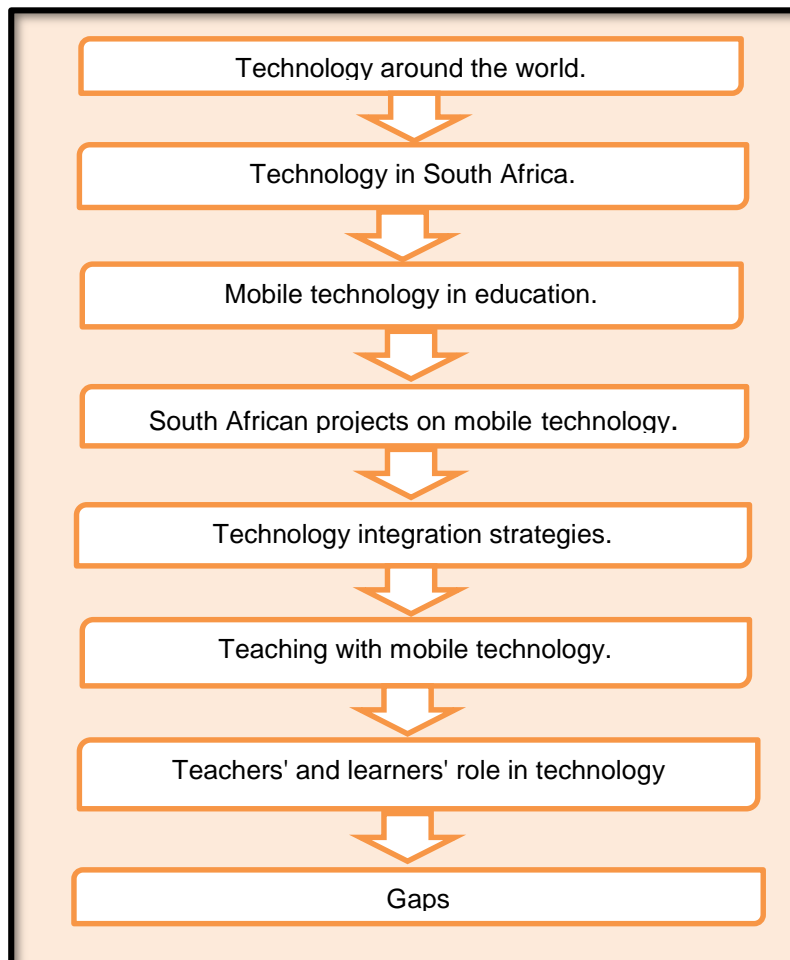
In 2017 South Africa had 21 million internet users with the majority of these connecting via mobile devices (Shapshak, 2017). Globally, the use of technology and its ownership is growing at an ever-increasing pace. In previous times, before these devices like mobile phones, tablets and laptops existed, you needed to locate a public phone if you wished to make a call. If you wanted to send a message you had to write a letter, post it and then it would take days, or even weeks, to reach its intended destination. If you wanted to type something, you would use a typewriter for this task. Nowadays, if you wish to make a call, or send a message, you simply reach for your mobile phone. Furthermore, if you want to type something, you can use your laptop or tablet and if they are not available, places like internet cafes, which are now found almost anywhere in the world, are there to help.

Technology has assisted us in doing tasks much quicker than we could have done them before ( Kim, Hagashi, Carillo, Gonzales, Makany, Lee, & Ga`rate, 2011). Furthermore, the creation of the internet has elevated communication to a whole new level allowing for interaction with the use of social media, emails and video calls. These applications allow for communication with people all over the world. The internet also allows for research of different topics. Technology is being employed on personal, business and educational levels. In addition, new technology and changes in school environments have led to technology being incorporated much more frequently in schools, not only by teachers but by learners as well.

In earlier times technological devices in schools were mainly used by staff. However, nowadays learners also use these devices to assist them with their learning inside, and outside, the classroom. These devices have replaced physical textbooks, paper handouts etc., which has led to a significant saving of paper. Electronic textbooks can be loaded, teacher notes can be posted and then accessed by learners and educators can both create and present presentations to their learners inside, and outside, the classroom. With the incorporation of technology, and if it is used to its full potential, teaching and learning in the classroom can be

elevated to a whole new level. Alternatively, if technology is *not* used to its full potential, it lapses into a mere distraction or prop.

The following literature review will focus on the subsequent headings and points. The topics are first grouped into a wider approach and then narrowed down to the South African perspective. The headings are: technology in education around the world, technology in education in South Africa, teachers' and learners' role in technology in education, technology integration strategies, MT in education, teaching English Home Language with MT, South African projects for mobile learning and gaps found in the research. Figure 2.1 presents this literature review in diagrammatic fashion.



**Figure 2.1: Literature overview**

## 2.1. TECHNOLOGY AROUND THE WORLD

The use of technology has grown substantially over the last years. Korenova (2015) describes technological devices as *digital technologies*. Lehtinen and Viiri (2014) describe it as the *digital age*. Furthermore, Alnahdi (2014) states that the world of education is in the midst of a *digital revolution*. These three sources describe technology as being digital and note that some form of transformation is occurring. In recent times technology has been used for almost everything - whether relating to matters business, educational or personal. The use of technology is growing in leaps and bounds around the world and development and infrastructure play a huge role (Tekinarslan, Kennedy, & Nicolle, 2015).

The United States of America (USA) is considered a *developed* country and, as such, it is at the forefront of technology, access and infrastructure developments (Tekinarslan et al., 2015). The USA is diverse in terms of cultures, ethnicities and religions. However, it does not conform to specific stereotypes as emphasis is placed on individuality (Tekinarslan et al., 2015). Technology is accessible to the majority of the citizens as a result of the availability of resources and creativity. Most businesses, universities and schools in the USA have ownership of, and access to, technological devices. In addition, these devices are mostly fully integrated. On the other hand, a country like Turkey, which was founded as a republic in 1923, is considered a *developing* country. This country values conformity, unlike the USA. However, technology infrastructure and access continue to grow in Turkey (Tekinarslan et al., 2015).

Poushter (2016) states that the world is becoming interconnected and the implementation of technology plays a part in the progress of humanity. A survey, conducted by the Pew Research Centre, notes that there has been a significant rise in the number of people who own a smartphone. The survey indicates that the highest ownership of smartphones is in South Korea with 88%, Australia is at 77% and the USA came in at 72% (Poushter, 2016). Russia indicated a 45% ownership and China 58%. Moving to Africa, Nigeria showed a 28% ownership, Tanzania 11% and Uganda 4% (Poushter, 2016). These statistics show that smartphone ownership in developed countries is much higher than in developing countries. Infrastructure and development are the determining factors to smartphone access in most of these countries.

As far as the educational domain is concerned, developed countries may use technology in their daily operations, as opposed to developing countries.

Globally technology in education can be used for many different tasks including: classroom activities, assignments, studying for exams and tests. Furthermore, these technologies possess different functions (including cameras, internet access and audio recorders) and thus various school-related tasks can be completed with ease. Other applications can also be downloaded to assist in the completion of a variety of activities, these may include drawing and studying tools (Lehtinen & Viiri, 2014). Lehtinen and Viiri (2014) and Alnahdi (2014) state that the possibilities are endless when using technological devices in education. As a result of the opportunities afforded for collaboration, all learners can now enjoy the same standard of education.

## **2.2. TECHNOLOGY IN SOUTH AFRICA**

Technology around the world is growing in leaps and bounds and this is also true of most developing countries. Although South Africa is considered a *developing* country, it has the highest smartphone usage in Africa at 37% in 2015 (Poushter, 2016). While these statistics might be true, there are still many places in South Africa, these being mostly rural areas, that do not have access to technology (Nkula & Krauss, 2014). Towns and cities are being developed and people often leave rural areas to seek employment elsewhere. This, in turn, results in rural areas being less developed.

In major towns and cities technology is generally more readily available. The use of the internet is quite common and free Wi-Fi hotspots abound. It is noted that South Africa's internet usage is 42% - the highest in Africa based on access to the internet (Poushter, 2016). The growing use of technology, and the embracing of the technological age, is evident in businesses, schools and personal day-to-day use. Higher Education is no exception and an increasing number of learners want to use technology in their learning (Tshabalala, Ndeya-Ndereya, & Van der Merwe, 2014).

The use of technology in South Africa, and South African schools, is growing at a very rapid pace, maybe not as quickly as the rest of the world, but never the less the country is steadily embracing the technological age (Tshabalala et al., 2014). Even though the use of technology in South Africa is generally more prevalent in privileged, private schools, the Gauteng Education MEC, Panyaza Lesufi, has been responsible for an initiative to give these technologies a chance in an increasing number of public school classrooms (SAinfo reporter, 2015).

Tshabalala et al., (2014), together with Scholtz and Kapeso (2014), state that the new generation of learners is more positive in their thinking regarding the use of technology in their everyday learning. If these learners use the technology daily *outside* their classrooms, they might be more willing to use it *inside* the classroom as well. The same cannot be said of educators in South Africa as most of them have been teaching according to the traditional way for many years. These educators may not fear using technology for social networking but are not yet comfortable using it in the classroom as a teaching aid.

The fact that learners are more willing to work with various types of technologies in the classroom milieu, to enhance their learning, may be placing additional pressure on their educators to fully incorporate these technologies into their teaching. This pressure is not only emanating from the learners but also from government and other learning institutions. If South Africa wishes to compete at an international level, it is imperative that it keeps up with the trends and new developments in education. Furthermore, if South Africa is able to keep up with other countries it will also enable interaction with these countries, therefore gaining new information and strategies on how to best implement the technology (Tshabalala et al., 2014).

There has been much discussion regarding the precise nature of technologies and how they should be incorporated into South African schools. There is, however, one question which remains unanswered: What about those schools that still have no access to information communication technologies (Nkula & Krauss, 2014)? Some schools lack access to technology and thus we cannot compete academically, at the same level as other countries, because not all learners' have been afforded the same technological opportunities.



In contrast, looking at more privileged private schools in South Africa there may be a notion that all is well when it comes to technology integration. However, there may be teachers and learners in these schools who have difficulty integrating the technology. A study by Eicker-Nel and Mathee (2014) focused on investigating factors that could have possibly influenced the adoption of e-textbooks in private schools. Using the Cultural Historical Activity Theory (CHAT) theoretical framework the following factors were discovered: tablet robustness, infrastructure, features afforded by tablets and the e-books, user age, training and knowledge sharing, and expectation management.

While a study by Sackstein (2014) which focused on the adoption of technology in South African private secondary schools relating to teachers Professional Dispositions and orientation towards Tablet Technology. Three private schools were collected data from while using mixed methodology. It was investigated that there is no relationship between teachers' Professional Dispositions and their Orientations towards Tablet Technology. Furthermore, teachers had specific reasons why they adopted technology, some being their pedagogic mode being critical in shaping decisions to adopt or not to adopt technology and their construal of their subject knowledge structure influencing the type of technology adoption activities used by teachers, with internet access and productivity being the most widespread and collaboration of learning being the least. Furthermore, it was found that teachers across all professional dispositions expect the use of tablets in educational contexts in the future to increase (Sackstein, 2014).

Apart from the fact that learners are *not* afforded the same opportunities, in terms of their access to technology, some schools who *do* have access to technologies do not use them to their full potential but only employ them to teach basic computer skills (Nkula and Krauss, 2014).

Nkula and Krauss (2014), Potgieter (2013) and Ng'ambi (2013) comment that there are no proper integration strategies at work in South African schools. If some schools are only using these devices in their most basic sense, then no progress is being made towards integrating the technologies in education.

This having been said, the country is slowly improving as projects have been created to address this issue.

## 2.3. MOBILE TECHNOLOGY IN EDUCATION

MT refers to very light-weight, easy to use, portable, affordable and user-friendly devices. These characteristics are also the very reason why more people are willing to use them (Kim et al., 2011). There are different devices in the MT sector including: mobile or cell phones, tablets, laptops and other portable devices which allow people to use them *anywhere* and at *any time* (Huda, Maseleno, Atmotiyoso, Siregar, Ahmad, Jasmi, & Muhamad, 2018). More recently these mobile technological devices have been incorporated into classrooms around the world ( Looi, Seow, Zhang, So, Chen & Wong, 2010). These tools allow learners and teachers to work in the classroom *and* at home. Moreover, teachers can work collaboratively with learners and send assignments and activities to other educators, anywhere in the world.

The younger generation is generally more adroit and comfortable with the use of MT and the fact that these devices have always been part of their lifetime experience may explain their willingness to use them. The younger generation can use the devices in both social, and educational settings, which truly cannot be said of many of the more mature teachers. The next generation of teachers may be more willing to use the devices in the classroom. In research conducted by Bilen, Lee, Messner, Nguyen, Simpson, Techatassanasoontorn and Devon (2009) more than 65% of learners stated that the use of MT enhanced their learning experience. This research obviously does *not* include the whole world and is subject to the specific area in which it had been conducted. The learners in said research study had access to devices and connectivity.

In South Africa, MT is slowly but surely being incorporated into schools. The technology is mostly used in private schools where parents can afford to purchase the devices or pay sufficient school fees for the schools to provide said devices. Nonetheless, a recent project designed by the Gauteng Education MEC, Panyaza Lesufi, aimed to afford public schools the opportunity to use mobile devices in the classroom (SAinforeporter, 2015). This was a pilot project and only seven schools in the Gauteng province participated.

This kind of initiative is a very positive step forward for South Africa. For it to succeed though, funding and a willingness from all involved parties are needed. Schools *must* be supported by

the government, not just in terms of consent for the project, but also with financial backing. Communities also need to show their support for schools which form part of this project. The MEC tested this pilot project in 2015 and he stated that he wishes in the future all schools in South Africa will have these technologies implemented (SAinfoporter, 2015). As it stands today, some South African schools still do not have proper learning materials and others still use black boards. This is especially true of schools in townships and rural areas.

#### **2.4. SOUTH AFRICAN PROJECTS ON MOBILE LEARNING**

In 2015, Deputy President Cyril Ramaphosa, supported by Gauteng Premier David Makhura and Education MEC Panyaza Lesufi kicked off the launched the new paperless education system pilot called the “*The Big Switch on*”. The project would see seven schools in the Gauteng province use MT instead of traditional textbooks. These devices have offline access, so teachers and learners could access material, like textbooks and other educational media, anywhere and at any time. This accessibility is facilitated by a Long-Term Evolution (LTE) modem which has been built into the device. The mobile devices were also installed with tracking devices to try and limit theft as it would be easier to locate these tablets should they be stolen (SAPA, 2015). The tablets, which had been taken back during the previous project “Gauteng online”, were redistributed to the new project. This project was not successful as some schools did not use their tablets at all while other schools reported high incidences of theft (SAPA, 2015). Mr Panyaza Lesufi then decided to take back 88 000 of the tablets which had been distributed to certain schools.

Panyaza Lesufi believed that this project would help to advance all learners to the same educational level. He did, however, make it very clear that it was a *pilot project* of which the aim was gauge whether there were any (significant) change in learners’ and educators’ attitudes toward learning and teaching (SAinfoporter, 2015). This project could very successfully establish a bridge between township and rural schools and other schools. Panyaza Lesufi also stated that the project’s aim was not that learners from Gauteng compete with learners from other provinces, but that they could compete with learners from other countries and continents. The minister stated that he planned to extend the project to other schools by 2017 - 2018 (SAPA, 2015).

The MEC stated that schools, which obtained a 100% matric pass rate, would be escalated to the top of the list of possible schools which would next be considered for the project. The minister stated that another aim of this project was to bridge the gap between learners who have and those who do not. In this way, learners who attend township or rural schools and who generally have access to less learning material will receive the same education as those learners who receive abundant educational material. This process will assist all learners to fulfil their potential. Another purpose of the project is to raise the standard of education in South Africa to be on par with other countries. This can become a reality if all schools in South Africa obtain the same level of education and, in addition, can gain information regarding how schools in other countries conduct themselves (SAPA, 2015).

Similarly, in the Eastern Cape Province a pilot project that was initiated in eleven schools in Confimvaba was started. This was a part of the South African government departments trying to integrate technology in schools to see whether it would improve teaching and learning. In Confimvaba the ICT4RED initiative was used to investigate how the integration of tablets for teaching and learning. For this study questionnaires were used to gather data, and some of the results indicated that the teachers mostly accepted the tablets and used them for professional development and personal use. In conclusion, in poorly resourced schools the introduction of tablets in the South African education system is very important (Phiri et al., 2014).

There are companies, including Vodacom, Samsung and Telkom, which have launched technology in education initiatives which aim to provide less privileged schools with technological devices and services. Samsung's initiative aims to provide *smart* classrooms which would allow learners to communicate with each other and their teachers. The service provider Vodacom's competition, *Vodacom YEBO Millionaires*, donates a fully functional and equipped computer centre to a deserving school every month. Telkom's initiative, *Telkom Business's Education Solutions*, aims to provide schools with ICT services which include internet access, devices and educational services (Telkom invests R200m, 2017).

## 2.5. TECHNOLOGY INTEGRATION STRATEGIES

Technology integration strategies are needed in order that learners and teachers become more comfortable with the use of technological devices in the classroom. Lee, Waxman, Wu, Michko and Lin (2013) affirm the importance of integrating technology into the classroom, especially due to the substantial growth in technology usage in the classroom by both teachers and learners.

Baert and Stewart (2014) note that research has shown that role modelling to show *how* technology can be integrated into the classroom is very important for teachers as it builds their confidence. The teachers then, in turn, communicate this confidence to their learners who will be inspired to use the technology as well. This type of motivation may also provide teachers with a better understanding of the methodology of technology integration and enable them to use the technology in an advanced manner (Nishizaki, 2015).

Machado and Chung (2015) comment that factors influencing the integration of technologies in the classroom include: teachers who are unwilling to integrate, an absence or limited availability of hardware and a lack of professional development for staff. If these factors are not properly addressed, integration cannot happen. On the other hand, Lane and Lummis (2013) state that online resources, and online learning, should always be made available so that the learners and teachers can interact with the learning materials, anywhere and at any time. This will promote teachers' and learners' interest towards the effective integration of technology.

One of the main concerns in integrating technology in most schools is that educators, and even learners, merely *substitute* the use of technology in the classroom by removing hardcopy textbooks and replacing them with electronic textbooks. They are thus making no effort to *redefine* the use of the technology, or trying to use it towards its maximum capacity, i.e. to use it for the completion of activities, tests, projects or assignments. It is therefore understandable that these different parties may be unable to correctly, and effectively, integrate technology as time constraints severely limit their attempts. Government and schools need to design and present proper training sessions to enable educators and learners to learn in their own time (Lane & Lummis, 2013).

Sugar and Tryon (2014), as well as Kalota and Hung (2013), investigated support systems used to assist teachers in integrating technology into the educational system. Sugar and Tryon (2014) investigated the effect of a virtual technology coach for kindergarten to Grade 12 educators. The virtual technology coach enabled teachers to undergo continued professional development to assist them towards integration of technological devices into the classroom.

On the other hand, Kalota and Hung (2013) investigated a programme named Performance System (PSS) technology. This PSS programme helps educators to integrate technology into their classrooms. This programme assists the educators in all their integration needs as they already have time constraints in the classroom. There are programmes and companies out there which can constantly assist teachers, and even pupils, towards integrating technology into the classroom, like ITSI (Information Technology School Innovation). This company can help schools to fully integrate technology. Integrated technology programmes also assist in the professional development of teachers so that they do not become too complacent and thus stifle progress in their careers.

## **2.6. TEACHING WITH MOBILE TECHNOLOGY**

Teaching different subjects with MT can be a very positive or negative experience, depending on proper integration and willingness. Korenova (2015) acknowledges that when teaching Mathematics, it is very important to know which types of technological devices can assist you. Korenova (2015) further indicates that in the teaching and learning of Mathematics, graphic calculators and tablets are very useful and can aid when writing tests and testing hypotheses. These calculators do not facilitate internet access which is also a positive element as learners will not get distracted while completing activities. Lehtinen and Viiri (2014) state that tablets have brought a different dimension to the teaching and learning of drawings in the Physics classroom. Generally, in traditional methods of assessment only the *completed* project, or drawing, could be viewed. Technology allows for the assessment of the *process* which was followed.

The English language is rich in history and is spoken and understood globally by many people. As such, English is often the language of choice in communication. English language teaching and learning is made up of many different components and include: reading, writing, poetry, prose, spelling, grammar and vocabulary. All these different grammar components allow teachers and learners to use MT in an ongoing fashion, thus integrating technology into the classroom Nisbet and Austin (2013).

The research of Nisbet and Austin (2013), as well as Basoglu and Akdemir (2010), state that learning English vocabulary is of cardinal importance, especially in the case of a non-English speaker who wants to study the language. The use of MT can assist learners whose first language is not English in acquiring and learning English vocabulary. Various software activities include vocabulary content which can assist in building learners' confidence. These types of software do not only help non-English speakers who want to learn English but also those learners who *can* speak English and who want to improve their English language skills.

Jung (2015), Shohel and Power (2010) and Nomass (2013) state that the use of MT in teaching and learning English has become a necessity, whether it is English First or English Home Language. MT can have a significant positive impact on the teaching and learning of English but then the technology needs to be used in the most effective manner. There are many teachers who may be skilled at teaching a subject, but when they must integrate MT into their teaching methods, they struggle. Therefore, teachers and learners need to have access to continuous technology integration workshops which can help them to successfully navigate this process.

## **2.7. TEACHERS' AND LEARNERS' ROLES IN TECHNOLOGY IN EDUCATION**

Alismail (2015) states that in schools there are teachers who integrate multimedia tools while teaching different skills in a classroom. These skills may include: synthesising, analysing, evaluating and presenting information. Learners, when using these tools, learn how to convert information and transform information into knowledge using technology (Alismail, 2015). This can aid them in their future to become independent researchers at university level and well into adulthood.

Computer skills are necessary and enable learners and teachers to integrate and use technologies in a constructive manner. Nishizaki (2015) and Clarke and Svanaes (2014) indicate that the integration of technology into education and classrooms has changed the way in which educators deliver information to learners. This may, or may not be, a good development. Some educators may focus on the technology only and not put much effort into teaching whilst other teachers may benefit from the use of technology as it can assist them in the delivery of information (Nishizaki, 2015).

Hocanin and Iscioglu (2014) state that the use of technology in the classroom has had a positive impact on collaborative learning as learners find it enjoyable and easy to work together in groups where they can receive help from their peers regarding the use of certain features of the technology. Despite the positive attitude of learners towards the use of technology in the classroom, the issue of learners' knowledge and willingness to use this technology has to be addressed. Li, Snow and White (2015) and Granito and Chernobilsky (2012) note that learners may seem unwilling because they are unfamiliar with the way in which technology works in a *school environment* as they use it primarily for *social interaction*. These learners need to be shown and taught what these technologies can be used for and *how*, if properly integrated, these technologies can improve their learning experience.

The research indicates that there are teachers and learners who have a positive attitude towards technologies integrated into the classroom. This group uses said technology to enhance both their teaching and learning experiences. However, there are other individuals who view technology negatively because they lack understanding as to how the technology works and/or its potential benefits (Lee et al., 2013). It is very important that teachers model the use of the technology in the classroom in a way that learners feel comfortable using it. To realise this, the teacher may first need to receive proper training, so he/she can affect this integration successfully. Often teachers are just handed the technology without being shown how to implement it. Both teachers and learners need to receive training towards effectively integrating technology in the classroom (Lee et al., 2013).



## **2.8.GAPS IN THE RESEARCH**

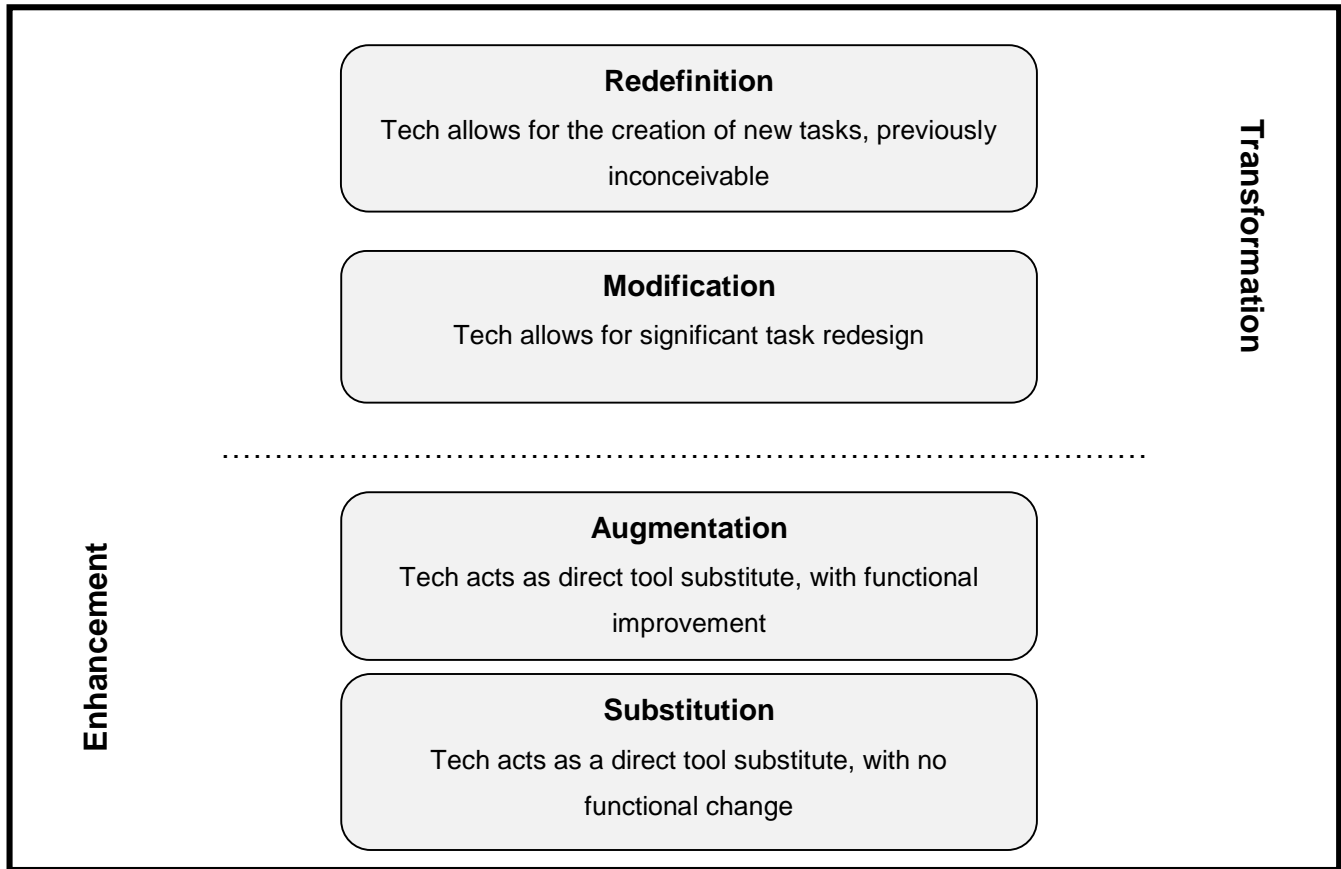
This study centred around articles written on different technology integration strategies being used in the English Home Language classroom. As well as how technology is being all over the world. MT is the main technology being integrated into schools and research on *how* it is being used is scarce as it has only recently been done. Furthermore, the South African context has not been looked at in an in-depth manner.

## **2.9.THEORETICAL FRAMEWORKS**

### **2.9.1. SAMR MODEL**

Mobile learning has become a phenomenon in schools. Schools are trying to move away from traditional teaching and learning methods towards a more modern and advanced approach. Mobile learning is learning and acquiring knowledge with the help of MT (Puentedura, 2013). The Substitution, Augmentation, Modification and Redefinition (SAMR) model is a framework that allows for the complex analysis of technological activities that happen in classrooms using MT (Puentedura, 2013).

The SAMR model provides information and methods on *how* computer technologies can possibly affect, or impact upon, teaching and learning in the classroom. The SAMR model also indicates that the development of educational technology often follows as teachers and learners proceed with technology in their activities (Puentedura, 2014). Different and innovative learning activities that are modified, situated and connected by a mobile device will further the use of a mobile device as a substitution tool for more traditional tools. The SAMR model allows the placement and classification of technological activities. The four levels that represent the SAMR model will now be described in detail with examples (q.v. Figure 2.2).



**Figure 2.2: Theoretical Framework - SAMR Model**

(Source adapted from: Puentedura, 2014)

### **A. Substitution**

Substitution is the simplest way to implement technology (Hockly, 2013). Substitution happens in situations where normal learning activities would have been completed without the mobile device present. Computer technology is used to perform the same task as was previously done before the devices were use (Puentedura, 2014). There may not be any need for technology, as it is neither used for a greater purpose nor to enhance learning. Since the teacher is the base of all aspects of the lessons, one must decide whether any type of technology is beneficial to the learners, or the lesson.

Evans (2008) states that in his research podcast lectures were used instead of normal review methods. The podcasts replaced the way learners would prepare for exams, for example going

through textbooks and classroom notes. He stated that there is no comparison between learners who did use the podcasts and those who did not. One could not know if there was any difference between the two methods of learning, even though the learners who did use the podcasts gave positive reviews (Evans, 2008).

A study conducted by Gromik (2012) states that in an English classroom the mobile phone camera was used to complete a certain activity. The learners were required to record 30-second videos on topics supplied by their teacher. The videos were then uploaded and made available to all the learners in the classroom. The main purpose of this activity was to help learners to become comfortable with communicating in English. These videos could, however, have been easily recorded with a normal video recorder which the learners could have taken turns to use. There was no indication that the innovation, or technological methods used, created a better activity because of the technology. However, the study indicated that the learners enjoyed using their own mobile phones to complete the activities (Gromik, 2012).

Lan, Tsai, Yang and Hung's (2012) study compared two different groups of learners. The one group was involved in online discussions using technological devices, while the other group was involved in face-to-face discussions. The group that used the devices were more engaged and frequently discussed the given topic. While, on the other hand, the group that did not use any mobile devices participated less frequently. This may be because the learners were able to access the discussion group anywhere and at any time.

All four authors indicated above have stated that there are certain positive effects in using mobile devices in the classroom. One positive effect was that the devices were available for use anywhere and at any time which allows learning to continue *outside* the classroom. However, if the mobile devices are being used merely for substitution, they then become a basic tool instead of a helpful tool. However, this statement can only be confirmed once proper research has been done completed.

## **B. Augmentation**

Computer technology is a tool that enables everyday activities to be completed with ease. (Puentedura, 2014). Learners using technology may save paper and immediate feedback can be provided. This, in turn, promotes engagement while learning. Some type of functional improvement can be observed compared to what could have been achieved with traditional tools. For example, learners can receive emails or messages containing certain information that was communicated in class. This may help the learners remember information (Chuang & Tsao, 2013).

In a study by Chuang and Tsao (2013) nursing learners were used to see whether informative text messages sent to them would assist in remembering content learnt. The learners were divided into two groups, one received text messages daily and one did not. The learners who received the text messages were in constant contact with the information whilst doing their daily activities and this showed that the use of the mobile devices had been augmented. This contrasted with only providing learners with online lectures in that they could not really engage with the content afterwards. The text messages which the learners received allowed them to better memorise the medication details (Chuang & Tsao, 2013).

In a study by Pfeiffer, Gemballa, Jarodzka, Scheiter and Gerjets (2009) learners were divided into two groups whilst on a snorkelling field trip during a marine biology course. The first group was given static printed field guides to help them to identify fish species. The second group used a DVD player and disc which contained video, audio and static screenshots to help them identify the same species. The second group had the advantage of the DVD player which supplied visuals, audio and the screenshots and thus they saw videos of the fish species and heard the sounds. Consequently, these learners did not have to memorise the species as they had the devices to help them along the way.

Both studies show how mobile devices were used to complete tasks, or activities, assigned in the classroom. Both activities used mobile devices, but the devices were not merely used as a *substitution tool* for those activities, however, were used to augment the specific scenario. The devices were used *outside* the classroom to help with the memorisation of different types of medicine and the identifying of different fish species. Although these tasks could have been

completed without the use of technology, the learners who used these devices found that they made the tasks easier and that the technology at hand proved to be helpful.

### **C. Modification**

Modification is the first step in the transformation section of this model. Technology enables learners to be creative in completing assignments. For example, learners can write an autobiographical essay and an audio recording could be made of the essay. This would allow parents, or university admission counsellors, to listen to a reading of the essay and thus assess learners in different way. In addition, all the learners are acquiring similar writing skills while completing these tasks. Computer technology facilitates peer and learner feedback (Puentedura, 2014).

In a study by Cornelius, Marston and Gemmell (2011), a flood disaster simulation system was used in a Geomorphology course using mobile devices. The simulation represented a real-life flood disaster. When an event occurred in the simulation, the learners received text messages as if it was happening in real time. Depending on their responses, they would then be sent another text message. This kind of activity allowed for interaction inside and outside the classroom. The mobile devices were not used for *substitution* only but were used to *modify* the learning experience. The devices were also used to redesign the tasks at hand (Cornelius et al., 2011).

In another study, conducted by Wang, Yu and Wu (2013), a module called eMASE (or Mobile Assisted Social E-learning) was created for a speech and debate course. For the learners to complete the tasks, they (as well as their teachers) received training on the use of social applications like Facebook and Twitter. The learners had to complete their assigned tasks in groups. They stated that they had learnt a lot through the use of this application and that it had allowed them to become more sociable in that they had encountered many people in the process (Wang et al., 2013).

In both studies the mobile devices were used to *modify* the learning experience. The activities could possibly have been completed through traditional teaching and learning methods, but the

mobile devices made the experience of completing the tasks much easier and more interesting. In addition, the learners stated that the use of mobile devices resulted in a better learning experience. They commented that they could complete the tasks anywhere, and at any time, and that they could communicate with their peers, or network with other people.

#### **D. Redefinition**

Computer technology allows for the completion of tasks which were previously not even conceptualised. For example, a class can create a documentary video based on a specific topic. Computer technologies, as used in these types of activities, will support learners' learning in the classroom (Puentedura, 2014). In a study by Liu and Tsai (2013), a mobile phone application was created to help Chinese pupils learn English. The application worked in real time so that when a learner entered an area, the application would pinpoint his/her location, via GPS coordinates, and describe things around him/her. This allowed the pupils to learn anywhere and at any time.

In another study by Redondo, Fonseca, Sánchez and Navarro (2013), learners were divided into two groups, an experimental and control group. A 3D amplified reality intersection was used to observe an architectural proposal was used by the experimental group. The traditional method of 2D and 3D drawings was used by the control group (Redondo et al., 2013). The findings indicated that the experimental group could complete the task quicker and easier, with learners praising the process. On the other hand, the control group took longer to complete the task.

In the study of Wu, Hwang, Su and Huang (2012), a system that made use of mobile learning was created for nursing learners. Instead of using *lists* during the practical section of their training, the learners used a mobile phone which supplied them with all the information they needed, as they needed it. They could access all the patient information, which in the case of training would be dummies, and then interact with them. Because of the real-time feedback which they received from the system, the learners were able to work quickly and thoroughly, rather than handling lists only. This showcases a redefinition of how learners can do their

practical work when training for a specific career. The practical work is not done in the traditional way and it produces motivated learners (Wu et al., 2012).

In both examples a *redefinition* of the learning experience was achieved using mobile devices. The devices were not only used for basic substitution but were used in a more innovative manner. This shows that the use of technology can be very useful and that it could help accomplish tasks quicker and in a more efficient way. In some instances, it may very well be that there are no significant differences between the traditional way of learning and the use of mobile devices in learning. However, the overwhelmingly positive response of learners show that the use of technology is indeed beneficial and promotes motivation. Furthermore, more time can be spent on teaching and learning, and less time on various administrative tasks. The main reason why this model was chosen for this study was because it focuses on MT integration levels. And this study's main aim was to find out on how MT strategies are incorporated in activities to support English Home Language teaching and learning.

### **2.9.2. REVISED BLOOM'S TAXONOMY**

In 1956 the original Bloom's Taxonomy was created by Dr Benjamin Bloom, an educational psychologist (Bloom, 1956). Bloom's Taxonomy was created to initiate higher levels of thinking and learning. Bloom indicated that there were three types of learning, namely: cognitive, affective and psychomotor. These three categories affirm that learners must have experienced different levels of learning (namely knowledge, skills and attitude) by the end of a lesson or set of lessons. Bloom stated that there were six skills, which should be taught and learnt, which resort under the *cognitive* domain. Firstly, the *knowledge* skill which requires that information is remembered. Secondly, the *comprehension* skill which requires the understanding of information. Thirdly, the *application* skill which requires the use of certain information or skills attained. Fourthly, the *analysis* skill which requires the noting down of information and the comparing of ideas. Fifthly, the *synthesis* skill requires that information is reconstructed. Lastly, the *evaluation* skill which requires critical analysis of the information (Bloom, 1956). The Revised Bloom's Taxonomy will be described in detail in the following section and has been indicated in Table 2.1.

**Table 2.1: Theoretical framework - Revised Bloom’s Taxonomy**

(Source: Anderson & Krathwohl, 2001)

<b>Knowledge Dimension</b>	Meta-cognitive						
	Procedural						
	Conceptual						
	Factual						
		Remember	Understand	Apply	Analyse	Evaluate	Create
	<b>Cognitive Process Dimension</b>						

The other theoretical framework used in this study is the revised version of the Bloom’s Taxonomy which was created by David Krathwohl (Anderson & Krathwohl, 2001).

This model contains, in the knowledge dimension: factual knowledge which is isolated and superficial and includes the basic aspects of each academic discipline. Conceptual knowledge which implies a mental model with complex and organised knowledge, reflecting a deeper understanding of the subject matter in categories, classifications and relationships. Procedural knowledge which creates procedures which can be applied in general and meta-cognitive knowledge which refers to self-reflection and control over one’s learning. Learners can compare and develop general strategies that can be applied to various tasks (Anderson & Krathwohl, 2001).

The cognitive process dimension includes the recognising, or identifying, of knowledge and recalling, *remembering* or retrieving it from long-term memory. When *understanding*, one can construct meaning from oral, written or graphic information. This includes aspects such as interpreting, illustrating, classifying, summarising, concluding, comparing and explaining.



*Application* implies the execution or implementation of a procedure. *Analysis* is the differentiation between irrelevant and relevant parts, the organising of elements into a structure and the determining of underlying intent of material. *Evaluation* implies judging, checking or critiquing, based on certain standards. *Creation* is the combining of elements into a whole, reorganising of elements into new patterns, or invention of new products (Anderson & Krathwohl, 2001). The reason why this framework was chosen was because lessons and activities need to be planned beforehand, focusing on what outcome is desired. And when it comes to making these decisions the Bloom's Taxonomy is the best framework to use. This framework allowed for the level of cognition of the activities to be determined. Furthermore, together with the SAMR model the Bloom's Taxonomy was used to create the conceptual framework.

## **2.10. COGNITION AND INTEGRATION**

The cognition and integration framework was designed by combining both theoretical frameworks namely the SAMR model and the Revised Bloom's Taxonomy. The SAMR model focuses on technology integration in classroom activities and the Revised Bloom's Taxonomy deals with the cognitive process and knowledge dimension of classroom activities. A reduced version of the SAMR figure is superimposed onto the Revised Bloom's Taxonomy to show when an activity is completed using MT. The activities are analysed using the activity theory which will be discussed in detail in Chapter 3 (q.v. 3.8.3 and Figure 3.3). The cognition and integration table is presented as Table 2.2.

**Table 2.2: Cognition and integration**

<b>Knowledge Dimension</b>	Meta-cognitive						
	Procedural						
	Conceptual						
	Factual						
		Remember	Understand	Apply	Analyse	Evaluate	Create
<b>Cognitive Process Dimension</b>							

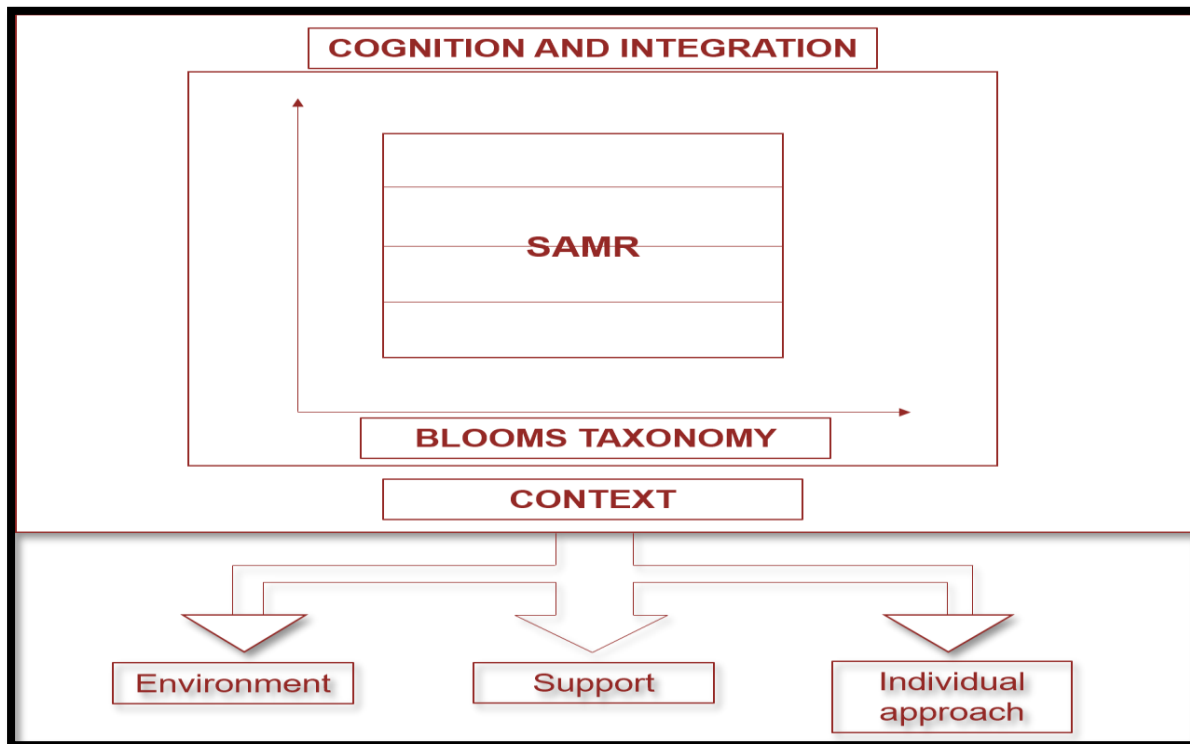
Both models assist in analysing more than just what the activity may consist of. The interactions between: the content being taught, the cognitive level of the activity, the tools being used to complete the activity and the participants in the activity for it to be completed to the best of its ability, all play a significant role. After all these components have been thoroughly analysed, one can assess whether the integration of the MT is merely at the level of substitution. However, some activities may well fall under substitution where a wider view or level of activities is addressed.

The main reason why the Bloom’s Taxonomy and the SAMR model were chosen to create the conceptual framework was because it allowed for the thorough analyses of the mobile technology-based activities that happened in the English Home Language classroom

specifically. The cognition levels of the activities could be determined as well as the technology integration levels of the activities.

### 2.11. CONCEPTUAL FRAMEWORK

The conceptual framework, indicated below (q.v. Figure 2.3), is an alignment of the different concepts that appear in the cognition and integration table (q.v. Table 2.2). The figure indicates the cognition and integration levels which an activity can be based namely, the Revised Bloom's Taxonomy and SAMR model. The figure places the activities into the context of the school's environment, support and individual approach.



**Figure 2.3: Conceptual Framework**

This figure is based on the cognitive and integration table in the previous section (q.v. 2.11 and Table 2.2). This figure is a summary and visual outline of what was identified and analysed, and it is still used to analyse the activities from the data collection. However, this figure also illustrates the process which this study followed. With the assistance of Bloom's Taxonomy and the SAMR model the school's environment, the support they received and each participant's

individual approach to the study could be analysed. This, in turn, allowed for these frameworks to be used to analyse the factors that govern the success and level of the schools in terms of cognition and integration.

## **2.12. CONCLUSION**

In conclusion, MT, and technology in general, has had a very big impact on individuals, businesses and schools. The literature analysed has shown that technology can have a very positive impact on teaching and learning *if* it is integrated in the correct manner. If the technology is not effectively integrated into the classroom it basically becomes “useless” to say as lightly as possible, as technology can be used for many activities other than assisting in teaching and learning (Phiri et al., 2014).

This literature study focused on *how* technology is used in education around the world, and in South Africa. It showed that technology usage around the world is much more advanced than it is in South Africa. Despite significant improvements in the use of technology in the country, South Africa is still lagging because in the developed world technological devices are generally easily accessible, available and affordable. The literature study further focused on the teacher and learner roles in integrating technology into education as both parties have major roles to play when it comes to technology integration.

Furthermore, it is important that these two parties are given the correct tools to enable them to integrate the technology. The discussion also looked at technology integration strategies in the classroom. The integration strategies that were addressed included programmes and companies like ITSI (Information Technology School Innovation) used to assist teachers and learners in the classroom. This company can help schools to fully integrate technology used to assist teachers and learners in the classroom. The exact steps taken, and what impacts these programmes had on the classroom, were not discussed.

The literature study also focused on MT in education. It was ascertained that MT in education is a growing phenomenon and that it has had positive effects on teaching and learning. The

technology is also being integrated into more classrooms. Teaching with MT was discussed. South African projects on mobile learning were discussed as well as a pilot project in the Gauteng Province. One other additional project, like the pilot project, was launched in 2015 but, as yet, it has not yet been introduced into other provinces or schools. This literature review discussed concepts pertaining directly, and indirectly, to this study and has pinpointed problem areas for further investigation.

In Chapter 2 a literature review was conducted. The focus was on technology, MT, role players of technology integration, teaching with MT and the different tools used in teaching and learning with technology. The use of technology is on the increased all over the world, even in developing countries. Furthermore, technology usage in the education environment is becoming more prevalent as well. The two theoretical frameworks, namely the SAMR model and Revised Bloom's Taxonomy were discussed, and the conceptual framework, which was created from combining the two theoretical frameworks, was discussed. In Chapter 3 the research methodology, research questions, research philosophy, approach and strategies are discussed. The population and sampling are explained, and the data collection procedures are indicated. Furthermore, the data analysis, limitations, ethical considerations and trustworthiness of the study is deliberated.

### 3. Chapter 3: Methodology

#### 3.1 INTRODUCTION

In Chapter 2 a comprehensive literature review was presented which dealt with technology integration in education and the theoretical and conceptual frameworks which relate to the study. In Chapter 3 the research methodology, as well as the research philosophy, approach and strategies will be discussed. The data collection strategy, data analysis, as well as the population and sampling of the data collected will be reviewed. In addition, possible limitations, trustworthiness and ethical considerations of the study will be discussed. Figure 3.1 provides an outline of how this chapter is structured.

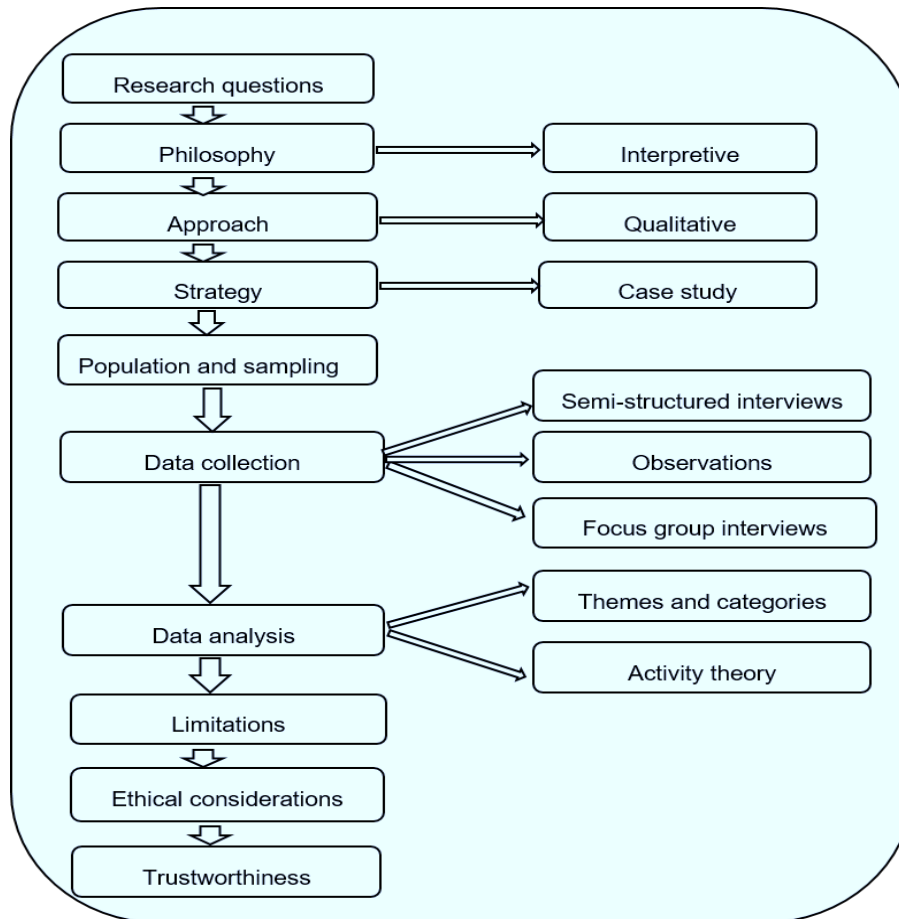


Figure 3.1: Chapter outline

## 3.2 RESEARCH QUESTIONS

### Main Research Question (MQ)

**MQ** – How are mobile technology strategies incorporated in activities to support English Home Language teaching and learning?

### Secondary Research Questions (SQ)

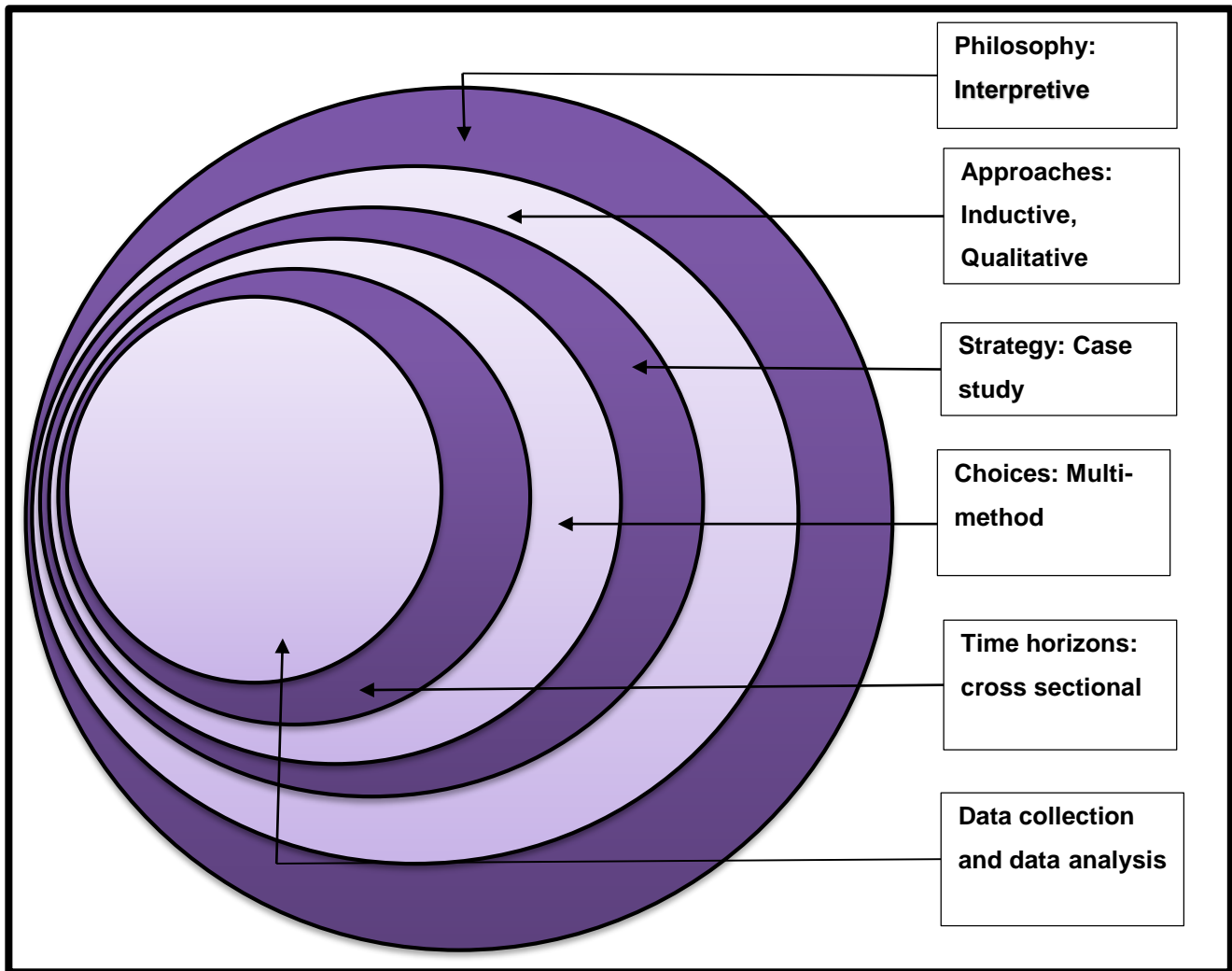
**SQ1** – Which mobile technology-based activities do teachers incorporate in their teaching?

**SQ2** – How are these activities managed by the teacher and learners in the classroom?

**SQ3** – On which level of cognition and integration are these activities?

## 3.3 RESEARCH PHILOSOPHY

Figure 3.2 is based on the research onion by Saunders et al. (2009). It indicates the progression of the research methodology, starting with the more general aspects and later focusing on the findings of the research. It begins with the philosophy governing the research, the interpretive paradigm, and then focuses on the research approach which is the qualitative approach. The figure then indicates the research strategy namely case study research. This research followed a multi-method approach with two cases being analysed. The research was conducted cross sectionally which means that there was a limited time span and data were collected once over a short period of time. The figure then focuses on the data collection choices for the research namely: semi-structured interviews, observations and focus group interviews. Furthermore, the data were analysed using themes, the activity theory and the conceptual framework (Saunders et al., 2009).



**Figure 3.2: Research onion**

(Source adapted from: Saunders et al., 2009)

### 3.3.1 PHILOSOPHY: INTERPRETIVE PARADIGM

The interpretive paradigm focuses on hermeneutics which is the investigation of the philosophy and practice of interpretation. People do not understand and interpret situations in the same manner. One needs to reconstruct a situation, and their understanding of it, in such a way that the researcher can fully comprehend a specific situation. This is called psychological reconstruction (Maree, 2007).



An author may present information in a certain way because that is how he/she understood the topic, but when an outsider reads the same information then he/she may not derive the same meaning from the text. This is because the text is open to different interpretations, and people are not the same in their thinking. This tenet also applies to pictures: one person might look at a picture and interpret it as a face and someone else may regard the same picture but interpret it as an animal. This principal also relates to a specific situation - one person might interpret a situation as constructive, whilst someone else might interpret it as destructive. These varying views are based on an individual's perception and the way he/she processes information in his/her brain (Guba & Lincoln, 1994).

Guba and Lincoln (1994) and Grix (2004) affirm that the interpretive paradigm is based on subjectivity. To be subjective is to see, or understand, a situation from one's own point of view or experience. Thus, it follows that *understanding* is a uniquely individual process and not any two persons share precisely the same view regarding a situation or content. Subjectivity is positive because it allows people to differ from one another and experience situations in their own way. Some critics' state that subjectivity, in terms of research, cannot be verified and that it is impossible to test validity and subjectivity. However, this is *not* the point of subjectivity in research, the point is to explore *how* people experience certain phenomena.

This research was based on MT usage in the classroom, therefore, research focused on how the educator implements integration strategies using MT in class. The study analysed the participants' behaviour and actions in the classroom and how the educator interacts with the learners in the classroom. The research tried to understand his/her view or understanding of the phenomena, which, in this case, would be the tablets (electronic devices). Extensive interaction between the researcher and participants is of the utmost importance. The learners in the classroom play a significant role in the gaining of data as their interaction and participation determine whether the educator can do his/her job.

The fact that the interpretive paradigm focuses on one participant to a small group of participants at a time it allows the researcher to gain an in-depth experience of the teacher and learners and how they experience the use of MT in the classroom. The way in which the teacher

implements, or integrates, the tablets in his/her teaching, as well as an analysis of whether the technology was only being substituted, was also investigated. Tablets can be used for many reasons, in many different activities and to facilitate many different forms of teaching. They should never be used because the teachers are forced to do so. Teaching with technology can also be classified as a teaching methodology.

### **3.4 RESEARCH APPROACH**

#### **3.4.1 QUALITATIVE APPROACH**

Qualitative research may be described as research which attempts to collect content rich descriptive data in the view of a context or situation. It also tries to investigate how people understand the world and how they see and think about their experiences in life. The qualitative research focus is on exploring and explaining a specific phenomenon based in its natural every day environment (Maree, 2007).

This type of research uses open-ended questions to delve deeper into the context that the phenomenon exists in, and to so fully understand how the participant/s use or deal with the phenomenon in a natural environment. The researcher is the main player as he/she must possess the proper skills to execute the research, whether it is conducting interviews or making observations. The success of the research is based on his/her performance and abilities as a researcher. If the data collected from the participants is not sufficient, or reliable, then the research will not be able to present. There are also less participants involved in qualitative research because it deals with a one on one approach or small groups of people who are being analysed or worked with (Key, 1997).

The main distinguishing factor of qualitative research is that it tries to understand people's interpretations of different situations. Reality changes with people's views as it is what people believe it to be. The different values held by people play a major part in the research process and here the values held by the participant must also be considered. A complete picture of the particular situation needs to be formed (Key, 1997).

The potential value which this approach holds for this study is that it allows the researcher to enter a classroom where there is a small group of participants who, were chosen because they use MT. This milieu is where the educator and learners use MT in their everyday teaching and learning and it allows for analysis of a specific situation to be done. It also allowed for investigations to determine whether the schools were *integrating* the technology and *how* they were using the MT. Data was collected on how the teachers and learners use the technology in the classroom and whether it is used to its full potential. MT has many uses and can be integrated in many subjects and activities.

### **3.4.2 ADVANTAGES**

- The qualitative research approach allows a researcher to study a situation within its natural environment (Baxter & Jack, 2008). This research paradigm explores situations, or people, in their natural setting which makes provision for the tenet that no two people experience a situation in the same way. This allows for the researcher to discover and understand what a participant is experiencing.
- The qualitative research design allows for an in-depth gathering of data as it focuses on a more intimate group, or one on one basis. The researcher is able to analyse different situations, or people, in their natural setting without disturbances (Key, 1997).
- This research paradigm uses information, gathered from subjective situations, to analyse and explain certain situations or phenomena. This enables the researcher to investigate a situation from the viewpoint of the participant/s who are physically integrated in the situation (Key, 1997).

### **3.4.3 DISADVANTAGES**

- One disadvantage of the qualitative research paradigm is that the methods used, and data obtained, are subjective in nature. Because qualitative research is based on an individual's perspective regarding a certain situation which happens in a natural occurring context, the researcher may transfer his/her *own* views onto the participant (Maree, 2007).

- Trustworthiness is an issue for if there are not many participants in the study, how can one be sure that the data is reliable and valid? A strategy that can be used to overcome this challenge is triangulation (Maree, 2007) which means the researcher regards a specific phenomenon from different angles. When collating information, whether from an interview or observation, all the details need to be noted down meticulously as to not miss anything.
- Ultimately, a prolonged study of the phenomenon needs to be completed in an effort to avoid some of these challenges indicated in the previous points. This could include visiting the classroom more than once where the phenomenon is being presented in order to obtain a proper view of it (Baxter & Jack, 2008).

### **3.5 RESEARCH STRATEGY**

#### **3.5.1 CASE STUDY**

Case study research refers to two entities: a *unit of analysis* or a *research method* (Maree, 2007) and in this study the focus is on case study as a research method. Case study research is the process of investigating people or institutions in their natural environment (Polit & Hungler, 1983). The researcher's job is to analyse the specific situation or phenomenon. The main purpose of this research design is to focus on one case, or situation, at a time which allows for more in-depth content to be gained and deeper understanding to be reached.

Bromley (1991) states that the case study research method is a step-by-step process of investigating a specific situation or situations which aim to describe a phenomenon. Yin (1984), on the other hand, states that the case study research method is an investigation of a contemporary phenomenon in its natural environment. Both Bromley (1991) and Yin (1984) hold forth that case study research is based on trying to find out what a specific phenomenon is about by investigating it in its real-life setting where there is no judgement and nobody, or

nothing, can interfere with the specific context. Case study research also aims to answer the *how* and *why* questions about the specific phenomenon (Bromley, 1991).

The fact that case study research allows for data to be gathered on an individual basis is in line with this research study which aims to analyse and investigate in more depth the topic of MT use in the classroom. Individual teachers, and even learners, may have different views regarding the use of the MT. Analyses will be conducted to ascertain whether the teachers, and learners, integrate the MT in different activities in the classroom. Substitution will not be the only component which will be looked at. The research will also investigate whether MT is used for activities like homework, assignments, group activities or exam purposes. If this research is done precisely and in-depth it may, in the future, be used for research on the specific phenomenon under consideration, or other phenomena related to the topic.

The figure in chapter 2 (q.v. 2.12 and Figure 2.3) indicates the context of the conceptual framework and relates to why a case study was chosen for this research. The two theoretical frameworks (Revised Bloom's Taxonomy and SAMR model) were combined in order to access the classroom activities' cognition and integration levels, as based on their context. In terms of context, the school environment was analysed, and the support received, in order to complete the activities with the MT, as well as the individual approach towards teaching and learning, was investigated.

### **3.5.2 COMPARATIVE CASE STUDY**

Comparative case study research can be defined as the investigation of similarities and differences of two or more cases (Goodrick, 2014). The focus needs to be clearly defined and explained from the beginning whilst different cases need to be fully understood for a comparison to be possible (Goodrick, 2014). Case study research allows for multiple data collection instruments to be used. In this research open-ended interviews, observations and focus group interviews were conducted.

During the course of this study, two private high schools were evaluated. The principal and English Home Language teacher from both schools and the IT specialist from school B were

interviewed. The two English HL teachers' classrooms were observed to ascertain *how* they integrate MT into their teaching. Then, six learners from each of the observed classrooms took part in a focus group interview based on the integration which occurred in their English class. Once all the data were assembled, the comparison process started. The data were compared against the conceptual framework which determined *where* these integration strategies (used in the classroom and school) fitted regarding the cognitive level and the substitution, augmentation, modification or redefinition level.

### **3.5.2.1 ADVANTAGES**

- The main advantage of the comparative case study, employed in this research, is that multiple data collection methods can be used to access information. These different methods ensure that the study is not one dimensional but encompasses different ways of seeing and analysing the same phenomenon (Yin, 1994).
- Case studies allow for the researcher to do an in-depth investigation into complex social situations. The researcher works with the participants either on an individual or group basis. He/she can thus become fully involved in the situation and fully understand the participant's experience. This research method gives rise to a rich and holistic view of the specific phenomenon (Hamel, Dufour & Fortin, 1993).

### **3.5.2.2 DISADVANTAGES**

- The main disadvantage of this case study research method is that the findings cannot be generalised. In other words, because the case study research method focuses on specific situations, groups or people, the findings cannot be replicated anywhere else and they cannot speak for the public. If the focus is on a specific educator, and their experience of using MT in the classroom, another educator may not have the same experience because he/she has a different personality and his/her classroom environment is different (Hamel et al ., 1993).

The table below (q.v. Table 3.1) presents an indication of the characteristics found at the two schools which took part in this study.

**Table 3.1: Schools' characteristics**

<b>Characteristics</b>	<b>School A</b>	<b>School B</b>
<b>Private or public:</b>	Private	Private
<b>Location:</b>	Suburbs	Suburbs
<b>Resources:</b>	Fully equipped with latest and relevant technology.	Fully equipped with latest and relevant technology.
<b>Arts and culture:</b>	Arts and culture activities included as extra-mural.	Arts and culture activities included as extra-mural.
<b>Sports:</b>	Variety of sports	Variety of sports
<b>Spirituality:</b>	Spiritual, Christian	Spiritual, Christian
<b>Community:</b>	Involved in community	Involved in community
<b>Educational beliefs:</b>	Invitational education	Educate learners to their full potential, mentally, physically, emotionally, spiritually and socially
<b>Life beliefs:</b>	Learners encouraged to explore and express their individuality	Educate children towards independent adulthood
<b>Knowledge beliefs:</b>	Curriculum covers different elements and skills	Knowledge is power

### **3.6 POPULATION AND SAMPLING**

Two private high schools from the Gauteng province were chosen for the population and sample of this study. Gauteng province was chosen for data collection because it is where the researcher is based and thus it is easier to gain the data. The reason why these two private high schools were chosen was because the schools had been using the mobile technology for daily task completion for many years. Furthermore, the focus of this research was not on *whether* technology was being used, but on *how* the technology was being used. The table below (q.v. Table 3.2) presents a summary of the sampling procedure that was followed in this study.

This study made use of the purposive sampling method as it had a *specific purpose* in mind (Maree, 2007). In this study the focus was on MT integration strategies in the classroom. The research was conducted in two schools, School A and School B. Two Grade 9 English Home Language classes, with +/-25 learners in each, were chosen to participate in this study. The English teachers who taught these two specific classes were also included in the study. The IT specialist from School B was included in this study. The IT specialist of School B did not participate in the study. The principals of the two schools were also included in this study.

The inclusion criteria for the two private schools were that they had to be using mobile technology in their everyday completions of tasks inside and outside of the school. The inclusion criteria for English teachers were that they had to be teaching English with the technology for several years, which the subject heads were chosen. In terms of the inclusion criteria of the focus groups, learners who signed the assent forms were eligible. Then the researcher asked the English teachers to ask the learners who were interested to participate. It was just a result of this that there happen to be different races and genders that participated.

**Table 3.2: Sampling summary**

<b>Participants</b>	<b>School A</b>	<b>School B</b>	<b>Activities</b>
Principal	1	1	Interview
IT specialist	N/A	1	Interview
English teacher	1	1	Interview/observation
Learners	6	6	Focus group interviews
Learners	+/- 25	+/- 25	Observations

### **3.7 DATA COLLECTION**

In this study, which dealt with the integration strategies of MT in an English Home Language classroom, the following data collection and documentation strategies were used: semi-structure interviews, observations and focus groups. A reflective journal, in which all the events pertaining to the research process were noted and kept during the data collection process.



### 3.7.1 SEMI-STRUCTURED INTERVIEWS

An interview is a communication process during which two people are having a conversation. There is an *interviewer* who has compiled questions based on a specific topic, and a *participant* who was chosen to answer these questions because of some form of connection to the topic at hand. These questions are asked in order to gain data about the views and opinions of the individuals participating in this study (Maree, 2007).

In this research, semi-structured interviews were conducted in two private high schools with the headmaster, English Home Language teacher from each school and IT specialist from school B. The interviews provided insight regarding the policies of technology integration in the classroom and school. The principals shared their perceptions regarding the integration of MT into their schools as well as any problems which they might have faced with the integration of technology in the classrooms. The IT specialist (School B) enlightened the researcher as to his/her role in the integration of MT in the classrooms. The educators shared an in-depth view of their integration strategies and whether they were merely substituting books with the MT or doing more with the MT in terms of other activities.

The conceptual framework, explained in Chapter 2, assisted in the construction of the interview questions as per Appendices A and B. The conceptual framework also assisted in the analysis of the interview questions. In the table below (q.v. 3.3) the interview question classifications and what they assess regarding the research questions are indicated.

**Table 3.3: Interview questions classifications**

Interview questions	Classification	Sub-Research question	Participant
Question 1	Context	SQ 1, 2, 3	Principal, IT specialist, English teacher
Question 2	Technology	SQ 1, 2, 3	Principal, IT specialist, English teacher
Questions 3 and 4	Training	SQ 1, 2, 3	Principal, IT specialist, English teacher
Questions 5, 6, 7, 8, 9, 10, 11, 12	Cognition and integration	SQ 3	Principal, IT specialist, English teacher

### 3.7.2 OBSERVATIONS

An observation is the process of recording and analysing situations or participants without necessarily becoming directly involved in or with them. (Maree, 2007). The person who is observing a situation, or other person/s, must employ all their senses towards attaining a complete view of what is happening. The use of this data gathering technique will lead to a higher understanding of the indicated phenomenon. There are different types of observation methods. Firstly, the researcher can *only* be an observer and not participate in the process where the phenomenon is present. Secondly, the researcher can be an observer *as well as* a participant in that he/she will take part in the situation and observe it at the same time. Thirdly, the researcher can be the participant as well as the observer when he/she becomes part of the research process and helps design and develop strategies. Lastly the researcher can also become a complete participant in that he/she becomes completely absorbed in the situation and the people being observed may not have a clue that they are being observed (Kawulich, B, 2005).

In this research teachers who are using MT in their everyday teaching were observed. The learners were also observed to understand *how* they experienced and interacted with the MT in their learning. The observation data collection method allowed for very important information to be gathered regarding the use of MT in the classroom. In addition, the learners were observed to distinguish how they interact using the MT in their learning process. The conceptual framework assisted in analysing the activities which were being observed towards determining

which level of integration and cognition was taking place in the classroom. The table below (q.v. Table 3.4) indicates the classification of the elements of the observation schedule.

**Table 3.4 Observation schedule classification**

<b>Elements observed</b>	<b>Classification</b>	<b>Sub-research question</b>
Participants	Context	SQ 1, 2 and 3
Activities	Objective	SQ 1, 2, and 3
Level on Bloom's Taxonomy	Cognition	SQ 1 and 3
Level on SAMR model	Integration	SQ 1 and 3
Explanation and conclusions	Summary	SQ 1, 2 and 3

### **3.7.3 FOCUS GROUPS**

The focus group interview data collection method refers to the process of gathering participants together who form part of a specific situation or are involved in a specific phenomenon. The assumption of focus group interviews is that they will be a setting that allow participants to feel free to speak about any topic that comes forward as there would be peer relations (Maree, 2007).

The focus group data collection method provides information about the learner's experience regarding the use of MT. After a teacher has presented a lesson in which the MT has been used, the learners' views and experiences regarding the way in which the lesson was conducted, are analysed. The learners' opinions are a vital key to understanding *what* impact or effect the MT has on learning, and whether the technology is being integrated to the best of its ability.

The conceptual framework helped in compiling questions which were posed in the focus group interviews. This process helped to determine whether the activities which were completed in the classroom using MT resorted under the substitution, augmentation, modification or redefinition level. The learners may give a more in-depth and objective view of how the activities were conducted with the MT. In addition, the learners were also able to explain whether they found the MT helpful in the activities or whether it did not make any difference. The questions

that the learners were asked can be found in Appendices D. In the table below (q.v. Table 3.5) indicates the classification of the questions and how they link to the sub-research questions.

**Table 3.5: Focus group classifications**

<b>Interview questions</b>	<b>Classification</b>	<b>Research question</b>
Questions 1, 4, 6	Learners' opinions	SQ 1, 2, 3
Question 2	Training	SQ 1, 2, 3
Questions 3, 5, 7, 8, 9, 10	Cognition and Integration	SQ 3

The table below (q.v. Table 3.6) presents a summary of the data collection strategy used in this study. The questions who, When, How, and Why are asked. In addition, the participants in the study are identified and the instruments used, and how they relate to the conceptual framework, are listed.

**Table 3.6: Summary of data collection strategies**

<b>SQ</b>	<b>Who?</b>	<b>When?</b>	<b>How?</b>	<b>Why?</b>	<b>Instruments</b>	<b>Conceptual Framework</b>
SQ1	Headmasters (2)	1st	The principal was asked for permission to conduct research.	Knowledge about school activities and MT phenomenon.	Interviews	Interviews were used to ascertain on which level the school was on.
SQ1	IT specialist (1)	2nd	Permission was obtained, and the IT specialist was asked to participate.	Knowledge about how the MT was being used in the classroom.		
SQ1, 2 and 3	Teachers (2)	3rd	Permission was obtained from the principal and the principal, in turn, asked whether the teacher would participate.	Working daily with the learners and the MT.		
SQ1, 2 and 3	Teachers (2) Learners (+/- 25 per class, 2 classes)	4th	Consent and assent was obtained from learners and parents.	Complete view of how the MT was used in the classroom and what integration strategies were used.	Observations	Observations in classrooms indicated which level the activities were on.
SQ 2, and 3	Learners (6 per class = 12)	5th	Six learners in the observed class participated in the focus group.	Learners participated in the classroom activities using the MT. Knowledge and opinions about what happened.	Focus Groups	The focus groups assisted in determining which level the class was on.

### **3.8 DATA ANALYSIS**

In this research three data analysis techniques were used namely *coding*, *themes* as well as the *activity theory*. These three processes will assist the researcher in analysing all the data obtained from the schools.

#### **3.8.1 CODES AND THEMES**

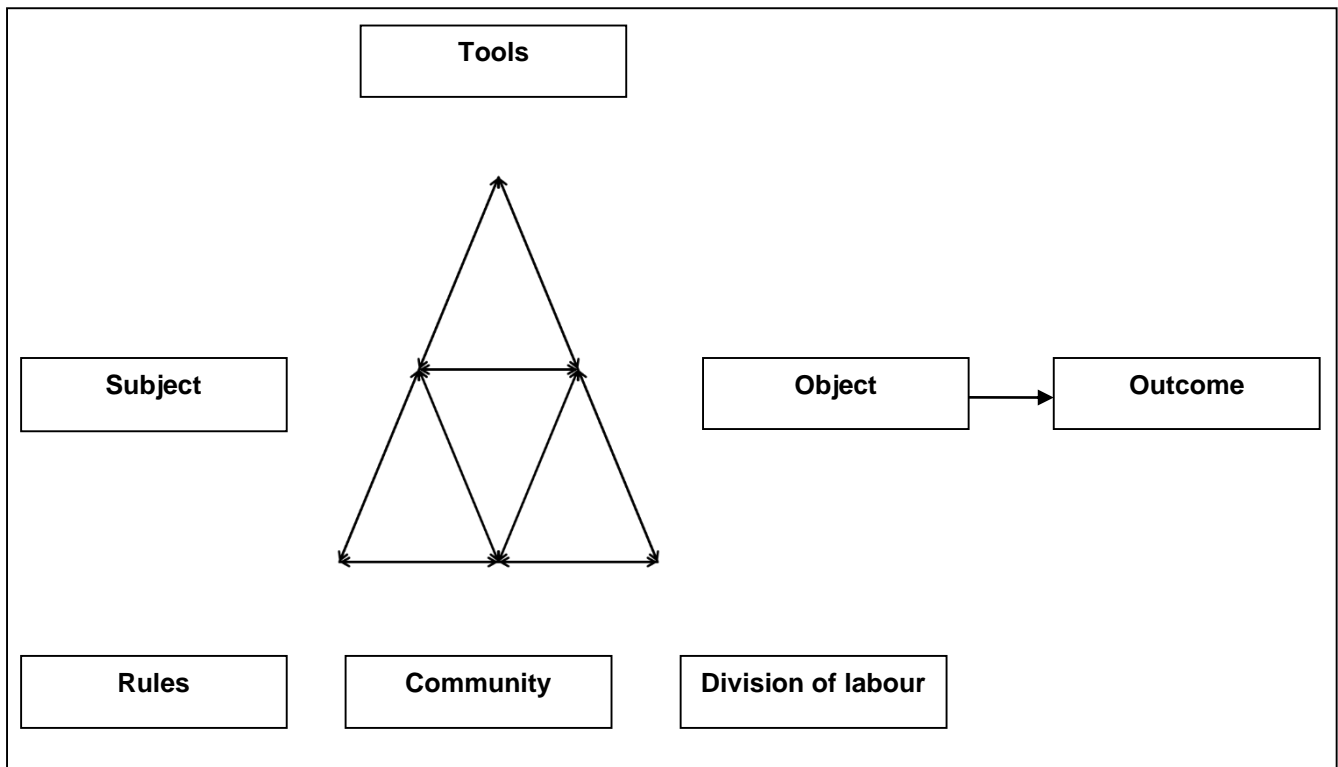
Coding can be defined as creating different names or words, related to a topic and indicating it in the data collected. This means that when you have found something of significance, or you have identified a specific theme in the data, you then assign a code to that segment. This will enable analysis of the data and subsequently group topics and sections together. In the analysis of the data for this study, codes were assigned to clarify the specific direction and type of data which the researcher was looking for. Thus, codes were assigned to that which pertained to the study before the researcher conducted interviews in order to simplify the data analysis, post collection (Maree, 2007).

This means that when you have found something of significance, or you have identified a specific theme in the data, you then assign a code to that segment. These themes can be assigned a word, or descriptive words, to thus establish a category. This process will help when writing the final report as there will be a clear indication of *how* the different categories fit together (Turner III, 2010).

The literature review and conceptual framework assisted in compiling themes and codes from the data. The semi-structured interviews were analysed using codes and themes and this allowed for the researcher to note which participants stated similar things and which participants stated different things. The focus group interviews are also analysed using codes and themes, but interview and observation techniques are employed to gain crucial data. As this study used multiple data collection methods, triangulation was possible. The use of different methods enabled the researcher to analyse the gathered data gathered.

### 3.8.2 ACTIVITY THEORY

The activity theory, which was created by Engestrom (2000) (q.v. Figure 3.3) is a research approach linked to the study of technology usage in activities (Nardi, 1996). It was first used by Russian psychologists, Vygotsky and Leont'ev, in the 1920s and 30s. The activity theory is used to study the cognitive processes of humans and has been indicated that elements that happen in activities are the centre of human behaviour (Zhang, 2014).



**Figure 3.3: Activity Theory**

(Source adapted from: Engestrom, 2000)

The activity theory allows a researcher to use a specific model to analyse a certain situation, or information, and determine the roles, or outcomes, of different sections. In the activity theory no component stands alone - all components effect and interact with one another. There are seven components and elements that are a part of this theory namely:

- Subject: which deals with what the focus of the activity is on. The term *subject* in the activity theory does not refer to a subject that is taught, like English, but rather who is involved.
- Tools: refers to by what means are the subjects carrying out this activity, what tools are used to mediate learning within the activity.
- *Rules*: what informal rules do you follow to meet the specific goal; what formal rules do you follow to meet the specific goal. Are there any cultural norms governing the activity?
- Division of labour: what specific responsibilities do you have to do to meet your goal? What responsibilities do you share to meet the goal? How are the roles organised?
- Community: in what environment is the activity being carried out in? What group do you work with/ work with to meet your goal?
- Object: what is the goal of the activity? What is the desired outcome of the activity?
- Outcome: what is desired outcome of the activity? What happened after all the other elements were met?

The activity theory was used to analyse the activities, as observed in the two English teachers' classrooms. The teachers will first conduct a lesson using the MT, then the learners will complete their assigned activity, or assignment, and then the activity theory will be used. The activity theory does not focus on the classroom alone but considers all the factors that contribute to the completion of the activities. In this study the activity theory was not be used as an approach or framework, however, it was used as an analysis process of the MT based activities that were observed and will be later placed on the conceptual framework.



### **3.9 LIMITATIONS**

The limitations of this research centres on the fact that the results cannot be generalised as only two private schools were observed. Thus, it cannot be said that *all* schools use MT in the way these two schools do. It would be a generalised assumption to state that all schools which use MT in their teaching and learning only *substitute* the technology. There could be schools which do this but the schools which were observed in this studied use the technology for more than just for textbooks. In addition, as the schools and classrooms were not observed for a longer period, it could not be determined whether the schools use the technology in all their lessons and activities. However, as this is a qualitative comparative case study, the findings do not have to be generalised.

### **3.10 ETHICAL CONSIDERATIONS**

In most research studies which deal with participants or companies, there are ethical issues involved. Participants need to give permission and their identities need to be protected. This research study was based in schools, consequently, many people who were directly, or indirectly involved, needed to be considered.

The following steps were followed to gain permission to conduct research:

- Proposal defence.
- Ethical clearance application.
- Permission granted by the University of Pretoria.
- Permission granted by two private school principals in Pretoria (q.v. Appendices F).
- Consent granted by two English Home Language teachers (q.v. Appendices H).
- Consent granted by one IT specialist (q.v. Appendices I).
- Permission granted by learners' parents (q.v. Appendices G).
- Assent granted by learners (q.v. Appendices E).

#### **a) Voluntary participation**

All participants were notified that their participation was voluntary and, if they at any time decided to leave the study, they could do so.

#### **b) Trust**

The participants were informed that they would be safe when participating in the study. Trust also needed to be established between the researcher and the participants for the research to run smoothly (Orb, Eisenhauer, & Wynaden, 2001).

#### **c) Anonymity and confidentiality**

The participants were informed that their participation in the study, and the information garnered from them, would be treated with the utmost confidentiality. Any personal information obtained would not be published. For the final dissertation, all participants were assigned pseudonyms. Only the researcher and her supervisor know the true identities of the participants. The data gathered would be stored at the University of Pretoria for several years (Maree, 2007; Witkin & Altschuld, 1995).

#### **d) Justice**

Capron (1989) stated respect is one of the main principles of ethics. That any research conducted should be guided by the principles of respect for people. The principle of justice refers to fairness and equality under all circumstances. Abuse of participants must be avoided at all costs (Orb, Eisenhauer, & Wynaden, 2001). All participants need to be protected from any possible harm.

Examples of permission, consent and assent letters are attached in the Appendices E, F, G and H in this study. All participants obtained these letters before any data collection was commenced. The participants who refused to participate in the study were excluded and the letters were given to other willing participants.

### **3.11 TRUSTWORTHINESS**

In all research studies validity and reliability as well as trustworthiness is needed. The strategies employed in the study are mentioned and discussed in detail below.

### **3.11.1 CREDIBILITY**

Credibility can be explained as that the information that is included in a study gained from participants are right and truthful (Shenton, 2004). By allowing your research participants, and other people who may have a specific interest in the research to comment on or assess the research findings, interpretations and conclusions, enhances the credibility of your findings (Shenton, 2004). In this research the participants, mainly the staff members who took part were sent the research findings and transcripts from interviews and observation to look over.

### **3.11.2 TRANSFERABILITY**

Transferability focuses on external validity and can be described as research findings that could possibly be tested, or referred to, in other situations. The main point is whether the research can be completed or carried out with more participants in similar, or different, situations (Anney, 2014). This research could be carried out with more participants and different situations, because the steps that were used together with the activity theory in this study can be completed again. This would obviously be in schools who use MT in their execution of daily tasks.

### **3.11.3 TRIANGULATION OF SOURCES**

One of the strategies used to ensure trustworthiness in this study was the use of multiple data sources. Using information from data sources, like interviews and focus groups, allows the researcher to combine and compare findings. If the findings are in line, they instil confidence *in* and credibility *to the* said study (Maree, 2007). Semi-structured interviews, observations and focus groups were used to collect data in this study which enhanced the trustworthiness.

### **3.11.4 DEPENDABILITY**

Dependability resorts under *reliability*. It refers to the assumption that if another researcher conducts the same research, using the same data collection instruments and participants, then the same results should be attained (Anney, 2014). This research is dependable because if

another researcher were to take the exact same steps that were used, then the same results should be found.

### **3.11.5 CONFIRMABILITY**

Confirmability can be described as the confirmation that the findings indicated in the study gained from the participants are solely their own. It is very easy for a researcher to lose their objectivity whilst conducting research as other people's thoughts and views may arise at any point during the research process (Shenton, 2004). In this research direct quotes were used from the participants to confirm that the findings gained were solely from the participants.

### **3.12 CONCLUSION**

In Chapter 3 the research methods, research philosophy, approach and strategies were presented and discussed. The data collection strategy and data analysis were also explained, and the population and sample criteria were discussed. In addition, the possible limitations, trustworthiness and ethical considerations were reviewed. Chapter 4 will present and discuss the results gained from the data. The two schools' interviews, observations and focus group interviews will be discussed separately. The participant interviews will be compared in accordance to themes, number of times certain topics came up and the responses to the research questions. The activities observed will be presented within the conceptual framework and cognitive level and integration level will be identified. The focus group findings will also be tabulated with frequency and correlation to the research questions indicated. The secondary and main research questions will be discussed.

## 4. Chapter 4: Results

### 4.1 INTRODUCTION

In Chapter 3 the data collection method was discussed in detail. In addition, the interpretive paradigm was explained and the qualitative research approach, and how it applies to this research, was explored. The case study research strategy, and its use in this research, was also noted. The data collection strategy and data analysis techniques were explained, and the population and sample of the study were defined. Possible limitations, trustworthiness and ethical considerations were discussed. Chapter 4 will present the results of the data collection at the schools. Furthermore, the research problem and main research questions will be looked at once more to elucidate *what* the methodology and data collection methods aimed to investigate. The results of the data collection will be presented and explained. Each school will be discussed separately. Interviews and focus groups interviews will be presented in tables and the activities observed will be presented within the framework of the activity theory.

### 4.2 THE RESEARCH PROBLEM AND QUESTION

The research problem, as stated in Chapter 1, noted that some schools used MT in their teaching and learning as a substitution tool for textbooks and for the teaching and learning of basic computer skills. The main research question was: How are mobile technology strategies incorporated in activities to support English Home Language teaching and learning?

The methodology of this study is a comparative case study. The data collection methods used included: interviews with the principals, IT specialist (School B) and English Home Language teachers, observations regarding the English teachers' classroom activities and a focus group interview at each of the two private schools. The subsequent aim was to compare the two private schools in their natural every day running environments and to ascertain which MT integration strategies they are using in the school and classroom environment.

The interviews conducted aimed to gather information regarding: the background of the schools, possible training and workshops that might have occurred, the integration of the MT inside *and* outside the classroom, other possible ways in which technology could have been

integrated as well as opinions on *why* it seems difficult to integrate the use of technology in the English classroom. The aim of *observing* the four activities was so that the researcher would not have to rely solely on the participant interviews to investigate the problem and formulate an answer to the research question. The researcher could do some practical investigation in the classroom and determine which strategies were being used instead of just substitution. The focus group interviews with the learners indicated *how* the learners experienced the use of the MT in their learning. These interviews also shed some light on which strategies they used to integrate the technology into their learning.

### **4.3 DISCUSSION OF RESULTS**

The results of the data collection are presented in the form of a case study in which each school was discussed separately and then the findings were compared in Chapter 5. The discussions began with the basic background information of the schools. The interviews conducted with the principals, IT specialist (School B) and English teachers from each school are reviewed and reallocated under five themes in tables. The four activities observed are presented using the activity theory which allowed for the presentation of all the factors that happened inside the classroom during the observations. The focus group interviews conducted with six learners from each school are presented in a table format and then discussed under five themes. The data were gathered using the instruments included in Appendices A, B and C. The interviews were audio recorded and the focus group interviews were videotaped. Consequently, the collected data was transcribed.

The IT specialist in School A did not participate in the study because the researcher was told that the school is part of a company and the latter assists with the integration of the MT. The themes identified were derived from the data which were collected and the interviews.

#### **4.3.1 CODE AND THEME DEVELOPMENT**

The identifying of themes from the interview questions and focus group interviews are presented in this chapter. These presented themes were derived from the interview questions and participants' responses to these questions after data was collected. The data collected from the staff interviews and learner focus groups are discussed under the following themes:

**Theme 1: Teaching and learning technology**

**Theme 2: Training and workshops**

**Theme 3: Integration**

**Theme 4: Strategies not incorporated**

**Theme 5: Difficulty of integration**

**Theme 6: Individual view**

**Theme 7: Enhancement of learning**

**Theme 8: Continuous use**

**Theme 9: Different methods**

**Theme 10: Management**

The observations are presented and described in accordance with the activity theory which was discussed in detail in Chapter 3 (q.v. 3.8.2). Table 4.1 presents the themes which are used and how they relate to the data sources. The table refers to both School A and B. Throughout this chapter, the abbreviation MGT refers to the *management of the MT* used during activities and in responses to said activities. This theme will also be dealt with separately under each school's results. The main reason for this is that the theme management was not dealt with as a separate theme but was included, and indicated, under the other results and themes. Furthermore, management resorts under the second secondary research questions namely: "How are these activities managed by the teacher and learners in the classroom?" but was not indicated in the data collection instruments as it is prevalent throughout all the results. In the table below (q.v. Table 4.1) the themes and codes that are used to present the data has been indicated and which data sources they relate to.

**Table 4.1: Presentation of themes, codes and data sources**

Themes	Codes	Data sources		
		Semi-structured interviews	Observations	Focus group interviews
Teaching and learning technology	TLT	X	X	
Training and workshops	TW	X	X	X
Integration	IG	X	X	
Strategies not incorporated	SNI	X		
Difficulty of integration	DI	X		
Individual view	IV			X
Enhancement of learning	EL		X	X
Continuous use	CTU		X	X
Different methods	DM		X	X
Management	MGT	X	X	X

In the table below (q.v. Table 4.2) indicates the codes that were assigned to the participants who took part in this study.

**Table 4.2: Participant codes**

SCHOOL	PARTICIPANT	CODE
School A	Principal	SAP
	English teacher	SAT
	Learner 1	SAL1
	Learner 2	SAL2
	Learner 3	SAL3
	Learner 4	SAL4
	Learner 5	SAL5
School B	Learner 6	SAL6
	Principal	SBP
	IT specialist	SBITS
	English teacher	SBT
	Learner 1	SBL1
	Learner 2	SBL2
	Learner 3	SBL3
	Learner 4	SBL4
Learner 5	SBL5	
Learner 6	SBL6	



Table 4.3 presents the codes which were used in the presentation of the activities in Chapter 4 and the placement of the activities in the conceptual framework in Chapter 5 (q.v. Table 5.2).

**Table 4.3 Activity codes**

School	Activity	Code
School A	Activity 1	A1
	Activity 2	A2
	Activity 3	A3
	Activity 4	A4
School B	Activity 1	B1
	Activity 2	B2
	Activity 3	B3
	Activity 4	B4

### 4.3.2 CLARIFICATION OF TERMS

The terms used throughout the discussion, and in tables and figures, are listed below (q.v. Table 4.4.).

**Table 4.4: Clarification of terms**

Term	Definition
<b>ITSI</b>	Information Technology School Innovation. A system that is used to integrate mobile devices into teaching and learning.
<b>miEbooks</b>	Interactive e-books that comprise teaching and learning textbooks, found on the ITSI system.
<b>Educator Console</b>	The school refers to an Educator’s folder which is a platform that works in collaboration with the e-books and allows for teachers to push content to learners’ devices.
<b>Subject camp</b>	Subject camps are workshops which help to improve subject teaching through the sharing of new and innovative mobile technology ideas.
<b>Edmodo</b>	Edmodo is a technology company that allows for interaction with schools and teachers.
<b>Kahoot</b>	A website and application that allows for the creation of multiple choice questions based on a topic. There are pre-set questions as well and all learners can access and answer the questions, while the results can be seen by all participants.
<b>ADD</b>	Attention Deficit Disorder.
<b>Two-in-one</b>	This is a device that is a tablet and laptop in one. The screen is detachable from the keyboard.

<b>Term</b>	<b>Definition</b>
<b>Change Management Consultant</b>	A specialist who assists with the transition from hardcopy textbooks to electronic textbooks.
<b>Google drive</b>	A platform on Google that allows for files and folders to be created, accessed and stored online with an element of collaboration.
<b>Google docs</b>	The document that is created in Google drive and which can be accessed online.
<b>Evernote</b>	An application where you can store your notes and share them with other people.
<b>3D printer</b>	A printer that allows you to design something and print it into a 3D real life figure.
<b>ADvTECH</b>	A company that contributes to education and resources.

#### **4.4 SCHOOL A RESULTS**

##### **4.4.1 INTERVIEWS**

School A is situated in a suburb in Gauteng. The school is a part of company and designed in a campus style which includes: a nursery school, pre-primary, primary and high school situated on the same campus. The high school has been running for 3 years and has been using technology in their teaching from its inception. The school is based on a Christian ethos. The maximum number of learners is 25 per class. The school offers a range of sports and cultural activities. Table 4.5 presents the staff participants' responses, as per the indicated and discussed themes (q.v. 4.3.1 and Table 4.1).

**Table 4.5: School A - Interview responses summarised**

<b>Participants</b>	<b>Teaching and learning technology (TLT)</b>	<b>Training and workshops (TW)</b>	<b>Integration (IG)</b>	<b>Strategies not incorporated (SNI)</b>	<b>Difficulty of integration (DI)</b>
<b>Principal</b>	Hardware: Tablets, laptops, data projectors.  Software: ITSI, miEbooks and Educator’s folder.	Subject camps, training and workshops completed through company.	YouTube and WhatsApp used.  Assignments submitted online (MGT).	The strategy that is not fully incorporated is assessment.	Writing is an important skill.  Different methods, like videos, can be used (MGT).
<b>English teacher</b>	Hardware: Tablets, laptops, data projectors.  Software: ITSI, miEbooks and Educator’s folder.	Subject camps, training and workshops completed through company.	Content pushed to tablets (MGT).  Online dictionary used (MGT).	Teacher thinks Edmodo and online classes can be incorporated.  ITSI eBooks can be incorporated better.	English involves a lot of writing and is an important skill.  Technology may not always be used.

Section 4.4.2 presents a discussion of the content presented in this table. The discussion is based on the themes which became evident during the interview process at School A.

## 4.4.2 SCHOOL A - INTERVIEW RESPONSES DISCUSSED

### 4.4.2.1 TEACHING AND LEARNING TECHNOLOGY (TLT)

School A's principal and English teacher stated that the hardware used were: tablets, laptops and data projectors and the software was: ITSI, miEbooks and the Educator's folder (*SAP: "all our kids work from tablets, so we don't have physical textbooks and the textbooks are on the tablets". "Overhead projectors, teachers teaching off laptops and those type of things"*). Teachers are provided with laptops and tablets by the school. Learners can purchase tablets elsewhere but have the option of purchasing branded tablets from the school. The school is trying to move from normal tablets to the two-in-one (*SAT: "they are phasing in what they call the two-in-one device"*) which is a tablet and laptop combined in one device. There are data projectors in the classrooms.

### 4.4.2.2 TRAINING AND WORKSHOPS (TW)

The principal of School A indicated that, as they form part of a company (*SAP: "we form part of a company, the company itself, it's a curriculum department and their people then come down to our school"*), the company sends out their personnel to the school to conduct training. The English teacher stated that he did not receive any training before he began teaching at the school, he was asked if he was capable and he indicated that he was (*SAT: "I didn't, I was asked are you capable and I said yes"*).

The principal and teacher indicated that the company offers subject camps once a year (*SAT: "I've just been on subject camp once a year we have subject related sort of conferences and there they do show us new things that we can do so once a year"*). The English teacher indicated that when he, or his colleagues, discover something new in terms of technology, or applications, they share the information.

#### 4.4.2.3 INTEGRATION (IG)

The participants indicated that MT is used inside *and* outside the classroom. The principal gave an example of when he was teaching Geography (*SAP: "I always use the example of teaching Geography in the normal textbook you'd open the page to Volcanoes for example you'd see a photograph of a volcano"*). In previous lessons, taught without technology, he would ask learners to open their textbooks and look at pictures of a volcano and then explain what happens. However, with the help of technology he could visit YouTube, search for volcanoes and show the learners footage of a volcano erupting. The English teacher explained that he pushes content, like poetry notes, to learners and that the miEbooks software grants access to the Pharos dictionary (*SAT: "What's nice is that my eBooks thing has access to Pharos dictionary, so they have access to that they can work on that"*). Learners do not have to use a physical dictionary to look up words they can search for words with the help of technology.

In terms of integration outside the classroom, both participants stated that some teachers have created WhatsApp groups for their learners (*SAT: "I think many teachers have established WhatsApp group and the kids amongst themselves have also got class groups where they exchange ideas and remind each other of tasks that are due"*). This allows for interaction outside of the classroom. Learners can ask their teachers school-related questions if they need help and interact with one another. The English teacher also indicated that some teachers have created Twitter accounts and blogs which the learners can access anywhere and at any time. The principal stated that some homework activities and assignments are not handed in during class time but that the learners can be required to upload them on the ITSI platform. The English teacher indicated that he downloads videos for some of his activities so that the learners can watch these at home as well (*SAT: "A video is something they can take home listen to and listen to again and listen to again, it enhances their written activities so it's an addition it's an add on basically"*). He also stated that he would instruct learners to create videos of them doing a speech on their phones, or tablets, as it helps those learners who may fear standing in front of the classroom.

#### **4.4.2.4 STRATEGIES NOT INCORPORATED (SNI)**

The principal of school A indicated that the strategy he would like to fully integrate is assessment (*SAP: “That’s got to do with assessment if the assessment was electronic it would be much easier”*). The English teacher stated that he would like to see the school use Edmodo and establish online classes (*SAT: “Establish classes online where everything is there”*). He added that the ITSI e-books could be also be integrated well.

#### **4.4.2.5 DIFFICULTY OF INTEGRATION (DI)**

The principal noted that the integration of technology in the English classroom might not necessarily difficult. If, for example, you are teaching Shakespeare, then you could search for a fitting video clip and show that to the learners. However, all participants agreed that English language comprises a great amount of writing, a very important skill that needs to be mastered (*SAP: “There is so much writing in English that they have to concentrate on that to get the writing skills done”*).

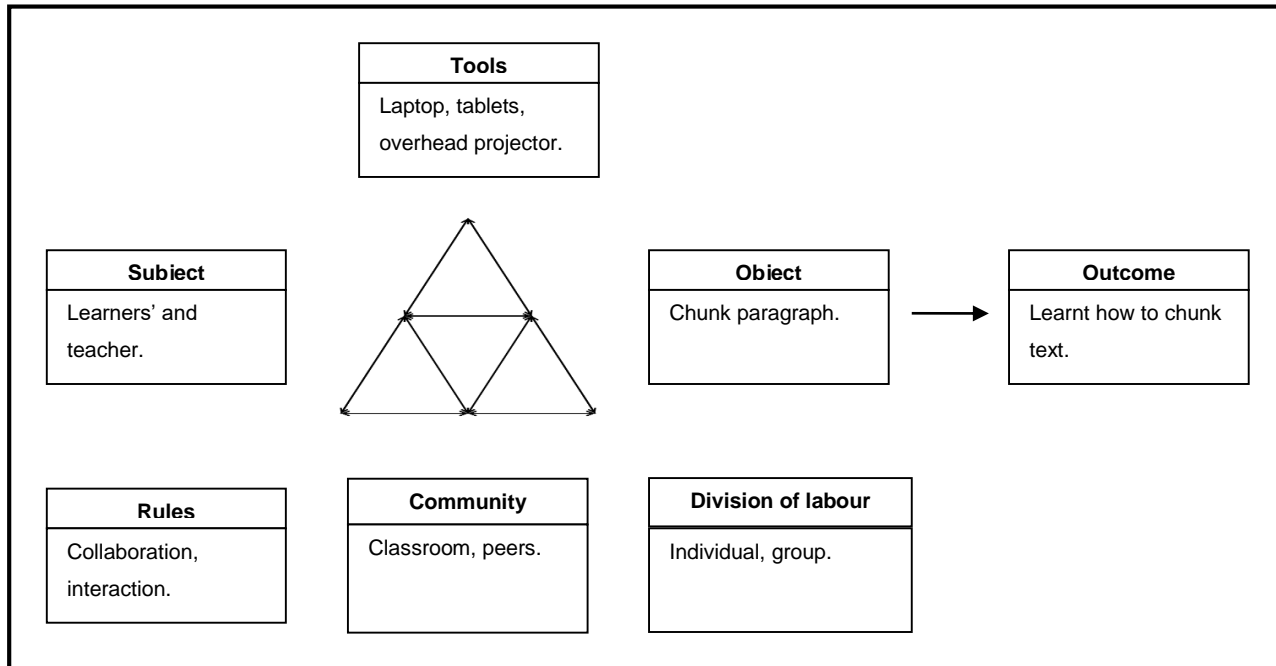
### **4.4.3 SCHOOL A OBSERVATIONS**

The results of the observations were presented in the activity theory (q.v. 3.8.2) with four figures indicating the type of activities that took place in the classroom. A description of the activity is indicated, then the figure is presented, and finally, the seven different components in the activities are indicated in more detail.

#### **Activity 1 (A1)**

The first activity observed at School A was chunking of paragraphs. The teacher pushed a comprehension to the learners’ tablets (MGT and TLT). The teacher then presented a PowerPoint (TLT) which explained closed reading strategies the learners would have to use to chunk sections in the comprehension (EL). The learners were already sitting in groups of 3 to 5 pupils and had to decide, in their groups, *how* they would chunk the paragraphs individually (IV). The learners could use the Pharos dictionary, available on their devices (MGT and IG), if they did not understand certain words. There were some learners who did not have their devices on the table, but everyone seemed very interested and participated in the activity. For the lesson to be successful, interaction between different elements are needed. The subjects

(learners and teacher) need the tools to be productive and the tools impact upon the research participants (TLT). The teacher needed to present the strategies to the learners (on how to chunk the paragraphs) using the tools towards reaching the outcome (MGT). Figure 4.1 illustrates *how* the activity has been placed within the activity theory.

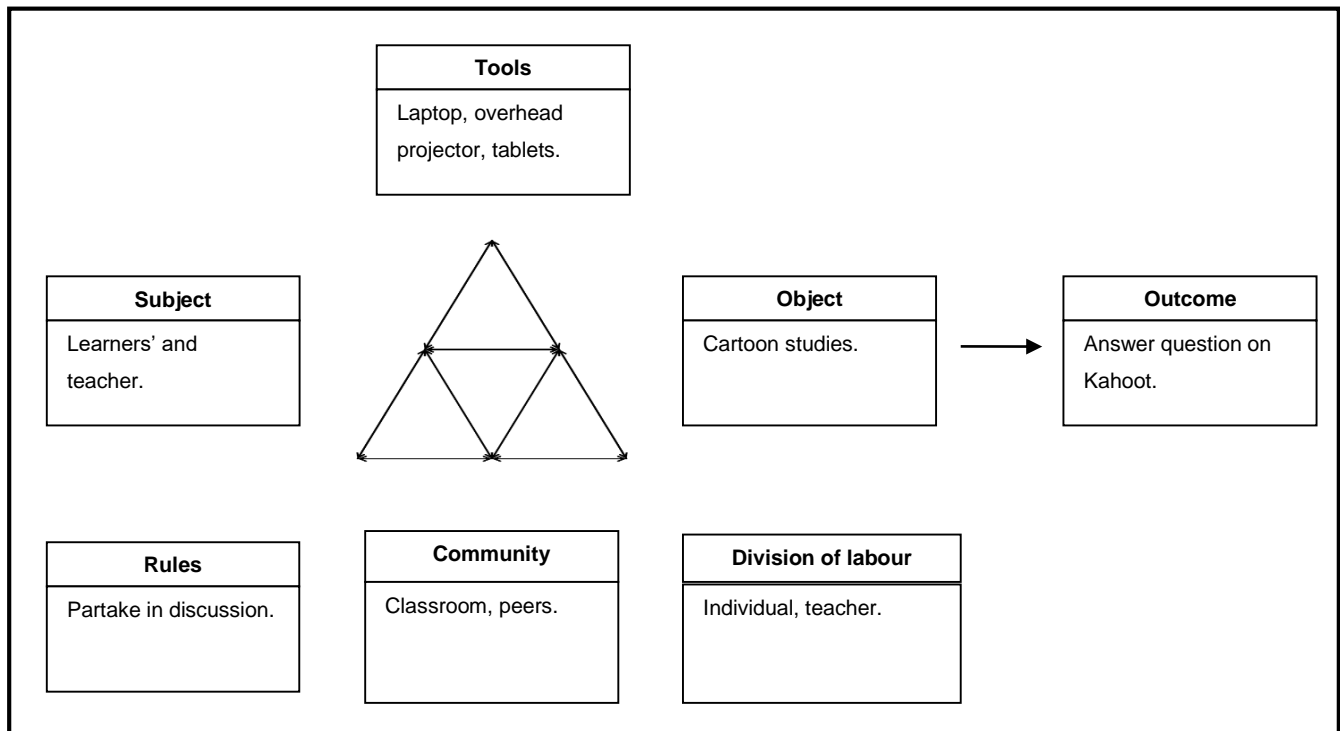


**Figure 4.1: School A - Activity 1 (A1)**

- **Tools:** Laptop, tablets, cell phones, overhead projector, whiteboard, PowerPoint slides, Educator’s folder.
- **Subject:** Learners and teacher.
- **Rules:** Work in a group to complete activity. Individual contribution to group effort. Use the strategies presented by the teacher to chunk the paragraphs.
- **Community:** The environment that the activities are completed is in the classroom environment.
- **Division of labour:** Groups of 3 to 5 learners needed to work together, and individually, to complete the task at hand. The teacher presented the work and facilitated group work.
- **Object:** To chunk a paragraph from a comprehension using closed reading strategies.
- **Outcome:** Learners have learnt which can assist them when making notes and for studying purposes.

## Activity 2 (A2)

The second activity observed by the researcher was cartoon studies. The teacher presented a PowerPoint (TLT) explaining terminology that can be used to describe cartoons: symbolism, exaggeration, labelling, analogy, irony and satire. The teacher also discussed certain points regarding colour, size, labelling, speech bubbles, symbols, focus, angle, tone, facial expression and context. The learners seemed very interested and the teacher also showed examples. Once the teacher had presented the PowerPoint the class played a game on Kahoot (MGT, TLT and DM). Kahoot is a website, and application, where you can play multiple choice learning games as well as create your own. Each learner, in his/her individual capacity, participated in the game and in the end a winner was chosen (IV and CTU). The teacher created a game based on the cartoon lesson (IG and EL). The learners participated in the lesson and answered the teacher's questions. Figure 4.2 illustrates the activity situated within the activity theory.



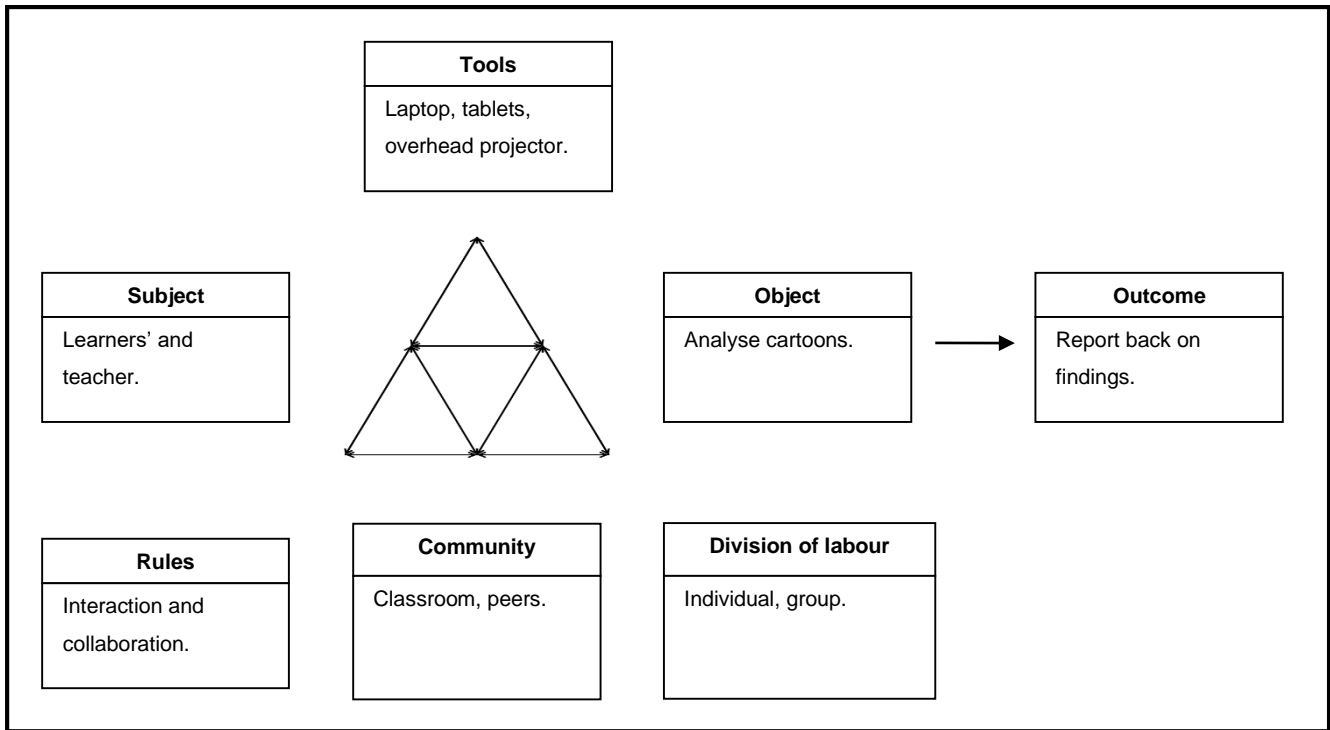
**Figure 4.2: School A - Activity 2 (A2)**



- **Tools:** Laptop, overhead projector, tablets, PowerPoint slides, Kahoot.
- **Subject:** Learners and teacher.
- **Rules:** Learners need to partake in the discussion as individual understanding of the topic is important.
- **Community:** The environment in which the activity is completed is the classroom.
- **Division of labour:** The teacher presents cartoon terminology. The teacher and learners play a game on Kahoot.
- **Object:** The object of the lesson was for learners to understand the different elements of a cartoon and consequently answer questions regarding cartoons on Kahoot.
- **Outcome:** Learners were able to answer questions about the different terminology used in cartoons.

### **Activity 3 (A3)**

The third activity observed was the analysis of cartoons. Activity 2 served as preparation for this activity. The teacher revised the content which had been taught the previous day. The learners divided into their groups of 3 to 5 and each group was given a cartoon to analyse. Learners could use their devices to research those terms which were unfamiliar to them (MGT, TLT and CTU). The learners seemed very excited and participated in the analysis. Once the learners had finished analysing the cartoons, they had to report back to the teacher and class. Each group presented what they had discovered, and the teacher also assisted the outcomes, where necessary (EL). In this way the whole class learned from all the cartoons. Questions were also asked regarding the cartoons. The findings from the cartoons were presented using the teacher's laptop and data projector (MGT, TLT and IG). Figure 4.3 shows the activity having been placed within the activity theory.



**Figure 4.3: School A - Activity 3 (A3)**

- **Tools:** Laptop, tablets, overhead projector, PowerPoint slides.
- **Subject:** Learners and teacher.
- **Rules:** Learners had to use the skills which they had acquired in the previous lesson. Each member of the group had to contribute.
- **Community:** The environment in which the activity is completed is the classroom environment.
- **Division of labour:** Each group of 3 to 5 learners must analyse a cartoon which is different from that of other groups. Each learner must contribute.
- **Object:** The object of the lesson is for learners, in groups of 3 to 5, to analyse a cartoon using the skills which they have acquired in the previous lesson.
- **Outcome:** Learners report back to the class, sharing their analysis of the cartoons.

### Activity 4 (A4)

In this activity learners were instructed to think of, and then name, five things they *knew* and five things they *did not know* about the content which they had been taught in the course of the term. This activity was done for revision purposes. The learners did this task individually and they could consult the notes on their devices (TLT, IV and CTU). They noted their responses on a piece of paper which they handed to the teacher. Once this activity had been completed, the teacher instructed learners to plan and design a two-minute video which provided definitions and examples of phrases, clauses, transitive and intransitive verbs (MGT). The learners were divided into groups of 5 and could consult past notes and PowerPoint slides (TLT, EL and CTU). The teacher explained that the learners would record the videos in their next lesson and that these videos would then be uploaded onto the Educator’s folder to enable other learners to watch them (MGT, TLT and IG). The learners seemed very hesitant about the activity as their peers were going to watch it, but they did begin to plan. Figure 4.4 places this activity within the activity theory.

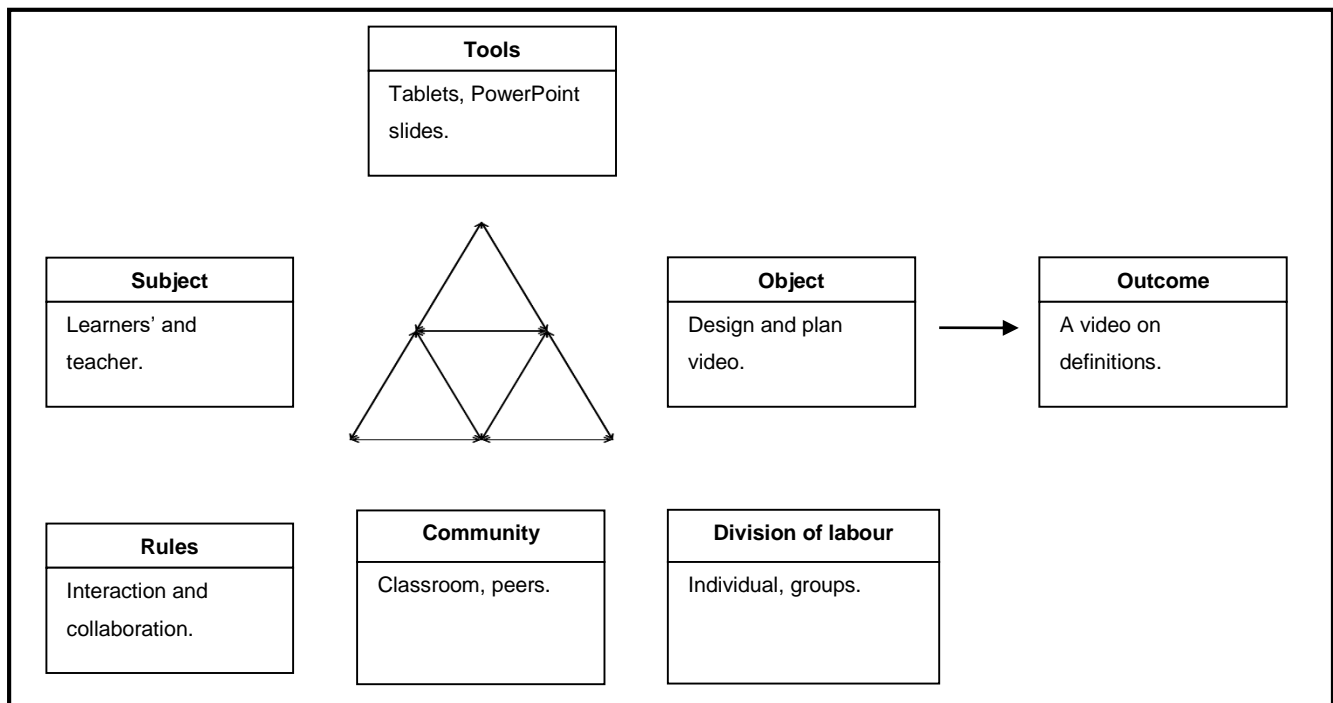


Figure 4.4: School A - Activity 4 (A4)

- **Tools:** Tablets, PowerPoint slides, Educator’s folder.
- **Subject:** Learners and teacher.
- **Rules:** Learners must do a detailed planning of the video before making it. All the members must prepare a section.
- **Community:** The environment in which the activity is being completed is the classroom environment.
- **Division of labour:** Learners are divided into groups of 5 and each member must complete a section of the work towards creating the video.
- **Object:** To plan and design a two-minute video containing definitions and examples of phrases, clauses, transitive and intransitive verbs.
- **Outcome:** A two-minute video from different groups that will be uploaded and could then be accessed by the whole grade.

#### 4.4.4 SCHOOL A OBSERVATIONS SUMMARISED

The table below (q.v. Table 4.6) presents all four activities that were observed and which themes and codes (q.v. 4.3.1) that were identified that they relate to.

**Table 4.6: School A - observed activities summarised**

No.	Theme	Activity 1	Activity 2	Activity 3	Activity 4
1	Teaching and learning technology (TLT)	X	X	X	X
2	Training and workshops (TW)				
3	Integration (IG)	X	X	X	X
4	Strategies not incorporated (SNI)				
5	Difficulty of integration (DI)				
6	Individual view (IV)	X	X		X
7	Enhancement of learning (EL)	X	X	X	X
8	Continuous use (CTU)		X	X	X
9	Different methods (DM)		X		
10	Management (MGT)	X	X	X	X

The table indicates that all School A’s activities (A1 - 4) made use of teaching and learning technology, which would be the tools that were used. The activities also indicated that

integration of the technology was present, whether it was on a basic or high level. In activities 1, 2 and 3 (A 1 - 3) individual work was completed using the technology. In all the activities (A1 - 4) there was an indication that learning was being enhanced with the use of the technology. However, this cannot be said for certain as it was not tested. In activities 2, 3 and 4 (A 2 - 4) it was evident that the technology was used consistently and not just for a specific section of work. In activity 2 (A 2) the technology was used in a different way as the class played an educational game. In all four activities (A 1 - 4) management of the technology was indicated and present. The elements of the activities may not have been present under all the themes, however, there was visibility throughout.

#### 4.4.5 FOCUS GROUP INTERVIEW WITH SCHOOL A

A focus group interview was conducted with 6 learners from School A. The learners' opinions and views on how the technology was being used in their learning, and their teacher's ability to teach, was collected. The interview was conducted with learners of different genders and ethnicities. The data collection instrument that was used can be found in Appendices D. Table 4.7 displays the learners' responses arranged under the indicated themes (q.v. 4.4.6).

**Table 4.7: School A - Focus group responses summarised**

Participants	Individual approach (IV)	Training and workshops (TW)	Enhancement of learning (EL)	Continuous use (CTU)	Different methods (DM)
<b>Learners 1 - 6</b>	<p>Positive view, easy and light weight.</p> <p>Wi-Fi connection outside school is a challenge.</p> <p>Content can be wiped off, and there is low storage.</p> <p>Previous textbooks return on device.</p>	<p>No training was conducted.</p> <p>Learners were just shown how to use the technology and software.</p> <p>Posters placed around the school.</p>	<p>MT does not enhance learning.</p> <p>Can be distracting for learners with ADHD.</p> <p>Can be visually straining.</p> <p>Some learners prefer textbooks.</p> <p>When writing tests in class the Wi-Fi does not always connect.</p>	<p>Games, like Kahoot, are played after sections of work (MGT).</p> <p>MT not used in all activities but is used most of the time.</p>	<p>Access to different websites as Wi-Fi blocks them.</p> <p>Two-in-one devices restrict sending content over ITSI platform.</p>

Section 4.4.6 presents an in-depth discussion of the elements listed in Table 4.7. The discussion will be completed in correlation to the themes that came up during the focus group discussion.

## 4.4.6 SCHOOL A - FOCUS GROUP RESPONSES DISCUSSED

### 4.4.6.1 INDIVIDUAL VIEW (IV)

Most of the learners were positive regarding the use of MT. They commented that it was very convenient and easy to carry around (*SAL5: “The most convenient part is that you can carry it around, and you don’t have to carry textbooks”*). However, they did indicate that it could be frustrating if it gets broken or if there is no internet connection (*SAL4: “I think it is very convenient, however sometimes it can be a hassle”*). They noted that information could get wiped off or deleted while studying for a big exam and that storage on the device could be a problem.

### 4.4.6.2 TRAINING AND WORKSHOPS (TW)

In terms of training, most learners stated that they had not received any formal training, posters were put up around the school and in classrooms (*SAL2: “They just have these posters against the wall”*) that explained how to download apps (*SAL6: “They show you how to download the app”*). Learners noted that the use of the technology was straight forward for them. They had not been shown by anyone (including their teachers) how to use the technology to its fullest potential. They basically obtained their skills by exploring the technology. If there was a certain application that the teacher wished them to use, then he/she would show the learners how to use it.

### 4.4.6.3 ENHANCEMENT OF LEARNING (EL)

Most of the learners indicated that the new way of learning (using MT) does not enhance learning because you can become distracted easily (*SAL4: “Yes and no, if you have games you can easily get distracted”*). One learner indicated that she has ADHD and that it was very difficult for her to concentrate in general and therefore she struggled even more with MT (*SAL1: “Especially if you have ADHD, I have ADHD for one and I get easily distracted if I’m studying and I hear a noise then I just go out and play a game”*). Some of the learners stated that the constant use of the technology could be visually taxing and that they had to wear reading glasses. Furthermore, some learners said that using a textbook might be better as you can

make notes in it. The negative aspect is that the textbooks are heavy, and the learners can hurt their backs carrying heavy bags (SAL2: *“I feel textbooks would be better, I know it’s heavier but it’s safer. When you’re studying in class you can make notes in the textbook”*). The learners indicated that hardcopy textbooks and tablets both have pros and cons. Furthermore, the learners indicated that the Wi-Fi was also problematic as it sometimes did not connect (SAL1: *“And the Wi-Fi does not connect sometimes”*) and this was a problem when you were writing a test, or you needed to access your textbooks, or notes, quickly.

#### **4.4.6.4 CONTINUOUS USE OF TECHNOLOGY (CTU)**

Most of the learners stated that the tablets are used for activities like Kahoot (SAL1: *“Kahoot helps a lot”*), which is a website where you can generate multiple choice questions based on a topic. All the learners can access the website and take part in answering the questions from their tablets. One learner indicated that you can take pictures (SAL4: *“Take pictures when you’re feeling a bit lazy”*) and that they write tests on the tablets (SAL6: *“Sometimes we write tests, tests on the tablets, it’s nice but at times its harder because some don’t have connection and can’t write the test. But some teachers have hard copies”*). They noted that even though the tablets are not always used in all classroom activities, they are used most of the time.

#### **4.4.6.5 DIFFERENT METHODS (DM)**

In terms of using the technology in different ways, the learners stated that they wished that the Wi-Fi did not block so many websites as they cannot access many of the necessary websites, (SAL2: *“put a little more leniency on Google, the only site that works is Wikipedia”*). They noted that when they are instructed to do some research, they cannot access the necessary information. They also explained that the two-in-one devices could not send things via the ITS I software (SAL4: *“especially with the two-in-one devices that we have, you actually have to go to the app store to download you can’t send it”*). You need to return to the app store and resend it. The previous year’s content also resurfaces on their devices and this limits space.



#### 4.4.7 SCHOOL A MANAGEMENT (MGT) OF MOBILE TECHNOLOGY (MT)

The table below (q.v. Table 4.8) presents School A's management of different activities using MT. The data collection instrument, from which the management of the activities originated, is also indicated. A further explanation of the table follows. These management skills, or techniques, were derived from the interviews, observations and focus group as it was not dealt with as a separate entity in the data collection instruments but was integrated in all responses.

**Table 4.8: School A - Management of mobile technology**

School	Management	Data collection instrument		
		Interviews	Observations	Focus group
School A	Assignments submitted online	X		
	Content pushed to devices	X	X	
	Online dictionary used	X	X	
	Videos used and created	X	X	
	PowerPoints presented on overhead projector		X	
	Educational games played on devices		X	X
	Content readily available on devices		X	
	Research work		X	

The table above (q.v. Table 4.8) indicates that School A manages activities that use MT in a variety of ways. The school stated that they submitted assignments online. They also push content to learners' devices so that documents do not have to be printed. They have access to the online dictionary and this prevents learners from having to fetch hard copy dictionaries. Learners were also expected to create videos with their devices. Presentations, using PowerPoint and the overhead projector, were used in the classroom. Educational games, like Kahoot, were played after certain sections of work had been completed. Content was readily available on the learners' devices in class, and at home, and learners did research work on their devices.

## 4.5 SCHOOL B RESULTS

School B is a private school which forms part of a church. The school was started by the church 17 to 19 years ago but only joined a group of private schools in 2014. In 2015 it became part of the ADvTECH group of schools. The school is Christian centred and forms part of the second largest private school grouping in South Africa. A variety of sport and cultural activities are on offer and the school is fully equipped with teaching and learning materials. The results attained from School B will be discussed in the following sections, starting with the interviews (q.v. 4.5.1).

### 4.5.1 INTERVIEWS

The table below (q.v. Table 4.9) presents School B's staff participant responses to interview questions (as included in Appendices A and B) in accordance with the discussed themes (q.v. 4.5.2).

**Table 4.9: School B - Interview responses summarised**

<b>Participants</b>	<b>Teaching and learning technology (TLT)</b>	<b>Training and workshops (TW)</b>	<b>Integration (IG)</b>	<b>Strategies not incorporated (SNI)</b>	<b>Difficulty of integration (DI)</b>
<b>Principal</b>	Hardware: laptops, tablets, iPad, Apple TVs and data projectors.  Software: ITS!, miEbooks, Wi-Fi.	Change Management Consultant (MGT).	Research work (MGT).  Textbooks, diaries and timetables are available on devices (MGT).	Assessment	More difficult to integrate technology in the English class.  Not as visually stimulating as Science and Geography.
<b>IT specialist</b>	Hardware: laptops, tablets, iPad, Apple TVs and data projectors.	Holds weekly training and workshops at school every Thursday (MGT).	Research work (MGT).  Textbooks, diaries and timetables are	Assessment not fully incorporated.	More difficult to integrate technology into the English class.

	Software: ITSI, miEbooks, Educator's folder.		available on devices (MGT).  Drop box folders used (MGT).		
<b>English teacher</b>	Hardware: laptops, tablets, iPad, Apple TVs and data projectors.  Software: ITSI, miEbooks, Wi-Fi and Google Drive.	Was one of three "Tablet Champions" who received basic training?	Textbooks, Research work, diaries and timetables are available on devices (MGT).  URLs, video and notes pushed to tablets.  Kahoot is played at the end of sections.  Google docs used (MGT).  Share notes on Evernote or Google Drive (MGT).  Animoto video editor application used (MGT).	Assessment.  Responsibility should be given to learners to innovate new learning methods.	In English there are important skills that need to be learnt. Teacher indicated that she had instructed learners to make videos.

The table above (q.v. Table 4.9) summarises the interview responses which are discussed in detail in section 4.5.2.

## 4.5.2 SCHOOL B INTERVIEW RESPONSES DISCUSSED

### 4.5.2.1 TEACHING AND LEARNING TECHNOLOGY (TLT)

The participants in School B indicated that they used laptops, tablets, iPads, Apple TVs and data projectors as hardware (*SBP: "Mobile uhm, its laptops, iPad, tablets and we have got Apple tv's in the classes with the data projectors"*). All teachers are provided with laptops and learners have tablets. The school has a loan system for a duration of two weeks should a learner's tablet break. All classrooms are equipped with data projectors, but only some of the classrooms are equipped with Apple TVs.

The software used is ITSI, miEbooks, Wi-Fi and Google Drive (*SBT: "tablets, Wi-Fi access, ITSI, Google drive"*). ITSI is the software, which was discussed previously, and which is also used in School A. Information Technology School Innovation makes use of interactive eBooks that learners can use during school, and at home. It has functions that allow teachers to upload content, like notes and past exam papers, and to then push the content to the learners' tablets (*SBITS: "we load resources so everything in the past that we would have printed out and given to the learners, notes or old papers or anything we load on their devices in what we call an educators folder"*). Users must create an account which they can then access from other devices.

### 4.5.2.2 TRAINING AND WORKSHOPS (TW)

The principal of School B stated that they worked with Change Management Consultants who helped them transition from hardcopy textbooks to electronic textbooks (*SBP: "Ok we first started with the Change Management, Change Management Consultant with the school. They took us through the whole process of moving from hard copy textbooks"*). The learners and teachers received a few training sessions. The English teacher indicated that she was one of three "Tablet Champions" and that they had gone through basic training (*SBT: "I was 1 of 3 Tablet Champions and we were given basic training"*). Furthermore, new ways of integrating technology would be communicated to other colleagues.

The IT specialist indicated that she holds weekly training sessions and workshops at school. In these sessions, held every Thursday, she shows teachers new and different ways of integrating the technology (*SBITS: “the Thursday morning trainings”*). She also indicated that there is a buddy system whereby every new learner visits the IT specialist. The English teacher stated that there are workshops called mobilelearn (*SBT: “There are “workshops” called Mobilelearn. These sessions are a short contact period in which teachers can learn from one another and share success/failure stories”*), and the principal has indicated that the school sometimes does attend Apple workshops in Johannesburg. The training and workshops help in finding and integrating innovative ways to use MT.

#### **4.5.2.3 INTEGRATION (IG)**

All participants agreed that learners use the technology to access their textbooks, but there are other ways in which they use them as well including research, accessing diaries and timetables (*SBP: “All their textbooks, all their timetables, their diaries, their homework on it, their memorandums, and their exams are on it so they’re using it fulltime”*). The English teacher indicated that she pushes content like URLs, videos and notes to learners’ tablets (*SBT: “I make use of ITSI to “push” content to the learners’ tablets”*).

The teacher and IT specialist noted that Kahoot (*SBITS: “Kahoot is a quiz programme”*) is played at the end of sections to test learners’ knowledge. Google Docs is also used for collaborative essay writing. In terms of integration *outside* the classroom, the participants indicated that learners can access content and share notes on Evernote or Google Drive (*SBT: “Many learners are expected to annotate and share notes with study-group participants by using cloud-based tools such as Evernote and Google Drive”*). Homework is posted on the ITSI platform. Learners may be instructed to make videos of presentations, make voice recordings of discussions and read aloud for fluency tests (*SBT: “...have learners create videos using the Animoto app, record group discussions using a voice recording app and have learners record themselves reading aloud for fluency checks”*). These recordings can later be posted on the ITSI programme and will then be available to the whole grade. The IT teacher also indicated that she created a drop box folder (*SBITS: “...with my IT learners I’ve created a drop box folder for every grade, then for every student”*) which allows her to share databases with the learners.

#### **4.5.2.4 STRATEGIES NOT INCORPORATED (SNI)**

The principal of School B stated that assessment using MT is still a dream (*SBP: “Assessments are still a dream, but we started now we are busy with a few assessments we wish we could go paperless with our assessments”*). They wish that they could integrate the assessment fully as Matriculants need to be prepared for their final exams. The English teacher added that educators need to place more responsibility on learners to initiate, and innovate, new ways of learning for themselves. Teachers should stop forcing technology into the classroom and allow learners to bring technology into the classroom themselves (*SBT: “I do feel that as educators we need to pass the responsibility onto our learners a little more. We need to trust that they will take responsibility for their learning”*).

#### **4.5.2.5 DIFFICULTY OF INTEGRATION (DI)**

The participants have indicated that it is more difficult to integrate technology into the English class because a lot of thought must go into making the content exciting. The principal indicated that it may not be as visually stimulating as subjects like Science and Geography (*SBP: “I think it’s not such a visual subject with proverbs and graphs, creative and colourful, with other subjects theirs video clips for different things”*). The English teacher indicated that she tries to incorporate technology, for example instructing the learners to make videos on poetry readings, which can then later be posted so that all the learners in the Grade can gain a deeper understanding of the poem being studied (*SBT: “I get pupils to annotate and record poetry readings of prescribed poetry and then share it with the entire grade so that all learners can get a better understanding of the poems being studied”*). They also agreed that, as languages in general require more written work, the technology cannot be used *more* than, or *in place of*, writing. The IT specialist stated that some teachers may have a mental block when it comes to integrating technology into their subjects.

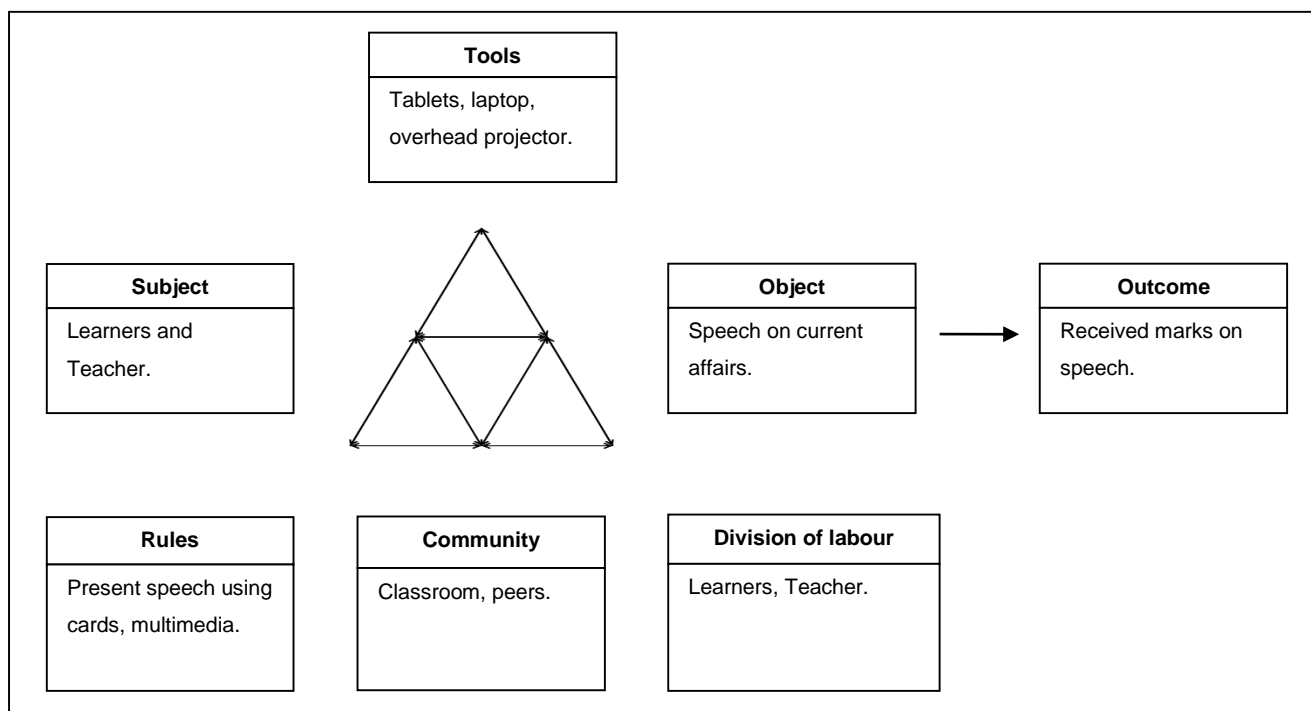
### **4.5.3 SCHOOL B OBSERVATION OF ACTIVITIES**

The results of these observations are presented in figure format. There are four figures which indicate what type of activities happened in the classroom. The model used to present the data,

garnered from the observations, is the activity theory which was discussed in Chapter 3 (q.v. section 3.8.2).

### Activity 1 (B1)

In the first activity observed in School B the learners had to present speeches which they had to prepare based on current affairs (IV). The learners had to choose a topic and report on it as if they were reporting the news. The teacher indicated that the learners had to use some form of multimedia to present their topic to obtain marks (MGT, TLT, IG and DM). The learners could either use their tablets, or the teacher’s laptop, which was connected to the data projector (MGT and TLT). Most of the learners had their speeches prepared and presented them with the help of various multimedia. There were a few learners who had not prepared their topics in time and who asked permission to present the next day. The teacher did not choose learners to present their work in alphabetical order but asked the last speaker to pick a number and row to thus determine who would present next. Figure 4.5 presents the activity within the activity theory.



**Figure 4.5: School B - Activity 1 (B1)**

- **Tools:** Tablets, laptop, overhead projector, videos, photos.
- **Subject:** Learners and the teacher.
- **Rules:** Learners must complete their live report speech using cards along with some form of multimedia.
- **Community:** The activity is carried out in the classroom environment.
- **Division of labour:** The learners need to present their speeches based on reporting on current affairs. The teacher allocates marks to the learners.
- **Object:** To present a speech based on reporting about current affairs.
- **Outcome:** Learners present their speeches using multimedia.

### **Activity 2 (B2)**

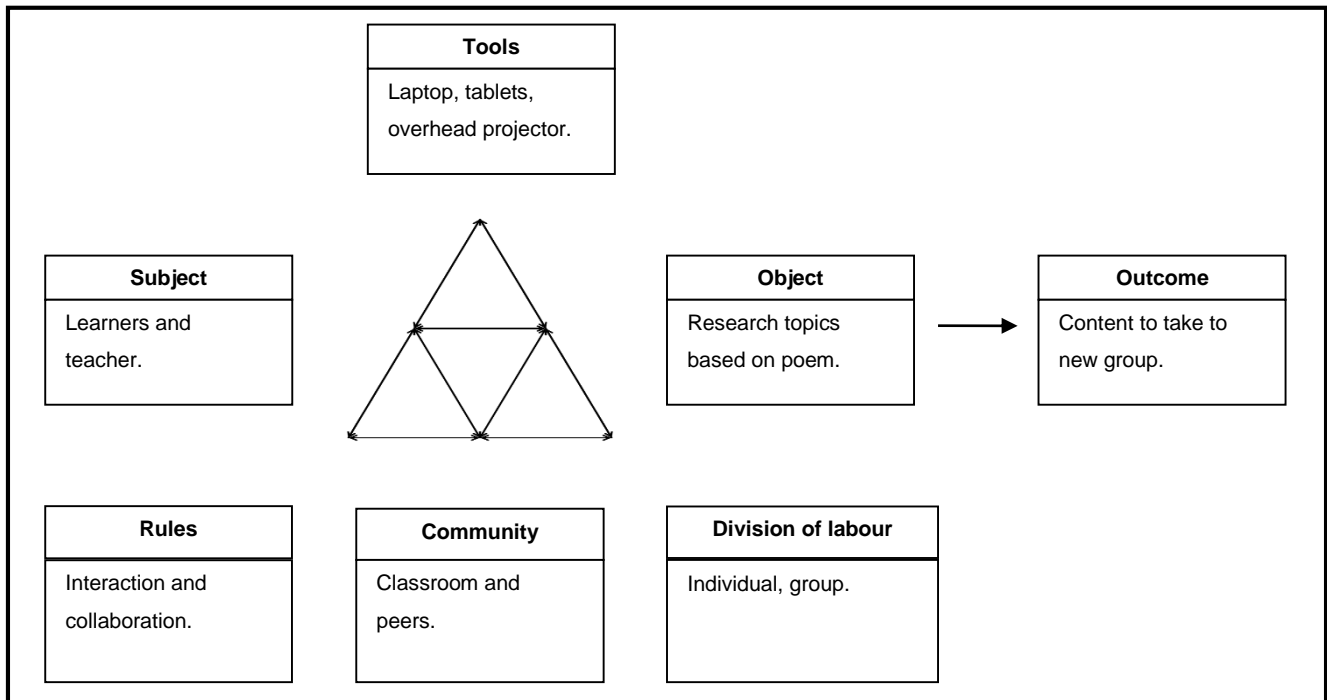
The second activity observed was a poetry lesson. The poem was “Do not go into that good night” by Dylan Thomas. The learners received paper-based handouts of the poem and were instructed to research (MGT and EL) the following, in groups of four:

- Group 1 researched the background of the poet, Dylan Thomas.
- Group 2 researched what a dramatic monologue was.
- Group 3 researched the meaning of the word “villanelle”.
- Group 4 looked at the diction in the poem.

The learners could conduct the research using their tablets and each group member would have the same information at the end of the session (TLT and IG). Once the learners had completed this task, the teacher played three videos showing people recite the poem (MGT and DM). The first clip was from a movie, the second from YouTube and the third person was the poet himself (TLT).

After having viewed the videos, the learners seemed to have gained a different perspective to the poem, as opposed to having the teacher go through the poem line for line. The teacher thus discovered a different way of teaching and analysing the poem. Figure 4.6 places the activity within the activity theory.





**Figure 4.6: School B - Activity 2 (B2)**

- **Tools:** Laptop, tablets, overhead projector, PowerPoint presentation, videos.
- **Subject:** Learners and teachers.
- **Rules:** Groups had to research different topics, but each learner in the group had to have the same information in the end.
- **Community:** The activity was completed in the classroom environment.
- **Division of labour:** Each member of a specific group shared the same topic, but each group was assigned a different topic so that, in the end of the lesson, each member had the same information to share with the next group.
- **Object:** Learners needed to research different topics, in groups of 4 to 6, based on the poem “Do not go into that good night” by Dylan Thomas. Each group receives one topic. The learners then watched three different versions of the poem being recited.
- **Outcome:** Every learner had information to take to a new group for the next lesson.

### Activity 3 (B3)

The third activity was a continuation of the previous activity which was the poetry lesson. In the previous activity there were four groups of learners, with 4 or 5 per group, researching different topics related to the poem and poet. On entering the class, the learners were placed into new groups, except for one member from each of the previous groups. The reasoning behind this is that the *old* member in the new group would have mastered the topic, this is called *jigsaw learning* (EL and DM). Every member (IV) depends on the other members to succeed. Once the learners entered the classroom the teacher explained that the groups had to design a mind map containing all four topics and using their notes. The teacher also indicated that she would take photos of the mind maps and post them on the Educator's folder for the whole grade to access and to learn from (MGT, TLT, IG and CTU). In Figure 4.7 the activity has been placed within the activity theory.

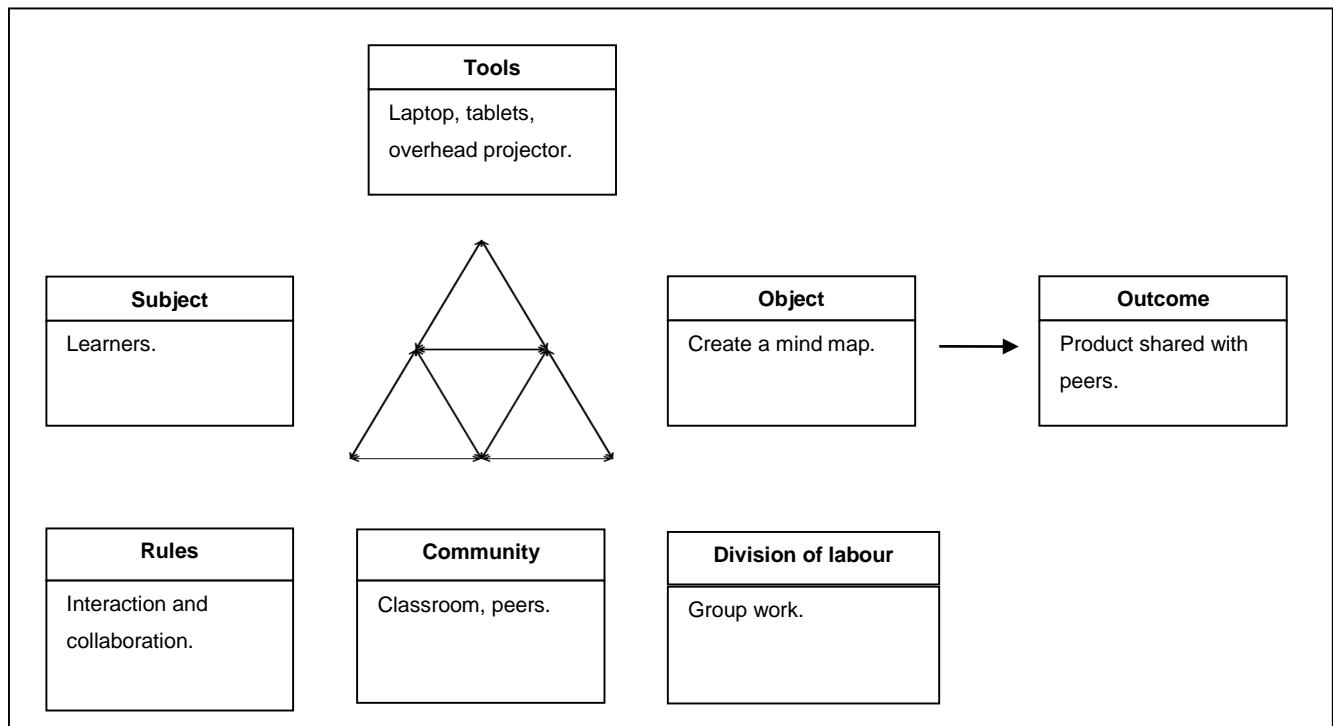
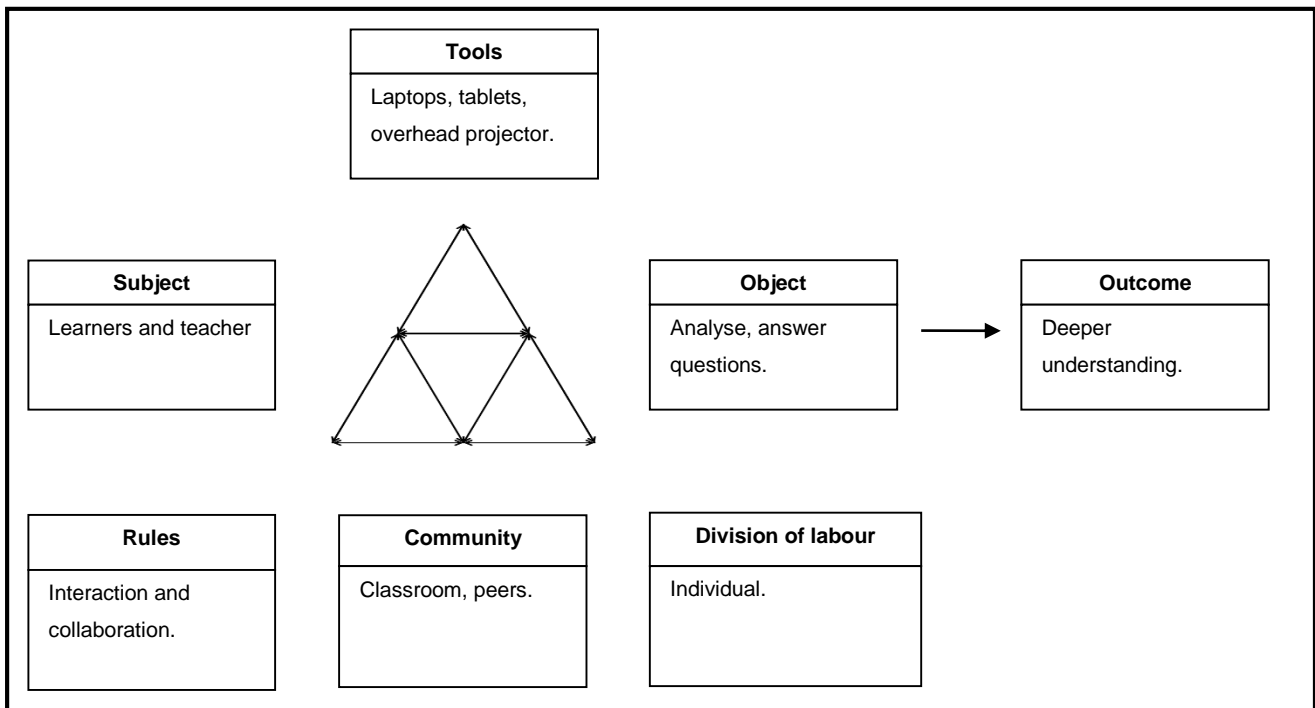


Figure 4.7: School B - Activity 3 (B3)

- **Tools:** Laptop, tablets, data projector, pictures.
- **Subject:** Learners.
- **Rules:** The new learner to the group shares the information he/she received from their previous group with their new group.
- **Community:** The environment in which the activity is completed is the classroom.
- **Division of labour:** All members in the group need to write down the information which they had researched in the previous group on their mind map.
- **Object:** The object of the lesson is for learners to create a mind map based on all four the topics from the poem “Do not go into that good night” by Dylan Thomas.
- **Outcome:** Once the mind maps are created, the teacher will take a photo of each of them and upload it onto the Educator’s folder for all learners to access.

#### **Activity 4 (B4)**

In this activity learners were required to answer questions based on the poem from the previous two lessons, “Do not go into that good night” by Dylan Thomas. The learners were assigned a homework task. They were to watch videos and access links placed on the Educator’s folder and then answer questions (MGT TLT and EL). If the learners had not/could not watch the videos at home, they were given the opportunity to do so in class (IG). With all the information that they gained from the previous activities the learners could analyse the poem on their own and answer the questions (IV). The teacher displayed the questions on the overhead projector and the learners could use the online dictionary if they needed to (MGT). Figure 4.8 illustrates the placement of the activity within the activity theory.



**Figure 4.8: School B - Activity 4 (B4)**

- **Tools:** Laptops, tablets, overhead projector, Educator’s folder, PowerPoint slides
- **Subject:** Learners and teacher.
- **Rules:** Learners need to use all the information that they have gained from the previous lessons to answer question based on the poem.
- **Community:** The environment in which the activity is being completed in is the classroom.
- **Division of labour:** Learners work individually as they need to analyse the poem and answer questions.
- **Object:** The object of the lesson is for learners to analyse the poem by Dylan Thomas and answer the questions.
- **Outcome:** Learners answer the questions based on the poem and gain a deeper understanding of the poem.

#### 4.5.4 SCHOOL B OBSERVATIONS SUMMARISED

The table below (q.v. Table 4.10) presents all four activities that were observed and which themes and codes (q.v. 4.3.1) that were identified that they relate to.

**Table 4.10: School B - observations summarised**

No.	Theme	Activity 1	Activity 2	Activity 3	Activity 4
1	Teaching and learning technology (TLT)	X	X	X	X
2	Training and workshops (TW)				
3	Integration (IG)	X	X	X	X
4	Strategies not incorporated (SNI)				
5	Difficulty of integration (DI)				
6	Individual view (IV)	X		X	X
7	Enhancement of learning (EL)		X	X	X
8	Continuous use (CTU)	X		X	
9	Different methods (DM)	X	X	X	
10	Management (MGT)	X	X	X	X

Table 4.10 indicates that all activities (B1 - 4) made use of technology for teaching and learning. The integration of the technology was also evident in all four activities. In terms of the individual view, only activities 1, 3 and 4 (B1, 3 - 4) clearly indicated that an individual perspective and participation was present. In activities 2, 3 and 4 (B 2 - 4) there was an indication that the MT was used in an enhanced way in terms of learning. Only in activities 1 and 3 (B1, 3) was it evident that the technology was used more than once during an activity. Different methods of technology use were evident in activities 1, 2 and 3 (B 1 - 3). Furthermore, in all activities (B1 - 4) management of the MT was present.

#### 4.5.5 SCHOOL B FOCUS GROUP INTERVIEW

A focus group interview was conducted with 6 learners in School B. The learners' opinions and views regarding the use of technology in their learning, and their teachers' teaching, were collected. The interview was conducted with learners of different genders and ethnicities. The data collection instrument that was used can be found in Appendices D. The table below (q.v. Table 4.11) indicates the learners' responses followed by a detailed explanation of the responses.

**Table 4.11: School B - Focus group interview responses summarised**

Participants	Individual view (IV)	Training and workshops (TW)	Enhancement of learning (EL)	Continuous use (CTU)	Different methods (DM)
<b>Learners 1 - 6</b>	<p>Convenient and nice. Textbooks are all in one place.</p> <p>Some prefer hard copy textbooks.</p>	<p>Did not receive in-depth training of how to use the technology.</p> <p>Shown how to use applications.</p>	<p>Can be very distracting during class time.</p> <p>Learners may do other things, such as play games or connect to the internet.</p> <p>Technology has helped in terms of delivery of lessons.</p> <p>You must search for content instead of flipping through pages.</p>	<p>They use the technology in different ways, for activities and studying.</p> <p>Orals and speeches are done on the devices.</p> <p>Notes are not printed, this saves paper (MGT).</p> <p>Devices are also used for exams (MGT).</p>	<p>3D printers can be incorporated.</p> <p>Applications that scan something and bring it to life.</p>

## 4.5.6 SCHOOL B FOCUS GROUP RESPONSES DISCUSSED

### 4.5.6.1 INDIVIDUAL VIEW (IV)

The learners in School B agreed that the use of MT is enjoyable and convenient when it comes to textbooks as you can have all of them in one place and it does not make your bag heavy (*SBL4: “Well I find it a lot easier than using textbooks to study because you have all of your textbooks in one device it makes it a lot easier when carrying books around at school”*). Also, you cannot use the excuse that you left your textbook at home. However, one student indicated that the technology is good, and you can Google, but that she preferred hardcopy textbooks (*SBL6: “...with mobile technology I would rather choose textbooks, mobile technology is nice and everything and you can google, but I like the textbooks more”*).

### 4.5.6.2 TRAINING AND WORKSHOPS (TW)

Most of the learners have indicated that they did not receive in-depth training regarding the use of the technology (*SBL4: “...they did show us how to use the different apps, they have given us, it’s not training but they have given us a brief overview of how to use it”*). They stated that the school only showed them how to use the apps (*SBL3: “I think the same with us most of us knew how to do it before we just had to learn a little bit more on how to use specific textbooks”*). Even though majority of them indicated that they already knew how to use the technology, training can always assist with effective use.

### 4.5.6.3 ENHANCEMENT OF LEARNING (EL)

All the participants agreed that MT could be very distracting during class as learners may do other things, such as play games or go on the internet, instead of completing their work (*SBL1: “...when you learn in class the majority of things people do on the tablets is play games or do other things on the internet”*). However, some learners indicated that the use of the technology has helped in terms of delivery of lessons as teachers can, for example make PowerPoint slides and use the overhead projector. One learners said that she preferred textbooks as you can make notes. She added that, with the use of MT, if you did not have access to Wi-Fi then you could not access textbooks and slides (*SBL6: “If the Wi-Fi is not on at school then or at home*

*then you can't get the stuff to study*"). Another learner argued that you could access notes, you just could not download new content (*SBL4: "...said if you don't have Wi-Fi you can't download new sources, you can access all your books at your resources your memorandums and everything*").

They also indicated that textbooks take up a lot of space on the desk while the technology does not take up so much space (*SBL3: "...with the iPad you can just put it there and have space for your pencil case, it takes up a lot less space in your bag as well*"). They added that with the textbook you could just flip pages to find what you are looking for but with the technology you must scroll to search for what you want (*SBL4: "...there is not enough space for a hardcopy textbook and with the device when it's in front of you concentrate on it. And you can look up you don't have to page through you just scroll*"). Furthermore, they said that learning to navigate the technology would help when they attended university, although they would use conventional textbooks as well.

#### **4.5.6.4 CONTINUOUS USE (CTU)**

The participants stated that they use the technology in different ways, to complete activities and for studying. In terms of lessons, the use of technology helps to make lessons more interesting as it grabs your attention. Furthermore, because they use Apple TVs, the visuals are more enhanced, and many more activities can be done (*SBL3: "I find it a lot easier, in a sense a bit more professional if we do projects and stuff we can use the Apple TV or put it on the projector*"). They also indicated that the use of MT helps to save paper as notes are not be printed (*SBL4: "...with being able to do projects and speeches, its saving the environment*"). In addition, orals and speeches can be done on the tablet which affords learners more freedom and allow them to be creative. The technology is also used for exams. The teacher facilitating the exam can see whether learners are accessing their notes, or textbooks, for research purposes. For example, in their technology exam they had to complete a live research exam.



#### 4.5.6.5 DIFFERENT METHODS (DM)

One learner indicated that 3D printers could be incorporated where you can design different objects and then print them (SBL4: *“What you can do is you can download an app on your device, then you can design whatever you want to design. You can design a squared block and connect your device to the 3D printer and it”*). There are also apps with which you can scan an object on paper and it then brings the object to life (SBL6: *“In the Physics class they put a skeleton out and you just download this app, you hold your tablet over it and it brings it to life”*). Most of the learners are aware of this app and felt that it could be incorporated in other subjects, not just Physics.

#### 4.5.7 SCHOOL B MANAGEMENT (MGT) OF MOBILE TECHNOLOGY (MT)

Table 4.12 presents a summary of School B’s management of the MT as indicated by the interviews, observation and focus group data collection instruments.

**Table 4.12: School B - Management of mobile technology**

School	Management	Data collection instrument		
		Interview	Observation	Focus group
School B	Consultants assisted in integrating technology	X		
	Constant training of new methods	X		
	Diaries and timetables available on devices	X		
	Research work completed on devices	X	X	
	URLs and notes pushed to devices	X	X	
	Video editor used for created videos	X		
	Multimedia used in presentations		X	
	Resources used in presentations	X	X	
	Videos played and available on devices		X	
	Notes not printed, accessed on devices	X	X	X
	Devices used for exams			X
	Educational games played	X		
	Notes shared over different applications	X		

School B indicated that they used a consultant which helped them integrate and manage the transition to MT. They further indicated that they have weekly training sessions on different and

new aspects of MT. Diaries and timetables were used on the devices to manage time and activities. Research work could be completed on the devices. Different content was pushed to learners' devices to be viewed at any time. Multimedia and resources were used in presentations. Videos were created and used in activities and notes were not printed and this saved paper. The devices were also used for exam purposes, to play educational games and to share notes via different applications.

## **4.6 CONCLUSION**

In this chapter the collected data was presented and discussed. The results, obtained from the two schools, were presented in a case study format. The interviews, observations and focus group interviews were presented in a table and then the two schools were discussed separately. Observations were presented in a figure format and the activity theory was used to analyse the activities. The theme management of both schools was discussed separately. Chapter 5 will continue and complete the comparison of the two schools, the research questions will be discussed, and conclusions of the results and the study will be drawn. The exceptions, recommendations, limitations, proposed new research and final conclusions will also be presented.

## **5. Chapter 5: Findings and conclusions**

### **5.1 INTRODUCTION**

In the previous chapter, data collection was presented and discussed. The data from the interviews, observations and focus group interviews from School A and B were presented in a case study format. In this chapter the findings of the results will be discussed, and the research questions will be answered. Final conclusions will also be drawn. An indication as to whether, or not, the research questions had been answered will also be given. Furthermore, exceptions, shortcomings or limitations of the research will be discussed. Recommendations to individuals who may be affected by the study will be done and the benefits of the research, to the field of study, will be stated. In conclusion, thoughts regarding whether the research could be continued, as well as possible future focus areas, will be shared.

### **5.2 COMPARING CASES A AND B**

In this chapter the findings from both schools' interviews with the participants, as well as focus group interviews with the learners, will be compared in table format. The activities observed during the data collection process were analysed using the activity theory and, in this chapter, they were placed within the conceptual framework, which is a combination of the Revised Bloom's Taxonomy (q.v. 2.9.2) and the SAMR model (q.v. 2.9.1). This framework is used to indicate the conceptual level of the activities together with the use of the MT. Both schools' activities are placed on the framework and this will aid in the discussion of the results and the answering of the research questions.

#### **5.2.1 INTERVIEWS**

Table 5.1 presents the data that was collected from the principals, IT specialist and English teachers. The two schools have been placed next to each other to easier indicate the frequency of the topic under each theme. Which theme correlates with which secondary research question is also indicated. Furthermore, an explanation of the table is also included to enhance clarity. A more detailed explanation of the participants' responses can be found in Chapter 4 (q.v. 4.4.1 and 4.5.1).

**Table 5.1 Interviews**

<b>Theme</b>	<b>School A</b>	<b>School B</b>	<b>Frequency</b>	<b>Research question</b>
<b>a) Teaching and Learning technology (TLT)</b>	Device: Tablets	Device: Tablets	<b>5</b>	<b>RQ 1</b>
	Device: Laptop	Device: Laptop	<b>5</b>	
	Device: Data projectors	Device: Data projectors	<b>5</b>	
		Device: iPad	<b>1</b>	
		Device: Apple TVs	<b>2</b>	
	Service provider: ITSi	Service provider: ITSi	<b>5</b>	
	Content: miEbooks	Content: miEbooks	<b>5</b>	
	Pushing: Educator's folder	Pushing: Educator's folder	<b>5</b>	
		Service provider: Wi-Fi	<b>1</b>	
		Collaboration: Google drive	<b>1</b>	
<b>b) Training and workshops (TW)</b>	Subject camps, training and workshops		<b>2</b>	<b>RQ 1</b>
		Change Management Consultant helped in transition	<b>1</b>	
		Weekly training and workshops	<b>2</b>	
<b>c) Integration (IG)</b>	Content: YouTube		<b>1</b>	<b>RQ 1 and 2</b>
	Communication: WhatsApp		<b>2</b>	
	Assessment: Assignments online		<b>1</b>	
	Pushing: Content pushed to tablets	Pushing: URLs, video and notes pushed to tablets	<b>2</b>	
	Content: Online dictionary		<b>1</b>	
		Content: Textbooks	<b>1</b>	
		Research work: Search engines	<b>1</b>	
		Time Management: Diaries and timetables	<b>1</b>	

Theme	School A	School B	Frequency	Research question
		Assessment: Kahoot	1	
		Editing: Google docs	1	
		Sharing: Evernote	1	
		Collaboration: Google Drive	1	
		Editing: Animoto		
		Assessment: Drop box folders		
<b>d) Strategies not integrated (SNI)</b>	Assessment.	Assessment	5	<b>RQ 1 and 2</b>
	Service provider: ITSI incorporated better		1	
	Educational technology: Edmodo		1	
	Online classes		1	
		Responsibility put on learners to initiate new learning methods	1	
<b>e) Difficulty of integration (DI)</b>	English writing is an important skill		5	<b>RQ 1 and 2</b>
		English not as visually stimulating as Science and Geography		

A discussion, and comparison, of the two schools' interview results, as indicated in Table 5.1, follows. The discussion will be in accordance with the themes presented in Table 5.1.

### **a) TEACHING AND LEARNING TECHNOLOGY**

MT is very light weight, easy to use, portable, affordable and user friendly (Kim et al., 2011). Both the observed schools indicated that they use MT and general technology *hardware* (laptops, tablets, data projectors, Apple TVs in some classrooms in School B) and *software* (ITSI, miEbooks and Educator's folder).

### **b) TRAINING AND WORKSHOPS**

Even though both schools indicated that they did not receive in-depth training on how the technology can be used, they both seemed to have a general understanding of the technology and workshops were continually held. School A is a part of a company which offers subject camps to assist in the integration of the technology in different subjects while School B's IT specialist holds weekly training sessions for their teachers.

### **c) INTEGRATION**

Both schools have indicated that the MT is used for activities, inside *and* outside the classroom. The technology is not just used to access textbooks, but they indicated that they use it for different types of notes and PowerPoint slides. YouTube videos are also shown in the classroom and pushed to learners' devices.

### **d) STRATEGIES NOT INCORPORATED**

Both schools use Kahoot, a website that allows teachers to create multiple choice questions based on a topic. The learners can then access and answer the questions while the results can be viewed by all participants. This website is usually used after a certain topic, or activity, has been concluded. School A stated that some of their teachers have created WhatsApp groups and Twitter accounts for their learners so, if they experience difficulties with the work at home, they could contact them. School B has indicated that learners also upload and share content on Google Drive.

### **e) DIFFICULTY OF INTEGRATION**

Both schools feel as if they could integrate the technology *more* in terms of assessment. They would prefer that their assessment was fully electronic, and they are working towards this goal. The English teacher in School A felt that ITSI could be better incorporated. Furthermore, School B noted that English may not be as visually stimulating as other subjects.

### **5.2.2 OBSERVATIONS**

Table 5.2 provides the conceptual framework which was created. A full description of this framework can be found in Chapter 2 (q.v. 2.11). This table places the two four activities, as observed in the two schools, based on their cognitive and knowledge dimensions. Furthermore, the level on which the technology was used in the activity is also indicated. The reasons *why* each activity is placed in its position is indicated after the framework. A complete discussion of the different activities can be found in Chapter 4 (q.v. 4.4.3 and 4.5.3).

The activities were analysed using the activity theory, whilst focusing on cognition and integration of the different activities. Furthermore, *within* the newly created conceptual framework (a combination of the SAMR model [q.v. 2.9.1 and Figure 2.2] and the Revised Bloom's Taxonomy [q.v. 2.9.2 and Table 2.1] the activities were placed in accordance with their level (q.v. Table 5.2).

**Table 5.2: Observations**

<b>Knowledge Dimension</b>	Meta-cognitive						
	Procedural			<b>II. B1: Modify</b>	<b>IV. A3: Augment  B2: Modify  B4: Augment</b>		<b>V. A4: Augment  B3: Augment</b>
	Conceptual		<b>I. A2: Augment</b>	<b>III. A1: Augment</b>			
	Factual						
		Remember	Understand	Apply	Analyse	Evaluate	Create
	<b>Cognitive Process Dimension</b>						

A discussion follows as to *why* the activities were placed in certain positions as based on their cognitive and integration level. The activities are discussed according to the section they resort under. These activities could not be compared based on content, but they were compared based on their levels of cognition and integration.



- I. **A2** - The second activity observed in School A was cartoon studies (q.v. Figure 4.2). This activity was placed on the conceptual and understanding level. The learners had to understand the different elements of a cartoon which included concepts like irony, satire, exaggeration etc. After the teacher had presented the lesson, the class played a game on Kahoot, as explained in Chapter 4. The level on which the technology use was placed is the augmentation level. The reason for this is that the technology was used for a PowerPoint presentation and to play an online game. There was no basic substitution but one level above substitution.
  
- II. **B1** - The first activity observed in School B was speeches based on current affairs (q.v. Figure 4.5). The learners had to include multimedia in their presentations. The learners could use their tablets or the teacher's laptop. This activity was placed on the procedural and application level on the Bloom's levels and on the modification level on the SAMR model. This was because the technology was not used in a typical way. The learners had to show pictures, or videos, and refer to them during their speeches. This activity, without the use of technology, would not have been as effective. Learners would probably have used printed pictures. However, technology can be timed to start and stop at certain points.
  
- III. **A1** - The first activity observed in School A was the chunking of paragraphs from a comprehension, using closed reading strategies (q.v. Figure 4.1). The activity was placed on the application and procedural level because the learners were applying what their teacher had shown them. The activity was also placed on the augmentation level on the SAMR model. The reason being that the technology was not used for basic substitution but used to research. The online dictionary was also used.
  
- IV. **A3** - The third activity observed in School A was a continuation of the cartoon studies activity (q.v. Figure 4.3). The previous activity was in preparation for this lesson. The teacher revised the terminology and then the learners were given different cartoons to analyse in groups. This activity was placed on the procedural and analysis level because the learners had to follow a certain procedure to analyse the cartoons. The technology

use in this activity was placed on the augmentation level again. This was because the technology was used for presentation and research. The teacher revised the PowerPoint and, while the learners analysed the cartoon, they could research those terms that they were unfamiliar with.

**B2** - The second activity observed in School B was a poetry lesson (q.v. Figure 4.6). The learners had to research four different topics in groups, each group received one topic. Once the groups had completed their research, the teacher played three different clips of individuals reciting the poem. The complete description of this activity can be found in Chapter 4. This activity was placed on the procedural and analysis level *and* the modification level. The reason for this is that the learners had to follow a certain procedure and analyse information regarding the poem and poet. Furthermore, the technology was used to research. If the technology was unavailable, the activity would not have been completed in the class.

**B4** - The fourth activity observed in School B was the analysis and answering of questions about the poem as per the previous two activities (q.v. Figure 4.8). Learners worked through the poem and answered the questions individually. If learners did not understand elements of the poem they could use their devices. This activity was placed on the procedural and analysis level. The technology usage was placed on the augmentation level. The reason for this was that the technology was not used for the substitution of textbooks neither was it used in a different, innovative manner.

**V. A4** - The fourth activity that was observed in school A was a revision activity (q.v. figure 4.4). The learners were asked to write down five things that they knew, and five things they did not know, from the content which they had been taught during the term. Then the learners were instructed to design a video of the different elements in groups. This activity was placed on the procedural and creation levels in the Bloom's levels. Then on the SAMR levels it was placed on the augmentation level, this was because the technology was only used to go through previous PowerPoint slides and notes. The technology was not used in any different or innovative manner.

**B3** - The third activity observed in School B was a continuation of the poetry activity (q.v. 4.7). In that activity learners were expected to research topics about the poet and poem, in groups. In this activity learners were divided into new groups, this was done so all members in the new groups could share information from their previous groups. The learners were then instructed to create a mind map with the different topics. They could use the notes made on their devices. This activity was placed on procedural and create level whilst the technology usage was placed on the augmentation level. The reason for this is that the technology was not used in an innovative manner but was used for something more than substitution.

### 5.2.3 FOCUS GROUP

The findings of the focus groups were presented in a table format. The interview questions can be found in Appendices D. Information from the two schools that resorted under the themes, as well as how frequent it was mentioned, is listed in Table 5.3 below. The correlation between theme/s and secondary research question/s, is also listed. Furthermore, an explanation of the table follows towards enhancing its clarity.

**Table 5.3: Focus group**

Theme	School A	School B	Frequency	Research Question/s
<b>a) Individual view (IV)</b>	Positive view. Easy and light weight.		12	<b>RQ 2</b>
		Convenient, textbooks in one place.	11	
	Wi-Fi connection an issue.		6	
		Some prefer hardcopy textbooks.	4	
<b>b) Training and workshops (TW)</b>	No training was conducted. Shown how to use applications.	No in-depth training. Shown how to use applications.	12	<b>RQ 2</b>
<b>c) Enhancement of learning (EL)</b>	Does not enhance learning.		4	<b>RQ 2 and 3</b>
	Distracting for learners with ADHD.	Distracting during class time.	11	
	Can be visually straining.		2	
		Technology helps with delivery of lessons.	5	
		Search for content instead of flipping.	2	
	Kahoot played after sections of work had been completed.		3	
	MT is used most of the time.		6	

<b>d) Continuous use (CTU)</b>		Technology used for activities and studying.	<b>6</b>	<b>RQ 2 and 3</b>
		Orals and speeches are done on the devices.	<b>6</b>	
		Notes are not printed, so it saves paper.	<b>5</b>	
		Devices are also used for exams.	<b>1</b>	
<b>e) Different methods (DM)</b>	Access to different websites as Wi-Fi blocks them.		<b>6</b>	<b>RQ 2 and 3</b>
	Two-in-one devices restrict sending content over ITSI platform.		<b>4</b>	
		One learner has indicated that 3D printers can be incorporated.	<b>1</b>	
		Applications that scan something and bring it to life.	<b>6</b>	

A discussion and comparison of the focus group findings from both schools, as depicted in Table 5.3, follows. The findings are discussed under the different themes.

### **a) OPINION**

The learners in School A *and* B indicated that the use of MT devices in learning is beneficial, interesting and fun. However, some of the learners expressed the opinion that they liked the technology but preferred the traditional learning and teaching methods. They indicated that they preferred textbooks to MT. The learners added that the mobile devices have many different functionalities: you can watch videos, play on Kahoot and access previous years' textbooks. They also stated that MT has resulted in their bags not being as heavy as all the textbooks are contained on the device.

### **b) TRAINING**

The learners in both schools indicated that they had not received in-depth training regarding the use of the technology. They were only shown how to use the technology and apps in a basic way. If they are required to learn anything new, their teachers explain it to them briefly.

### **c) ENHANCEMENT OF LEARNING**

Most of the learners in both schools stated that they preferred to use MT as there are many different things you can do with it including: making notes on the textbooks and watching videos that have been pushed to the tablets. Learners can also access YouTube to watch videos. The learners in School A, however, indicated that most websites were blocked and sometimes, if they needed to do some research, they could not. They also complained that the Wi-Fi was sometimes not strong enough and thus they were not able to complete activities on time. Furthermore, in both schools there were learners who preferred the use of traditional textbooks. One learner in School B stated that she liked to make actual notes in the textbook, while one learner in School A indicated that she has ADD and that she could not concentrate for long periods at a time. For her technology can be very distracting because there are games which you can play and you can also access the internet. Learners from School B agreed that there are many learners do that use the technology for non-school activities but, in the end, it boils down to self-discipline.

#### **d) DIFFERENT METHODS**

The learners in both schools agreed that the technology is used for activities inside, and outside, of the classroom. Some activities and assignments are submitted electronically. There are some activities that the learners need to plan beforehand and then execute. For example, in School A learners were required to make videos, or make a recording of themselves reciting an oral. This can help those learners who might be nervous. When it comes to studying, all their notes are contained on the devices. In School B, learners write open book exams with their tablets and can research information.

#### **e) CONTINUOUS USE**

The learners in School A indicated that they felt that there are no other, or better, ways of integrating the technology. Learners in School B felt that interactive apps could be used more in other subjects.

### **5.2.4 MANAGEMENT OF MOBILE TECHNOLOGY (MT)**

In Table 5.4 the two schools' management of MT has been compared and the corresponding research questions have been listed. Following the table there is a further explanation of the comparison.

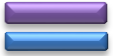
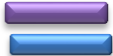

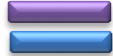
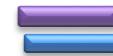


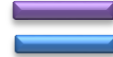






















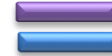






**Table 5.4: Management of mobile technology**

Management	School A	School B	Secondary research question
1	Assignments submitted online		<b>SQ 3</b>
2	Content pushed to tablets	URLs and notes pushed to devices	
3	Online dictionary used		
4	Videos used and created	Video editor used for recorded videos	
5	PowerPoints presented on overhead projector	Resources used in presentations	
6	Educational games played on devices	Educational games played	
7	Content readily available on devices	Notes not printed, accessed on devices	
8	Research work	Research work completed on devices	
9		Consultants assisted in integrating technology	
10		Constant training of new methods	
11		Diaries and timetables available on devices	
12		Multimedia used in presentations	
13		Videos played and available on devices	
14		Devices used for exams	
15		Notes shared using different applications	

The table above (q.v. Table 5.4) indicates that School B managed the technology more successfully. This table is discussed further in the section which deals with research questions (q.v. 5.4.2). The reason for this is that the *management of School A and B* was not dealt with as part of the data collection instruments but was an integral factor that came up in all the data collected. The table below (q.v. Table 5.5) presents a summary of the findings and results sorted under the themes dealt with in Chapters 4 and 5. The schools' data are visually presented in a summarised format.



**Table 5.5: Findings and results summary**

Theme	Code	Interviews	Observations				Focus group
			Activity 1	Activity 2	Activity 3	Activity 4	
Teaching and learning technology	TLT						
Training and workshops	TW						
Integration	IG						
Strategies not incorporated	SNI						
Difficulty of integration	DI						
Individual view	IV						
Enhancement of learning	EL						
Continuous use	CTU						
Different methods	DM						
Management	MGT						

School A:  School B: 

### 5.3 DISCUSSION OF CONCLUSIONS

The main reason for conducting this research was to investigate *how* MT is being used in English Home Language classroom activities. The problem relevant to this study was the phenomenon that technology is being incorporated into schools to replace textbooks, and other types of notes, but that this technology may not be used to its full potential. Furthermore, because reading and writing are important skill which need to be mastered and practiced in the English class, most teachers may shy away from using the technology so much. This, in turn, may hinder learners from using the technology as teachers need to model the use of the technology.

There were two theoretical frameworks that were chosen in this study, the SAMR model (q.v. section 2.9.1) and the Revised Bloom's Taxonomy (q.v. section 2.9.2). The conceptual framework used was a combination of the two theoretical frameworks discussed in Chapter 2 (q.v. section 2.11 and 2.12). The philosophy that was used was the interpretive paradigm (q.v. 3.3.1), the approach employed was qualitative (q.v. 3.4.1) and the strategy chosen was a comparative case study (3.5.2), discussed in detail in Chapter 3.

It was decided that data would be collected from two private high schools, with the principals, IT specialist (School B), English teachers and learners from each school being participants. Interviews and focus group interviews were conducted with participants, as well as observations of activities using MT were observed. The data gathered were analysed and presented using themes and the activities were presented using the activity theory which was discussed in Chapter 4. The two schools' interviews and focus group interview results were compared using tables and the activities were compared using the conceptual framework. A brief reminder of the main, and secondary, research questions which were addressed in this study to follow.

## **5.4 RESEARCH QUESTIONS**

### **Main Research Question (MQ)**

**MQ** – How are mobile technology strategies incorporated in activities to support English Home Language teaching and learning?

### **Secondary Research Questions (SQ)**

**SQ1** – Which mobile technology-based activities do teachers incorporate in their teaching?

**SQ2** – How are these activities managed by the teacher and learners in the classroom?

**SQ3** – On which level of cognition and integration are the activities?

#### **5.4.1 FIRST SUB-RESEARCH QUESTION DISCUSSED**

##### **Which mobile technology-based activities do teachers incorporate in their teaching?**

In School A the first activity was chunking of paragraphs from a comprehension (q.v. Figure 4.1). This activity was a MT-based activity and the research part of the activity could be completed in class instead of having to visit the library after school. The second activity, cartoon studies (q.v. Figure 4.2), was a MT-based activity. The teacher presented the different terminology with a PowerPoint slide show and then the class played a multiple-choice game, on Kahoot, based on the presentation. The whole class would have not been able to play the game without the MT.

The third activity was cartoon analysis (q.v. Figure 4.3) and was also a MT-based activity. The learners were given cartoon handouts but could research that which they did not understand. The fourth activity was designing a video explaining certain definitions and phrases (q.v. Figure 4.4) and this activity was also a MT-based activity. The learners had to access PowerPoint and other notes on the content and design a two-minute video.

In School B the first activity observed was a speech based on current affairs (q.v. Figure 4.5). This activity was a MT-based activity and learners obtained marks for incorporating multimedia in their presentation. The learners could use their tablets, or their teacher's laptop. This activity would not have been completed as per requirement without the technology. The second activity observed was a poetry lesson (q.v. Figure 4.6) which was a MT-based activity. The learners were required to research different topics in groups about the poem and poet. The teacher then showed them three different videos of people reciting the poem. These videos could be viewed again at home on their tablets. It would not have been possible to complete this activity in the classroom without the technology.

The third activity from School B was a MT-based continuation of the poetry lesson (q.v. Figure 4.7). The learners were divided into new groups and had to design a mind map of the different topics which they had researched in their previous groups. The learners used the notes which they had made on their devices to complete the mind maps. The teacher took pictures of the mind maps and posted them on the Educator's folder. The fourth activity was the analysis and answering of questions based on the poem (q.v. Figure 4.8). This activity was a MT-based activity. Learners used the devices to view the poem and could use the online dictionary to look up words which they did not understand.

All eight activities observed were MT-based activities as the technology was present in the presentation and completion of the activities. Whether the technology was used on a basic level, or a higher level, is not as important as the fact that it was utilised. The technology was used for research purposes and this enabled the learners to complete the activity at school, and not at home, after school. The technology did not reach the redefinition level but was used in a different and creative ways. Furthermore, for specific activities the technology was a requirement without which it would not have been possible to complete the activity. In terms of the interviews, the participants indicated different elements of the technology which were used in teaching and learning activities. Different websites and applications like YouTube, Kahoot, Google drive, Evernote and Edmodo were mentioned.

#### **5.4.2 SECOND SUB-RESEARCH QUESTION DISCUSSED**

##### **How are these activities managed by the teacher and learners in the classroom?**

In School A the educator began the lesson by either explaining what would happen or introducing the activity as a PowerPoint presentation. The learners' mobile technologies were not always present on their tables. This was because most activities were completed in groups and the learners took advantage of this fact. However, when the teacher needed the learners to use their devices, he would say so. The learners seemed interested in the activities, however, when the technology was used they seemed to engage better (q.v. Table 4.4).

In School B the teacher used the laptop in all the activities which were observed. She made use of PowerPoint presentations, played videos and displayed work. The learners, for the most part, participated in the activities and had their devices on their tables. However, in the first activity, when learners had to present a speech using multimedia, not all the learners had their multimedia. Learners who were not ready to present (q.v. Table 4.6) were afforded the opportunity to bring the multimedia the next day.

Table 5.4 presents a summary of both schools' management of activities using technology. Both schools have indicated various methods by which they manage these activities. Both schools push content to learners' devices which allows for all learners to have all learning materials. In both schools' videos are used for presentations, learning and creating. Furthermore, in both schools the content is always readily available on the devices, which eliminates the printing of notes and thus saves paper. Research work was also completed on the devices which resulted in work being complete as learners could continue with their activities during class time. If the devices had not been present, then the work would have had to be completed at a later stage. Both schools also indicated that presentations were used in the classroom and were available on the devices. They also indicated that educational games were played after the completion of sections of work, especially Kahoot.

The following management points in School A differed from School B: assignments were submitted online, and the online dictionary was used. In School B consultants assisted in

integrating the technology, constant training of new methods was integrated, diaries and timetables were available on devices and multimedia was used in presentations and activities, videos were played and available on the devices, devices were used for exams and notes were shared using different applications. Even though the same strategies were not mentioned in both schools, observing the schools the researcher noticed other similarities which did not surface in the data collected.

Both schools seemed to manage the activities using the MT in a very relaxed and unique manner. The schools have been using the technology for many years and did not hesitate when it came to incorporate technology in the activities. The technology generally managed well throughout the activities.

### **5.4.3 THIRD SUB-RESEARCH QUESTION DISCUSSED**

#### **On which level of cognition and integration are the activities?**

School A's (q.v. Table 5.2) first activity correlated with the application and conceptual cognition levels, while their MT usage was on the augmentation integration level. Their second activity was on the understanding and conceptual level of cognition whilst their integration level was that of augmentation. The third activity was on the analysis and procedural cognition level and the integration level was that of augmentation. The fourth, and final, activity in School A was on the creation and procedural cognition level whilst the integration level was that of augmentation. The cognition levels of the activities corresponded to different levels, but none reached the meta-cognitive level. The integration levels of the activities were not that of basic substitution. However, these activities never reached the modification, or redefinition, levels. The technology was used as an enhancement tool with functional improvement.

School B's (q.v. Table 5.2) first activity correlated with the procedural and application cognition levels, while the integration level was that of modification. The second activity resorted under procedural and analysis cognition levels whilst integration was on the modification level. Their third activity operated within the procedural and creation cognition levels whilst technology integration was on the augmentation level. The fourth activity was placed on the procedural and

analysis levels, while the integration was placed on the augmentation level. In School B the cognition levels of the activities varied significantly. The MT usage was placed on two levels. The first two activities were placed on the modification level, as they allowed for significant task redesign, however, it was not something new or innovative. The last two activities were placed on the augmentation level as they technology acted as an enhancement tool.

Both schools' activities were placed on different cognition levels. On the *knowledge dimension* the activities were placed on the conceptual and procedural levels whilst on the *cognitive process dimension* the activities were placed on the understanding, analysis, application and creation levels. The MT integration for the schools were placed on the augmentation level because the technology use was not mere basic substitution but there had been some functional improvement. However, School B's technology use was also placed on the modification level as the technology was used with some significant change and task redesign. When looking at the conceptual framework, in the cognitive process dimension, the activities fell between the *understanding* and *creation* levels with more activities belonging to the analysis level. Furthermore, under the knowledge dimension the activities fell between *conceptual* and *procedural* levels. This shows that the activities were dispersed all over the framework and that they were generally on an advanced level.

#### **5.4.4 MAIN RESEARCH QUESTION DISCUSSED**

**How are mobile technology strategies incorporated in activities to support English Home Language teaching and learning?**

In teaching and learning languages, reading and writing is a very important skill. As different skills need to be practiced In the English Home Language classroom, integrating technology may not be as simple and/or creative as in other subjects. In School A the teacher was comfortable with the technology and used his laptop in all activities presented. The teachers were provided with tablets which were never used during the period that data was collected.

The learners seemed comfortable using the technology. They did not always take out the technology when activities began and thus it was not always present on the tables. In the

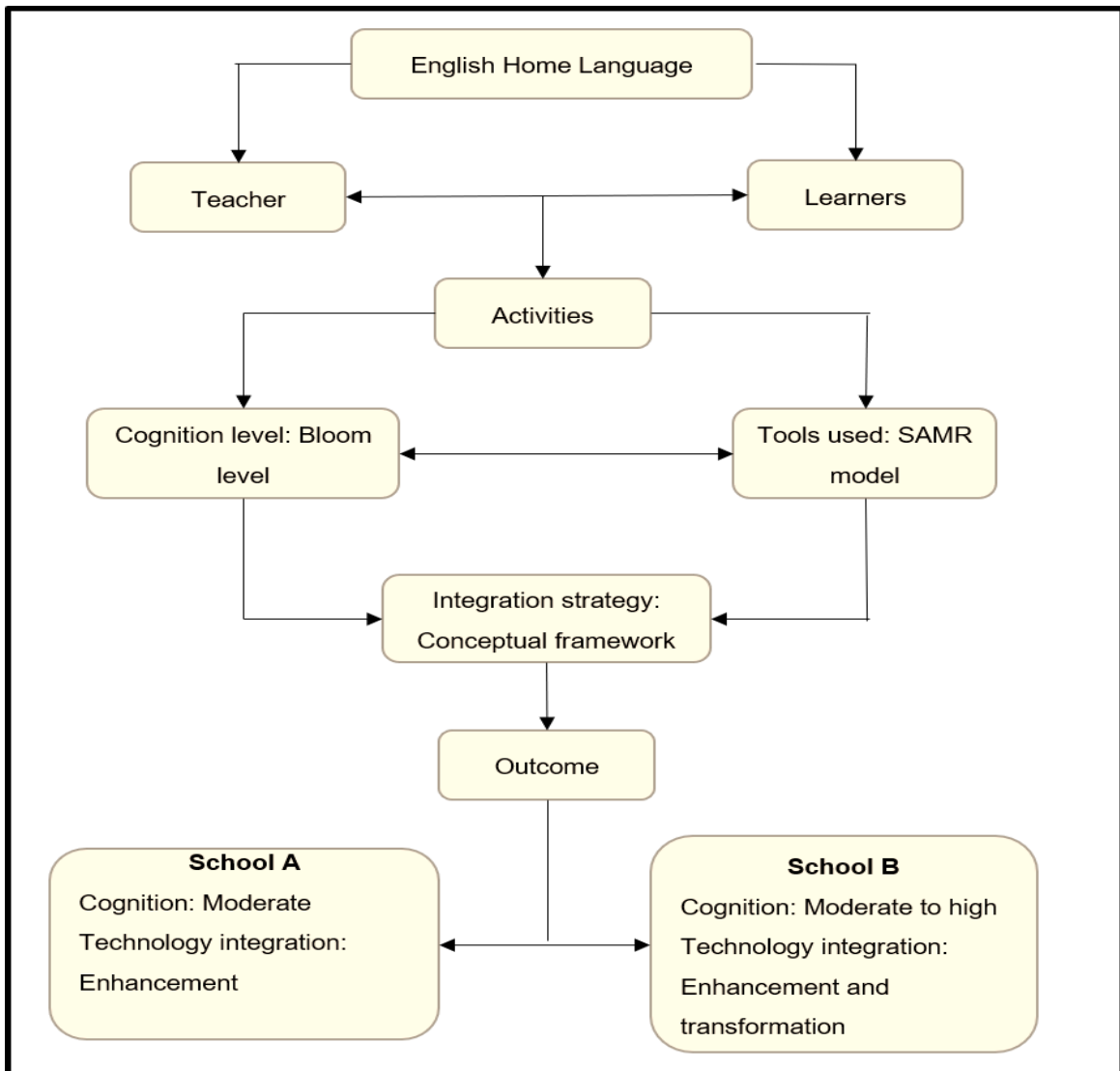
interviews conducted in School A, participants indicated that the MT was incorporated in: presentations, videos were shown, and social media was used by teachers to communicate with learners. In the activities observed the technology was incorporated in: research work, analysis, tests and dictionary work (q.v. Table 5.1).

In School B the teacher only had a laptop and used it in every activity that was conducted. The learners took out their devices immediately and, most of the time, they were not asked to do so. In the interviews conducted, participants indicated that the devices in the English class were used for: collaboration, presentations, investigations, analysis, research work and sometimes tests and exams. In the activities that were observed the technology was incorporated in: speeches and the analysis of a poem (q.v. Table 5.1).

As only four activities were observed from each school, there is no definite answer as to whether or not the technology is incorporated in all activities. However, in the observed activities, MT was incorporated more frequently in the School B. The strategies did, in a way, support the teaching and learning process. However, in most activities the technology was *not* used in an innovative way, *neither* did it serve a higher purpose than to augment the teaching and learning activities.

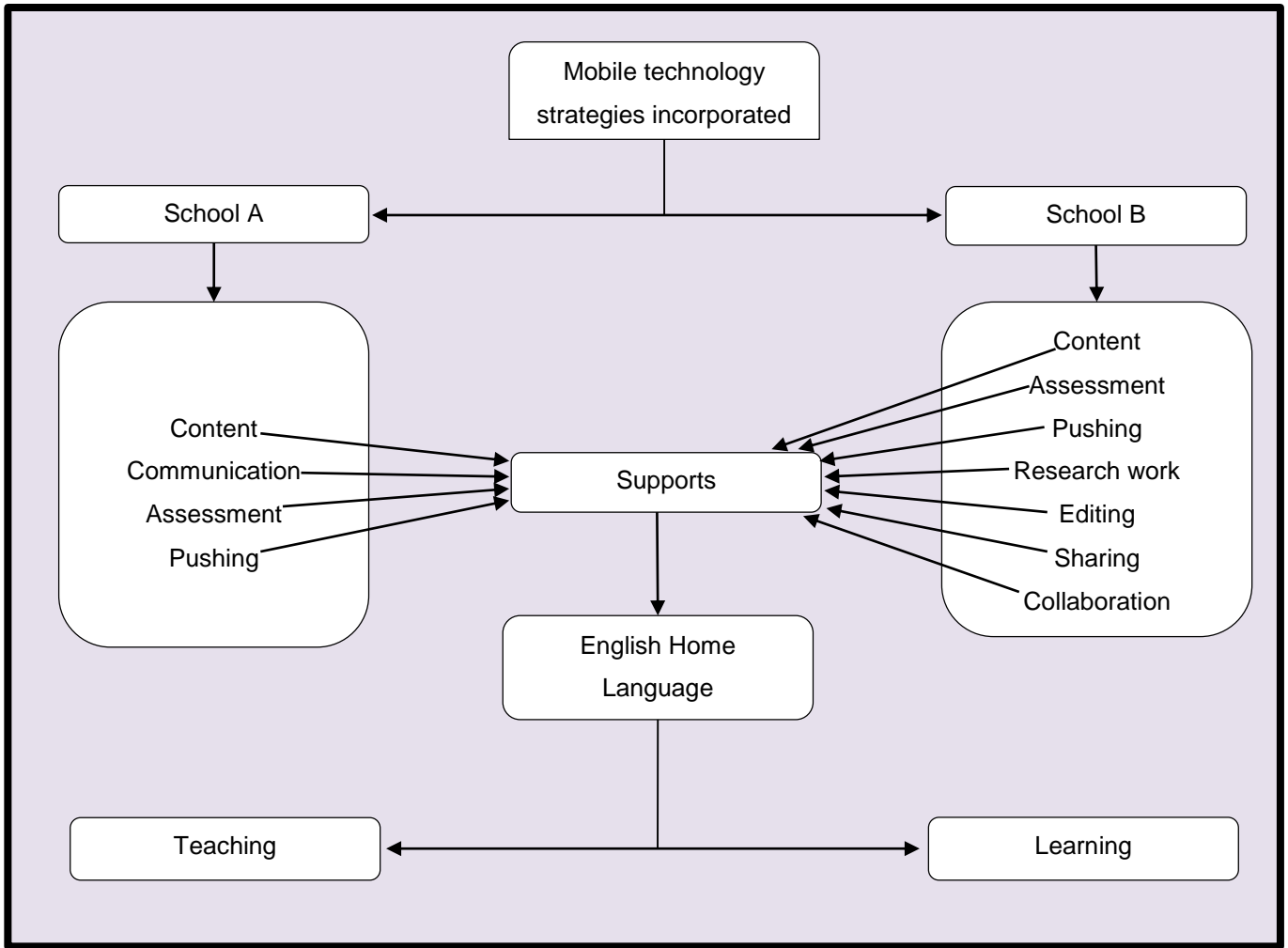
Figure 5.1 presents a visual presentation of *how* the research was structured with regards to the activities observed in relation to the research questions. In the figure the subject is indicated at the top and then the participants are indicated. The activities that the participants participated in are shown and the two elements that were incorporated into the activities are indicated. The outcomes of the two schools' activities, in relation to the conceptual framework which was created, indicated that School A's cognition level was *moderate*, and the technology integration was on the *enhancement* level. School B's cognition level was *moderate to high* and the technology integration was on the *enhancement and transformation* levels.





**Figure 5.1: Visual presentation of activities**

Furthermore, Figure 5.2 visually presents *how* MT strategies were incorporated into the activities and schools. In School A the strategies used were technology based and included: textbooks, notes and videos on the mobile devices. Communication channels included WhatsApp and Twitter, assessment tools included Kahoot and there was also pushing of content and notes to learners' devices. In School B, the strategies used were: content, assessment, pushing, research work, editing, sharing and collaboration.



**Figure 5.2: Visual presentation of integration strategies**

Table 5.6 indicates a summary of the activities observed in both schools. The table indicates that the activities on the knowledge dimension resorted between the conceptual and procedural levels. On the cognitive process dimension, the activities resorted amongst the understanding, application, analysis and creation levels. This indicates that none of the activities were on the lower, or factual, level and the higher, or meta-cognitive, level. The technology integration level that both schools' activities were assigned to were the augmentation and modification levels. School B used the technology as an enhancement, as well as a transformational, tool. However, School A only used the technology as an enhancement tool.

**Table 5.6: Summary of activities on conceptual framework**

<b>Knowledge Dimension</b>	Meta-cognitive						
	Procedural						
	Conceptual						
	Factual						
		Remember	Understand	Apply	Analyse	Evaluate	Create
<b>Cognitive Process Dimension</b>							

The answers to all the questions differ as School B’s cognitive levels and integration do not exactly match that of School A. The technology was used more creatively in the observed activities in School B. However, only four activities were observed, so this cannot be held as a definitive result. If four other activities had been observed in School A, their cognition and integration could have been above that of School B.

There were certain elements of the research questions that were answered. The fact that data was only gathered in two schools, and that only four activities in one classroom per school were observed, posits that the findings cannot be generalised. The activity theory was used to present the activities that were observed, and the conceptual framework was used to analyse them. With the created conceptual framework, the research questions could be analysed and discussed. The research questions could not be answered with a mere “yes” or “no” and were therefor discussed. The discussions pointed out different elements of the questions and tried to answer them.

## **5.1 SHORTCOMINGS AND LIMITATIONS**

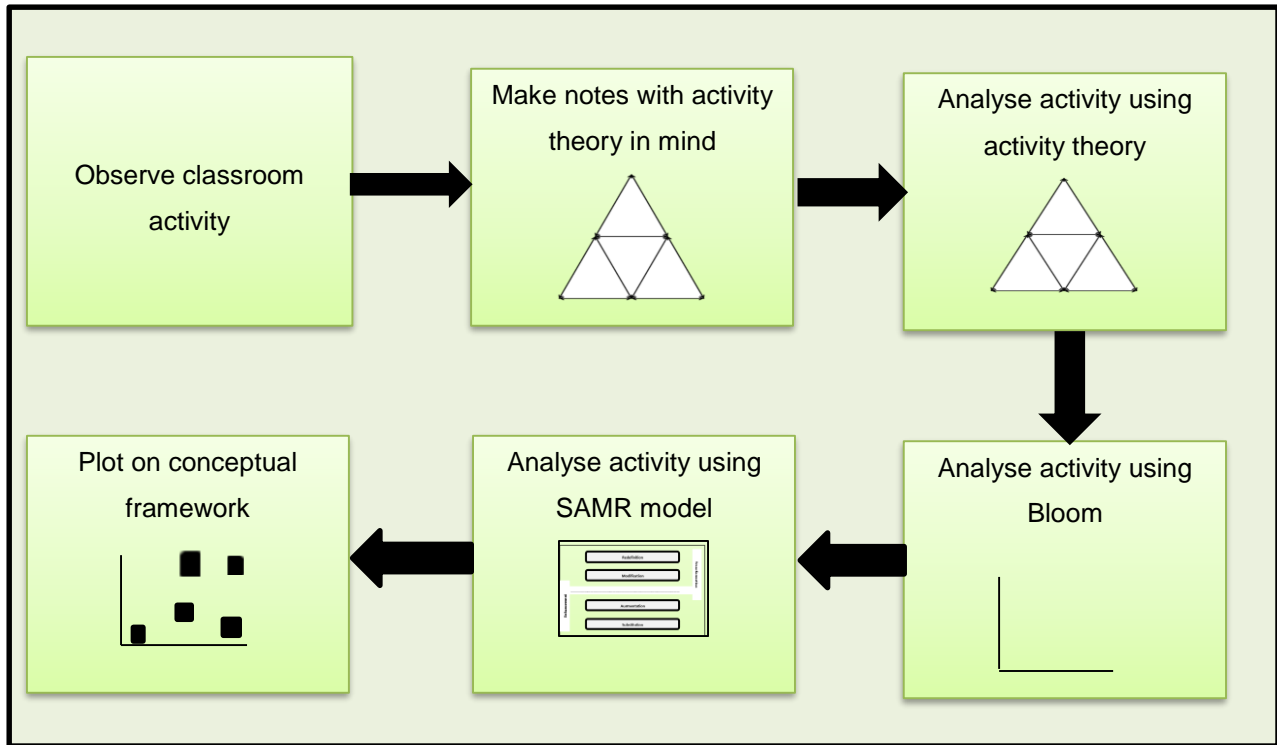
The shortcomings and limitations of this research centres on the fact that the results cannot be generalised as only two private schools were observed. Thus, it cannot be said that *all* schools use MT in the way these two schools do. It would be a generalised assumption to state that all schools which use MT in their teaching and learning only *substitute* the technology. There could be schools which do this but the schools which were observed in this studied use the technology for more than just for textbooks. In addition, as the schools and classrooms were not observed for a longer period of time, it could not be determined whether the schools use the technology in *all* their lessons and activities. However, as this is a qualitative comparative case study, the findings do not have to be generalised.

## **5.2 BENEFITS TO THE FIELD OF STUDY**

This research has contributed to the knowledge store surrounding the use of MT and that it does not have to be used as a substitution tool alone but can be used in many different activities. The study concedes that it may be difficult to integrate devices in each activity and to use the technology to its full potential. However, it is the job of the schools, teachers and learners to try and use the technology on an everyday basis to enhance teaching and learning.

### **5.2.1 METHODOLOGICAL CONTRIBUTION**

The methodological contribution of this study is that classroom activities were observed using the activity theory and could then be placed in the created conceptual framework using two existing theoretical frameworks namely: the SAMR model and the revised Bloom's Taxonomy. This process allowed for activities to be analysed and categorised based on the cognition level and MT usage. Firstly, teaching and learning activities were observed. Secondly, notes were taken during the observation with the activity theory elements in mind. Thirdly, the activities were analysed and placed in the activity theory. Fourthly, the activities were analysed using the Revised Bloom's Taxonomy. Fifthly, the activities were analysed using the SAMR model and, lastly, the activities were plotted on the conceptual framework.



**Figure 5.3: Visual presentation of contribution**

### **5.2.2 PRACTICAL CONTRIBUTION**

A practical contribution of this study is that schools and teachers can use the process to analyse classroom activities which use MT in different subjects and grades. This would allow for an objective view of activities and would indicate whether the MT is used sufficiently or not and if it is being used to its full potential. This assessment would allow schools to implement the relevant changes in their subjects and classrooms. The analysis could be conducted by teachers themselves and colleagues could then be afforded a chance to see learn from what is happening in a colleague’s classroom. Below is a step by step guide on how this process could be carried out.

**Table 5.7: Classroom activity analysis steps**

No	Steps to follow
1.	Choose the subject that will be analysed.
2.	Decide how many activities will be observed and over which time frame.
3.	Use the SAMR model and Bloom’s Taxonomy during observation.
4.	Plot and analyse activities using the Activity theory.
5.	Take the designed conceptual framework and plot the activities.
6.	Determine on which cognition and integration level activities fall.
7.	Compare activities observed from classrooms and subjects.

### **5.3 PROPOSED NEW RESEARCH**

It is recommended that more effort and research be done on *how* MT can be used in different and creative ways. Technology in education should be a methodology which is practiced daily. It is understood that in the English class, as in *all* languages, there are skills that need to be practiced. However, there are many applications and websites that can assist with these skills. If similar research was to be done, it would be recommended that not only private schools are looked at. It would be interesting to ascertain how public schools use technology in their teaching and learning.

If this research were to be continued it would be proposed that a comparative case study be completed to analyse the use of technology in both private and public schools. This research was done in two private schools because these schools use technology on an everyday basis. Public schools were to benefit from the government’s tablet initiatives but there were some complications. It would be interesting to discover the ways in which public schools use technology and for what purposes

### **5.4 FINAL CONCLUSION**

It is proposed that School B interacted with and integrated the technology regularly and successfully. This may be due to the culture of the school as there are weekly sessions where

new ideas are discussed, and training of new software and apps is conducted. The learners also enjoy support from the teachers and IT specialists as regards technology. It was also apparent that management supported the use of technology in the school. In School A it seemed as if participants' use of technology was *not spontaneous*, there was no ease of use. The participants generally did not have a positive view of the technology and pointed out all the mishaps and limitations. There was limited support from inside and the school depends on the company for workshops.

The majority of learners preferred physical textbooks and indicated that the technology was a distraction and strained their eyes. Even though the technology could be distracting, School B's learners indicated that they generally enjoyed using it. If this is the case, then schools need to analyse the process by which technology integration takes place as this would allow schools to identify gaps that exist in integration. Furthermore, if there is an understanding of the shortfalls, it would help schools in integrating the technology to its full potential.

Technology is an innovative entity that allows tasks to be completed in ways which were previously inconceivable. This research focused on MT and its use in teaching and learning activities. A comparative case study was completed with two private high schools as participants. The interpretive philosophy was chosen as it allowed for the interpretation of a specific phenomenon in its natural setting. The data collection methods that were used were: interviews, observations and focus group interviews. The data were presented and analysed using themes and the activity theory. Furthermore, the data were also analysed using the conceptual framework which was created using two theoretical frameworks, the SAMR model and the Revised Bloom's Taxonomy. In conclusion, it can be said that School B's activities were on a higher cognitive and technology integration level than those of School A in relation to the data collected and the discussion conducted.

Taking the collected data into consideration, I believe that technology is a very innovative and helpful tool that allows for everyday teaching and learning tasks to be completed with ease. The specific environment, support provided and everyone's approach towards using the technology allowed for activities to be completed. Technology can be very beneficial in teaching and

learning if all parties are interested and involved. With the needed support and appropriate resources, technology can *redefine* teaching and learning for all.



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## **APPENDICE A: Teacher Interview Questions**



## Interview Questions: Teacher

Topic: "Mobile technology strategies incorporated in teaching and learning activities to support English Home Language"

Date of interview: \_\_\_\_\_

Time of interview: \_\_\_\_\_

Interviewer: \_\_\_\_\_

Interviewee: \_\_\_\_\_

### Questions

1. Please tell more about the schools' history, dynamics and characteristics?
2. What types of mobile technology hardware and software are used?
3. What kind of training did you go through to be able you to integrate the technology?
4. Are there constant workshops that happen? If yes how do these workshops help with integration in the classroom?
5. How are these mobile technologies used in the classroom environment?
6. How are the mobile technology used outside of the classroom, but in an educational manner?
7. Do you use blooms taxonomy in your planning of activities, if yes how?
8. What integration strategies are used in the classroom to enhance teaching and learning?
9. How are teaching and learning activities using the mobile technology redefined?
10. How do you feel after integrating the technology into your lessons?
11. In which other ways do you think the mobile technology can be used to enhance teaching and learning?
12. Why do you think that it is much harder to integrate mobile technology in English than other subjects?

## **APPENDICE B: Principal and IT specialist's Interview Questions**

### **Interview Questions: Principal and IT specialist**

Topic: “Mobile technology strategies incorporated in teaching and learning activities to support English Home Language”

Date of interview: \_\_\_\_\_

Time of interview: \_\_\_\_\_

Interviewer: \_\_\_\_\_

Interviewee: \_\_\_\_\_

#### **Questions**

1. Please tell more about the schools' history, dynamics and characteristics?
2. What types of mobile technology hardware and software are used?
3. What kind of training was conducted for the school to be able you to integrate the technology?
4. Are there constant workshops that happen? If yes, how do these workshops help with integration in the classroom?
5. How are these mobile technologies used in the classroom and school environment?
6. How are the mobile technology used outside of the classroom, but in an educational manner?
7. In which other ways do you think the mobile technology can be used to enhance teaching and learning?
8. Why do you think that it is much harder to integrate mobile technology in English than other subjects?

## **APPENDICE C: Observation schedule**

Topic of study: \_\_\_\_\_

Name of observer: \_\_\_\_\_

Date of observation: \_\_\_\_\_

Length of observation: \_\_\_\_\_

	<b>Activity</b>
Participants	
Activities	
Level on SAMR model	
Blooms Taxonomy	
Explanation	
Concluding comments or remarks	

## **APPENDICE D: Focus Group Interview Questions**

## Focus group interview questions

Topic: "Mobile technology strategies incorporated in teaching and learning activities to support English Home Language"

Date of interview: \_\_\_\_\_

Time of interview: \_\_\_\_\_

### Questions

1. What is your opinion on mobile technology?
2. Did your class or school get training before you started using the technology in the classroom? If yes, how has it helped you to integrate the technology in your learning?
3. Do you think using the mobile technology in the classroom enhances learning? Why do you think so?
4. Please describe your feelings about using the mobile technology versus the traditional way of learning?
5. Do you think that there is any difference between the two ways of learning?
6. What is your opinion on the way your teacher incorporates the technology in his/her lessons?
7. What kind of activities are these mobile devices used for in the classroom?
8. Do all of your classroom activities use the mobile devices? If no, then approximately how many do?
9. Are these mobile devices used outside of the classroom to complete activities? If yes, how?
10. In which other ways do you think the technology can be used in the classroom?

**APPENDICE E: Letter of assent for learners**





UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Education

Department of Science, Mathematics and Technology  
Faculty of Education  
University of Pretoria  
0001 Pretoria

Dear learner

I am a student currently studying at the University of Pretoria, doing a BEd Master's degree. And I am currently doing a module that requires me to conduct research in schools and write a report about what I researched. I would like to ask you whether you will be willing to participate in this research.

My research focus is "Mobile technology strategies incorporated in teaching and learning activities to support English Home Language". Technology is becoming a major part in schools. Schools are using technology to replace or substitute textbooks. But what else are these technologies being used for to enhance teaching and learning?

If you agree to participate in this study, your classroom will be observed as well as a focus group interview will be conducted with +-6 learners in my classroom at a venue and time that will suit you, but it may not interfere with school activities. The focus group interview with the learners' will not take longer than an hour. The observation will be as long as a lesson. The observation and focus group interview will be audio taped and transcribed for analytical purposes. Parents/guardians will receive letters to inform them about the research.

You do not have to participate in this research if you do not want to. If you decide to participate, but you change your mind later on, you can withdraw your participation at any time. Your identity



will be protected. Only my supervisor and I will know your real name, as a pseudonym will be used during data collection and analysis. Your school will not be identified either. The information you will provide will only be used for academic purposes. In my research report and in any other academic communication, your pseudonym will be used, and no other identifying information will be given. The data collection will be in the possession of me or my supervisor. After the completion of the study, the material will be stored at the university's Science, Mathematics and Technology Education Department according to the policy requirements.

If you agree to take part in this research, please fill in the consent form provided below. If you have any questions, do not hesitate to contact my supervisor or me at the numbers given below, or via Email.

---

**Name of student:** Golekane Mthelebofu

**Name of supervisor:** Dr Ronel Callaghan

**Contact number:** 0711778858

**Contact number:** 083 445 4918

**Email address:** [gmthelebofu@yahoo.com](mailto:gmthelebofu@yahoo.com)

**Email address:** [ronel.callaghan@up.ac.za](mailto:ronel.callaghan@up.ac.za)

**Signature of student:** \_\_\_\_\_

**Signature of supervisor:** \_\_\_\_\_



## Assent form

I, \_\_\_\_\_ (name and surname), agree / do not agree (circle what is applicable) to take part in the research project titled “**Mobile technology strategies incorporated in teaching and learning activities to support English Home Language**”.

I understand that my classroom will be observed, and I understand that +- 6 learners in my classroom will participate in a focus group interview. The observation and focus group interview will be audio taped. And I understand that the role of the researcher is to remain objective throughout the data collection phase.

I understand that the researcher subscribes to the principles of:

Voluntary participation in the research, implying that the participants can withdraw at any stage, informed consent, implying that participants are fully informed at all times during the research, safety in participation, implying that participants should not be placed in harm's way. Privacy, information gathered during the data collection will be dealt with anonymity and confidentiality, trust, which implies that participants will not be subjected to any forms of deception.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Education

## **APPENDICE F: Letter of consent for principal**



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Education

Department of Science, Mathematics and Technology  
Faculty of Education  
University of Pretoria  
0001 Pretoria

Dear Headmaster

I am a student currently studying at the University of Pretoria, doing a BEd Master's degree. And I am currently doing a module that requires me to conduct research in schools and write a report about what I researched. I would like to ask you whether you will be willing to participate in this research.

My research focus is "Mobile technology strategies incorporated in teaching and learning activities to support English Home Language". I would like to investigate how EHL teachers' and learners incorporate mobile technology in teaching and learning. The research will include interviews with the principal, IT specialists and English teachers. Observations will be conducted in this particular teachers' classroom as well as a focus group interview will be conducted with 6 learners from the class that was observed.

If you agree to participate in this study, you will be interviewed, and your English teacher and IT specialists will be interviewed. The English teachers' classroom will be observed as well as a focus group interview will be conducted with some learners at a venue and time that will suit you, but it may not interfere with school activities. The interview will not take longer than an hour; the focus group interview with the learners' will also not take longer than an hour. The observation will be as long as a lesson. The interview, observation and focus group interviews



will be audio taped and transcribed for analytical purposes. The English teacher, IT specialist, Learners' and their parents/guardians will receive letters to inform them about the research.

You do not have to participate in this research if you do not want to. If you decide to participate, but you change your mind later on, you can withdraw your participation at any time. Your identity will be protected. Only my supervisor and I will know your real name, as a pseudonym will be used during data collection and analysis. Your school will not be identified either. The information you will provide will only be used for academic purposes. In my research report and in any other academic communication, your pseudonym will be used, and no other identifying information will be given. The data collection will be in the possession of me or my supervisor. After the completion of the study, the material will be stored at the university's Science, Mathematics and Technology Education Department according to the policy requirements.

If you agree to take part in this research, please fill in the consent form provided below. If you have any questions, do not hesitate to contact my supervisor or me at the numbers given below, or via Email.

---

**Name of student:** Golekane Mthelebofu

**Name of supervisor:** Dr Ronel Callaghan

**Contact number:** 0711778858

**Contact number:** 083 445 4918

**Email address:** [gmthelebofu@yahoo.com](mailto:gmthelebofu@yahoo.com)

**Email address:** [ronel.callaghan@up.ac.za](mailto:ronel.callaghan@up.ac.za)

**Signature of student:** \_\_\_\_\_

**Signature of supervisor:** \_\_\_\_\_



## Consent form

I, \_\_\_\_\_(name and surname) , Principal of \_\_\_\_\_ (name of school) agree / do not agree (circle what is applicable) to take part in the research project titled **“Mobile technology strategies incorporated in teaching and learning activities to support English Home Language”**.

I understand that I will be interviewed about this topic and the interview will be audio taped. I also understand that staff members will be interviewed, the English teachers' classroom will be observed, and that +-6 learner's will participate in a focus group interview. And I understand that these methods will be audio taped. I understand that documents relating to this topic including activities completed in the classroom will be analysed.

I understand that the researcher subscribes to the principles of:

Voluntary participation in the research, implying that the participants can withdraw at any stage, informed consent, implying that participants are fully informed at all times during the research, safety in participation, implying that participants should not be placed in harm's way. Privacy, information gathered during the data collection will be dealt with anonymity and confidentiality, trust, which implies that participants will not be subjected to any forms of deception.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

**Faculty of Education**

## **APPENDICE G: Letter of consent for parents**





UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Education

Department of Science, Mathematics and Technology  
Faculty of Education  
University of Pretoria  
0001 Pretoria

Dear parents/ guardian

I am a student currently studying at the University of Pretoria, doing a BEd Master's degree. And I am currently doing a module that requires me to conduct research in schools and write a report about what I researched. I would like to ask you whether you would allow your child to participate in this research.

My research focus is "Mobile technology strategies incorporated in teaching and learning activities to support English Home Language". Technology is becoming a major part in schools. Schools are using technology to replace or substitute textbooks. But what else are these technologies being used for to enhance teaching and learning? The research will include an analysis of the teacher, learners, IT specialist and principal. This will be done through the means of interviews with the headmaster, IT specialist and English teacher. An observation will be conducted in this particular teachers' classroom as well as a focus group interview will be conducted with +- 6 learners from the class that was observed.

If you agree to let your child participate in this study, your child's classroom will be observed, and he/ she may be chosen to participate in a focus group interview, but it will not interfere with school activities. The focus group interview with the learners' will also not take longer than an hour. The observation will be as long as a lesson. The observation and focus group interviews



will be audio taped and transcribed for analytical purposes. Learners' will receive letters informing them about the research.

You do not have to provide consent for your child to participate in this research if you do not want to. If you decide to let your child participate, but you change your mind later on, you can withdraw at any time. Your child's identity will be protected. Only my supervisor and I will know your child's real name, as a pseudonym will be used during data collection and analysis. Your child's school will not be identified either. The information your child will provide will only be used for academic purposes. In my research report and in any other academic communication, your pseudonym will be used, and no other identifying information will be given. The data collection will be in the possession of me or my supervisor. After the completion of the study, the material will be stored at the university's Science, Mathematics and Technology Education Department according to the policy requirements.

If you agree to take part in this research, please fill in the consent form provided below. If you have any questions, do not hesitate to contact my supervisor or me at the numbers given below, or via Email.

---

**Name of student:** Golekane Mthelebofu

**Name of supervisor:** Dr Ronel Callaghan

**Contact number:** 0711778858

**Contact number:** 083 445 4918

**Email address:** [gmthelebofu@yahoo.com](mailto:gmthelebofu@yahoo.com)

**Email address:** [ronel.callaghan@up.ac.za](mailto:ronel.callaghan@up.ac.za)

**Signature of student:** \_\_\_\_\_

**Signature of supervisor:** \_\_\_\_\_



## Consent form

I, \_\_\_\_\_(name and surname) , agree / do not agree (circle what is applicable) to allow my child, \_\_\_\_\_(name and surname) to take part in the research project titled **“Mobile technology strategies incorporated in teaching and learning activities to support English Home Language”**. I understand that my child’s classroom will be observed and that he/she may participate in a focus group interview based on the topic above. I understand that these methods will be audio taped for analytical purposes.

I understand that the researcher subscribes to the principles of:

Voluntary participation in the research, implying that the participants can withdraw at any stage, informed consent, implying that participants are fully informed at all times during the research, safety in participation, implying that participants should not be placed in harm’s way. Privacy, information gathered during the data collection will be dealt with anonymity and confidentiality, trust, which implies that participants will not be subjected to any forms of deception.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

**Faculty of Education**

## **APPENDICE H: Letter of consent for teachers**



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Education

Department of Science, Mathematics and Technology  
Faculty of Education  
University of Pretoria  
0001 Pretoria

Dear educator

I am a student currently studying at the University of Pretoria, doing a BEd master's degree. And I am currently doing a module that requires me to conduct research in schools and write a report about what I researched. I would like to ask you whether you will be willing to participate in this research.

My research focus is “**Mobile technology strategies incorporated in teaching and learning activities to support English Home Language**”. Technology is becoming a major part in schools. Schools are using technology to replace or substitute textbooks. But what else are these technologies being used for to enhance teaching and learning? The research will include an analysis of the teacher, learners, IT specialist and principal. This will be done through the means of interviews with the headmaster, IT specialist and English teacher. An observation will be conducted in this particular teachers' classroom as well as a focus group interview will be conducted with +- 6 learners from the class that was observed.

If you agree to participate in this study, you will be interviewed, and your classroom will be observed as well as a focus group interview will be conducted with some learners at a venue and time that will suit you, but it may not interfere with school activities. The interview will not take longer than an hour; the focus group interview with the learners' will also not take longer than an hour. The observation will be as long as your lesson. The interview, observation and



focus group interviews will be audio taped and transcribed for analytical purposes. Learners' and their parents/guardians will receive letters to inform them about the research.

You do not have to participate in this research if you do not want to. If you decide to participate, but you change your mind later on, you can withdraw your participation at any time. Your identity will be protected. Only my supervisor and I will know your real name, as a pseudonym will be used during data collection and analysis. Your school will not be identified either. The information you will provide will only be used for academic purposes. In my research report and in any other academic communication, your pseudonym will be used, and no other identifying information will be given. The data collection will be in the possession of me or my supervisor. After the completion of the study, the material will be stored at the university's Science, Mathematics and Technology Education Department according to the policy requirements.

If you agree to take part in this research, please fill in the consent form provided below. If you have any questions, do not hesitate to contact my supervisor or me at the numbers given below, or via Email.

---

**Name of student:** Golekane Mthelebofu

**Name of supervisor:** Dr Ronel Callaghan

**Contact number:** 0711778858

**Contact number:** 083 445 4918

**Email address:** [gmthelebofu@yahoo.com](mailto:gmthelebofu@yahoo.com)

**Email address:** [ronel.callaghan@up.ac.za](mailto:ronel.callaghan@up.ac.za)

**Signature of student:** \_\_\_\_\_

**Signature of supervisor:** \_\_\_\_\_



## Consent form

I, \_\_\_\_\_ (name and surname), agree / do not agree (circle what is applicable) to take part in the research project titled “**Mobile technology strategies incorporated in teaching and learning activities to support English Home Language**”. I understand that I will be interviewed about this topic and the interview will be audio taped.

I understand that my classroom will be observed, and activities done in the classroom will be analysed. I understand that +- 6 learners in my classroom will participate in a focus group interview. The observation and focus group interview will also be audio taped. And I understand that the role of the researcher is to remain objective throughout the data collection phase.

I understand that the researcher subscribes to the principles of:

Voluntary participation in the research, implying that the participants can withdraw at any stage, informed consent, implying that participants are fully informed at all times during the research, safety in participation, implying that participants should not be placed in harm's way. Privacy, information gathered during the data collection will be dealt with anonymity and confidentiality, trust, which implies that participants will not be subjected to any forms of deception.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Education

## **APPENDICE I: Letter of consent for IT specialist**





UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Education

Department of Science, Mathematics and Technology  
Faculty of Education  
University of Pretoria  
0001 Pretoria

Dear IT specialist

I am a student currently studying at the University of Pretoria, doing a BEd Master's degree. And I am currently doing a module that requires me to conduct research in schools and write a report about what I researched. I would like to ask you whether you will be willing to participate in this research.

My research focus is **“Mobile technology strategies incorporated in teaching and learning activities to support English Home Language”**. Technology is becoming a major part in schools. Schools are using technology to replace or substitute textbooks. But what else are these technologies being used for to enhance teaching and learning? The research will include an analysis of the teacher, learners, IT specialist and principal. This will be done through the means of interviews with the headmaster, IT specialist and English teacher. An observation will be conducted in this particular teachers' classroom as well as a focus group interview will be conducted with +- 6 learners from the class that was observed.

If you agree to participate in this study, you will be interviewed at a venue and time that suits you, but it may not interfere with school activities. The interview will not take longer than an hour. The interview will be audio taped for analysis purposes.



You do not have to participate in this research if you do not want to. If you decide to participate, but you change your mind later on, you can withdraw your participation at any time. Your identity will be protected. Only my supervisor and I will know your real name, as a pseudonym will be used during data collection and analysis. Your school will not be identified either. The information you will provide will only be used for academic purposes. In my research report and in any other academic communication, your pseudonym will be used, and no other identifying information will be given. The data collection will be in the possession of me or my supervisor. After the completion of the study, the material will be stored at the university's Science, Mathematics and Technology Education Department according to the policy requirements.

If you agree to take part in this research, please fill in the consent form provided below. If you have any questions, do not hesitate to contact my supervisor or me at the numbers given below, or via Email.

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**Name of student:** Golekane Mthelebofu

**Name of supervisor:** Dr Ronel Callaghan

**Contact number:** 0711778858

**Contact number:** 083 445 4918

**Email address:** [gmthelebofu@yahoo.com](mailto:gmthelebofu@yahoo.com)

**Email address:** [ronel.callaghan@up.ac.za](mailto:ronel.callaghan@up.ac.za)

**Signature of student:** \_\_\_\_\_

**Signature of supervisor:** \_\_\_\_\_



## Consent form

I, \_\_\_\_\_ (name and surname), agree / do not agree (circle what is applicable) to take part in the research project titled “**Mobile technology strategies incorporated in teaching and learning activities to support English Home Language**”. I understand that I will be interviewed about this topic and the interview will be audio taped.

I understand that the researcher subscribes to the principles of:

Voluntary participation in the research, implying that the participants can withdraw at any stage, informed consent, implying that participants are fully informed at all times during the research, safety in participation, implying that participants should not be placed in harm’s way. Privacy, information gathered during the data collection will be dealt with anonymity and confidentiality, trust, which implies that participants will not be subjected to any forms of deception.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_