EXPLORING THE USE OF TABLETS TO IMPROVE READING IN A GRADE 2 AFRIKAANS HOME LANGUAGE CLASSROOM

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DEDICATION

I dedicate this thesis to my first-born son, Frederick Joshua Bergstedt and my husband Darryl Bergstedt. Frederick, may you ALWAYS find the courage to pursue your dreams. Always be reminded to PRAY and stay HUMBLE.

DECLARATION

I, Josmorine Gushwonita Bergstedt declare that this thesis entitled "*Exploring the use of tablets to improve reading in a Grade 2 Afrikaans Home Language classroom*" is my own work and that it has not been submitted for any degree or examination to any other university. Furthermore, the sources used have been quoted and acknowledged by detailed and accurate references.

---------------------------- (Signature)

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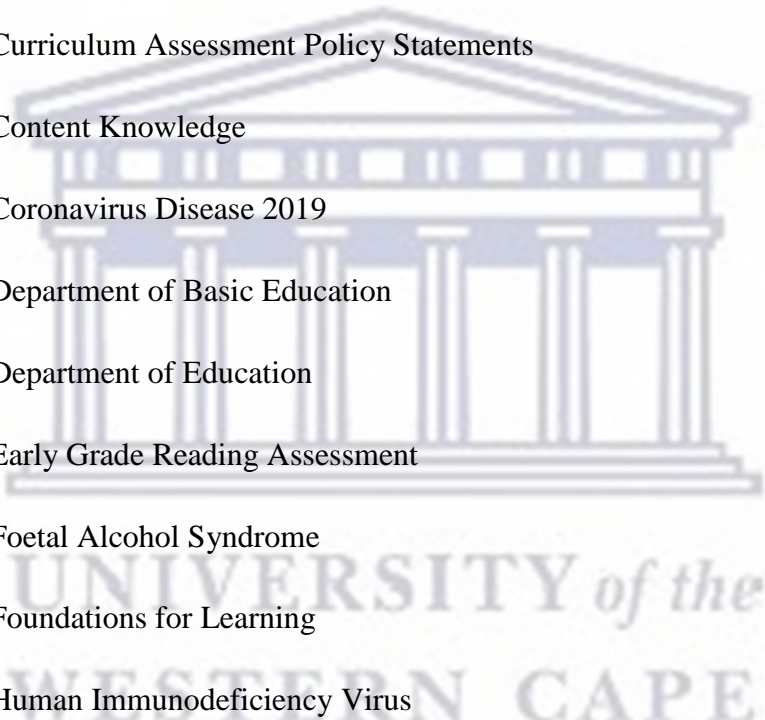
ABSTRACT

The aim of this study was to explore the use of tablets to improve reading in a Grade 2 Afrikaans Home Language classroom. I worked with the assumption that most schools in the Western Cape have integrated digital technologies such as tablets into their teaching and learning practices. However, not much is known about the effectiveness of using these devices in improving learners' reading skills. The study is underpinned by an interpretive paradigm using a qualitative single case study research approach to make sense of the experiences of both teachers and learners in using tablets to improve reading. Semi-structured individual interviews, focus-group interviews, observations and document sources were used to collect data.

The theory used to frame this study comprises the work of Koehler and Mishra's (2006) Technological Pedagogical Content Knowledge (TPACK) and Vygotsky's (1978) Socio-cultural theory. Vygotsky's Socio-cultural theory, and his constructs (ZPD), mediation and scaffolding were used as a conceptual lens to understand learning as a social practice. TPACK theory was used to understand how teachers and learners make meaning when actively engaging in the use of tablets in the classroom to improve reading. The results show that there is a marked difference between traditional teaching vs learning with tablets (integration of technology). It further shows a pedagogical shift happens when teachers and learners engage in the use of tablets. Furthermore, there are both benefits and challenges when using tablets to improve reading.

Lastly, it sheds light on learners' perceived engagement with tablets and how tablets could be used as a mediating tool in learning to read. This study contributes to the growing body of knowledge on teaching and learning in the 21st century, more specifically the use of technological devices and how it could lead to more meaningful learning experiences for young children, more specifically how tablets can contribute to improving reading in the Foundation Phase of schooling.

Keywords: Foundation Phase; tablets; single case study; Afrikaans Home Language; reading proficiency; Social Cultural Theory; Technological Pedagogical Content Knowledge

LIST OF ACRONYMS

4IR:	Fourth Industrial Revolution
ACT:	Advanced Certificate in Foundation Phase Training
AI:	Artificial Intelligence
ANA:	Annual National Assessment
App:	Application
ASER:	Annual Status of Education Report
CAPS:	Curriculum Assessment Policy Statements
CK or C:	Content Knowledge
COVID-19:	Coronavirus Disease 2019
DBE:	Department of Basic Education
DoE:	Department of Education
EGRA:	Early Grade Reading Assessment
FAS:	Foetal Alcohol Syndrome
FFL:	Foundations for Learning
HIV:	Human Immunodeficiency Virus
ICT:	Information and Communication Technology
ILA:	International Literacy Association
NEEDU:	National Education Evaluation and Development Unit
NEEDU:	The National Education Evaluation and Development Unit
NGO:	Non-Governmental Organisations
NRS:	National Reading Strategy

PCK: Pedagogical Content Knowledge

PIRLS: Progress in International Reading Literacy Study

PK or P: Pedagogical Knowledge

SACMEQ: South African Consortium for Measuring Educational Quality

SCT: Social Cultural Theory

TCK or TC: Technological Content Knowledge

TK: Technology Knowledge

TPACK: Technological Pedagogical Content Knowledge

TPK or TP: Technological Pedagogical Knowledge

US: United States

WCED: Western Cape Education Department

ZPD: Zone of Proximal development

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1.1   Introduction

This study explored the use of tablets to improve reading in a selected Grade 2 Afrikaans Home Language classroom at a Primary School in the Western Cape. The purpose of the study was to explore how tablets can assist learners in improving their reading skills. In this chapter, Chapter One, the study's background and rationale are discussed to provide context to the study. This is followed by the problem statement, research questions and the aims and objectives of my study. I conclude this chapter by providing the methodological considerations, outlining the significance of the study and offering a brief overview of the chapters to follow.

1.2   Background and rationale for my study

Globally, there is a concern regarding the increasing rate of learners who exhibit reading difficulties in the Foundation Phase. Even though learners are enrolled in a school, their reading achievement remains low (Taylor, Stephen & Spaull, 2015). According to the latest Annual Status of Education Report (ASER) 95, 9% of learners aged 6-14 are enrolled in schools (Kim, Boyle, Zuilkowski & Nakamura, 2016). Across all languages, only 47,8% of learners in India can read a Grade 2 level text (Kim et al., 2016). Of all surveyed learners in Grade 3, only 19% could read simple words such as "day" or "sit" (James, 2014; Foy, 2021). The ASER report only surveyed learners in rural India. The United States (US) National Assessment of Educational Progress states that 31% of learners in Grade 4 are reading below the basic level (Douglas & Albro, 2014). When learners read grade-appropriate reading material, they did not understand what they were reading, because the basic foundation of learning to read, that is, phonemic awareness and phonics were not consolidated (Douglas & Albro, 2014; Motilal & Fleisch, 2020).

The Progress in International Reading Literacy Study (PIRLS) (2021), an international benchmark on literacy includes four reading comprehension levels, which includes: low (learners focus on and locate and retrieve stated information), intermediate (basic references and inferences are made), high (interpret and integrate ideas and information) and advanced (context and textual elements that are evaluated and critiqued) (PIRLS, 2021a). The PIRLS (2021a) results portray that in the top-achieving country, only 35% of learners reached the

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advanced level and in the second and third-achieving countries only 21% of learners reached the advanced level. The median percentage reaching the advanced international benchmark was 7. This means that learners that were assessed in these countries at the end of Grade 4 had only 7% or fewer reaching the advanced level. From this, it can be inferred that improvement in reading is imperative for every country.

In South Africa, matters appear worse. Many learners under the age of 10 in South African schools are reading below grade level (Ardington, Wills & Kotze, 2021). According to the PIRLS conducted in 2006, Grade 4 learners in South Africa scored the lowest of participating countries. Eight out of ten learners obtained less than 50% for reading and 35% obtained between 0% and 34% overall for Home Language. The Grade 4 PIRLS test results of 2011 indicated that many learners in Grade 4 struggled with higher-order comprehension skills such as inferential, interpretive, analytical and critical reading skills (Van Staden & Zimmerman, 2016). The PIRLS (2021a) results depicted that South African learners in Grade 4 are significantly below the PIRLS 500 benchmark. Only 19% of learners achieved the lowest benchmark while 1% reached the advanced, 3% the high benchmark and 9 % the intermediate benchmark (PIRLS, 2021b). South Africa's best readers in reading achieved lower marks than the top-achieving country's lowest reading achievers.

Low achievement levels in the reading of South African learners were also reported in the South African Consortium for Measuring Educational Quality III (SACMEQ) [Department of Basic Education (DBE), 2017]. These results indicated that overall performance in reading is at 21%, while achievement in higher-order comprehension is below 20%. Low results and patterns in the Annual National Assessment (ANA) in Grade 3 Literacy confirm the above conclusions. The ANA qualitative report from 2012 indicated an improvement in Grade 3 learners' performance in literal comprehension, while the majority of learners struggled to interpret and integrate ideas and information (DBE, 2011; DBE, 2015). The ANA reported that the majority of learners were unable to respond to questions correctly, left blank spaces without providing answers, transcribed the questions and failed to construct sentences to respond to the text in the reading comprehension section.

The problems regarding reading were common, especially in learners from rural areas and historically disadvantaged township schools (Du Plessis, 2014; Cilliers & Bloch, 2018b). Moreover, according to Spaull and Pretorius (2019), 78% of Grade 4 learners do not comprehend what they are reading. Lawrence (2011); Fourie, Sidibe & Muller (2018) confirms

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that the media had continually published an unattractive picture of the low reading results in the Foundation Phase since the launch of Curriculum 2005, in March 1997. Despite various curriculum changes from 1997 to 2004, the findings of tests such as the Progress in International Reading Literacy Study (PIRLS) of 2006 reveal that South African learners have obtained the lowest overall reading literacy average out of 45 participating educational systems (Spaull et al., 2016) and the SACMEQ highlights that more than half of the learners in South Africa's primary schools are not even, reading at a minimal level to allow them to survive reading at grade level. Considering the results of PIRLS 2021 and SACMEQ we need to look at the reasons why learners are not capable of reading at grade level.

The reasons why learners struggle to read are multiple and complex. According to Spaull (2017), results of prior research show that both learner and school factors influence learner's achievement in learning to read. Some factors such as "malnutrition and stunting, extreme poverty, Foetal Alcohol Syndrome (FAS) and Human Immunodeficiency Virus (HIV) may lead to developmental delays and disabilities. Learner's background knowledge, motivation, gender, home language, home background and geographical location may also affect reading achievement (Spaull, 2017, p.1-5). For Sayed & Motala (2012) ; Spaull & Hoadley (2015), poor reading levels could be attributed to how learners are taught by their teacher, the lack of parental involvement and the social divide in South Africa.

Despite great advances in increasing quality teaching in primary schools, reading achievement rates remain low Wolf, Gottwald, Gaylean, Morris and Breazeal (2014); Rule & Land (2017). There is generally a crisis in the supply of teachers who have the appropriate language backgrounds to teach Grades R-3 in their Home Language (Nomlomo, Stofile & Sivasubramaniam, 2018). This factor has attributed failures in reading to poor teacher content knowledge. Teachers need content knowledge to teach learners, which entails questioning and higher-order questioning skills that need to be developed to grow learners as independent critical thinkers (Nomlomo et al., 2018). Initial Teacher Education programmes focussing on the Foundation Phase should include thorough training in how to teach a learner to read.

Poor reading results can be attributed to the way teachers are trained. Verbeek (2014); Motilal & Fleisch (2020) asserts that although teachers are fully qualified in Foundation Phase teaching, they have no coherent understanding of how reading develops nor do they have appropriate pedagogical knowledge to inform their teaching practice. Taylor and Von Fintel (2016) argue that there is no dedicated course teaching Foundation Phase teachers how to teach

reading. Reading is modelled with an emphasis on correct punctuation and accuracy instead of making meaning. Jones, Clark and Reutzel (2013); Kimathi & Bertram (2019a) found that most early literacy teachers repeatedly used oral drill sequences to teach reading, where learners failed to engage in the meaning of the text. No practice or guidance in silent reading takes place (Steinke & Wildsmith-Cromarty, 2019). Zimmerman and Smit (2014); Mukhari (2016) state that it appears that South African teachers are not able to teach reading and will in future not know how to assist struggling readers in their classroom.

In response to the reasons provided why learners find reading challenging, efforts have been initiated to improve reading. In the words of the Western Cape Education Department (WCED) (2019):

> Many countries in the world are concerned about the poor reading skills of learners in the Foundation Phase. The global community has committed to ensuring that by 2030 all learners under the age of 10 complete quality education that ensures that they are able to read and understand what they read (WCED, 2019, p.8).

The Foundation Phase is the key phase where learners accumulate building blocks to become independent readers. When a learner is unable to read at the end of Grade 3, this can have a detrimental effect on that learner's future. Not only does the inability to read affect the learner academically, but also emotionally and psychologically. The lack of reading skills in Foundation Phase teachers needs to be addressed urgently.

Numerous recommendations have been made to see how reading skills can be improved. The National Education Evaluation and Development Unit (NEEDU) (2013); Carnoy, Hinchey and Mathis (2015), recommended that the South African government address the lack of reading skills among the majority of Foundation Phase learners. The NEEDU's recommendations included: "more efficient time management by teachers, the building of school management teams, leaving it to schools to decide on their preferred language of learning and teaching (LOLT) in the Foundation Phase and starting a new uniformity approach to teaching reading and learning" (NEEDU, 2013, p.71-73). The Department of Basic Education (DBE) (2015, p.21) wrote a report and stated that they need to delegate the writing of graded sets of reading materials. Furthermore, the employment of additional language-trained subject advisors to provide leadership, advice and training to schools, teachers and parents was required. When teachers teach reading to learners, they should equip learners with skills to interact with text,

assist in understanding and meaning and develop skills in interpretative reasoning (NEEDU, 2013); Carnoy et al., (2015).

The Foundations for Learning (FFL) campaign, which was launched in 2008, was another initiative adopted by the DBE to address the reading crisis. The purpose of this campaign was to increase the average literacy results in South African schools to at least 50% by providing appropriate resources to the teachers, detailed daily lesson plans and establishing teacher conferences in all districts (Lawrence, 2011; Fourie et al., 2018). In contrast, the FFL programme posed challenges for teachers. It claimed to be a burden on teachers who were already struggling to implement work schedules. Several schools did not take the FFL seriously in the way tests were administered because of poor support provided to teachers by district officials (Lawrence, 2011). The ANA's was highlighted as one of the non-negotiable outcomes of the FFL campaign (DBE, 2011) and was enforced in all Primary schools to provide standardised evidence of learner achievement in reading that would enable teachers to plan effectively for the improvement of reading results (Lawrence, 2011). Cilliers and Bloch (2018, p.2) note that "the primary school curriculum states that learners should be able to read and write fluently at a complex level of cognitive skill at the end of Grade 3. From Grade 4, learners then use these literacy skills to investigate a variety of disciplinary fields. Research portrays that this is not the current situation in the South African schooling system (Taylor, 2017).

The results of the ANA seem to indicate that the development of basic literacy skills, such as reading and writing skills have not received enough attention in the Foundation Phase (Nel, Mohangi, Krog & Stephens, 2016). Even though the ANA tests were of great benefit in gaining information regarding reading and writing in the Foundation Phase, there has been criticism against using these tests. Spaull (2015) and Van Der Berg (2015) offer a critique of the ANA by noting that these tests were used as evidence that "improvement" has taken place in education while the ANA's can show no changes over time. They found no methodological foundation to make any comparisons over time and across grades. Comparisons that were made were found to be misleading and inaccurate. In addition, the ANA tests' difficulty levels differed every year across grades. It appeared that the results had nothing to do with improvements but rather to test the difficulty and content that was covered.

The latest project the DBE is embarking on is a synthetic reading programme. This synthetic reading programme is aimed at improving learners' reading skills. This approach focuses on isolating each sound in a word and separately analysing it to form a word. For example, the

word cat is parted in the sounds c-a-t. This is based on the work of Scarborough's (2001) reading rope. Learners are taught the sounds that are represented by letters and letter combinations. They blend these sounds to pronounce words and finally identify which phonic generalisation applies (Scarborough, 2001; Altun, 2019). This method also emphasises the forming and pronunciation of sounds and emphasises that words are made up of different sounds. Despite the effectiveness and popularity of this latest project, there are factors such as lack of materials and teacher knowledge that hinder the productivity of this project (Filita & Thuthukile, 2023).

One way of addressing the reading problem amongst Foundation Phase learners, especially geared towards the 21st century learner, is through the use of technology. Jantjies and Joy (2015) state that technology has become a crucial aspect of the teaching and learning process across the world. For Chigona (2013); Johnston (2019) educational technology must be integrated into classrooms and the curriculum, since traditional methods of teaching may no longer be effective. Integrating tablets across teaching and learning is argued to require a greater effort but would facilitate greater changes in teaching and learning in the classroom, especially for reading (Hoadley & Muller, 2014; Johnston, 2019). The tablet, which allows for explorations similar to those voluntarily used by learners is suited for the school setting due to its portability, the size of the screen, its ability to connect to the Internet and its touchscreen interface (Sergi, Gatewood, Elder & Xu, 2017). Additionally, useful apps are plentiful, affordable and some even complimentary, and they allow for a uniform space for all learners to engage in educational experiences simultaneously (Sergi, Gatewood, Elder & Xu, 2017). Rozeboom (2017, p.3) argues that "it is important to find the appropriate technological tool for the appropriate learning situation to develop a specific skill, such as reading".

Quinn (2016) found that improved teaching outcomes in Australia can increasingly be linked to the rate of investing in tablets. Literacy organizations such as the International Literacy Association (ILA) recognize the changing nature of literacy and have issued statements to help inform classroom teachers as well as higher education institutions of the shifting literacy needs in most American classrooms. Wells (2012); Hannaway (2019) urges teachers to utilise tablets as a crucial part of their teaching in the classroom. Wells (2012, p.32) argues that "it is important to recognise emerging technologies, such as tablets, cell phones and smart boards as potential tools for reading development as part of our everyday lives in the 21st century." Tablets should be utilised to their fullest potential when schools are in possession of these tools.

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In South Africa, several schools are in the process of introducing tablets. Three provinces in South Africa: Limpopo, Free State and Mpumalanga benefited from the tablet distribution by Afrika Digital Education Centre Initiatives, as a way to improve reading in schools (Eicker-Nel & Matthee, 2014; Camilleri & Camilleri, 2020). Picton (2019) announced that the DBE is on track to provide each learner with a tablet and allow teachers to teach with these devices. She added that the rollout would begin at selected schools in 2020. The DBE (2004); Ahmed & Noor (2022) explains that the National Policy on e-education in South Africa focuses on the teaching and learning of a new generation that is comfortable with technology use at home, as well as at school.

In the Western Cape, many learners in the province have access to new technologies for communication and spend most of their free time playing and chatting on such platforms (Walton & Donner, 2012; Mukhari, 2016). The WCED supplied Information and Communication Technology (ICT) materials to most of the under-resourced schools in the Western Cape to aid teaching and learning through the Khanya Project established in 2002. The Khanya technology project was to supply and augment the current curriculum to enhance the quality of teaching and learning in all schools in the Western Cape (WCED, 2011; Jantjies & Joy, 2015). By 2011 all public schools in the Western Cape were equipped with computer laboratories and most of these schools were provided with interactive whiteboards as well as Internet connectivity. During the distribution of the technologies, the Khanya Project trained in-service teachers on how to use ICTs (Chigona, 2013; Jantjies, 2015). Even though the effects of technology use in the classroom for teaching and learning have been explored extensively, (Divall & Zgarrick, 2013; Quinn, 2016; Homer et al., 2014 and Camilleri & Camilleri, 2020) research regarding the educational potential of tablets to improve learner's reading in the Foundation Phase appear rare.

1.3   Problem statement

As mentioned, globally and nationally, reading in the Foundation Phase is a big concern. According to published reports, by the end of fourth grade, over half of South African students have not learned to read in either their home language or any other language (Spaull et al., 2016). The reasons for low reading proficiency are varied, and researchers have so far identified a wide range of causes. According to Kimathi and Bertram (2019), there are several factors

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contributing to South Africa's reading crisis, including socioeconomic status, health, and access to books. Taylor (2012) studied classroom and school-related factors, while Spaull and Comings (2019) focused on factors that occur at home, like socioeconomic status and language. Hoadley and Muller (2014) discussed the dearth of instructional resources and books in the home as a possible reason.

Steinke and Wildsmith-Cromarty (2019) highlighted the lack of teacher training regarding the teaching of reading. The aspect of a lack of teacher training is further expanded on by Rule and Land (2017) who state that teachers were taught to use visual methods to teach reading, such as pictures associated with words and flashcards. The emphasis of meaning-making was on individual words in isolation rather than on larger segments of texts such as paragraphs, sentences or text as a whole. These conclusions resonate with Taylor's (2012) findings, which state that teachers lack knowledge of operational pedagogies to teach reading. Foundation Phase teachers in South Africa do not have content knowledge as well as the pedagogical skills to teach learners how to read (Spaull & Hoadley, 2015). According to Kimathi and Bertram (2019), teacher training institutes seem to have little or no impact, as learning from these institutions does not contribute to the teachers' knowledge base or competencies in a meaningful way, therefore, new ways of addressing how teachers teach reading are warranted.

Despite the prevalence of technology, there appears to be an under-utilisation or non-adoption of accessible tools and technologies for educational benefit (Filita & Thuthukile, 2023). Despite the increased need to understand the subsequent effects of tablet integration and use within an educational context, Banoobhai, Maboe and Makgatho (2018); Clarke and Svanaes (2014) and Haßler, Major and Hennessy (2016) purport that research on the use of tablets for educational purposes is still in its infancy, since there are only a handful of researchers that have studied the use of tablets in educational settings. The purpose of this study is, therefore, to explore how the use of tablets can improve reading in a Grade 2 Afrikaans Home Language classroom.

1.4   Research questions

The main research question this study aimed to address was: How can the use of tablets improve reading in a Grade 2 Afrikaans Home Language classroom?

The following sub-research questions will aid in answering the main research question stated above.

- What are the teachers' experiences of the use of tablets to improve reading?
- What are the learner's experiences of the use of tablets to improve their reading?
- What are the contextual benefits and challenges associated with the use of tablets to improve reading?

1.5   Aims and objectives

The overall aim of this study was to explore how the use of tablets can improve reading in a Grade 2 Afrikaans Home Language classroom. The study's objectives are to:

- Explore teachers' experiences of the use of tablets to improve reading amongst Grade 2 Afrikaans Home Language learners.
- Investigate learners' experiences of the use of tablets to improve their reading.
- Determine the contextual benefits and challenges associated with the use of tablets to improve reading.

1.6   Methodological considerations

This study employed a qualitative research approach, using a single case study design. According to Denzin and Lincoln (2011), the generation of qualitative data is how human experiences can be understood. The participants' authentic experiences, their wording and rich description of the phenomenon were studied in its natural context (Denzin & Lincoln, 2011). I selected a qualitative approach because it enabled me to gain an in-depth understanding of the experiences of the teachers and learners' use of tablets to improve reading in the Grade 2 Afrikaans Home Language classroom. I conducted individual interviews with two Grade 2 Afrikaans Home Language teachers, a focus-group interview with 5 learners and collected document sources. In addition, I did classroom observation, observing teachers and learners engaging with tablets in the classroom.   A more comprehensive discussion of the methodological considerations for this study will be done in Chapter Three. Following are definitions of key terms used in this study.

1.7   Significance of the study

This study contributes to the growing body of knowledge on teaching and learning in the 21st century, more specifically the use of technological devices and how it could lead to more meaningful learning experiences for young children, more specifically how tablets can contribute to improving reading in the Foundation Phase of schooling. As previously noted, research on the effective use of tablets is still in its infancy stage. This study will therefore be of use to all education stakeholders wanting to improve reading proficiency, especially among younger children.

1.8   Thesis structure

This thesis consists of 6 chapters. Chapter One outlines the context of the research as well as why this study was undertaken. It comprises the introduction, background and rationale, problem statement, research questions and aim and objectives. This is followed by the study's significance, and definition of key terms and ends with the structure of the thesis. Chapter Two has a dual purpose in that it offers both a review of literature on reading and the use of technology in the teaching of reading, as well as the theoretical frameworks that underpinned my study.

In Chapter Three I focus on the methodological issues surrounding this study, which included a discussion on the metatheoretical framework, research approach and research design. Included in this chapter are the data collection methods, data analysis as well and the ethical considerations of my study. The data derived from the findings is presented in Chapter Four. Chapter Five offers an analysis and discussion of the main findings. This is followed by the final chapter, Chapter Six, which provides an overview of the study, outlines the limitations encountered in doing this research looks at the implications of the findings and provides recommendations for future research.

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LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

In Chapter One, I provided background literature, which unveiled the reading crisis in South Africa. In this chapter, Chapter Two, my focus is twofold; firstly, to review the literature on the phenomenon under study and secondly, to offer a discussion of the theoretical frameworks that underpin this study. I start by offering an analysis of literature pertaining to the issues relating to reading and the use of tablets to support reading in a Grade 2 Afrikaans Home Language classroom. This is followed by a discussion of the two theoretical frameworks that framed this study, namely, Vygotsky's (1978) Social Cultural Theory (SCT) and the Technological Pedagogical Content Knowledge (TPACK) by Koehler and Mishra (2006).

2.2 Section 1: Literature review

As mentioned, this chapter offers both a literature review as well as the theoretical lenses used to underpin this study. The review of literature that follows will assist in conceptualising reading and discuss aspects relating to reading and challenges teachers face in teaching reading. It also provides a discussion on the use of technology in education and the benefits and challenges teachers face in the use of tablets to improve reading.

2.2.1 Conceptualising the term reading

Even though this study foregrounds the use of technology, more specifically tablets against the reading backdrop it is crucial first to delve into how reading is taught and conceptualised. Mullis, Martin and Sainsbury (2015, p.11) define reading "as the ability to understand different forms of written language that is required by society and valued by the individual". From the work of Maboe, Smith, Banoobhai and Makgato (2018) we acknowledge that recognition, fluency and comprehension are key to reading. For them, reading is, "a cognitive process where symbols are interpreted to make meaning of text. This involves identifying words in print, called recognition, identifying and coordinating words for reading to become automatic, called fluency and constructing meaning from print, called comprehension" (Maboe et al., 2018, p.1).

Kocaarslan (2016) states that:

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> Comprehension is the result of reading. Comprehension is the strategic process where the reader use cues from a text in conjunction with prior knowledge to make and monitor predictions and finally construct meaning from text, thus what we refer to as reading for meaning (Kocaarslan, 2016, p.676).

Without comprehension, learners are not able to read for meaning. It is crucial that learners are taught to engage with a text to add meaning to it. Pretorius and Klapwijk (2016) are of the opinion that the tools for learning to read must be accumulated from a young age to enhance the development of this complex process.

Reading is a complex developmental process that needs to be taught. Numerous learners get to school without the tools they need to begin this complex task of learning to read (DBE, 2017). These tools include the following skills: how to listen, follow directions and decipher non-verbal messages. These tools can be described as emergent or pre-reading. Some learners are not exposed to pre-reading activities, which form an integral part of their development. Pre-reading entails that a child listens to a story that is read aloud and eventually retell the story, reads pictures and turns the pages of the book, reads books and point to their names, pictures or print, know words are made up from sounds and knowledge of syntax and ability to understand and tell stories (Weadman, Serry & Snow, 2022). In this stage of pre-reading the concept of print becomes known to learners. They then realise that letters differ from each other and are different to whole words (Weadman et al., 2022).

Pre-reading thus helps learners understand what print is, how it works and why it is used. These understandings give rise to oral language competencies and print skills (Nel et al., 2016). Parents and/or guardians play an important role in developing emergent literacy skills and encouraging a love for reading in learners by reading bedtime stories, modelling reading and exposing learners to as much as possible print at home, as well as communicating with their children using rich vocabulary (McNab, 2016). The PIRLS (2006; PIRLS, 2021) found that early reading activities at home are crucial in developing learner's reading skills and abilities at school. Different skills can be applied by learners, at the different school levels they find themselves in.

A table by Ekwall and Shanker (1989) (Table 1) is used to illustrate the components of reading at each school level. Even though this table is outdated it does give one a sense of what learners at different levels ought to have achieved.

Table 2.1: Reading enfoldment from Foundation Phase to Intermediate Phase

LEVEL	SCHOOL LEVEL	SKILLS ACQUIRED
1	Preschool to Grade 1 in the Foundation Phase	**Pre-reading skills:** Phonemic awareness Letter-sound relations

2	Grades 1-4 in the Foundation Phase and the beginning of the Intermediate Phase.	**Word identification and decoding of words, understanding words and ideas:**
		Basic and other sight words
		Phonemic analysis
		Structural analysis
		Contextual clues
		Vocabulary
		 -meaning vocabulary
		   -utility vocabulary
		Comprehension
		  -Literal meaning
		  -Inference
		  -Evaluation
		  -Appreciation
		Oral reading

3	Grade 4 in the Intermediate Phase and onward	**Reading and study skills**: -Dictionary skills - Study skills and learning

Source: Adapted from Ekwall and Shanker (1989, p.16).

What we draw from the table is that there are three levels of reading, as set out by Ekwall and Shanker (1989). These three levels assist in one's understanding of what learners should be able to do with regard to reading at their grade level. Not all learners reach each level exactly at the same time, however, some reach a higher level at an earlier or later school level. Older learners in the Intermediate Phase may still use reading skills acquired at a previous level when they encounter unknown words. The first two levels need to be mastered by Foundation Phase children if they want to read proficiently and with meaning at the end of that phase, which is Grade 3.

2.2.2 Debates on the teaching of reading to learners

Researchers have for decades debated on how to effectively teach learners to read. These debates include decoding and comprehension when reading a text, spending more time on meaning, teachers' knowledge of teaching reading, bottom-up and top-down approaches and getting learners involved in discussions around reading (Van Rijk, De Mey, Van Oers & Volman, 2017). For Hugo (2011, p.9; Pollatsek & Treiman(2015) teaching reading to learners entails two issues; decoding and comprehension of texts when reading. She defines decoding as "the abilities used for reading where written signs and symbols are translated into language.

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Comprehension deals with the understanding of text where meaning is assigned to the text". When we talk about skilled readers they can use decoding and comprehension speedily and simultaneously (Miller, 2017). However, Spaull, Pretorius and Mohohlwane (2020) argue that the majority of learners have not mastered the basics of decoding skills in their Home Language in either Grade 1 or 2 therefore, making reading unlikely. There should be a bigger focus on decoding, oral language proficiency, vocabulary and fluency. Spaull et al. (2020) note from the PIRLS (2016) results that this evaluation focuses on comprehension but not the "input" components of reading which are: decoding, oral language proficiency, vocabulary and fluency. It is argued if teachers can enhance decoding skills, reading will improve in learners (Fox, 2014; Pollatsek & Treiman, 2015).

In contrast, Taylor (2017) argues that too much time is spent on decoding and too little time is spent on meaning and comprehension. However, time spent on an activity in the classroom does not necessarily equate with effective instruction. Zimmerman and Smit (2014); Hoadley (2016) state that learners who have developed fluent decoding skills often experience a rapid drop in reading comprehension marks when the instructional focus changes from learning to read to reading as a tool to learn. The PIRLS (2016) results reveal poor comprehension abilities in both Grade 1 and Grade 2 readers, but at the same time, poor comprehension inevitably also raises questions about basic reading abilities in the Foundation Phase (Hoadley, 2016). Hoadley (2016) warns that if learners struggle even with literal comprehension in Grade 1 or Grade 2, then it is because they can barely decode the texts that they are expected to read. If the multiple components that give rise to meaning and comprehension, also known as the big five of reading (phonological and phonetic knowledge, alphabetical knowledge and phonics, oral reading fluency, word recognition and vocabulary) are not well developed, then the overall efficiency of the reading process is compromised. Pretorius and Klapwijk (2016) found that teachers at state schools observed that learners struggle to read but did not make teaching reading a main focus in the classroom.

It seems that numerous Foundation Phase teachers in South Africa have an under-developed understanding of teaching reading (Dudula, 2013; Hoadley, 2016). According to DoE (2008); Pretorius and Klapwijk (2016), teachers tend to use methods such as group reading while other methodologies can be explored such as guided reading, shared reading, independent reading and reading aloud [Department of Education (DoE), 2008]. Group reading is not suitable for individuals and their abilities and this is at times the only method teachers use to teach reading.

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In line with this, the National Reading Strategy (NRS) (DoE, 2008) states that one teaching method is not sufficient for teaching reading.

Gibbons (2015) outlined two prevalent approaches when it comes to teaching reading, namely bottom-up and top-down approaches. These approaches are also best known as the phonics approach and the look-and-say approach (Hugo, 2011; Pollatsek & Treiman, 2015). The bottom-up approach refers to a phonics approach where the learner learns to read by learning the relationship between sounds and letters (phonemic awareness) building words, saying the word as a whole and then writing sentences (Phala & Hugo, 2018). An emphasis is put on decoding and not on what the reader brings to the text. The top-down approach also known as the whole language approach where learners learn to read using existing knowledge of the content and genre of a text to make sense of what is being read (Gibbons, 2015). This emphasises that learners read whole words and sentences without sounding them. However, both approaches have their limitations.

The bottom-up approach has limitations when the reader starts reading poetry and narratives. This approach does not allow for higher-order meaning-making processes and limits the reader in that regard (Dole, Duffy, Roehler and Pearson, 1991; Gibbons, 2015). In the top-down approach, the reader is not a participant in the meaning-making process and views that all readers will interpret the text the same (Phala & Hugo, 2018). Educationists agree that learners should use both top-down and bottom-up approaches in the reading process to be effective readers. These two approaches mentioned previously, focus on a balanced approach where the focus is on both what is written in a text and what the reader brings to it (Phala & Hugo, 2018).

Furthermore, Lundberg and Reichenberg (2013); Tiba (2018) suggest that:

> Teachers should encourage learners to be actively involved during reading instruction by asking questions that promote discussions. This result in less teacher talk and more interaction with the learners. Learners should be encouraged to talk about what they have read, thus actively engaging them and allowing them to participate in the reading process that could improve thinking, reasoning skills and comprehension. This enables learners to understand and be able to explain the meaning of what has been read (Lundberg & Reichenberg, 2013, p. 91).

Teachers must understand that reading is an interactive process. If teachers want to improve learners' reading and meaning-making skills, learners should be questioned on texts they were read. Not only should learners be taught to interpret a text in a literal meaning-making process,

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but from a young age they must be taught how to add a deeper meaning to a text and to make assumptions.

It is essential that teachers plan their reading instruction. This includes a variety of approaches to provide an opportunity to practice skills through interactive reading (Ardington, Wills & Kotze, 2021). The more exposed learners are to reading and skilful reading strategies, the better their language development will be. However, despite recommendations and the CAPS curriculum's emphasis on using communicative approaches to teaching reading, rote learning continues to be used in classrooms around South Africa (Motala & Sayed, 2012; Spaull & Hoadley, 2015). Rote learning can be defined by Wium and Louw (2011); Neumann (2016) as drilling or chanting the same word and sentence, where the teacher reads the word and learners repeat it thereafter. This does in essence not facilitate meaningful learning. Pretorius and Machet (2004); Neumann (2016) state that rote learning is not conducive to meaningful literacy practices and adds no knowledge to learners' reading skills. Howie et al. (2017) state that attention to reading leads to the improvement of reading skills, which in turn results in the improvement of language proficiency, positively influencing academic performance.

2.2.3 Comprehension: Reading for meaning

In a traditional sense, comprehension is viewed as understanding what you read. This is assessed in schools by accurately recalling what was read to answer questions (Taylor, 2017). According to McLaughlin (2012, p.433) ; Maboe et al., (2018) Comprehension is the process of extracting and constructing meaning while interacting with text by using prior knowledge, general understanding, previous experiences and how information is synthesized. Comprehension has been verified and studied and is an essential part of the reading process (Kocaarslan, 2016). If you cannot understand what is being read to you or what you are reading, meaning cannot be constructed.

Furthermore, according to Lessing (2017)

> Comprehension means readers do not only think about what they are reading but what they learn. Constructing meaning means building their store of knowledge. Meaning is, therefore, constructed in the form of connections made by the reader. These connections can be one or multiple combinations and include text-to-self (where the text relates to something of importance to the reader), text-to-text (the text relates to another text previously read) and text-to-world (text relates to issues that an individual can relate to in their own world) Lessing (2017, p.462).

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Being able to comprehend what you read is crucial for a learner's emotional and intellectual development. Being able to comprehend what you are reading is a gateway to interpreting information, nurturing empathy and developing critical thinking skills. When a learner reads with meaning, they engage with a text on a deeper level and can form connections between the text and their own experiences. Meaningful reading equips a learner with tools for academic achievement, fosters curiosity and enriches a love for reading.

Teaching comprehension skills to a learner is vital to each learner's store of knowledge that pertains to reading skills. Making meaning of a text should be taught and tested while reading is taught. Making these connections allows the reader to go beyond the information given (Miller, 2017). Hulme and Snowling (2013); Pollatsek and Treiman (2015) consider numerous reasons why learners with poor comprehension skills fail to understand text. At this level, they find it difficult to make inferences and appreciate story structure. Learners with poor comprehension also exhibit oral language weaknesses in relation to vocabulary and word knowledge, sentence comprehension, inflexion and understanding of figurative language. Lastly, learners with poor comprehension skills have a poor working memory, however, research in this regard has not been able to show whether difficulties with memory cause difficulties with comprehension or vice versa (Hulme and Snowling, 2013; Pollatsek and Treiman (2015). It is crucial that comprehension skills should be taught from a young age, preferably in the Foundation Phase.

To increase learner's comprehension skills in Grades 1 to 3, it is imperative to understand this from a neurological perspective. Acquiring comprehension skills is not a straightforward linear process that takes place in one region of the brain, however, a developmental progression of sub-processes that occur in numerous parts of the brain (Kweldju, 2015).

Al Dahhan, Kirby and Munoz (2016) state that:

> These sub-processes include speech-motor processing, comprehension, sensory visual processing of words and letters and long-term memory. Due to this multi-componential nature of the brain, deficits may occur in any given sub-process that may result in comprehension difficulties in a learner. Strengths in some sub-processes may occur that can compensate for weaknesses in other sub-processes (Al Dahhan et al., 2016, p.2).

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In the classroom, there might be many learners that show signs of comprehension difficulties, however, before any intervention methods can commence, one needs to understand the nature of these difficulties. Some learners may have deficits in one or multiple components or just be unable to integrate information across these above-mentioned sub-processes.

Research by Evans and Hulak (2020) found that a key fundamental component of the reading process is word reading. Most reading difficulties usually occur when a learner is unable to read sight words and simple 3-letter words (Al Dahhan et al., 2016). In essence, word reading is an important phase since it could lead to reading comprehension. Learners who are characterised as good readers are those who accurately identify and read words fluently. Al Dahhan et al. (2016) further state that:

> Components such as accuracy and fluency are crucial in the reading process, and if this is not achieved, deeper levels of comprehension cannot be achieved by any learner. Success in word reading development involves the integration and interrelation of phonology (how different words sound), semantics (what words mean) and orthography (how words appear visually) (Al Dahhan et al., 2016, p.4).

Learners who are challenged by identifying single sounds and have difficulty blending sounds will not reach the deeper levels of comprehension. George and Bloch (2017) state that a mind shift in the early teaching of reading must take place for teachers to understand that making meaning and comprehension is the end of a necessary process in the teaching of reading.

2.2.4   Challenges with reading in the Foundation Phase of schooling

There are challenges that teachers experience in the teaching of reading in the Foundation Phase. According to Whitworth and Chiu (2015), despite being qualified teachers, many of the teachers in rural or semi-rural schools are either untrained or only partially trained to teach in the Foundation Phase. Steinke and Wildsmith-Cromarty (2019) argue that Initial Teacher Education has a strong impact on teachers but this training tends to produce teacher-led approaches with little flexibility Steinke and Wildsmith-Cromarty (2019) found that teaching reading formed a small section of a university's curriculum and teachers are not adequately prepared to teach reading in the Foundation Phase. Furthermore, Fatyela, Condy, Meda and Phillips (2021) found that teachers focus primarily on code-based reading activities in the classroom and neglect meaningful literacy practices.

A few studies of teachers in Grade R–3 classrooms showed links between the early literacy experiences of teachers, their conceptualisations of literacy and their consequent practices of literacy as a narrowly constrained code-based activity with little attention to meaning (Fatyela et al., 2021). The tendency of teachers to rely on whole-class oral chorusing of reading, the lack of reading resources, lack of individual reading assessment, lack of reading homework and minimal reading of extended texts in the early grades have also been identified as instructional practices that contribute to poor reading development (Pretorius & Klapwijk, 2016). Hoadley (2016) found that poorer schools face additional challenges in the teaching of reading in the Foundation Phase. For her, learners in poorer schools do not get enough opportunities to practise reading or to meaningfully engage with text. Spaull (2019) argues that various other challenges prevent learners from becoming proficient readers in poorer schools including insufficient policy focus on early childhood development and primary schooling, language barriers, weaknesses in the instructional core (teacher content knowledge, inadequate teaching time and teacher absenteeism), home background and extreme class sizes in the Foundation Phase.

2.2.5   Research on the use of tablets in an educational setting

The adoption of tablets in the classroom has gained prominence in recent times. Research is starting to demonstrate the value of incorporating these devices in teaching and learning (Huang, Liang, Su & Chen, 2012; Camilleri & Camilleri, 2020). According to Dlamini (2018), a learner's use of tablets is dependent on the support the teacher gives in the classroom, where the learning environment should be supportive and encouraging. Churchill, Fox and King (2012); Morgana (2018) argue that the extent to which tablets will be used in the classroom depends largely on teachers' awareness of these devices and the affordances of this technology. If teachers feel inferior about tablet use or have poor knowledge of integrating tablets into teaching and learning in the classroom, the learning experience of using tablets for learners is compromised.

McNab (2016) purports that teachers who have access to tablets and have the knowledge to integrate tablets into their teaching and learning should seek ways in which they can be used more effectively and use them to promote learning in the classroom. Teachers therefore have a responsibility to provide learning experiences to learners to bridge the digital divide in our society. Many learners are growing up in a world that is saturated with new technologies, and because of this, teachers need to adapt to these changes (Dlamini, 2018). D'Agostino, Rogers,

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Harmey and Brownfield's (2016) study investigated whether an iPad app could assist first-grade students who were struggling readers to improve their letter identification skills. They compared students using an app for letter recognition and those using traditional ways of learning using magnetic letters. The activities conducted with the two groups were designed to be nearly identical. Significantly higher scores on tests related to letter recognition and identification, an important first step in learning to read, were achieved by the first group learning with the use of iPad App. D'Agostino et al. (2016) determined that the use of iPads had a greater benefit than traditional methods when working with students who have been identified as struggling readers.

A significant body of research indicates that tablet use enhances learning for students. Sergi et al. (2017) claim that a better method of predicting the impact of tablets on learning is to examine the characteristics of the tablets and how these characteristics are mediated by teachers' attitudes toward technology. Prior studies evaluating students' opinions of utilizing tablets for education discovered that students frequently experience increased motivation and encouragement to learn (McTigue & Uppstad, 2019). On the other hand, Churchill et al. (2012); Morgana (2018) contend that the evidence for tablet use's potential to improve learning is insufficient.

2.2.6 Perceived benefits and challenges of integrating tablets in educational settings

Research has pointed to the perceived benefits and challenges related to the use of tablets in educational settings. Using tablets in the classroom enables real-world 21st-century experiences for learners. The Internet, along with technology that allows learners to communicate, simulate and visualize has allowed for more authentic and engaging learning to take place (Ah-Nam & Osman, 2017). Biancarosa and Griffiths (2012); (Miller, 2017) argue that tablets can be an instrument for mitigating many reading challenges and it has already been used in new ways to address the full range of skills, both procedural and conceptual required for improving reading. Tablets hold great potential for learners to improve their knowledge, skills and learning performance in an informal manner (Huang, Liang, Su & Cheng, 2012; Camilliri & Camilleri, 2020).

Due to the large use of technology in the world in which we live, the use of tablets in teaching and learning is vital if we have to make a lasting impact on how learners learn. The use of tablets has a positive effect on learners' motivation to learn. It is well-known that learners are

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more engaged when they are enjoying themselves. Fokides (2017), found that fun plays a significant role in learning and is a contributing factor to the improved learning outcomes reported by learners. According to a study by Iyare, James and Amonde (2018), learning is more enjoyable when the learner actively engages; fun is enhanced when learning is supported by technology. Teachers observed that learners are engaged because they find the activities to be enjoyable rather than academic (Mize & Park, 2020). Furthermore, learners find motivation when using tablets because of the gaming elements. Fokides (2017) is of the view that games attract learners and they are motivated to learn more. In addition, these games also motivate competition between learners. Dhir, Gahwaji and Nyman (2013); Soffer & Yaron (2017) investigated the instructional benefits of using tablets in classrooms. They concluded that while tablets can motivate learners, overall, the research on the actual uses of tablets in learning is limited.

Using tablets in the classroom can be challenging. Ertmer and Ottenbreit-Leftwich (2012); Mukhari (2016) reported that teachers in the classroom often find it difficult to integrate new forms of technology into their teaching. This is due to the prohibitive costs of digital devices, inadequate training, insufficient time to create new lessons using this technological equipment and a lack of technical support. However, the dominant issue with technology integration is that many teachers report that while learners are comfortable using technology they do not feel adequately prepared to use tablets in everyday lessons (Dovigo, 2021). Despite the prevalence of technology, there appears to be an under-utilisation or non-adoption of accessible tools and technologies for educational benefits (Tamim, Borokhovski, Pickup, Bernard & El-Saadi, 2015).

According to Shuler (2012); Major, Habler and Hennessy (2017), there is currently a lack of research and evidence of the influence educational apps have on teaching and learning and, therefore, the industry has to collaborate to create standards to make it easier for parents and teachers to detect beneficial content for the learners. They further argue that one of the limitations of research on the influence of tablets is that it often looks at the affordances or qualities of tablets separately from teachers' theories of how they can be used in teaching.

In brief, this section offered a review of literature pertinent to understanding the topic under investigation, by discussing the complexities and nuances of ways of learning and teaching early reading and the integration of technology (tablets) to support the learning of reading. Next is a discussion of the theoretical framework(s) that framed this study.

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2.3   Section 2: Theoretical framework

2.3.1   Combining two theoretical frameworks

In this study, a combination of theories was used to frame the study theoretically, namely, the Socio-cultural Theory (SCT) pioneered by Vygotsky (1978) and the Technological Pedagogical Content Knowledge (TPACK) model introduced by Koehler and Mishra (2006). Vygotsky's SCT and his constructs the Zone of Proximal Development (ZPD), scaffolding and mediation provide insights into how learners learn and what teachers need to do to ensure that learning takes place. The TPACK model deals with the knowledge required for the teacher to integrate technology, in this case tablets, into their classroom practices. Following is a discussion of Vygotsky's seminal work.

2.3.2   Engaging with Vygotsky's theoretical constructs

2.3.2.1   Socio-cultural theory (SCT)

SCT stems from the work of Russian Psychologist Lev Vygotsky (1978). As mentioned, Vygotsky's theoretical framework SCT is used in this study to explain how learning happens. Wang, Bruce and Hughes (2011, p.297) note that SCT is not only a theory of culture or social aspects but "rather it is a theory of mind and knowledge". In addition, they note that "it recognises the role social relationships and cultural constructs play to form the development of cognition" (Wang et al., 2011, p.297). For Vygotsky (1978) learning and human development originate in social and cultural interactions. Three fundamental concepts define SCT: firstly, social interaction plays an important role in learning, secondly, language is an essential tool in the learning process, and thirdly, learning occurs within the ZPD (Vygotsky, 1978).   In Vygotsky's words: "every function in the learner's cultural development appears twice: first, on the social level, and later, on the individual level; first between people (inter-psychological) and then inside the learner (intra-psychological)" (Vygotsky, 1978, p.57). Parents, teachers and peers with whom the learner interacts daily are important to their learning. These social interactions, according to Vygotsky (1978), occur within a particular cultural context.

As explained by Vygotsky (1978):

> Learning awakens a variety of internal developmental processes that are able to operate only when the learner is interacting with people in his environment and with his peers. Learning is not development; however, properly organized learning results in mental development and sets in motion a variety

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of developmental processes that would be impossible apart from learning. Thus, learning is a necessary and a universal aspect of the process of developing culturally organized, specifically human, psychological functions (Vygotsky, 1978, p.90).

Social interactions are central to a learner's cognitive and emotional development. Donald, Lazarus and Lolwana (2010) explain that knowledge is not fixed but varies across different historical and social contexts. Knowledge can, therefore, not be handed over, but is a process of construction and re-construction individually and socially. Vygotsky (1978) further argues that "any learner's holistic development cannot be understood by a study of the individual only. Learning can, therefore, never be divorced from the social setting as it occurs when learners interact with people, objects and the immediate environment around them" (p.287).

The social use of language through communication is emphasised in SCT since language forms the main method of communication in social interactions. Vygotsky (1978) describes how children acquire inner speech. Young children organise their thoughts, perceptions, and experiences by talking aloud while they play. As the child gets older, these gradually turn into internal dialogues. At this point, the child's inner speech and thought combine to allow them to think through language (Donald et al., 2010). According to Vygotsky (1978), it is during this transition that the child begins to develop independent thought. The key concepts proposed by Vygotsky are discussed below, which will help to clarify how learning occurs and how learners learn.

2.3.2.2 Zone of proximal development (ZPD)

At the heart of Vygotsky's views on learning lies his construct of ZPD. Figure 1 provides a graphical representation of this construct.

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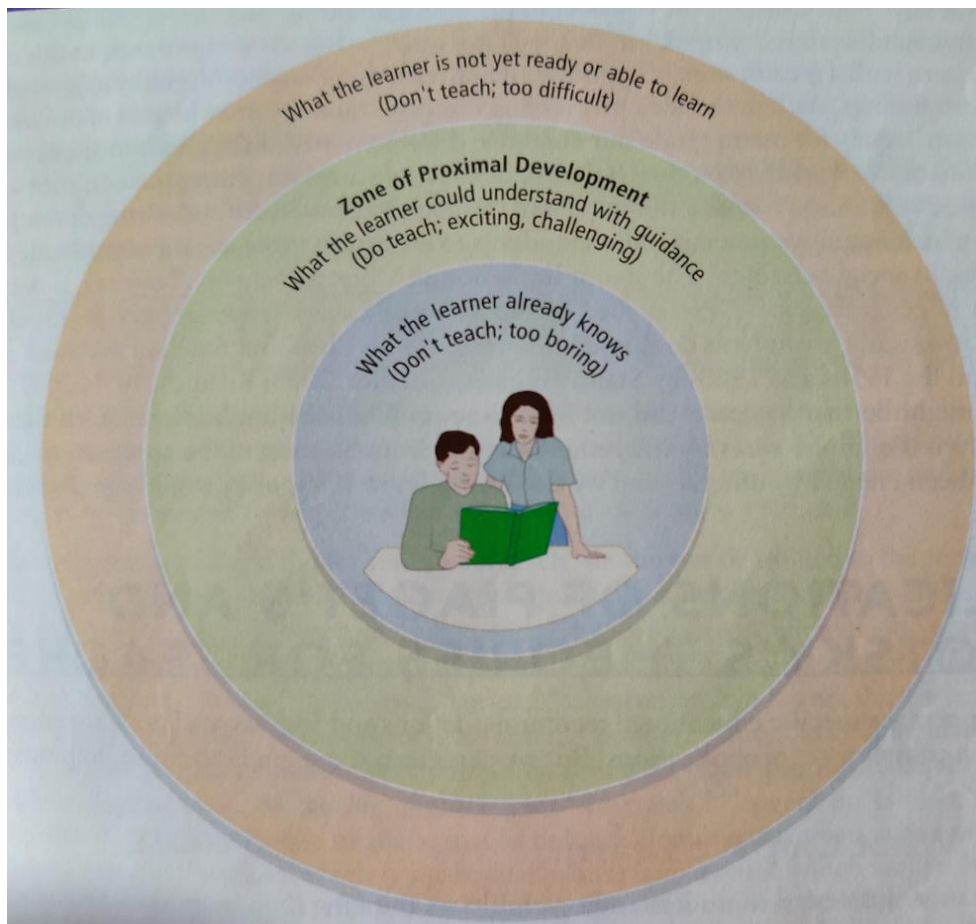
Figure 2.1: A graphical representation of the Zone of Proximal Development (ZPD) (Berger, 2004)

ZPD is defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978,p.86). More simply stated: "what the learner can do in collaboration today he will be able to do more independently tomorrow" (Vygotsky, 1978, p.211). ZPD helps teachers conceptualize the difference between the level of actual performance and the learning potential of the learner (Kozulin, Gindis & Miller, 2003, p.17). This definition suggests that there is a significant difference in the development of the learner when in the company of a

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knowledgeable other. The difference means that the learner learns promptly and actively in the company of a teacher, mentor or a more knowledgeable peer. Vygotsky (1978) views interaction with peers as effective and a way of developing strategies and skills. Teachers can use cooperative learning experiences where less competent learners develop with the help of more knowledgeable skilled peers within the ZPD.

2.3.2.3 Mediation

Mediation and the use of mediating tools are important for learning. For Lantolf & Poehner (2008, p.1) "... the most fundamental concept of sociocultural theory is that the human mind is mediated". Vygotsky (1978) defines mediation as the representation of tools, where these tools are adopted by the learner to help resolve a problem in a social setting that hinders achieving the goal or target. Mediation, in social interactions, is described as an engine that drives development. It is the process through which a learner takes possession of the cognitive tools that make the construction of knowledge possible (Donald et al., 2010). A person interacts with the world through mediation. The world is never taken directly in the course of the development of higher cognitive functions, but always mediated (Wertsch, 1991).

The natural relationship between the person and the world is mediated through the socio-cultural relationships. Mediation, therefore, leads to the development of higher cognitive functions, which are unique to being human (Donald et al., 2010). The concept of mediation helps us understand the essence of pedagogy, as guided assistance, thus where the teacher or more competent peer guides a learner into establishing more advanced ways of knowing and being. This is done through the use of both physical and symbolic mediators (Vygotsky, 1978; Lantolf, 2000). Learners therefore use various tools (calculators, computers, tablets apps etc.) and cultural artefacts (language and cultural practices) to enhance their cognitive abilities. For Vygotsky (1978), these mediating tools or mediators are influenced by cultural and social factors and are acquired through social interactions.

2.3.2.4 Scaffolding

Lantolf and Poehner (2012) define scaffolding as support or assistance where a teacher, more knowledgeable other or parent mediates the environment. The teacher or knowledgeable others would sequence difficulty levels of an aspect and then support learners in becoming more efficient (Landsberg, Krüger & Swart, 2016). Using a scaffolding technique in the classroom holds great benefits for learners. In the process of scaffolding, the teacher or more

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knowledgeable other models key knowledge structures or strategies to the learner (Donald et al., 2010). When the learner begins to master these strategies and internalises them, the teacher gradually withdraws the amount of assistance provided. According to Verenikina (2004), the term scaffolding is an attempt to operationalise the concept of teaching in the ZPD. Demonstration, dividing tasks into manageable pieces, providing guidelines, keeping attention focused, as well as providing examples and questioning are examples of some scaffolding techniques teachers can draw on (Rasmussen, 2001). According to Rasmussen (2001, p.264), "the quality of the child-adult interaction is seen as crucial when scaffolding children's learning".

2.3.3   Critique of Vygotsky's seminal work

Applying the ZPD in practice is more problematic. Vygotsky failed to provide information regarding the effective use of ZPD in classrooms (Shayer, 2003). Verenikina (2004) argues that Vygotsky's ZPD presents a restricted view of the learning process and reduces the learners' role to one of passivity and dependence upon the peer, teacher or tool. Moreover, the role of the teacher or peer in ZPD is to shape the social environment of the learner, and the teacher, peer or tools cannot directly influence the learners in their cognitive development. Despite this criticism, Vygotsky's work is still widely used to explain how learning happens. Next, I turn to the second theoretical framework, TRACK, which will be used in this study to understand what happens when tablets are integrated into teaching and learning.

2.4   Engaging with the Technological Pedagogical Content Knowledge (TPACK) model

TPACK theory stems from the work of Koehler and Mishra (2006). TPACK can be defined as "the integration of the development of knowledge of the subject matter with the development of digital technology and knowledge of teaching and learning" (Niess, 2005,p.509). Harris, Mishra and Koehler (2009) note that TPACK comprises three knowledge components, namely, knowledge of content, knowledge of pedagogy, knowledge of technology and understanding the complex relationship between these three knowledge components. The following figure (Figure 2) provides a diagrammatical representation of the inner workings of TPACK.
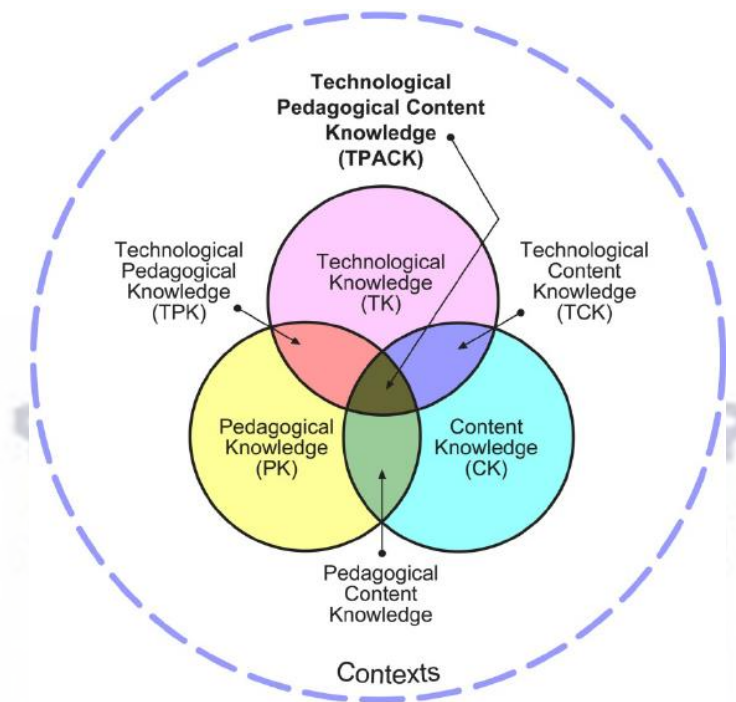
Figure 2.2: The Technological Pedagogical Content Knowledge (TPACK) model (Koehler & Mishra, 2006)

The following section, taken from Harris et al. (2009) offers a detailed explanation of the elements of TPACK. The elements include:

Content Knowledge (CK or C): This comprises the teacher's knowledge about the subject matter to be taught to the learner. The content that is covered varies by subject matter as well as the age of the learners. Teachers must understand and know the subjects they teach, including concepts, knowledge of facts, procedures and theories in the field, and knowledge of rules of evidence and proof. If a teacher does not have these understandings they can misrepresent those specific subjects (Harris et al., 2009). Shulman (1986) observes this content knowledge includes ideas, theories, concepts and the organisational framework. This aspect embraces different ways of practical incorporation of technology into the educational setting.

Pedagogical Knowledge (PK or P): This form of knowledge comprises a teacher's deep knowledge about the processes or methods of teaching and learning. This includes, among

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other things, the overall educational goals, teacher's aims and values. This is a form of knowledge that involves all matters of student learning, lesson plan development and the implementation thereof, classroom management and evaluation of all learners, including knowledge about methods and techniques and the nature of the target audience. Any teacher with deep pedagogical knowledge understands how learners acquire skills construct knowledge and develop positive depositions towards learning. PK requires an understanding of the social and cognitive development of theories of learning and how this applies to learners in the classroom (Harris et al., 2009, p.396).

Technology Knowledge (TK or T): This form of knowledge deals with practically implementing technological resources and tools such as books, chalk, and more advanced technologies, such as the internet, artificial intelligence and digital media. This includes knowing how to use information technology effectively in the classroom, as well as in everyday life. This knowledge of technology use includes knowledge of operating systems and computer hardware, the ability to use software tools including web browsers, word-processors and email programs, basic knowledge about installing and upgrading hardware and software and staying up to date with dynamic technologies. Teachers should recognise when information technology can impede or assist the achievement of goals, and constantly adapt to changes in technologies. It, therefore, requires a deeper understanding and mastery of information about technological tools to process information and improve communication and problem-solving than does the traditional definition of technology literate. Given this, technology knowledge evolves and consists of interaction with technology (Harris et al., 2009, p.396).

Pedagogical Content Knowledge (PCK): this form of knowledge is consistent with similar ideas of knowledge applying to the teacher of specific content. PCK covers the core business of teaching and learning, the curriculum, assessments, conditions to promote learning, assessment and pedagogy. PCK advocates that teachers interpret subject matter, adapt instructional materials to alternative conceptions, and find multiple ways to represent it and the learner's prior knowledge of a specific subject matter (Shulman, 1986, cited in Harris et al., 2009, p.396).

Technological Content Knowledge (TCK or TC): This section deals with how content and digital technology influence and limit one another. Teachers must master more than the content they teach and understand how the content can be changed by tablets in use. Teachers need to familiarise themselves with different technological tools, which are best suited for addressing

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subject matter, and learning how the content influences the technology or vice versa. Therefore, teachers need to understand the impact of digital technology on the practices and knowledge of a given discipline if they want to develop the appropriate technological tools for educational purposes (Harris et al., 2009).

Technological Pedagogical Knowledge (TPK or TP): This form of knowledge is an understanding of how teaching and learning can be affected when digital technologies are engaged in pedagogy. It includes knowledge of pedagogical limitations and possibilities of a range of technological tools as they relate to developmental and disciplinary pedagogical designs and strategies (Harris et al., 2009).

Technological Pedagogical Academic Content Knowledge (TPACK) forms the core of all the different domains. Different pedagogical techniques make room for using technologies to teach content. Incorporating tablets in teaching and learning helps stimulate prior knowledge aid in developing new epistemologies and reinforce old ones (Harris et al., 2009).

2.4.1 Critique of the TPACK model

Different reasons are highlighted for the difficulty of enacting TPACK in pedagogical practices. TPACK theory does not leave room for explaining teachers' backgrounds when investigating pedagogical practices (Niess, 2005). Despite the contribution of TPACK even after many years of study, teachers' application of TPACK remains unclear (Koh, Chai & Tsai, 2013). Teachers need to understand what kind of technology works, how to integrate this and in which context they can use technology when teaching. TPACK was not designed to be a complete package for integrating technology it needs to be viewed in context (Koh et al., 2013).

2.5 Chapter summary

This chapter offered a review of the literature drawing on various sources to shed light on the intricacies and complexities surrounding the research topic at hand. By reviewing the literature, this review illuminated key concepts, perspectives and debates on the integration of tablets to teach reading. In addition, this chapter also included discussions on the theoretical underpinnings that were used as conceptual lenses to guide the research and for interpreting the findings that emanated from the analysis process later in this study. Both Vygotsky's (1978) SCT and Koehler and Mishra's (2006) TPACK model were used to frame my study

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theoretically. In the next chapter, Chapter Three, I offer a discussion on the methodological considerations for my study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter comprised the literature review and discussed the theoretical frameworks that underpinned my study. This chapter, Chapter Three is devoted to the methodological considerations of the study. Following is an overview of the research paradigm, the methodology approach employed as well as the research design. This is then followed by how I dealt with the aspects of trustworthiness of the study and I provide an overview of the ethical considerations pertinent to this study.

3.2 Research paradigm

My study is framed within an interpretivist paradigm. A paradigm, as defined by Maree et al. (2016, p.52) "is a set of assumptions or beliefs about fundamental aspects of reality that gives rise to a specific worldview". Three fundamental assumptions were addressed, which include ontology, epistemology and methodology. Ontology refers to one's belief about the nature of reality, epistemology refers to how knowledge is constructed and the relationship between the knower and the known (Stebbins, 2001). "All qualitative research is based on underlying assumptions about what constitutes as "valid" and which research methods are appropriate for a specific reason and a particular context" (Ritchie & Lewis, 2003, p.11). Seeking to understand the experiences of the participants is a process that is described as interpretive (Denscombe, 2007).

Generally, interpretive studies attempt to understand a specific context through meanings that people assign to it. Henning (2004, p.22) states that "the interpretive paradigm portrays the use of qualitative research methods in collecting and analysing data". The interpretive paradigm is used to understand, explain and demystify social reality through the eyes of different participants, where human actions are socially constructed activities and need to be interpreted (Cohen, Manion & Morrison, 2020). Interpretivism, therefore, concerns itself with making sense of the lived practices, giving the researcher insight into how a phenomenon can be interpreted. Following in Table 2 is an overview of the methodological considerations of my study.

Table 3.1: An overview of the methodological considerations

RESEARCH DESIGN AND METHODOLOGY	
Research Paradigm	Interpretivist
Methodology Approach	Qualitative approach
Research Design	Case Study
Sampling	Purposive
Site	Historically disadvantaged Primary School in the Northern Suburbs
Participants/Unit of Analysis	Grade 2 Afrikaans Home Language teachers, 5 Grade 2 Afrikaans Home Language learners
Data Collection	Interviews -Semi-structured interviews with 2 class teachers -Focus-group interviews with 5 learners Field notes and observations Type of observation: Observer as participant - Learners were observed in the classroom engaging with tablets. Observations were done over 2 weeks for 30 minutes daily. During this time, I kept field notes capturing each learner participant's daily progress. Gathering of document sources
Data Analysis and Interpretations	Thematic Analysis
Trustworthiness	Credibility, transferability, dependability, confirmability
Ethics	Informed consent, Confidentiality, Risk and Harm, Privacy Act

3.3   Research approach

The research approach that best suited this study was qualitative research. Myers (2009, p.293) defines a research method "as a plan of action that is aimed at and structured to meet certain goals". There are three research approaches or methods, which are: qualitative, quantitative and mixed method research. Quantitative and qualitative research approaches are well established in social and behavioural science and mixed methods approaches are growing in prominence (Maree et al., 2016). It is acknowledged that these previously mentioned research approaches relate to how information regarding data collection, representations and analysis are deducted from collected data (Myers, 2009). No approach is superior to the other.

Each approach has its own purpose, methods of conducting inquiry, criteria for judging quality, analysis of data and strategies for collecting data. Some researchers prefer using mixed methods to reduce bias depending on the nature of the study (Maree et al., 2016). In order to get preferred answers to research questions, the research approach needs to be clear and provide

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specifications of actions to be followed to answer the research questions successfully (DelaRey, Duncan, Swartz & Townsend, 2008). The goal of research studies using a qualitative research approach is "to define and describe rather than explain behaviour in a specific context" (Babbie & Mouton, 2001, p.270). Qualitative research enables the researcher to explore interactions between people, behaviours, feelings and people's lives. Merriam (2009, p.23) explains that qualitative research focuses on: 1) how people interpret their experiences, 2) how they construct their worlds and 3) what meaning they attribute to their experiences.

For Denzin and Lincoln (2011) the participants 'authentic experiences, their wording and rich descriptions of the phenomenon are studied in its natural context. I studied both teachers' and learners' perceptions and experiences of the use of tablets (the meanings they attached to these experiences), within the Afrikaans Home Language Grade 2 classroom (an authentic space or within the natural context. Now that I covered the research paradigm (Interpretivism) and the research method that is framed by interpretivism (qualitative research), I now turn to the qualitative research design I employed in this study.

3.4   Research design

Qualitative research, as described earlier, complemented by the case study research design is based on the perception that reality is constructed through the individual's interaction with the social world. According to Babbie and Mouton (2001, p.75), "a research design is a model or plan of what steps to follow and how the research should be conducted". Thomas (2011, p.23) states that "a case study is an analysis of decisions, people, occasions, periods, projects, policies, or systems that can be viewed holistically using more than one method". Case study research "also tends to be research-centred, which involves observation of participants in an attempt to provide a holistic portrayal and understanding of the research setting" (Maree et al., 2016, p.82).

The strength of a case study rests in its ability to allow a researcher to study the various interactive processes at work as he or she concentrates on a particular phenomenon under study (Denzin & Lincoln, 2000). Yin (2003) suggests that placing boundaries on a case can prevent the researcher from going too broad and becoming unfocused in the research. Suggestions as to how to bind a case include time and place, time and activity, definition and context. Figure 3.1 is a graphical representation of the three dimensions of my case study.

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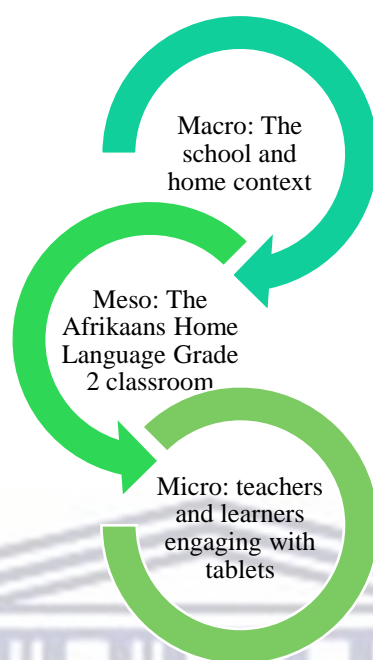
Figure 3.1: The case; the three dimensions of the case study (Adapted from Yin, 1984, p.46)

In this study, boundaries were placed on the case. There are three cases which included: The Macro-case, Meso-case and the Micro-case. From Figure 3.1, the Macro case is the school context, the Meso case is the Afrikaans Home Language Grade 2 classroom where the tablets were used and the Micro-case, is also the unit of analysis, both the teachers and learners. I conducted individual interviews with the class teachers, a focus-group interview with the learners and collected document sources to extract data. The unit of analysis will be used in the study to answer the research questions that the study posed (Yin, 2003). A brief overview of the sampling strategy employed is discussed next, followed by how the data was collected.

3.5 Sampling strategy

For this study, the sampling strategy that was deemed effective was purposive sampling. According to Ritchie and Lewis (2003), qualitative research generally makes use of purposive sampling. This means that members of a sample are chosen to represent a phenomenon. Using purposive sampling in this study ensures that the participants selected were a rich source of information (Silverman, 2013). This enabled me to explore and gain in-depth knowledge of how tablets were used to improve reading in Grade 2 in the Afrikaans Home Language classroom. The two class teachers and five learners in this study were purposively selected from the population of the historically disadvantaged Primary School. An interview with the

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school principal (Appendix G1) was also conducted to gain information about the school context. The inclusion criteria were as follows: learners who are achieving below 50% in Afrikaans Home Language. The learners' Home Language must be Afrikaans and they should not have repeated the grade. Even though the principal does not form part of the unit of analysis, I interviewed him to provide the context of the school.

Table 3.2 demonstrates the profiles of the five learners who participated in this study. It also portrays the learner's age, gender, home language and average marks for the Afrikaans Home Language subject for Term 2. The learner's real names were not used to maintain anonymity and confidentiality. The profiles of the class teachers are demonstrated in Table 3.3.

Table 3.2: Learner profiles

Learners	Gender	Age	Home Language	Home Language average
Participant 1	Male	8	Afrikaans	42%
Participant 2	Male	7	Afrikaans	37%
Participant 3	Female	7	Afrikaans	33%
Participant 4	Female	7	Afrikaans	38%
Participant 5	Female	7	Afrikaans	48%

Table 3.3: Afrikaans Home Language Grade 2 class teacher profiles

Teacher	Gender	Home Language	Language of Teaching and learning	Post Level	Highest qualification	Teaching experience
Teacher 1	F	Afrikaans	Afrikaans	1	B.Ed. Foundation Phase degree	6 years
Teacher2	F	Afrikaans	Afrikaans	1	Advanced Certificate in Foundation Phase Teaching (ACT)	10 years

Table 3.3 focuses on the class teachers. There are no rules for a sample size in qualitative research. The sample size depends on what the purpose of the inquiry is, what is useful and what can be done with the available resources provided (Ritchie & Lewis, 2003). Small sample

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sizes are sufficient and provide accurate and complete information in a context. Samples as small as four can produce accurate information. Sample sizes in qualitative research should not be too large, because this hinders thick, rich data (Sandelowski, 2010). Next, I will discuss the data collection instruments.

3.6 Data collection instruments

The data collection instruments I used to produce data were: semi-structured individual interviews, focus-group interviews, observations and document sources.

3.6.1 Semi-structured individual interviews

In qualitative research, interviews are commonly used for data collection. According to Cohen et al. (2020):

> An interview is a flexible tool used for data collection within qualitative studies as it is social in nature and regards the knowledge collected to be based on human interaction through the use of conversation. It is a specially constructed inter-subjective event that entails a question-based approach whereby the interviewer asks the interviewee content-specific questions that evoke detailed and explicit responses to achieve a focused and research-relevant purpose (Cohen et al., 2020, p.368).

A researcher can differentiate between three different interview methods. According to Berg (2001) in qualitative research, we normally differentiate between open-ended (also known as unstructured), semi-structured and structured interviews. An open-ended or unstructured interview often takes the form of a conversation with the intention that the researcher explores with the participant her or his views, ideas, beliefs and attitudes about certain events or phenomena. Open-ended interviews are normally spread over some time and can consist of a series of interviews (Maree et al., 2016).

Semi-structured interviews are commonly used in research projects to corroborate data emerging from other data sources (DiCicco-Bloom & Crabtree, 2006). It seldom spans a long period and is usually based on a line of inquiry development by the researcher in advance of the interview (Patton, 2002). On the contrary, in a semi-structured interview, questions are detailed and developed in advance. The interviewer controls the pace of the interview by treating the interview questions in a standardised and straightforward manner (Maree et al., 2016). Structured interviews entail detailed questions that are developed well in advance. The interviewer asks each participant the same set of questions and controls the pace (Ritchie &

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Lewis, 2003). When the interviewer asks questions, there is little flexibility in the asking and answering of questions. Structured interviews are likely to be used in descriptive studies where factual data is of the researcher's interest (Ritchie & Lewis, 2003).

I conducted two individual semi-structured interviews by utilising an interview schedule (Appendix G, Appendices G1-G2). As mentioned, this study conducted semi-structured individual interviews with the two Grade 2 Afrikaans Home Language class teachers. By doing this, I gained insight into how these teachers perceived and experienced the use of tablets to improve learner's reading in the Afrikaans Home Language classroom and the benefits and challenges associated with using tablets.

During the interviews, I focused my attention on the responses from the participants to identify new emerging lines of inquiry related to the phenomenon under study. Maree et al. (2016) warn that with semi-structured interviews, it is easy to get sidetracked by trivial aspects that have no relation to the study. I took caution of this and guided the conversation to what the focus of the interview was. I recorded the interviews with my cell phone, which lasted about 45 minutes. While conducting these interviews, I placed the cell phone in a strategic place on the table. This allowed me to do a recording and also not distract the teachers or make them feel conscience and uncomfortable (Qu & Dumay, 2011). New emerging lines of inquiry emerged that were directly related to the phenomenon being studied (Maree et al., 2016).

3.6.2 Focus- group interview

Besides semi-structured interviews, I also conducted a focus-group interview. Focus- groups usually consist of 6–8 people and are led by the interviewer following a topic-guided interview schedule (Maree et al., 2016). According to Adler, Salanterä and Zumstein-Shaha (2019), focus-group interviews are based on the assumption that group interaction will be productive in widening responses and releasing inhibitions that may otherwise discourage participants from disclosing information. Focus-group interviews produce rich data in detail that is difficult to achieve with other methods of research (Patton, 2002). Group dynamics becomes an integral part of the discussion where participants discuss the topic rather than giving individual answers to the researcher (Adler et al., 2019).

A focus-group interview allows participants to build on each other's ideas (Neuman, 2006). This helps to generate unexpected comments that can set a new perspective and add value to the study. I employed a focus-group interview with five Grade 2 Afrikaans Home Language

learners. I was aware of the limitations of focus-group interviews which include that information collected may be biased through group processes such as domination of discussion and views by more outspoken individuals. Also, difficult to assess the viewpoints of less assertive participants. Furthermore, in a focus-group interview, only one or a few topics can be discussed (Henning, 2004). I was sensitive to the Grade 2 learner's misunderstanding or having different interpretations of the meanings of words and questions being asked. I was, therefore, cautious when asking questions, and I provided clarification where requested.

The focus group interview took approximately 30 minutes. It was important for me to create a safe and relaxed space where everyone sat on chairs in a circle, this was to make eye contact with each learner and also to make them feel valid and respected. Adler et al. (2019) state that learners may be slow when responding or lose interest if the researcher is dominant. I created a child-friendly demeanour where patience, humour and warmth were essential.

3.6.3 Classroom observations

In qualitative research, observations are useful tools to gather data from a specific environment. Creswell (2014, p.239) takes the view that "observation is the systematic process of recording the behavioural patterns of participants, objects and occurrences without necessarily questioning or communicating with them". Kumar (2014, p.125) argues that "an observation is purposeful and a selective manner in which the researcher watches and listens to interactions taking place in a context".

According to Maree et al. (2016, p.91), there are four types of observations used in qualitative research, which include:

- **Complete observer:** This refers to the researcher who is a non-participant observer looking at a context from a distance, also known as the outsider perspective. This is known as the least obtrusive form of observation. The limitation however is that the researcher does not become immersed in the situation and does not understand and know what they are observing.

- **Observer as participant**: Here, the researcher gets involved in the context but the focus is mainly on his/her role as an observer. The researcher may look at behaviours, patterns, beliefs, values and dynamics but the main goal is to remain uninvolved and not influence the dynamics of the context.

- **Participant as an observer:** This strategy is mostly found in action research projects. The researcher works closely with participants to develop intervention strategies. The researcher, therefore, becomes a participant in a situation being observed and may intervene in the context or try to alter it. The researcher is immersed in a context to gain an insider perspective.

- **Complete participant**: The researcher gets completely immersed in the context of the participants being observed and does not know they are being observed. The limitations of this strategy raise serious ethical concerns where those observed have not granted consent to be observed.

My role during these observation sessions was as a 'complete observer'. Learners were observed in the classroom engaging with tablets. Observations were done over 8 weeks in order to capture sessions where learners were working on tablets. I kept field notes during the observation period, to make sure that I captured the activities, actions, feelings, body language and facial expressions of participants while they interacted with the tablets. My field notes became a valuable source of data collection. Another source of data collection was document sources, to which I now turn.

3.6.4   Document sources

The main focus of document sources is to analyse and interpret information that has been recorded. Bailey (2008) refers to documents as a piece of information like artefacts and electronic information that are black and white, published or stored electronically. Bowen (2009, p.28) defines the term document sources "as a systematic procedure to evaluate documents which include print (books, photos). Silverman (2013) states that documents are social truths that are created and shared. Document sources require that "data should be examined and interpreted to elicit meaning, develop knowledge and gain understanding of a phenomenon under study" (Bowen, 2009, p.27). Documents that are used for systematic evaluation for a research study can include registers, tests, journals, books, scripts, charts, papers, artefacts, reports and public records. The main purpose of gathering relevant documents is for the researcher to inspect them at a later stage. Researchers, therefore, use documents that they study and interpret to gain in-depth information about a specific context.

Document sources have numerous uses in qualitative research. According to Bowen (2009), specific uses of document sources include:

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Firstly, providing data on a specific context and historical insight and background knowledge, secondly, specific information in that documents contained can suggest questions that the researcher can ask and evoke new situations that the researcher needs to observe, thirdly, it provides supplementary data. This data includes new information and insight that can be valuable to adding additional knowledge to the research context and lastly, documents enable tracking change and development (Bowen, 2009, p.27).

Document sources can be analysed to verify findings and verify evidence from other sources. In this study, I used different document sources to expand my knowledge on the use of tablets to improve reading. These documents included: learner profiles, past EGRA (Early Grade Reading Assessment) tests and WCED schedules to extract the scores of the 5 learners. I also had access to the documentation, workshop minutes, and lesson plans of the Foundation that donated the tablets and trained teachers to integrate these into the teaching of reading. These documents previously mentioned besides providing me with ready-made data to understand the context and phenomenon under study, also served as a type of record-keeping and aimed to increase the reliability of this study.

3.7 Data analysis

During the research process, data was collected, recorded and analysed continuously. Merriam (2009) states that in qualitative research, the preferred way to do data analysis is to do it simultaneously with data collection. If data is not analysed continuously, it can become overwhelming, unfocused and repetitious. The data analysis procedure that this study employed was thematic analysis. According to Braun and Clarke (2012), thematic analysis is a method used to systematically identify, organise and offer insight into patterns of meaning and themes across data gathered. Firstly, data from observations and individual and focus-group interviews were audio-recorded, transcribed, sorted and then organised into themes. In addition, I provided detailed information on how data was analysed and discussed, using a flowchart.

The following flowchart, illustrated in Figure 3.3, is a map to explain the data analysis process employed in this study.
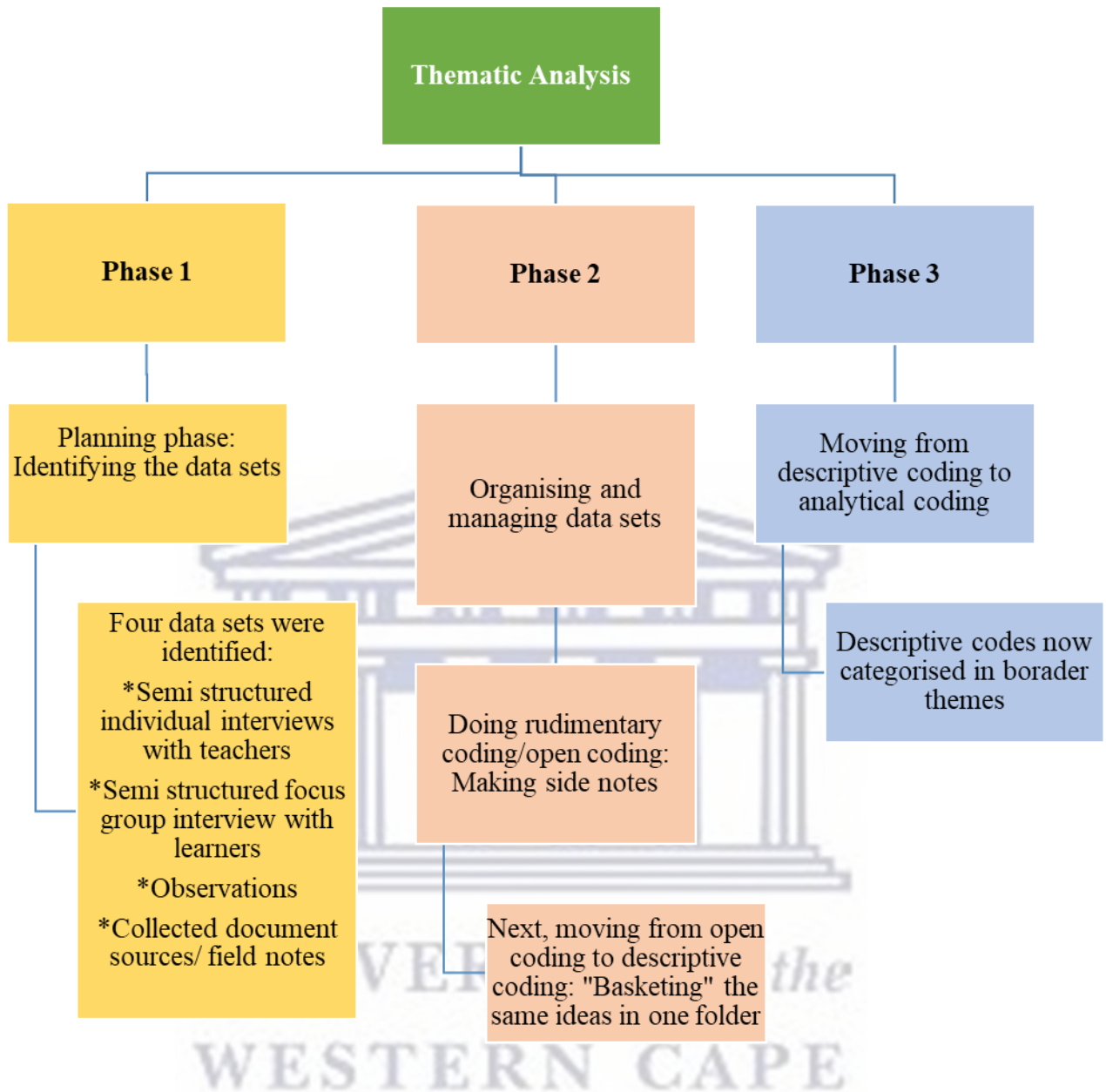
Figure 3.2: Thematic Data Analysis process (Adapted from Merriam, 2009; Braun & Clarke, 2006, p. 87-93)

Phase 1: Planning phase: Familiarising oneself with the data

At this phase, I identified all data sets and tried making sense of the data I gathered. Merriam (2009) states that it is important to know your data sets and keep in inventory of every data set. The next table, table 5, is an overview of the four data sets and data I gathered.

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Table 3.4: Identifying data sets

Data set	Information regarding the data set
Individual semi-structured interview	Conducted with the Grade 2 Afrikaans Home Language teachers
Focus -group interview	Conducted with 5 learners
Observations	Classroom observation: Literacy gameplay on tablets
Document sources	Learner Profiles, WCED schedules, past EGRA tests, Foundation Files, training workshop minutes, lesson plans

Phase 2: Organising and managing data sets (Moving from rudimentary coding/open coding to descriptive coding)

In this phase, initial codes are generated. For Merriam (2009) after identifying the data sets one needs to turn the transcriptions into readable text or text data. The transcriptions (Figure 3.3) were read through, and I listened to my interview recordings. By doing this, I made side notes (preliminary notes), called rudimentary analysis or open coding (Merriam, 2009). These are the first ideas and thoughts that came to mind while reading transcripts (Figure 3.5). I looked at each sentence and highlighted it then wrote down what I saw fit happening at each highlighted section.
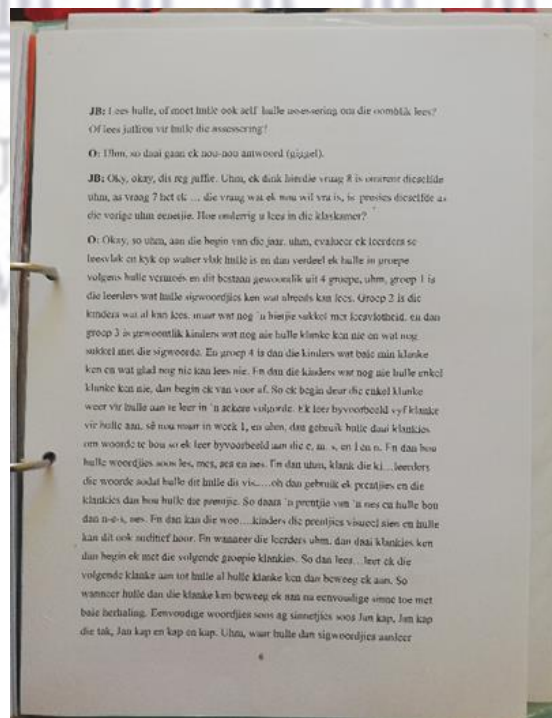
Figure 3.3: Snapshot of transcribed interview

42
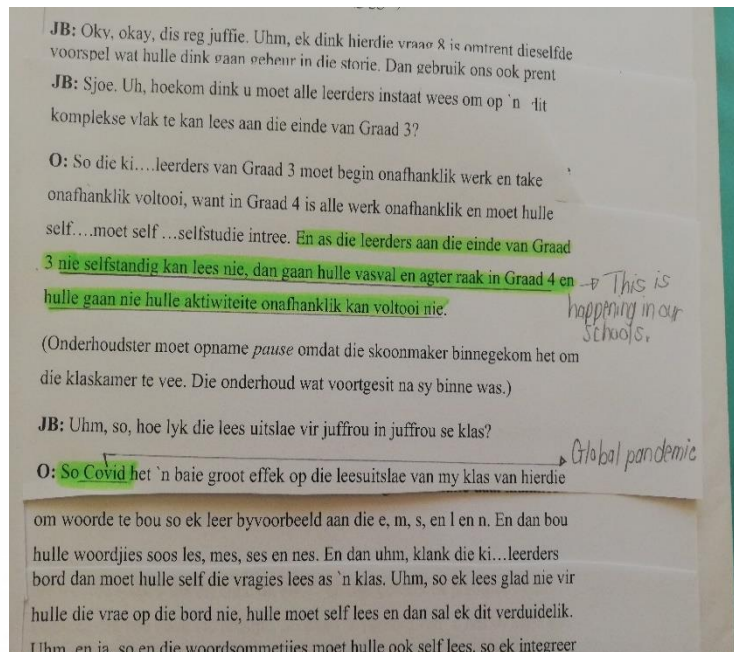
Figure 3.4: Snapshot showing: Doing rudimentary analysis (open coding)

Following in Table 3.5 is an illustration of how I worked with the data (an extract from Teacher1 interview), moving from mere note-taking/open coding to clustering points together and adding a descriptive code.

Table 3.5: Coding data – moving from open to descriptive codes

Data extract	Coded allocated	Descriptive Code
The learners [1]do not know all their single sounds and therefore [1]find it difficult to sound words. They also have trouble with auditory analysis, phonemic awareness and synthesis so they sound the word m-a-n [m-a-n] but they say sun [son]. So, they are not capable of making [1]auditory and oral connotations. And then, learners struggle with reading because there is [2]not enough time for consolidation I think, in Grade 1. The learners fall behind and they do not get the necessary assistance to make sure they know their sounds. And [2+3]numerous teachers, I think, do not really know how to teach children how to read	1. Identified reading problem 2. Reasons for reading problem 3. Lack of training	Traditional teaching

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Phase 3: Searching for themes -Moving from descriptive coding to analytical coding

According to Merriam (2009, p.180), analytical coding goes beyond descriptive coding. This coding comes from interpretation and reflection on meaning. The descriptive codes (see Table 12) are now categorised into broader themes. Themes were captured using recurring patterns that cut across data. When established themes are emerging, these themes will be used for discussions and to make sense of data. It is important to understand that: "themes are abstractions from the data gathered and not the data themselves" (Merriam, 2009). Braun and Clarke (2008) describe this phase as "searching for themes", by combining descriptive codes within and across data sets, and then "organising them into theme piles". The following Figure is an example illustrating how two theme piles combined to form one possible theme.
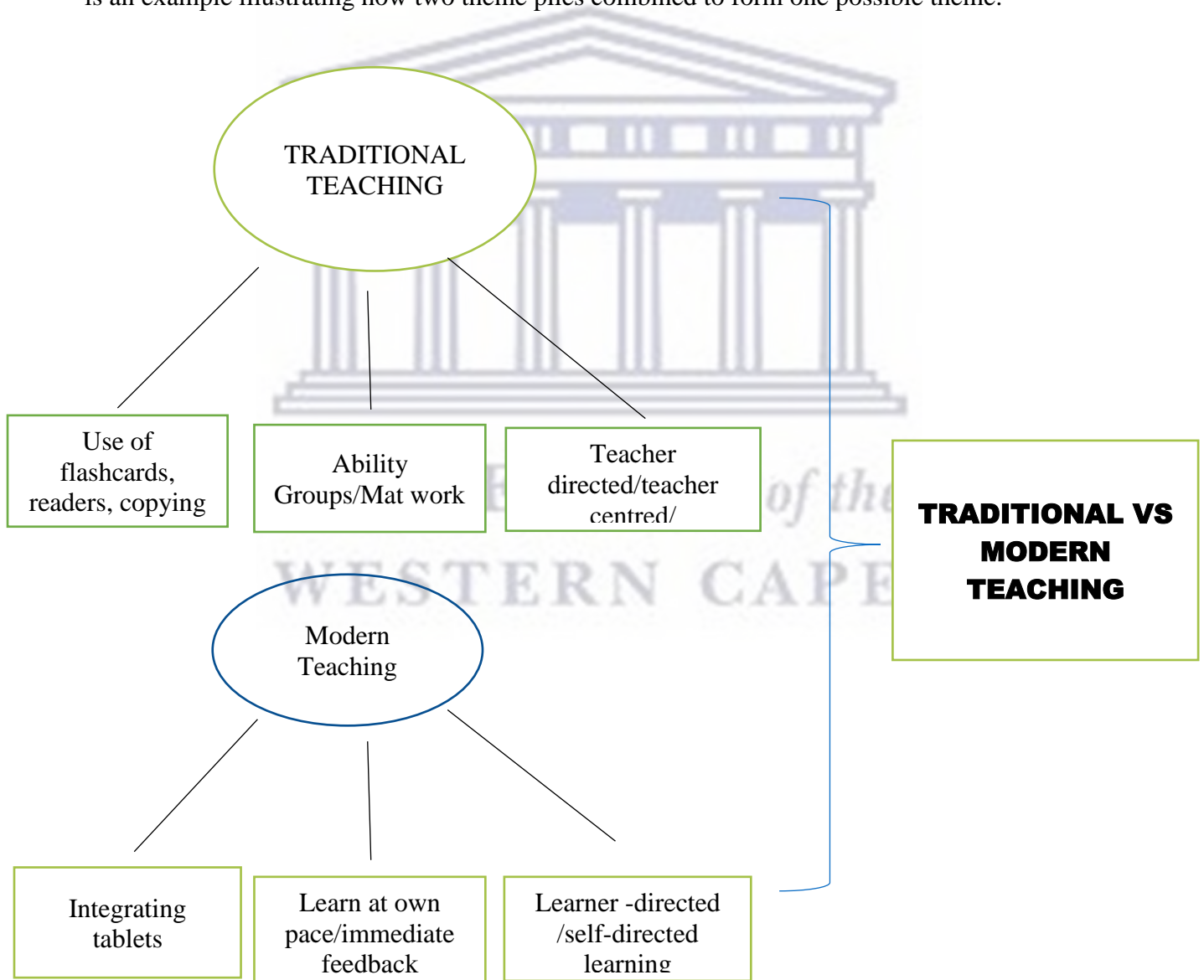
Figure 3.5: Two theme piles combined to form one theme

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More than two theme-piles were created from across the data sets forming a thematic map. Before deciding on the final themes, possible themes were revised or refined depending on recurring patterns that emerged from across the different data sets. According to Braun and Clarke (2008), it is at this point that the researcher must return to the data sets and compare themes against them. This process in turn led to the defining and refining themes (identifying the 'essence' of what each theme is about (Braun & Clarke, 2008, p.92).

The themes which emerged from this thematic analysis process were as follows:

- Traditional teaching vs modern teaching-integrating tablets;
- Tablets mediating and scaffolding function;
- Pedagogical shift-centred learning to self-directed learning through play; and
- Perceived benefits and challenges of using tablets to improve reading proficiency.

Merriam (2009, p. 181), asserts that "the challenge is to construct categories and themes that cuts across your data. It should be clear that the categories are abstractions derived from the data, not the data themselves". Glaser and Strauss note that these categories have a life of their own apart from the data from which they came, (Glaser & Strauss, 1967, as cited in Merriam 2009, p. 181).

3.8   Trustworthiness of my study

Establishing trustworthiness in a qualitative study is of utmost importance. Trustworthiness is defined by Merriam (2009, p. 209) as "producing research validly and ethically". As proposed by Lincoln and Guba (1985) qualitative research has strategies to establish authenticity and trustworthiness in a study. He proposes four criteria that he believes should be considered in the pursuit of a trustworthy study: credibility, transferability, dependability and confirmability. In Table 3.5, I list the four components of trustworthiness, state what each entails (offer a brief description of each) and show what I did in the study to address each of these components.

Table 3.5: Strategies to improve the credibility and trustworthiness of my study

Trustworthiness component	Description	How I applied this in my study
Credibility	"Credibility involves establishing that the results of the research are believable from the perspective of the participant in the research." (Lincoln & Guba, 1985, p. 84).	*Thick description of participants was used. *Member checking, where participants verified information.
Transferability	Invites the readers to make connections between elements of a study and their own experience (Lincoln & Guba, 1985). This refers to the degree to which the results of the study may be transferred to other contexts (Kumar, 2014).	* I provided detailed descriptions of the participants, the context, research design and used purposive sampling. *I extensively described the research processes for future researchers to follow.
Dependability	Refers to how reliable the data is (Lincoln & Guba, 1985).	*I kept a journal of decisions made during data collection and analysis of data to enable readers to understand my reasoning. *The analysis process followed was documented.
Confirmability	Described as "the degree of neutrality or extent to which the findings of a study are shaped by the participants and not by research bias, interest or motivation" (Lincoln & Guba, 1985, p.88).	*I included triangulation in my study. *I reflected on what I was thinking throughout the research process, thus reducing the effect of researcher bias. * I made use of member checking. *The Supervisor had access to audio recordings to check authenticity of transcripts

Adapted from Lincoln and Guba (1985)

These strategies speak to both my ontological beliefs (recognising that there are multiple truths-recognise different perspectives) and axiological belief (recognising that research is not value free).

3.9   Ethical considerations

It is every researcher's moral obligation to act and conduct research ethically. The following section outlines what I did to make my research ethically sound.

3.9.1   Informed consent

Informed consent refers to where the researcher explains to the participants what the research is about and what will be done with the information gained from the research study (Mareschal, 2019). Before I interacted with my participants, I made sure they understood the research. I provided each participant with an information sheet (Appendix C). Parents of minor children (learner participants) were asked for their consent (Appendix D). A different form (Learner Assent Form, refer to Appendices E2) was used to explain the research process to learners.

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This form was written in basic language for learners to understand and after they understood and agreed to participate they were asked to sign the form.

3.9.2 Anonymity and confidentiality

The data obtained in this study were completely anonymous and confidential. In this study, anonymity and confidentiality were established through the use of pseudonyms. Furthermore, instead of using the names of the school and the participants, I provided each participant with a code when referring to them, to protect their identity. The codes were also used in my research report (dissertation), to further enhance anonymity and confidentiality.

3.9.3 Risk and harm

In light of the COVID-19 pandemic, all safety protocols were adhered to at all times. The school followed protocols daily which I adhered to when conducting the research. Learner and teacher participants could withdraw from the research at any time without suffering any harm.

3.10 Chapter summary

In this chapter, I outlined the methodological considerations for my study. The study is a qualitative single case study and it is framed or underpinned by an interpretivist paradigm. Furthermore, I provided information about the sample, sampling procedures and data collection tools. Outlining the data analysis process over different phases followed. In addition, I provided a discussion on how trustworthiness and ethics were addressed in this study. In the next chapter, Chapter Four, I present the data that produced the findings related to my study.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1   Introduction

This chapter, Chapter Four is dedicated to presenting the data to derive the findings for the study. The data presented here was gathered over four data sets: through semi-structured and focus-group interviews, classroom observations and document sources. An interview with the school principal was also conducted to provide context for the school in the study. These data-gathering strategies were used to address the main research question under study. The main research questions this study aimed to address were: How does the use of tablets help learners to improve reading in a Grade 2 Afrikaans Home Language classroom?

The following sub-research questions will aid in answering the main research question stated above.

- What are the teachers' experiences of the use of tablets to improve reading?
- What are the learner's experiences of the use of tablets to improve their reading?
- What are the contextual benefits and challenges associated with the use of tablets to improve reading?

In Chapter Three, I provided a graphical representation of the three dimensions of this case study (see Figure 3.1). I reintroduced this diagram here to show how I approached this chapter.

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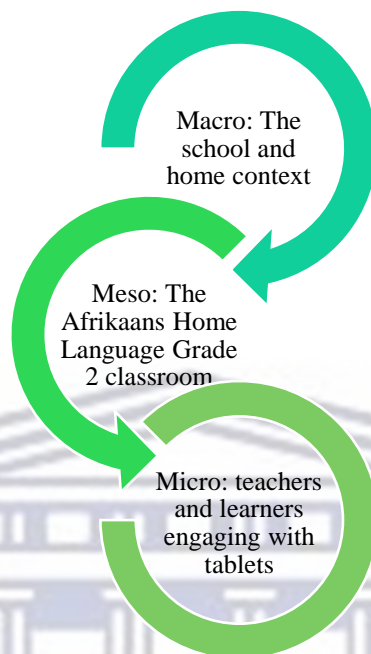
Figure 4.1: Three dimensions of this case study

Firstly, I present data from the Macro case that entails the school and home context. Then, the Meso case entails the Afrikaans Home Language Grade 2 classroom and lastly, data from the Micro case entails data from the teachers and learners and the use of tablets. Here, I treat each case as an individual case. This is followed by a cross-case analysis to derive particular findings that I will take forward into the discussion chapter, Chapter Five.

4.2   The Macro case: the school and home context

The macro case involves both the school and home context. In the following extract, the principal provided a glimpse into the community the school serves. In his own words:

> Our school is located in a historically disadvantaged area in the Northern Suburbs of the Western Cape. The community is plagued by unemployment, poverty, drug use or abuse, gangsterism and crime reigns, like with most places on the Cape Flats. This school has 45 educators with more than 1500 learners enrolled and class sizes vary between 38-45 learners. The school runs from Grades R-7 and has three phases, the Foundation, Intermediate and Senior Phase. Teaching and learning in the school take place in brick classrooms and some in containers. The Languages used for teaching and learning in the school are both English and Afrikaans. Learners from all

ethnic backgrounds and religions, in and around this area attends this school. The school is a no-fee school since most parents are unemployed and therefore not able to pay school fees. The majority of learners at the school are dependent on the school feeding scheme. The school is funded by the Western Cape Education Department and also receives funds from generous donors, like the Foundations, the one who donated the tablets. (School Principal interview, 1st September 2022).

No-fee paying schools are normally situated in previously disadvantaged areas serving communities where the majority of households live below the poverty line. Parental involvement in this community is problematic. Certain parents of the school community do not assist learners when it comes to academics or the use of technology at home. This could be due to a lack of knowledge from parents or significant others. Parents or caregivers themselves find it difficult to assist learners with reading or technology use. Some parents and grandparents in the community are not literate and, therefore, do not by means help with homework or tasks. The community is plagued with social ills, including drug abuse and gangsterism, as alluded to by the principal.

Most learners stay in small brick houses or shacks in family member's backyards. Although learners come from poor socio-economic circumstances, they mentioned that "*we have a cell phone at home. I use it for watching videos on YouTube*" (Grade 2 Afrikaans Home Language participant interview, 27th July 2022). T1 mentioned that "*most of the learners here, parents have some kind of technology in their homes that they can use to play games on or use for other purposes such as social media*" (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021). As previously mentioned, the teacher encourages learners to read at home. However, in most cases, learners do not read at home. T1 mentioned that "*the learners that are not performing well academically, have no support at home from parents. Some parents do not have the knowledge to support the learners. I try to provide guidance, but even if I do that, yet the parents do not do their part*" (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021). T2 states that: "*I sent reading material home so that learners can practice that with their parents, but in most cases, this does not happen because it is those struggling readers whose parents doesn't assist them at home*" (Grade 2 Afrikaans Home Language class teacher T2 interview, 13 July 2022).

The learners have technological tools at their disposal at home, however, these are not used for educational purposes. Learners use technological devices at home for entertainment which includes: "*PlayStations, cell phones, laptops, tablets and televisions*" (Grade 2 Afrikaans

Home Language participant interview, 27th July 2022). Learners acknowledge that by using technological devices, they can teach themselves aspects of reading. One participant stated: "*I have a laptop at home that works, I play a game on my laptop. I use my cellphone to go on TikTok and YouTube. I download new games and Apps from Play Store.*" (Grade 2 Afrikaans Home Language participant interview, 27th July 2022).

The school, as shown in Table 4.1 does have access to certain technological resources.

Table 4.1: Technological resources Foundation Phase teachers and learners have access to at the school

Facilities	Teachers	Learners
Computer lab	Yes	No
Tablets	Yes	Yes
Interactive whiteboard	Yes	Yes
Laptop	Yes	No

At the school in the study are two types of computer labs. The one computer lab is mainly used by teachers for administrative purposes or creating learning activities or worksheets, and not used by Foundation Phase learners for teaching and learning. The second computer lab is used by Grade 4-7 learners only for teaching and learning purposes. The tablets that are available to teachers and learners in the Foundation Phase can only be accessed on a rotational basis because there are not enough for each learner. In other words, learners have access to tablets twice per week, seeing that the tablets are shared amongst Grades R to 3. Only one classroom in the Foundation Phase has an interactive whiteboard. Whenever a teacher wants to use the interactive whiteboard, she needs to exchange the classroom with the teacher where the whiteboard is situated, which is time-consuming and disruptive. As a result, most teachers do not make use of the interactive whiteboard for teaching and learning. Most teachers make use of their laptops to prepare lessons, design classroom activities, and in some teaching cases. Following is a look at the Meso case.

4.3   The Meso case: The Afrikaans Home Language Grade 2 classroom

The meso case is the Grade 2 Afrikaans Home Language classroom. In this space, one gets to observe the teacher teaching reading in a traditional way, as well as in a more modern way with

the use of tablets. The data from this case was extracted from interviews with the teachers, and learners and extracted from my observation notes (fieldnotes). The following is an extract from my classroom observation:

> The class consisted of 42 learners. The classroom is spacious and can accommodate up to 50 learners. There are 21 tables in the classroom, with 2 chairs at each table. All tables were facing forward and there was enough space between desks for the teacher to walk around the class and observe the learner's work. At the back of the classroom next to the teacher's table was a mat for learners to sit on while reading with the teacher. By paying attention to posters, images and the reading corner that is in the classroom, this revealed insight into teaching and learning practices in the classroom context. The classroom was neat and windows were dressed in curtains covering half of the window and still allowing sunshine and natural light from outside in the classroom. The windows also had burglar bars on the front. The classroom had a great educational atmosphere where any learner could learn. The sounds they do weekly were portrayed on the walls as well as classroom rules and a talking educational word wall.
>
> The alphabet cards were placed as a border on the Afrikaans side of the wall. The teacher's reading corner was vibrant with colourful books, both in English and Afrikaans. The positive learning atmosphere of the classroom, lightning and aids on the wall had a positive influence on learner's emotions. In addition, posters on the wall had a positive influence on learner's attitudes, behaviour and interaction with their peers and class teacher. The teacher would present a lesson on sounds, and afterwards write the activity on the blackboard for the learners to copy in their workbooks. Following this, the teacher now starts by calling each ability group separately to the mat for reading. The ability groups were colour-coded. The green group are the strong academic achievers, the orange group is the average academic achievers and the red group is the weaker academic achievers (the struggling readers). The teacher always starts reading on the mat with the green group (Classroom observations, 21 July 2022).

The classroom observation was of great benefit to me because it provided me with insight into the reading practises of both teachers and learners. From my observation, teachers mainly taught reading in a traditional way, following routine practices. Learners are divided into their ability groups, according to their achievement levels. First, the teacher would revise the sound of the previous week before starting the new sound. Secondly, she would write on the blackboard and learners would copy from the board. The activity the teacher was writing was about the sound of the week. On the board, the activity entailed the teacher writing the word that contains the new sound and drawing the picture. Afterwards, write a sentence using each word. The green and yellow groups are encouraged to write their own sentences, and the red group are allowed to copy from the board because they are not able to write their own sentences.

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The purpose of this activity was for learners to use the new sound, "aa" in an activity to test their knowledge about the sound. The teacher wanted to see if they could write and form their own words by using the sound taught. While some learners are busy writing from the board, one ability group would be seated on the mat with the teacher.

Reading takes place every day with all colour-coded groups on the mat. The green group's learners are confident and always eager to get to the mat for their turn to read. The teacher uses flashcards to reinforce sounds and sight words. Next, they read the readers with the teacher, and then each learner will read to the teacher independently. Following the green group is the orange group. The teacher would follow the same patterns for reading on the mat with the orange group, as with the red group. I observed learners from the red group, the weakest reading group, displaying a sense of hesitance when it was their turn to go to the mat for reading. They take their time to take out their reading files and it takes time for them to settle down to read. The learners from the red group normally experienced challenges with blending sounds to form words, which impacted their decoding skills and ability to read fluently and with understanding.

Table 4.2 describes the Early Grade Reading Assessment (EGRA) subtask that learners have to master to become proficient readers. The purpose of the EGRA tests is to determine each learner's reading skills in the different subtasks. The teacher will then be able to see which subtasks the learner might require more attention on and work on that.

Table 4.2: EGRA subtasks and description per task

EGRA Subtask	Description
Letter-Sound Knowledge	Learner gain marks by the number of letter sounds they read correctly in one minute. There is a total of 40 sounds and letters.
Word recognition	Learner gain marks by the number of words they read correctly in one minute. There is a total of 80 words.
Paragraph reading	Learner gain marks by the number of correct words in the sentences they read correctly in one minute. There is a total of 138 words.
Comprehension	Learner gain marks by the number of questions they answer correctly about the story read. There are normally 5 questions.

In Table 4.3 below, I drew on past EGRA tests to evaluate what the learner's level of knowledge was in relation to the various components of reading in Table 4.3.

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Table 4.3: Learner's past EGRA test results

Name of participant	Sounds (mark out of 40)	Word reading (mark out of 80)	Reading a passage (mark out of 138)	Literal comprehension (mark out of 5)
Participant 1	30	1	8	0
Participant 2	5	0	0	0
Participant 3	3	0	0	0
Participant 4	16	0	0	0
Participant 5	6	0	0	0

Information that I gained from EGRA tests was that the majority of learners did not know their single sounds, hence, when they were asked to do word and paragraph reading, this activity became difficult. Phonemic awareness is problematic for learners because they are unable to blend sounds to make up a word. It was evident how poor learners' literal comprehension was, evidently because of not being able to read fluently. T1 and T2 in an interview session expressed why learners struggle with reading proficiency, more specifically the inability to recognise single sounds.

According to T1:

> The learners do not know all their single sounds and therefore find it difficult to sound words. They also have trouble with auditory analysis, phonemic awareness and synthesis so they sound a word m-a-n [m-a-n] but they say sun [son]. So, they are not capable of making auditory and oral connotations. And then, learners struggle with reading because there is not enough time for consolidation I think, in Grade 1. The learners fall behind and they do not get the necessary assistance to make sure they know their sounds. And numerous teachers, I think, do not really know how to teach children how to read (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021).

T1 noted the challenges these learners were experiencing with basic single sounds and not being able to make the connection between what they hear (auditory sounds) and the oral word (speaking the word). Similar sentiments were expressed by T2 who noted that:

> Learners come to Grade 2 at the beginning of the year and don't know their single sounds and sight words. At the beginning of the year, I have to reinforce sight words or in some cases start over from scratch to teach single sounds. Some learners can also not identify the beginning, middle and end sound in 3 letter words. The phonemic awareness is a problem for most

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learners in the class…" (Grade 2 Afrikaans Home Language class teacher T2 interview, 13 July 2022).

Phonemic awareness is thus one of the building blocks for independent readers. However, most learners lack this crucial skill which makes reading fluency and reading with comprehension difficult.

In addition, T2 expresses that:

> These learners' tend to memorise texts and read as if they know what is written on the page. When I ask them to identify a word, some of them have to sound the word and sometimes some of the learners cannot identify the word. Learners that cannot read with fluency and that sound when reading or that cannot identify any sounds, do not know what they read and find it difficult to answer comprehension tests. I still read tests and classwork to learners up until term 4. The strong learners read with me, but they are the minority. The rest is unable to read independently (Grade 2 Afrikaans Home Language class teacher T2 interview, 13 July 2022).

It is clear from both the EGRA results and the verbatim responses of teachers that these learners are struggling to read. Various reasons are provided for this like the lack of phonetic awareness, and the inability to connect auditory and oral connotations, which should have been taught in the previous year, in Grade 1. T1 expressed her frustration regarding learners who struggle to read. In her own words:

> Every child should be taught the skills to be able to read for meaning where they are able to answer questions after they read a passage. Many learners cannot yet read a passage fluently, and take a very long time to read a paragraph. When they get to the end of the paragraph, they already forgot what they read at the beginning of the paragraph. This results in learners not being able to answer any questions regarding the story read (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021).

Besides blaming the Grade 1 teacher for failing to consolidate the learning of sounds in Grade 1, one of the teacher participants also felt that she was not adequately prepared to teach children how to read and that the many workshops that the Department offers as an intervention to improve reading is also not working. She explains:

> My situation is completely different. I studied tourism, and when the school needed a teacher, I helped out and completed a certificate to teach, however, not Foundation Phase specific. I walked into the Foundation Phase not knowing what to do. I didn't know where to start. After I completed the qualification in Foundation Phase, I would say that I still don't know how to effectively teach reading, as I'm currently doing. Reading has numerous components and CAPS is vague in terms of what exactly should be done to

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enable all learners to be effective readers. I feel every school teach children "differently" how to read and follow strategies that works for them (Grade 2 Afrikaans Home Language class teacher T2 interview, 13 July 2022).

The teaching of reading, strategies that teachers draw on appear to differ from one school to the next. The CAPS document, as mentioned by T2 above "is vague in terms of what exactly should be done to enable all learners to read effectively". Contrary to T2, T1 felt she was adequately prepared by her institution, especially when they went out on teaching practice and getting exposure to how to teach children with barriers to learning. According to her:

> Yes, we had practical experiences during our studies. We received teaching in Language, where they taught us the theory, on how a child learns to read. We done weekly practical lessons internally where we were divided in groups where everyone could present a lesson, so for example one presented Mathematics, one Language, one English and one Life Skills so you could see how the other one presented. And then the lecturers provided guidance afterwards. And then we also done practice teaching where teachers could observe the teachers' strategies. And we had a learner support class for one year where we taught how to help learners with barriers to learning (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021).

T1, in turn, acts as a mentor teacher to pre-service teachers and often has to assist by teaching them how to teach reading, so there appears to be something lacking in their initial teacher training. As she puts it:

> I was a mentor teacher for one of the students attending a University close to Rassberry Primary. The student was in the third year of study and did not even know what shared reading was. I had to explain to the student what it entails and demonstrate how to go about doing shared reading. Not everyone receives good training where they study. I also learned a lot from my teacher where I did my practice teaching. One learns as you go along (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021).

According to the Adapted teaching plans (ATP's) (DBE, 2011, p.12) that were distributed to all schools during the Coronavirus Disease 2019 (COVID-19) pandemic, 4 sections needed to be taught in Grade 2 Afrikaans Home Language. Each of these sections has its own time allocation that guides the teacher as to how much time needs to be spent on each section daily. Following is a table, Table 4.4, which highlights the time allocation teachers are required to spend on each section per week in the Afrikaans Home Language.

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Table 4.4: Time allocation for each section in Grade 2 Afrikaans Home Language

Time allocation for each section in Grade 2 Afrikaans Home Language	
Listening and Speaking	3x15min = **45minutes**
Reading (shared and group-guided reading) and sounds	Sounds:60 minutes Shared reading: 60minutes Group guided reading: 150 minutes = **4 hours 30minutes**
Handwriting	15minx3 = **45minutes**
Writing	30 minutes x2= **1hour**

As alluded to by T2, the Curriculum Assessment Policy Statements (CAPS) curriculum is already loaded with content, therefore, weaker academic learners, such as the red group from the study, face challenges in keeping up with the pace in the classroom, exacerbated by the additional time the learners spend on tablets. Not only does the use of tablets compete with time designated for curriculum instruction, but also hinders struggling learners from the red group, to keep up effectively. T2 is of the assumption that the CAPS document is tailored for learners in favourable home and school environments and might overlook the challenges the struggling learners face. To integrate tablets, the teacher utilises valuable teaching time for learners to engage with tablets during allotted sessions and this in turn impacts the weaker academic learners' educational experience. Next, is a look at the Micro case.

4.4 The Micro case: Teachers and learners engaging with tablets

This case concerns itself with how the teachers and learners interact with the tablets as a means to improve reading proficiency. The data from this case was extracted from interviews with the teachers, and learners, as well as from my field notes taken during classroom observations. The following is an extract from my observation notes.

> The Foundation who donated the tablets is a French-based company that identified impoverished schools who need technological devices and where teachers could benefit from these devices. Only 50 tablets have been donated to school by this Foundation. The tablets were preloaded with different literacy Apps in Afrikaans for learners to interact and learn from. The school has a scheduled timetable for when each grade per class can use the tablets. The teachers are not allowed to make use of tablets for teaching and learning when it is not allocated on the timetable. The tablets are used twice per week per classroom (Classroom observations, 21 July 2022).

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Continuous access to tablets is problematic given that only 50 tablets were issued and that teachers have to rotate use amongst the entire Foundation Phase (+/- 654 learners) making access difficult. Teachers were given training at a workshop on how to plan lessons using tablets and how learners could advance from one activity to the next.

Each teacher received a file from the Foundation that donated the tablets. The file contained information about each App on the tablet, it portrays the name and App icon, the category the App is located in (eg. literacy or critical thinking), skills that are developed when using the App by the learners, age the App can be used for, the significance of the App, different levels the App or game consist of teacher assessment instrument that can be used at the end of the game, the language focus of the game or App, website of the App and useful videos to enhance the teacher's knowledge about the App in use. At the beginning of the lesson, the teacher teaches the skill to the learners. This is to consolidate what was taught during the week. In the middle of the lesson, the learners should use the App to practise the skill, and at the end, the teacher should collect the tablets again and monitor the learners' progress. If need be, there should be a follow-up session if the learner does not meet the outcome of the lesson. Following is an example of a lesson plan (Table 4.5) used by teachers to integrate the use of tablets into their teaching of particular skills.

Table 4.5: Lesson Plan for integrating tablets into classroom

Lesson plan Date: ……………….		
CAPS objective: …………….……….. Relevant App used: …………….………..		
	Activity	Teacher notes
Beginning (I do…teacher demonstrate skill to learners)		
Materials:		
Middle (you do…Learners practise the skills using the specified App. Specify what setting can be set for differentiation.		
Materials:		
End (We do…teacher and learner determine if the objective was met)		
Materials:		
Possible follow-up lesson(s)		

Integrating tablets into normal lessons is problematic or challenging for both teachers even though they have 3 to 4 years' experience with engaging with tablets in the classroom. The challenge is that integration of tablets into the classroom takes time and planning, which they often do not have because of the time constraints of the curriculum. As T2 notes: "It takes a lot of planning, and if I was not assisted in integrating technology, I would not have used it in my classroom". T2 further mentioned that "sometimes, I allow learners to play what they want to on the tablets if I did not get to plan a tablet lesson".

Following is an extract from my field notes taken during one observation session where the teacher and learners are seen to be integrating tablets into the lesson.

Table 4.6: Extract taken from field notes: Integrating the use of tablets into a lesson

Observation Sheet	
Date: 20.07.22 Day of observation: Week 1, day 2 Research study: Exploring the use of tablets to improve reading in a Grade 2 Afrikaans Home Language classroom.	
What the teacher did	**What the learners did**
*The teacher presented a lesson on the "oe" sound. The teacher revisited the sound and asked learners to identify the pictures she showed using flashcards, that contain the "oe" sound. She explains that is it two different sounds that came together to form one sound.	*A few Learners raised their hands in response to the teacher's questions, whilst others were silent.
*The teachers write the activity for learners on the board to copy. Learners are instructed to copy the words from the board, and then draw a picture next to the word in their classwork books. They are further instructed to select their own "oe" word to build a sentence with. The teacher differentiates by writing a sentence with the 'oe' sound for the weaker group.	*Some learners start immediately, others fidget and take their time to settle down to begin the activity.
*Once the tablets arrive the teacher instructs the learners to set aside their classwork books.	*Learners eagerly pack their books away. The atmosphere in the classroom changes as students eagerly show their excitement.
*The teacher starts by calling out the numbers of each tablet one by one, and learners collect the tablet from the teacher. As part of the class rules, learners know that they are not allowed to switch on their tablets before every learner has a tablet in front of them.	*Learners are familiar with the tablet rules. Class captains assist the teacher in handing out the tablets to learners. Whenever learners completed their activity on their tablets and achieved the outcome of the lesson, they would put up their hands and the teacher would approach them to monitor their progress.
Reflection: The learners from the red group (weaker academic performers) played the sound reinforcement game. They beamed with pride whenever they would receive three stars for a level, motivating them to continue with the next level. The teacher moved about the classroom observing and monitoring learners from each group as they engaged with varying activities on the tablets.	

The extract in Table 4.6 provides a glimpse into this classroom as the teacher moves from traditional teaching to the use of tablets. Even though both these teachers found that integrating the use of tablets to teach reading was challenging they also noted the perceived benefits of the use of tablets, especially since it catered for a variety of learning styles and learners were learning through play. T1 mentioned that "technologies can definitely help learners improve their reading skills especially since not everyone has the same learning style. The tablets cater for a variety of learning styles in a fun and creative way". She further explained:

> What is great about the tablets is that learners learn through play even without them knowing. By playing games on tablets, learners can teach themselves aspects of reading because activities are fun, colourful and there is a lot of repetition learners learn new things differently. Some learn visually, others auditory and another concrete. The tablets keep learner's attention and they learn in a fun and creative manner. Sound recognition, word building and fluent reading is promoted and it promotes fine motor skills. There is a lot of repetition, a method through which learners learn using tablets also prepare learners for the 21st century, high school, University and the workplace (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021).

T2's response is similar to T1's. According to her "learners play and learn at the same time, and that is what learners enjoy. If one uses the relevant Apps, it can improve reading skills in your classroom" (Grade 2 Afrikaans Home Language class teacher T2 interview, 13 July 2022). Both teachers, despite the challenges also saw the benefits of using tablets for learners, especially in terms of improving reading proficiency. For them, it not only addresses different learning styles and encourages learning through play but also promotes self-directed learning, as was noted by T2:

> Talk and chalk methods of teaching are boring to learners. Learners enjoy every moment of a colourful games where they can play and learn by using Apps… The Apps on the tablets enable learners to consolidate concepts in an innovative manner, and each learner can work at their own pace and level. By using tablets, learners teach themselves how to use technological devices, they learn through play, it teaches them to work independently It also promotes creative thinking and accommodate learning through sound, play and colour (Grade 2 Afrikaans Home Language class teacher T2 interview, 13 July 2022).

In the focus group discussions with the learner participants, they expressed their views about using tablets for learning. It was clear that some had home experiences with some form of technology be it a cell phone, laptop or tablet at home but it was merely used to play games, watch YouTube videos, mainly listen to music, and not so much to learn to read. As one learner

noted, "I like gun games Miss, gun games. Then I can shoot people". He further adds: "I play the whole night, not the whole night, only until my father comes home, then I play till I get tired". They are aware that the tablets at school are for learning to read as one learner puts it "I learn sounds and how to build sounds". Learners were aware that by using the games on tablets they would be able to progress. It became apparent during the discussion that they particularly liked the instant feedback when using the 'feed the monster' App, which meant that every time they could build a word the monster would get bigger and bigger. They were extremely excited to be rewarded with three stars the game had to offer after each level was achieved, and immediately called for the teacher's attention to praise them. Their faces lit up when their "monster friend" on the tablet grew because this meant that they fed him the correct letters and built their expected words to progress to the next level. One learner respondent noted that "… on a tablet, there are a lot of things to learn, which can make you clever". Another respondent added, "…it is very good since it has a lot of words on it and it's fun".

Numerous challenges are associated with the use of tablets. This includes malfunctions on the tablets where games don't work, batteries that do not last for the duration of the lessons and the lack of adequate training. T1 stated that:

> Technology is unpredictable. Sometimes some of the games on the tablets are not working, then you planned a lesson and then the lesson cannot continue as planned. Sometimes, a number of tablets' batteries are flat because of not charged properly. This leads to 5 or 6 learners in classroom that cannot learn and use tablets (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021).

T2 stated that:

> Without training from the Foundation that donated the tablets, I would not have used the tablets as I should, because the curriculum is already so much content on its own. I would not have allowed learners to spend more time on tablets. It takes a lot of planning to use digital technologies in a classroom. There are days where I allow learners to use any Apps on the tablets. The learners also don't get time with the tablets daily (Grade 2 Afrikaans Home Language class teacher T2 interview, 13 July 2022).

Learners were also open about the challenges they experienced with using tablets. One of the challenges includes: "Technologies make your eyes tired and then you also feel tired" (Grade 2 Afrikaans Home Language participant interview, 27th July 2022). Other challenges were related to uncharged devices or not being able to complete tasks. Learners mostly expressed

positive sentiments towards the use of tablets in the classroom using words like 'fun', and 'exciting'.

4.5 Cross case interpretations

As mentioned, the findings were derived through the thematic analysis process outlined in the previous chapter, Chapter Three and then by drawing cross-case inferences, looking across the data sets, and searching for recurring patterns in the data that I could compare the themes against. The following diagram is a model representing the main research finding.

- traditional teaching methods
- Routine
- Abilty groups
- flash cards, copying from board/reading readers
- tablets compliment traditional teaching
- multimodality

- Mastering of levels
- levels of difficulty increases
- immediate feedback
- earning rewards

Traditional vs Modern teaching methods

Tablets mediating and scaffolding function

Pedagogical shift -teacher directed to self-directing learning through play

Perceived benefits and challenges

- Teacher directed teaching
- Teacher selects content
- chorusing
- passive
- Learner directed learning
- play based teaching with selected Apps.
- interactive

- teacher experiences with technology
- lack of trainng
- time constraints
- learners experiences
- fun and engaging

Figure 4.2: Model of main findings

4.6 Chapter summary

This data presentation chapter drew on multiple data sets (Individual interviews with 2 class teachers, a focus group interview with 5 learners, field notes taken during classroom observation sessions, as well as document sources) to derive at findings for this study. I

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approached this chapter by first analysing data from individual cases: the macro case (school and home context), the meso case (the Afrikaans home language classroom) and the micro case (teachers and learners engaging with tablets). This was followed by drawing cross-case inferences to derive the findings for this study. In the next chapter, Chapter Five, I interpret and discuss these findings.

5.1   Introduction

In Chapter Four data was presented drawing on responses from individual interviews with teachers, a focus-group interview with learners, classroom observations and document sources to derive the findings of this study. In this chapter, Chapter Five, I offer a discussion and interpretation of the main findings that resulted from the inductive analysis process. As mentioned, (see Figure 4.2), the findings of this study are as follows:

- Traditional teaching vs modern teaching-integrating tablets;
- Tablets mediating and scaffolding function;
- Pedagogical shift-teacher centred learning to learner-centred learning through digital play; and
- Perceived benefits and challenges of using tablets to improve reading proficiency.

5.2   Discussion of research findings

5.2.1   Traditional teaching vs modern teaching-integrating tablets

The data reveals that reading in this grade 2 Afrikaans classroom is mostly taught using, as the teacher puts it, 'talk and chalk' traditional way of teaching. Teachers teach using flashcards, writing activities on the board, reading aloud from class readers, and using print-based materials to teach reading. In this space, the teacher is largely in control of teaching and learning. The extract provided in Chapter Four (see 1.4) provides a glimpse into the classroom showing that the teacher selects what is to be taught, sequences the lesson and also appears to control the pace at which the learners work. Learners are mostly passive receivers of knowledge answering mostly in unison (chorusing answers). This practice of delivering knowledge to learners via a transmission approach (teacher-orientated approach) remains dominant in most parts of the world (OECD, 2009; Maboe et al., 2018).

According to Banoobhai et al. (2018) teaching the millennials demands more than the usual teacher-orientated approach of enforcing silence when learning in the classroom. It requires innovation and adaptation with regard to the way teachers approach learners who are far more

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accustomed to using technology than a few years ago. They further argue that technology has changed the insistence on learner-centred approaches as successful modern learning has become linked with technology-driven lessons that naturally involve learner-centredness without having to focus pertinently on being learner-focused (Banoobhai et al., 2018, p1).

Prensky, as early as 2001; Camilleri & Camilleri (2019), made the statement "***Our students have changed radically. Today's students are no longer the people our educational system was designed to teach***" (Prensky, 2001, p.1) emphasis in the original). He refers to these learners as 'Digital natives' -since they are native speakers of the digital language of computers, video games and the internet. Teachers, according to Prensky (2001, p.2) are 'Digital Immigrants' "who speak an outdated language (that of a pre-digital age) and are struggling to teach a population that speaks an entirely different way", and ultimately demand a different way of learning. Wang (2022) advocates for more modern teaching methods and notes:

> To improve the quality of teaching and provide students with a better education, modern teaching methods are also widely used. Modern teaching methods pay more attention to improving students' values and abilities. In the modern classroom, the teaching atmosphere is more relaxed, and there are multiple technology products to assist teaching and the classrooms are student-centred (Wang, 2022, p.270).

A study by Jaiswal (2020) indicated that the modern approach to teaching not only aids in excelling learners` academic achievements but it caters for different learning styles, allows learners to work at their own pace and offers a large variety of different resources learners can engage in.

The data further reveals that teachers in the study were somewhat constrained in using tablets for teaching. The reasons for this could be attributed to the fact that access to tablets was limited (only 50 tablets were donated and the class only had access once a week), another reason could be the teacher's attitude towards the use of technology. Dovigo (2021) points out that:

> Teachers' attitude towards technology is determined not only by institutional constraints but also by personal factors that include one's teaching philosophy, perceptions and convictions about technology, to the extent that one feels at ease with it and how much one uses it (Dovigo, 2021, p.235).

Besides teacher attitude, the lack of training could also be a contributing factor. Teacher participants in my study expressed their reluctance to integrate the use of tablets in their teaching noting that they never had prior training (not being exposed in their initial training

courses) or that the Foundation that donated the tablets only offered a once-off workshop. In addition, they saw the integration of tablets into teaching as time-consuming and that it demanded a lot of planning, as one teacher expressed "It takes a lot of planning, and if I was not assisted in integrating technology, I would not have used it in my classroom". Teachers also felt that the curriculum was already 'overloaded' and did not make space for the integration of technology.

Replacing traditional methods with modern methods is still up for debate. Wang (2022) argues

> The modern teaching method can better cultivate the talents of students, can be used in special education, and so on. But if you only pursue the advantages of modern teaching without knowing how to avoid the shortcomings, the teaching method will not be effective (Wang, 2022, p.276).

I argue that a combination of the two teaching methods should be considered (a Blended Approach) since both have their perceived benefits and challenges, which I will highlight further in this chapter. I now turn to the second finding, the mediating and scaffolding function of tablets.

5.2.2   Tablets mediating and scaffolding function

From the data (see observation notes on learner engagement with tablets) one can derive the tablets in this context have both a mediating and scaffolding function. Vygotsky (1978) believed that human action and the mind (both social and individual processes) are fundamentally shaped by cultural tools or mediational means. In other words, higher mental functioning (problem-solving, logical thinking, creativity etc.) and human action are generally mediated by tools (technical tools) and signs (psychological tools). According to Vygotsky (1978), psychological or semiotic tools (e.g. language) mediate human activities and physical tools (mediators) or artefacts (e.g. mobile devices like tablets) contribute to constructing knowledge (Morgana, 2018, p.191).

Mediation serves as a keyword in a significant number of studies based on Vygotsky's ideas. It involves either symbols - semiotic mediation- and/or artefacts (objects) like the tablet. Morgana (2018) is of the view that the human aspect has an impact on the use of the tablet in the classroom. This supports the idea that a task-based and computer-mediated interaction can become a 'cognitive amplifier', in the sense that it provides learners with a new dimension and stimulates learning (Morgana, 2018, p.1196). The learners involved in this study knew that the

tablets could assist in their learning, in their own words "I learn sounds and how to build sounds" or "… on a tablet, there are a lot of things to learn, which can make you clever".

In addition, tablets support and provide important scaffolding functions (e.g. providing a modelling sample, motivating, stimulating interests on a specific topic, and simplifying the task) (Morgana, 2018). Through the scaffolding created in the interaction with the purposefully selected apps, a learner may be able to perform beyond his zone of proximal development (ZPD). Vygotsky (1978, p.86) defines ZPD as "the distance between the actual development level as determined by independent problem solving, and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers".

As evidence of this, while doing classroom observation, I was able to see learners whilst engaging in the 'feed the monster' App, become extremely excited to be rewarded with three stars the game had to offer after each level was achieved, and immediately called for the teacher`s attention to praise them. Their faces lit up when their "monster friend" on the tablet grew because this meant that they fed him the correct letters and built their expected words to progress to the next level.

The 'monster App' progressing from one level to the next was used as a scaffolding technique to support their performance. Digital devices, like tablets, can thus be used to supplement a teaching approach, which is based on play and can give the learners easy instructions to follow (scaffolding). The notion of scaffolding, according to Vygotsky, is important in aiding understanding of how young children acquire language, as they are empowered and prompted to understand what is being said or done as quoted by (Berson & Berson, 2010) cited in Morgana, 2018, p.196). Vygotsky's idea of a 'scaffolded pedagogical approach' is a co-construction of knowledge within learner-centred activities, which are adult-driven and based on an understanding of teacher-learner interaction as a one-way process (Gonzalez-Mena, 2011, p.27).

5.2.3 Pedagogical shift-teacher centred learning to learner-centred learning through digital play

According to Rikala, Vesisenaho and Myllari (2013); Zhang & Nouri (2018) there are only a few studies that highlight the differences between the pedagogical opportunities of tablets and the actual pedagogical use of tablets. Despite the huge popularity of tablets, very few published

studies have addressed the impact of tablets on learning and teaching (Rikala et.al.,2013; Zhang & Nouri (2018). Based on the literature, the process of incorporating tablets into school learning can fall into two main categories: using tablets to support and improve traditional school tasks and using tablets to extend practices (Sheehy, Kukulska-Hulme & Twinning, 2005; Jaiswal, 2020). As previously mentioned (see discussion in 5.2.1), teachers in this study largely followed a teacher-centred method (teacher-driven instruction and text-based approach). Furthermore, learning in this approach focuses on promoting the authority of the teacher where she is in control and decides the teaching methodology, where learners learn through repetition and memorising and there is not much room for critical thinking (Sadeck, 2016).

This method of teaching poses challenges for the teacher, as well as for the learners because this approach extinguishes learners' curiosity and their aspiration to learn (Bakhshandeh, 2019). When teacher-centred learning is the main focus of a classroom, learners will lack the development of higher-order thinking skills, collaboration, sustained engagement and reading skills (Sullivan, 2015). From the data, it is evident that in this Afrikaans Home Language classroom tablets are used once a week. It normally follows traditional teaching methods and it is mainly used to 'consolidate learning' or as one teacher puts it "The Apps on the tablets enable learners to consolidate concepts innovatively, and each learner can work at their own pace and level" (T2). Naturally, the use of tablets is a move towards more learner-centred teaching practices (Banoobhai et al., 2018).

The role of the teacher changes from instructor to facilitator, learners are in control of their learning since it affords them to work at their own pace. For Traxler and Wishart (2011) (cited in Major, Haßler & Hennessy, 2017, p.2) Mobile devices, like tablets, can enhance, extend and enrich the concept of learning in several ways (1) contingent mobile learning and teaching (where learners can respond and react to their environment and changing experiences, and where learning and teaching opportunities are no longer predetermined); (2) situated learning (where learning takes place in surroundings that make it more meaningful); (3) authentic learning (where learning tasks are meaningfully related to immediate learning goals); (4) context-aware learning (where learning is informed by the history, surroundings and environment of the learner); and (5)personalised learning (where learning is customised for the interests, preferences and capabilities of learners).

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The use of tablets leads to another pedagogical shift from a transmission-based pedagogical approach largely dependent on text-based activities to learning through play using games. Both teacher participants noted that the use of technology could help struggling learners, as T1 stated "Learners play and learn at the same time, and that is what learners enjoy. If one uses the relevant Apps, it can improve reading skills in your classroom" or as T2 responded, "learners enjoy every moment of colourful games where they can play and learn by using Apps…". Learners themselves enjoyed learning to read using tablets as is evident from observing them engaging with tablets. It became apparent during the discussion that they particularly liked the instant feedback when using the 'Feed the Monster' App. Their faces lit up when their "monster friend" on the tablet grew because this meant that they fed him the correct letters and built their expected words to progress to the next level. One learner respondent noted that "… on a tablet, there are a lot of things to learn, which can make you clever". Another respondent added, "…it is very good since it has a lot of words on it and it's fun". Marsh (2010); Picton (2019) argued that

> These virtual worlds are fast becoming a part of the online landscape of play for young children and rather than dismiss them as irrelevant, or deride them as potentially harmful environments, academics and educators need to examine their affordances more closely in order to identify what children gain from their playful engagement in these worlds and how their experiences can be built upon in early years settings and schools (Marsh, 2010, p.36).

The use of tablets and engaging with apps (educational games) teach learners skills, like persistence in problem-solving, trial-and-error exploration, trust in rules and enjoyment while playing and learning (Rosenberg, 2011; (Sergi et al., 2017). Educational games can motivate and encourage learners that experience academic difficulty (Nelson, Fien, Doabler & Clarke, 2016). Fleer (2016) refers to this type of play that involves digital devices or engagements with different kinds of apps as digital play. Van Der Westhuizen and Hannaway (2021) in a recent study titled '*Digital play for language development in early grades*' found that:

> Teachers are willing to experiment with digital games. However, there is a need to understand more about digital technology and increase their knowledge on using digital games when teaching language. Teachers shared the view that digital games should, as is the case with traditional play-based pedagogies, be used to enhance language teaching as this generation is growing up in a digital environment (Van der Westhuizen & Hannaway, 2021, p.3).

My data showed that the learner participants had prior experiences with technological devices (cell phones, father's laptop, computer) in their homes despite coming from low-income households. They play games, create TikTok videos, and listen to music on YouTube amongst other things, showing that they have prior exposure in a digital environment by engaging in digital play.

Parette & Blum (2015) cited in Van der Westhuisen and Hannaway (2021, p.5) note that there are three types of play: 'exploratory play' (e.g. devising new methods for goal achievement, 'functional play' (where they use the right tools and toys) and 'symbolic play' which is akin to make-believe play. For them, these types of play can be enabled using digital technology. Van der Westhuisen and Hannaway (2021) elaborate by saying:

> For example, in exploratory play, functional play is reflected in filling in blocks, deleting material, sorting and the repetition of patterns (e.g. on a tablet screen), and during symbolic play when they use their own creativity and their memories of photos or drawings of various objects (Van der Westhuisen & Hannaway, 2021, p.5).

Here Van Der Westhuizen and Hannaway (2021), showcase examples of how traditional play can be translated into digital play using tablets. Teachers, and a change in their pedagogical practices, are key to moving towards better use of tablets for teaching and learning or in this case for improving the reading proficiency of younger learners. Rikala et al. (2013, p.124; Zhang & Nouri (2018) are of the view "that the main driver for the decision to adopt tablets in an educational context seems to be the initiative of the individual teacher to change the way students learn and how he/she teaches, to change his/her pedagogies". Shulman (1986, p.8) identifies TPACK as an effective theory to apply when integrating pedagogy … because it focuses attention on the way the content is taught highlighting educational and academic content, bearing in mind the importance of the teachers' ability to use the technology effectively.

In Chapter Two (see 2.4) I engaged with the TRACK Model as a theoretical lens to understand the types of knowledge teachers ought to grapple with when integrating technology into their teaching. Technological pedagogical content knowledge serves as the foundation of efficient teaching with technology, requiring an understanding of the unique concepts when incorporating technologies (Banoobhai et al., 2018, p.2). For Koehler and Mishra (2005, p.67) knowledge of incorporating technologies in lessons to stimulate prior knowledge can aid in developing new epistemologies and reinforcing old ones.

Banoobhai et al. (2018) note that understanding the relationship between content, pedagogy and technology is crucial. They question whether knowing technology automatically leads to quality teaching when using tablets in the classroom to teach reading skills. Shulman (1986, p.12) describes this emphasis as a form of applied technocratic rationality, a view that technology is self-contained and has an independent integrity and that unlocking its potential and power requires merely learning certain basic skills. Teachers, in our study were subjected to one such workshop and then left to manage the process of integrating tablets into their teaching. Koehler and Mishra (2005,p.98) assert that traditional methods of technology training for teachers, mainly workshops and courses, are ill-suited to produce the deep understanding that can assist teachers in becoming intelligent users of technology to teach reading in the classroom. In order to achieve sustainable and successful outcomes, Banoobhai et al. (2018), assert that:

> A shared vision has to be a belief that technology is beneficial, as defined by different communities of users or practice and education models, and to be embraced with an open mind by all involved. Teachers should be guided to develop their capability to engage actively and collaboratively with learners (Banoobhai et. al., 2018, p.5).

Teachers should therefore take cognisance of the benefits, as well as challenges afforded by integrating tablets into their classrooms.

5.2.4 Perceived benefits and challenges of using tablets to improve reading proficiency

The use of tablets to improve reading proficiency has both perceived benefits and challenges. As T1 expressed:

> …By playing games on tablets, learners can teach themselves aspects of reading because activities are fun, colourful and there is a lot of repetition learners learn new things differently. Some learn visually, others auditory and another concrete. The tablets keep learner`s attention and they learn in a fun and creative manner. Sound recognition, word building and fluent reading is promoted and it promotes fine motor skills. There is a lot of repetition, a method through which learners learn using tablets also prepare learners for the 21st-century… (Grade 2 Afrikaans Home Language class teacher T1 interview, 6th September 2021).

The features of tablets that can support learning gains, as stipulated by T1, are supported by Outhwaite, Gullford & Pitchford (2019). These authors highlighted certain similar features in their study. First, the software includes immediate feedback and continuous assessment. The immediate and personalised feedback (positive or negative) after every interaction with the

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software (App) encourages individual learners to engage actively with the learning activity. Furthermore, the staged progression of the delivery of the App's content ensures that learners are working on activities that are just beyond their current ability level and more challenging than their previous accomplishments; characteristics that are known to facilitate learning (Vygotsky, 1978). Second, the reading apps employed in this study allow for tasks and instructions to be repeated as often as desired by individual learners. The repetition allowed them to employ trial-and-error strategies, which in turn encouraged these learners to persevere with challenging tasks. For Outhwaite, Faulder, Guilliford and Pitchford (2019):

> Technology with learner-centred software can be used effectively to foster an inclusive learning environment as the apps support child-centred learning and adapt to the pace of individual pupils so can be used in the same setting with children of different abilities. Overall, these findings support Kucirkova`s (2014) assertion that well-designed, age-appropriate, software grounded in an evidence-based curriculum can provide a beneficial classroom tool to support the acquisition of basic skills (Outhwaite et al., 2019, p.54).

Selecting the correct software (well-designed and age-appropriate Apps) appears not to be enough. Curriculum designers should create time for the integration of tablets into daily lessons.

The use of tablets in teaching and learning also presented certain challenges. Teachers and learners alluded to the technical issues that could arise due to the use of tablets. These technical issues included: low battery power due to uncharged tablets or certain apps on the tablets being active one day, and inactive the next disrupting the efficient use of these tablets. Eicker-Nel and Matthee (2014); Camilleri & Camilleri (2020) mentioned that frequently the implementation and pedagogy of tablets may be resisted by teachers. Yu et al. (2013); Haßler et al., (2016) reported this might be due to the costs of digital devices, inadequate training, insufficient time to create new lessons using this technological equipment, the lack of technical support, fear of coping with new technology, fear of change, lack of support by school management and adding more planning or workload onto teachers (Culén & Gasparini, 2012; Butler, 2017).

According to Venketsamy and Hu (2022), the reason teachers experience challenges with tablets is due to the lack of understanding and knowledge of how to effectively use tablets. Teachers in this study received limited training (once-off workshop) in the use of tablets which could account for their resistance to using technology. Furthermore, access to tablets was

limiting (once a week), which was a major hurdle for these teachers. They attributed this to not only having limited access but also the current curriculum did not allow for the effective integration of tablets. There was a definite gap between the actual pedagogical benefits of tablets and the potential pedagogical benefits of tablets. These sentiments are supported by Rikala et al. (2013); Zhang & Nouri (2018) study that found "that tablets can diversify and enhance teaching and learning in many ways, particularly in supporting learners' motivation and independent learning and promoting engaging teaching methods. Nevertheless, teachers voiced concern that the student-to-device ratio at the moment is too low, thus serving as a barrier to widespread use of tablets".

5.3   Chapter summary

The purpose of this chapter was to offer an analysis and discussion of the findings. It is evident from this discussion that the use of tablets in the classroom has become pertinent and necessary in the classroom especially because learners (Digital Natives) learn differently. In addition, traditional teaching methods that dominate in most classrooms are not effective on their own. Highlighting that more modern methods of teaching and integrating tablets in teaching and learning will lead to learning gains. Furthermore, tablets have both a mediating and scaffolding function dovetailing with Vygotsky's SCT.

Integrating tablets into teaching and learning required a pedagogical shift moving from teacher-centred and text-based approaches to learner-centred approaches using digital play. Finally, it highlighted both the perceived benefits (support learner gains, active learner engagement, continuous assessment, immediate and personalised feedback, inter alia), as well as the challenges (requiring additional planning, limited access, curriculum overload, the difference between actual and potential benefits) of using tablets to improve reading. In the final chapter, Chapter Six that follows, I offer conclusions, implications of the study and recommendations for further studies.

CHAPTER SIX

CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

6.1   Introduction

This chapter provides an overview of the study conducted. A summary of key findings is discussed in relation to the research questions. This is followed by the limitations of this study, the implications of the findings and recommendations for further study. I end by offering some concluding remarks.

6.2   Overview of the study

The main purpose of the study was to explore the use of tablets to improve reading in a Grade 2 Afrikaans Home Language classroom. Literature on the use of tablets for educational purposes is still in its infancy since there are only a handful of researchers who have studied the use of tablets in educational settings (Banoobhai et al., 2018; Haßler et al., 2016). This qualitative research study employed a single case study as a research design. Classroom observations (observation fieldnotes), interviews (semi-structured individual interviews with two teachers and a focus group interview with five learners), and document sources were the main instruments for data collection. The data that was collected represents the perceptions of participants in this study with regard to the use of tablets to improve reading skills in an Afrikaans Home Language Grade 2 classroom.

Theoretically, this study was framed by the Socio-cultural Theory of Vygotsky (1978) along with the TPACK model advocated by Koehler and Mishra (2006). Vygotsky's theory stems from Social Learning Theory. Vygotsky's SCT, in particular his constructs like ZPD, mediation and scaffolding brought me closer to understanding how learners acquire knowledge in a social setting, how learners learn and what teachers need to do to ensure that learning takes place. The TPACK model assisted in understanding the knowledge required for the teacher to integrate technology, in this case tablets, into their classroom practices creating new pedagogical opportunities for teachers. The study was guided by the following research questions. The main research question was: How does the use of tablets help learners to improve reading in a Grade 2 Afrikaans Home Language classroom?

The sub-research questions were;

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- What are the teachers` experiences of the use of tablets to improve reading?

- What are the learner's experiences of the use of tablets to improve their reading?

- What are the contextual benefits and challenges associated with the use of tablets to improve reading?

Four key findings emerged from the data that was collected, namely: Traditional teaching vs modern teaching-integrating tablets; Tablets mediating and scaffolding function; Pedagogical shift-teacher centred learning to learner-centred learning through digital play; Perceived benefits and challenges of using tablets to improve reading proficiency. These findings are discussed in relation to the research questions.

6.3 Discussion of findings in relation to research questions

6.3.1 What are the teachers` experiences of the use of tablets to improve reading?

Teachers in this study, relied heavily on traditional teaching methods (teacher-centred and text-based methods) to teach reading in this Afrikaans Home Language classroom. Although they were aware of the potential use of tablets (using tablets to consolidate what was learnt, allowing learners to have fun whilst learning, teaching to different learning styles and allowing learners to learn at their own pace) to improve struggling learners reading proficiency and reading skills. They also felt constrained by several challenges in using tablets. Teacher participants attributed their reluctance to use tablets to the lack of access to tablets (having to share 50 tablets for +/- 640 learners limiting their access to once per week), insufficient training (attending one training workshop and not being exposed to the use of tablets in their initial teacher training programmes), as well as to the excessive demands already placed on them by the prescribed curriculum. There was therefore a clear difference between the potential benefits of using tablets and the actual experiences of using tablets to improve reading.

6.3.2 What are the learner's experiences of the use of tablets to improve their reading?

Findings show that learners who participated in this study use technological devices at home for various activities. There is no doubt that learners found learning from tablets enjoyable, fun and educational. From learning and consolidating sounds to enhancing their creativity, using tablets comes as second nature to learners. Data portrayed that tablets are not used frequently in the classroom to maximise learning or to benefit learners. During observations, it was evident that learners experienced a sense of achievement when they were able to recognise

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sounds and build words on their own by using letter-sound knowledge taught by the game. Learners experienced a sense of belonging and academic empowerment because of the knowledge and skills they gained through digital play (play using technological devices like tablets). The data depicts that when tablets are used in the classroom, learners tend to be calmer and more disciplined, as tablets accommodate all learning styles, and allow learners to work at their own pace.

Reading and learning become fun, as learners` attention is grabbed and they play while they learn. Struggling learners' knowledge of sounds and reading fluency is accommodated for and improved but this depended on the correct app which had to be purposefully selected and age-appropriate. The immediate and personalised feedback (positive or negative) after every interaction, and the staged progression of the delivery of the App's content ensures that learners are working on activities that are just beyond their current ability level and more challenging than their previous accomplishments. Furthermore, the repetition allowed them to employ trial-and-error strategies, which in turn encouraged these learners to persevere with challenging tasks.

6.3.3 What are the contextual benefits and challenges associated with the use of tablets to improve reading?

Tablets thus hold great benefits for improving reading. The size of tablets alone is an enormous benefit. It is light in weight, portable and comfortable for learners to work on. The touch screen feature makes it easy to click and move fingers on the screen. Learners can play a literacy game, and at the same time learn from playing. Learners were able to revise and consolidate sounds and sight words while playing digital games. A significant benefit of learners interacting with tablets is the development of 21st-century skills. These skills are crucial in this digital age. The perceived benefits (support learner gains, active learner engagement, continuous assessment, immediate and personalised feedback, inter alia), as well as the challenges (requiring additional planning, limited access, curriculum overload, the difference between actual and potential benefits) of using tablets to improve reading, should be highlighted.

6.4 Limitations of the study

Three limitations are worth mentioning. Firstly, with relation to the sample size and secondly translating data from Afrikaans to English. The sample size (2 teachers, 1 classroom and a

focus group with 5 learners) could be considered small, reducing the generalisability of the research findings. One cannot therefore make broad assumptions. I would like to think that this research adds intrinsic value, especially for teachers who might stumble across this thesis and who find themselves in a similar context and experiencing similar challenges. To them, it might hold some value.

Secondly, teacher and learner participants' verbatim responses were in their home language, Afrikaans. I preferred doing my study in English, this meant that I had to translate these responses into English, which came with certain limitations. In the art of translating, it is important to notice that there is always a possibility of information that may be lost in translation. Certain subtle details and nuances may have been unintentionally misinterpreted, especially idiomatic expressions. Furthermore, different languages have different grammatical structures. Translating data between languages with different grammatical structures can be challenging since it requires rephrasing or restructuring sentences to maintain coherence. To overcome and address this limitation I shared my interview transcripts with my supervisor to ensure the authenticity of responses.

Thirdly, relates to my positionality. As a Grade 1 Afrikaans teacher, that previously taught at the school where the research was conducted could lend itself to certain biases. I therefore knew that my positionality was multifaceted and could impact various aspects of my research. To increase the validity of my study and address the issue of positionality (Holmes, 2020), I adopted the following strategies: 1) reflexivity -through ongoing reflection on my own biases, assumptions and motivations to ensure that they do not unduly influence the research; 2) by being transparent about my role in the writing up of this thesis; 3) Peer reviews-external feedback not only from my supervisor but also from my colleagues and fellow researchers helped to ensure objectivity.

Implication and recommendations for further studies

The finding holds various implications for teaching and learning, especially if one wants to improve the reading proficiency and reading skills of children in the Foundation Phase of schooling and opens up possibilities for further study.

The curriculum is an important driver in the successful integration of tablets into teaching and learning of reading.

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- **Implication:** Teachers however find it to be a constraining factor, amongst their lack of training and limited access to tablets.

- **Recommendation**: Curriculum designers should provide adequate space in the curriculum for the integration of technology into existing teaching practices. In addition, they should consider continuous support (providing guidelines and training) for the successful integration of technology (tablets).

The findings show that traditional teaching methods and pedagogical practices still dominate the teaching of reading in Grade 2.

- **Implication**: This type of teacher-centred teaching does not suit the type of learners we have today. These millenniums or 'Digital natives' learn differently. However, not much is known about the effective use of technology (tablets), which is more learner-centred, in improving reading.

- **Recommendation**: More research, both qualitative and quantitative research is required to ascertain the actual and potential benefits and challenges of a balanced approach to teaching and learning of reading. One which incorporates both traditional and modern methods to ensure a well-rounded literacy experience.

Availability and access to tablets, especially in under-resourced marginalised schools remain a concern.

- **Implications**: As technology continues to advance, learners need to be familiar with various devices and software. Without this exposure, they might face challenges in adapting to new technologies and may be less prepared for the digital demands they will face in the workplace in future.

- **Recommendation**: A shared vision is required from all stakeholders (government, NGOs, private donors etc.) to ensure that all young children at all schools get early exposure to the use of tablets and experience the benefits of using tablets in their schools. These stakeholders must be encouraged to invest in technological infrastructure and provide funding for the purchase of devices and training of teachers and learners to effectively integrate technology into the learning process.

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6.5   Concluding remarks

The final chapter of this thesis provided an overview of the study conducted. It discussed the findings in relation to the research questions and provided limitations of the study. In addition, the implications and recommendations of the study were discussed.

This study, although small, added to the existing knowledge base on the use of tablets in educational settings, knowing that research in this area is still fairly new and that not much is known about the effective integration of tablets for improving reading in the Foundation Phase of schooling, especially in a South African context. Teachers are aware of the potential use of tablets but due to various constraints, the actual pedagogical benefits of tablets (tablets can be personalised to meet individual learners needs) are seldom taken advantage of. Notwithstanding, the integration of tablets promotes digital literacy and technological skills, which are essential to succeed in today's world. The use of tablets in the Foundation Phase has thus proven to be a plausible tool. It requires teachers to redefine and reimagine their teaching pedagogies, to create an engaging, effective and balanced learning environment that benefits these young learners on their journey to becoming effective readers.

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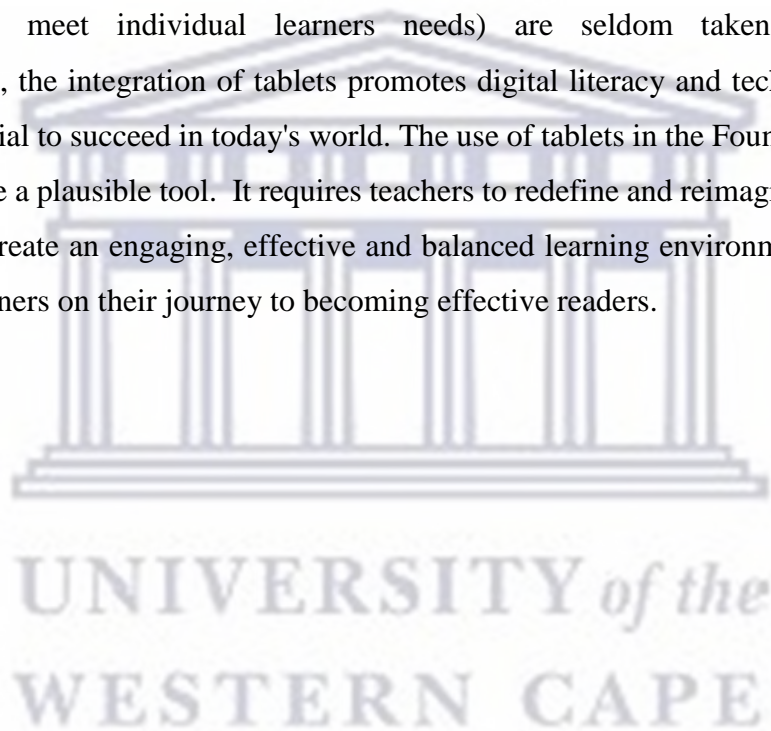
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APPENDICES

Appendix A: Permission to the WCED

University of the Western Cape
Faculty of Education, Private Bag X17, Bellville, South Africa

The Research Director

Western Cape Education Department

Dear Mr M Kanzi

Request for Permission to conduct research in a Grade two class at a school in the Western Cape.

My name is Josmorine Bergstedt. I am a master's student at the University of the Western Cape in the Educational Studies Department. I am conducting research on the use of digital technologies to improve reading in a Grade 2 Afrikaans Home Language classroom. My thesis title is: Exploring the use of Digital Technologies to improve reading in a Grade 2 Afrikaans Home Language classroom. I hereby wish to request permission from the WCED to conduct this study at a Primary school in *****region, Northern Suburbs, Cape Town.

The purpose of this study is purely for research. I intend to spend six weeks (Monday- Friday) at the school to collect data for the research study. I need to emphasise that my presence in the classroom will not disrupt, interrupt or interfere with any classroom activities.

The following will be adhered to in my research:

• The identity of the school, principal, educators and parents will not be mentioned.

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• Subsequent permission will be requested from the Principal of the school before data will be collected.

• Data collected will be confidential and will only be used for the study.

• Voluntary participation of participants.

• Withdrawal of research participants at any time without providing any reasons for such action.

• Respect for the privacy and anonymity of research participants.

• Making the research information available to research participants when requested.

This research project aims to significantly contribute towards literacy pedagogical issues in the Foundation Phase. This means that the study hopes to bring out new insights related to the teaching of reading approaches in classrooms by using digital technology.

My appointed supervisor, Dr L. Du Plooy will be guiding me during this process to ensure that I follow the prescribed protocol. For further inquiries about the research, please do not hesitate to contact me or my supervisor Dr Du Plooy.

I received ethical clearance for my project from the University of the Western Cape's Ethics Committee, and the reference number is HS21/5/30.

Thank you in advance

Yours sincerely
Josmorine Gushwonita Bergstedt

21/07/2021

Signature of researcher   Date

Supervisor: Dr Lucinda Du Plooy   **HOD**: Dr N. Ravjee

Email: lduplooy@uwc.ac.za   **Email**: nravjee@uwc.ac.za

Acting Dean of Education Faculty: Prof. R. Govender

Email: rgovender@uwc.ac.za

Appendix B: Permission letter to the Principal

University of the Western Cape
Faculty of Education, Private Bag X17, Bellville, South Africa

PERMISSION LETTER

THE PRINCIPAL X PRIMARY SCHOOL

12/04/2021

[Address removed for anonymity purposes]

Dear Sir/ Madam,

Re: Permission to conduct research in your School

My name is Josmorine Bergstedt. I am a master's student at the University of the Western Cape in the Educational Studies Department. I am conducting research on the use of digital technologies to improve reading in a Grade 2 Afrikaans Home Language classroom.

Title: Exploring the use of digital technologies to improve reading in a Grade 2 Afrikaans Home Language classroom.

Research Objectives
I understand that the school's participation in this study is voluntary and that the school has the right to withdraw from the study under any circumstance. I am also aware that the information collected from the school will be treated confidentially to protect the identity of the school. I am aware of the intention of the researcher to capture some research data through audio recordings of interviews. I am guaranteed that the findings will be used for research purposes and not damage the name of the school.

This research project has been explained to me clearly and in a language I understand. I hereby agree to participate in this research project under the conditions stipulated above.

I………………………………………………………………..(Name and Surname)
hereby give consent to the researcher to conduct research at my school in a Grade 2 Afrikaans
Home Language classroom.

Principal signature: ………………………………

Date: …………………

Researcher: Mrs Josmorine Gushwonita Bergstedt   Supervisor: Dr Lucinda Du Plooy
Email: 4067219@myuwc.ac.za   Email: lduplooy@uwc.ac.za

Appendix C: Information Sheet

Appendix C1: Information to the Principal, teachers and parents

University of the Western Cape
Faculty of Education, Private Bag X17, Bellville, South Africa

12/04/2021

Background information sheet

Dear Sir/Madam,

My name is Josmorine Bergstedt, a Masters student in the Educational Studies Department of
the Faculty of Education at the University of the Western Cape. I am conducting research
exploring the use of digital technologies to improve reading in a Grade 2 Afrikaans Home
Language classroom.

Title of the research project: Exploring the use of Digital Technologies to improve reading
in a Grade 2 Afrikaans Home Language classroom.

Purpose of the research: The purpose of this study is to explore the use of digital
technologies to enhance reading in Grade 2 young children in a Primary school in the
Western Cape. Furthermore, the research aims to explore why Grade 2 learners at the specific
school fail to become proficient readers.

Location: Northern Suburb area, Cape Town, Western Cape in South Africa

Sample: Grade 2 educator, 6 Grade 2 learners from a Primary school located in *****

Participation in the research is completely voluntary and participants have the right to
withdraw from the research project at any time without any disadvantage to themselves. All
participants will be asked to complete a consent form consenting to the following:

- Focus group and/or individual interviews
- Observations
- Use of documents or material related to teaching and learning.

Confidentiality and Anonymity

The school as well as all participants in the study will remain anonymous. Information received as part of the study will be used for research purposes only.

The research will not interfere with the normal functioning of the school or learning in the classroom. It will not be used in public for any purposes other than to understand how the use of tablets will enhance reading in a Grade 2 Afrikaans Home Language classroom. There are no known or anticipated risks or discomforts associated with participating in this study.

Significance of the study

This research project aims to significantly contribute towards literacy pedagogical issues in the Foundation Phase. This means that the study hopes to bring out new insights related to the teaching of reading approaches in classrooms by using digital technologies such as tablets.

Voluntary participation

Participation in this study is voluntary. Participants may refuse to participate, answer questions or withdraw from the study at any time with no effect on their future.

Should you wish to find out more about the research, you are more than welcome to contact my supervisor, Dr Lucinda Du Plooy, whose contact details are provided below, or me.

Researcher: Mrs Josmorine Gushwonita Bergstedt   Supervisor: Dr Lucinda Du Plooy
Email: 4067219@myuwc.ac.za   Email:lduplooy@uwc.ac.za

…………………………….   ………………………………….
Signature of researcher   Date

Appendix C2: Information to the Grade 2 Afrikaans Home Language learners

University of the Western Cape
Faculty of Education, Private Bag X17, Bellville, South Africa

12/04/2021

Information Sheet for Grade 2 learners

Dear Learner,

My name is Josmorine Bergstedt. I am a student at the University of the Western Cape. I am conducting research on how young children use tablets to help them do better in their reading in a Grade 2 Afrikaans Home Language classroom.

Name of the research project: How young children use tablets to help them do better in their reading in a Grade 2 Afrikaans Home Language classroom.

Purpose of the research: I want to find out if using tablets every day over a certain time will help you to better your reading skills in class and at home. I also want to know what things you like doing on tablets, what you feel you learn and enjoy on the tablets and what things you do on the tablets that you struggle with.

Location: At your school

Sample: 5 of your friends in the classroom.

Confidentiality and Anonymity

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Your name, your friends' names that are also in this study, and your school and teacher's name will not be said to anyone. No one will know that you were part of this study. I will use a different name for you to protect you when writing down results in my notebook every day.

Significance of the study

I want to help young children to better themselves in reading so that they can do better in their school work and get good marks. When you can read well and on your own, you will do well in higher grades and can also help your younger siblings or community members in learning to read.

Voluntary participation

You are going to use the tablets from Monday to Friday for 10 days for 30 minutes. You will be using an Afrikaans game (App) on the tablets and I will sit and watch as you play and learn. Each day, you will continue the game where you stopped the previous day. In the first week of the project, I will have a focus-group interview with all my friends in this study after school. This project will take place every day in your teacher's classroom.

Taking part in this project is your own decision. If you do not want to be part of this research project I will not be upset with you. If you feel that you do not want to be a part of this research any more, you can let me know and nothing will happen to you.

What are the risks of taking part in this study?

There is a medium risk to this study. We do not know how all the friends in the study will react to being interviewed or observed during this project. They might feel uncomfortable or shy to give answers. I will do my best to make you feel comfortable and at ease while I do interview questions and watch while you play on the tablet. You will work on the tablets in your teacher's classroom and can work at your own pace. I will sit and watch when you are busy on the tablets.

Should you wish to find out more about the research, you are more than welcome to contact me or my supervisor, Dr Lucinda Du Plooy, whose contact details are below.

Researcher: Mrs. Josmorine Gushwonita Bergstedt
Email: 4067219@myuwc.ac.za

Supervisor: Dr Lucinda Du Plooy   **HOD**: Dr N. Ravjee
Email: lduplooy@uwc.ac.za   **Email**: nravjee@uwc.ac.za

Acting Dean of Education Faculty: Prof. R. Govender
Email: rgovender@uwc.ac.za

Appendix D: Consent form to parents/guardian(s)

University of the Western Cape
Faculty of Education, Private Bag X17, Bellville, South Africa

The parents/ guardians

12/04/2021

Dear Sir/Madam,

Re: Permission to sit in your child's classroom activities for research in Grade 2 Afrikaans Home Language classroom.

My name is Josmorine Bergstedt. I am a master's student at the University of the Western Cape in the Educational Studies Department. I am conducting research on the use of digital technologies to improve reading in a Grade 2 Afrikaans Home Language classroom.

Research title: Exploring the use of Digital Technologies to improve reading in a Grade 2 Afrikaans Home Language classroom.

I would like to request permission to sit, observe and audio record as well as access your child's written materials for my research to understand how digital technologies can improve reading in a Grade 2 Afrikaans Home Language classroom. Your child will be requested to participate in a focus-group interview. I will also observe while your child is using digital technologies and look at documents like workbooks, EGRA tests and WCED schedules. Their work will be kept confidential and parents on request will be able to access results. Your child's learning activity will not be disrupted nor will I force them to participate in an interview.

CONSENT FORM

Please sign the form below and return it to your child's class teacher. Thank you for your kind assistance.

_____

I, (name of parent/legal guardian) ……………………………………………………parent of (child's name)……………………………………………………….have read the information provided above and **do/do not** (please circle your choice) give permission for my child to participate in this study.

Parent/ Guardian's signature: ………………………………. Date: …………………………………

Researcher: Mrs. Josmorine Gushwonita Bergstedt   Email: 4067219@myuwc.ac.za

Appendix E: Participant consent form

Appendix E1: Participant consent to the class teacher and learners

University of the Western Cape
Faculty of Education, Private Bag X17, Bellville, South Africa

Participant's Informed Consent Form

Research Title: Exploring the use of digital technology to improve reading in a Grade 2 Afrikaans Home Language classroom.

Please read the following very carefully so that you are aware of what you are consenting to.

I agree to:

Please tick mark (x) the appropriate box

To participate in a personal / focus-group interview	
To be audio recorded during the interview	
To authorize the researcher full access to documents/ materials	

I hereby give my consent to participate in this study and to be interviewed by the interviewer. This is for data to be collected by means of an interview to be used in the research study. Permission to record the interviews has been requested, and I am aware that I may refuse to have the interview tape-recorded.

I understand the participation is voluntary, that may refrain from answering any or all questions which might make me feel uncomfortable and that I have the right to withdraw from the study at any time if I so wish. Information gathered from the study will be handled with confidentiality and pseudonyms will be used to protect my identity.

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I am confident that the information will be used for research purposes only and I am assured that there is no risk involved in participation in the study.

I consent to voluntarily participate in this research study by signing this form.

………..…………….. …………….…………….. ……………
Participant's signature Destination Date

………………..……. …………………………
Researchers' signature Date
Researcher: Josmorine Gushwonita Bergstedt Supervisor: Dr Lucinda Du Plooy
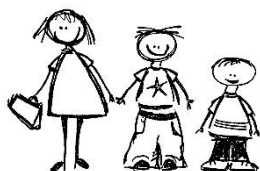Email: 4067219@myuwc.ac.za Email: lduplooy@uwc.ac.za

HOD: Dr Neetha Ravjee
Email: nravjee@uwc.ac.za

Appendix E2: Child assent form

ASSENT FORM FOR MINORS

TITLE OF THE RESEARCH PROJECT: *How young children use tablets to help them get better in their reading in a Grade 2 Afrikaans Home Language classroom.*

RESEARCHERS' NAME(S): Josmorine Bergstedt

RESEARCHER'S CONTACT NUMBER: 083 957 4566

What is RESEARCH?

Research is something we do find **NEW KNOWLEDGE** about the way things (and people) work. We use research projects or studies to help us find out more about children and teenagers and the things that affect their lives, their schools, their families and their health. We do this to try and make the world a better place!

What is this research project all about?

I want to find out if using tablets every day over a certain time will help you to better your reading skills in class and at home. I also want to know what things you like doing on tablets, what you feel you learn and enjoy on the tablets and what things you do on the tablets that you struggle with.

Why have I been invited to take part in this research project?

I want to help young children to better themselves in reading so that they can do better in their school work and get good marks. When you can read well and on your own, you will do good in higher grades and can also help your younger siblings or community members in learning to read.

Who is doing the research?

My name is Josmorine Bergstedt, I used to be a teacher at this school but wanted to work closer to my house and asked the principal for a transfer to another school closer to my home. I am a Grade 1 teacher. I see that many young children love playing games on cellphones and tablets and the school also has tablets they use to help you with reading. But you don't use tablets every day. I want you to use the tablets every day to see if this can help you get better marks in Afrikaans Home Language.

What will happen to me in this study?

You are going to use the tablets from Monday to Friday for 10 days in the morning for 30 minutes. You will be using an Afrikaans game (App) on the tablets and I will sit and watch as you play and learn. Each day, you will continue the game where you stopped the previous day. In the first week of the project, I will have a focus-group interview with all my friends in this study after school. This project will take place every day in your teacher's classroom.

Can anything bad happen to me?

There is a medium risk to this study. We do not know how all the friends in the study will react to being interviewed or observed during this project. They might feel uncomfortable or shy to give answers. I will do my best to make you feel comfortable and at ease while I do interview questions and watch while you play on the tablet. You will work on the tablets in your teacher's classroom and can work at your own pace. I will walk around and watch when you are busy on the tablets.

Can anything good happen to me?

When you are finished with this project, you will surely be able to know more sounds than you used to and might be able to read words much easier without having to sound them. You might also be able to identify words while reading much easier than before.

Will anyone know I am in the study?

Your name, your friends names that are also in this study, and your school and teacher's name will not be said to anyone. No one will know that you were part of this study. I will use a different name for you to protect you when writing down results in my notebook every day.

Who can I talk to about the study?

If you or your parents/guardians have any questions you are welcome to contact me, Josmorine at 083 957 4566 or via email at 4067219@myuwc.ac.za

My supervisor Dr Lucinda Du Plooy at 021 959 3001 or email at lduplooy@uwc.ac.za

My co-supervisor Dr Nosisi Dlamini at 021 959 2911 or email at npdlamini@uwc.ac.za

What if I do not want to do this?

You can say if you don't want to take part in this study even if your mom/dad/guardian said you can take part. If you feel at any time during this study that you do not want to be part of this study anymore you can tell me and you are not going to be in trouble. Myself or your teacher will not be mad at you.

Do you understand this research study and are you willing to take part in it?

YES	NO

Has the researcher answered all your questions?

YES	NO

Do you understand that you can STOP being in the study at any time?

YES	NO

_____   _____

Signature of Child   Date

Appendix F: Teachers consent form

University of the Western Cape
Faculty of Education, Private Bag X17, Bellville, South Africa

Foundation Phase Grade 2 Afrikaans Home Language teacher

12/04/2021

Dear Sir/Madam,

Re: Permission to conduct research in your classroom

My name is Josmorine Bergstedt. I am a master's student at the University of the Western Cape in the Educational Studies Department. I am conducting research on the use of digital technologies to improve reading in a Grade 2 Afrikaans Home Language classroom.

Research Title: Exploring the use of digital technologies to improve reading in a Grade 2 Afrikaans Home Language classroom.

I……………………………………………. (Name and Surname) hereby give consent to the researcher to do observations and audio recordings in my classroom.

The study was explained to me clearly and I understand that the presence of the researcher will not disrupt, interrupt or interfere with daily classroom practices. Participation of my class in this study is voluntary and I have the right to withdraw at any time during research. I understand that the researcher will inform me when planning to use the audio in my class. All information will be treated confidentially when writing the thesis to protect my classroom identity. I am promised that my classroom participation in this study will not risk my job and my professional personal image will not be damaged.

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Teacher's Signature: …………………………………Date…………………

ADDITIONAL CONSENT TO AUDIO RECORDING

In addition to the above, I hereby agree to the audio recording of the interview and/or lessons for data capture. I understand that the recordings will be kept securely and will be destroyed or erased once data capture and analysis are complete.

_____   _____

Name and signature participant ……………   Date…………………

Researcher: Mrs. Josmorine Gushwonita Bergstedt

Email: 4067219@myuwc.ac.za

Appendix G: Interview schedule

Appendix G1: Principal interview schedule

<u>Personal Profile</u>

1. For how long have you been the principal at this school?
2. Briefly tell me about your academic and professional journey.

<u>Interview questions</u>

1. Briefly tell me about the school and the community the school serves.
2. How did the school end up using tablets in the Foundation Phase?
3. What is your personal opinion on the use of digital technologies such as tablets to enhance Foundation Phase reading skills?
4. Would you say the use of Apps on tablets contributes to good results in reading?
5. How do you monitor or regulate the integration of tablets with regard to reading development?
6. What measures are taken to support teachers' use of tablets?
7. What impact does tablet use have on the development of reading and literacy in the Foundation Phase?
8. What has the Afrikaans Home Language performance been like this year in Grade 2?
9. What is your opinion about the Grade 3 and 6 systemic results for 2022 in Afrikaans Home Language?

Appendix G2: Teacher interview schedule

Personal Profile

1. How many years have you been a teacher at this school?

2. Briefly tell me about your academic and professional journey.

Interview Questions

Reading:

1. Do you feel the place of study (University) has adequately prepared you to teach reading?

2. Do you promote positive reading habits in your classroom? Motivate.

3. What kind of reading problems have you experienced from learners in your class?

4. What is your understanding of reading in Grade 2?

5. Why should all learners be able to read at a complex level at the end of Grade 3?

6. What has the performance been like in your class in terms of reading?

7. Which reading strategies or methods have you implemented to teach reading in Grade 2?

8. How do you teach reading in your classroom?

9. What support do you get regarding new methods and approaches to teaching reading?

   Tablets:

10. Which type of technology are you familiar with?

11. What digital technological tools do you recon are easy for Foundation Phase young children to use?

12. How long have you been teaching using digital technology such as tablets?

13. Do you think using digital technology such as tablets in the classroom is of any advantage to learners' reading skills? Please name a few.

14. Do you think technologies such as tablets can improve reading in this class?

15. What challenges do you face using tablets in the classroom?

16. What are the benefits of using tablets in your classroom?

17. Do you feel using tablets in the classroom is important for the 21st-century child?

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18. In your opinion, can young children teach themselves aspects of reading using specific apps on tablets?

19. Do you find it challenging to integrate tablets with teaching?

20. How are you adapting to the use of tablets in the classroom?

21. What support do you get regarding the use of tablets for language teaching and learning?

Appendix G3: Learner interview schedule

Reading:

22. Do you like reading?

23. Who taught you to read?

24. Do you read any books/ magazines/ newspapers at home?

25. Do your parents read to you at home or help you with homework? If yes, what is your favourite story?

Tablets:

26. Which type of technologies are you familiar with?

27. Do you have a cellphone or tablet at home? If yes, what do you do on this device?

28. What do you use tablets for at school?

29. Do you enjoy working on the tablets at school? Why?

30. What activities have been used in your class with tablets to improve your reading?

31. What is your favourite app on the tablets and why?

32. Do you think using tablets in your class has helped you improve your reading? Why do you say so?

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Appendix H: Ethical clearance HSSREC of UWC

UNIVERSITY *of the* **WESTERN CAPE**

60 YEARS *of hope, action & knowledge*

20 July 2021

Mrs JG Bergstedt
Educational Studies
Faculty of Education

HSSREC Reference Number: HS21/5/30

Project Title: Exploring the use of digital technologies to improve reading in a Grade 2 Afrikaans Home Language classroom.

Approval Period: 20 July 2021 – 20 July 2024

I hereby certify that the Humanities and Social Science Research Ethics Committee of the University of the Western Cape approved the methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report by 30 November each year for the duration of the project.

The permission to conduct the study must be submitted to HSSREC for record keeping purposes.

The Committee must be informed of any serious adverse events and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

HSSREC Registration Number: HSSREC-130416-049

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

Appendix I: Ethical clearance WCED

Western Cape Government
Education

Directorate: Research

meshack.kanzi@westerncape.gov.za
Tel: +27 021 467 2350
Fax: 086 590 2282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20210812-4955
ENQUIRIES: Mr M Kanzi

Mrs Josmorine Bergstedt

Dear Mrs Josmorine Bergstedt,

RESEARCH PROPOSAL: EXPLORING THE USE OF DIGITAL TECHNOLOGIES TO IMPROVE READING IN A GRADE 2 AFRIKAANS HOME LANGUAGE CLASSROOM.

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from 20 August 2021 till 30 September 2021.
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Mr M Kanzi at the contact numbers above quoting the reference number.
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. The approval of your research request does not imply a promise of any data from the WCED. Should you require data, you will have to request it from the participating schools where it will be possible to secure parental consent.
11. Please note that POPIA prohibits the sharing of personal information without parental consent.
12. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
13. The Department receives a copy of the completed report/dissertation/thesis addressed to:
    The Director: Research Services
    Western Cape Education Department
    Private Bag X9114
    CAPE TOWN
    8000

We wish you success in your research.

Kind regards.

Meshack Kanzi
Directorate: Research
DATE: 20 August 2021

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