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Exploring the integration of information and communication technologies (ICTs) in the foundation phase: a case study of a Grade 3 South African teacher

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MINOR DISSERTATION

"Exploring the Integration of Information and Communication Technologies (ICTs) in the Foundation Phase: A case study of a Grade 3 South African teacher.

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Submitted in the partial fulfilment of the requirements of the Master of Education by coursework and research report at the University of the Witwatersrand

PREPARED UNDER THE SUPERVISION OF: DR NOKULUNGA SITHABILE NDLOVU

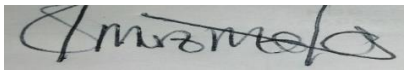
Acknowledgements

I would like to take this opportunity to thank My Lord who has kept me strong and determined to complete this research project. It was not an easy task as it was filled with hurdles and endless challenges. However, all that has taught me much in my academic life and career development. I would also like to take this opportunity to thank my family in particular, my wife Thendo Mukhauli, who supported me throughout this research project and my supervisor Dr Nokulunga Sithabile Ndlovu. My supervisor ensured that this research project was profound and guided me in building this study from her PhD thesis. I will always be grateful and indebted to her selflessness. I take this opportunity again to thank the Livhuwani Primary School management team, which I am part of, my two former seniors, ex-Principal Sophie Nthwaleng Sihlali and ex-Deputy Principal, Mr Adam Ngobeli who ensured that I completed this degree through their support and advice.

My parents, Eunice Mukondeleli Muremela and Patrick Muremela, your support is also noted in this research project. The Department of Basic Education through EDTP SETA, thank you for offering me a bursary to further my studies (MED), it was not going to be easy without your funding. My fellow students and mentors, thank you for being there for me academically, whenever I needed you. Finally, yet importantly, I would like to take this opportunity to thank myself, for the endurance, perseverance, diligence, and courage I have put into this research project.

Declaration

I THINASHAKA MUREMELA certify that this research report is original except where citations and acknowledgements indicate otherwise. I also certify that *Exploring the Integration of Information and Communication Technologies (ICTs) in the Foundation Phase: A case study of a South African teacher* is my own work.



---------- JULY 2022

THINASHAKA MUREMELA **Date**

Abstract

While the ICT in Education policy and the White Paper on e-Education recommends the use of digital technology to enhance the delivery of the curriculum, clear guidance on how to implement this in classrooms still needs to be articulated. This guidance should begin with Foundation Phase (Grade R-3) teachers if the impact of ICTs in our education system is to be realised as learners will be exposed to them at an early age. Hitherto, most of the documented interventions have focused on higher grades; therefore, the purpose of this study was to understand how best to integrate ICTs in the teaching of the Foundation Phase in a way that promotes the achievement of the intended learning outcomes. This was a qualitative case study that involved a Foundation Phase teacher in a school located in South Africa in the Gauteng province.

Data was generated through interviews and classroom observations of three lessons and analysed using an analytical framework adopted from Ndlovu to categorise and describe ICTs used, their affordances, and pedagogical value. The study used constructivism as the theoretical framework whose main tenet is learner-centred teaching and learning, wherein the learners are allowed to construct knowledge and meaning.

The main research finding was that the teacher who was observed and interviewed uses ICTs and has a thorough understanding of the different media forms and their affordances. The teacher integrates ICTs in teaching and learning to improve all aspects of learning and has become adept at using ICTs due to the training attended as part of continuous professional development. Out of the five media forms four were used which are interactive, communicative, adaptive, and narrative. The productive media forms were not used since it was mainly the teacher who used the ICTs, yet the productive media forms should be used mainly by the learners. The school is also well resourced. The findings indicate that when ICTs are used during learning, Foundation Phase learners become more active and understand concepts taught because learning is centred around them, and they take charge of their learning in the learning process.

Keywords: ICT pedagogical integration; enhancement of teaching; Foundation Phase; media forms

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List of Abbreviations

ATP	Annual Teaching Plans
CAPS	Curriculum Assessment Policy Statement
CFT	Competency Framework for Teachers
DoE	Department of Basic Education
DBE	Department of Basic Education
EDTP	Education, Training and Development Practices and Sector
GDE	Gauteng Department of Education
HOD	Head of Department
ICT	Information and Communication Technology
IWB	Interactive White Board
KWICK	Key words in context
MST	Microsoft Teams
SACE	South African Council of Educators
SETA	Sector Education and Training
SGB	School Governing Body

UNESCO	United Nations Educational Scientific and Cultural Organization
WWW	World Wide Web
ZPD	Zone of Proximal Development

Definition of Terms

FOUNDATION PHASE	This refers to the first three years of schooling during which the learner's home language is the medium of instruction (Beni, Stears & James, 2017).
INFORMATION AND COMMUNICATION TECHNOLOGY	This is an overarching term that refers to all the technologies that are used in digital communication and include *inter alia* telecommunication, hardware, and software (Chen & Castillo, 2015).
PEDAGOGY	Theory and practice of teaching and learning and how it impacts and is impacted by the social, political and psychological development of the learners (Orlando, 2013).
MEDIA	Technological means and channels by which the media is created, produced, distributed, consumed and read (Chambers, 2017).
CURRICULUM ASSESSMENT POLICY STATEMENT	The statement that guides the way assessments are carried out as published by the Department of Education (DOE, 2011)
LEARNERS	Any individual getting an education or supposed to receive education in terms of the Gauteng School Education Act, 1995 (Act No. 6 of 1995)

Chapter One: Introduction

1.1 Introduction

The Foundation phase (Grade R-3) is a significant phase in education as it is responsible for laying the foundational knowledge for learning in higher schooling levels and in acquiring much-needed skills. This is the period from five to ten years of age that is critical in the development of children's reading, writing, and thinking skills. Arasomwan and Mashiya (2021) discussed skills needed in the early childhood development (Foundation Phase) below:

- **Communication and collaboration** – Foundation Phase learners are more likely to solve problems collaboratively, construct, draw or record, using screen-based applications and experiment effortlessly with technological devices.
- **Creativity** – Technology can support children's creativity.
- **Socio-dramatic play** – Innovations and improvisations of both existing hardware and software can be used for child's play to reproduce shop environments, family situations and so forth.
- **Learning to learn** – Technology helps young children think about thinking, therefore establishing their metacognition (Mulovhedzi & Jacobs, 2022).

When learning takes place effectively, it results in the holistic development of the learners. Costley (2014) asserted that the use of technologies in teaching and learning is important for the development of skills and competencies which include communication and collaboration. When learners develop these skills, they will in turn develop higher-order thinking skills that are important in the technology-driven age that we are living in. The learners are then able to think critically and will also be able to solve problems. Ghavifekr and Rosdy (2015) argue that ICTs can be employed to help learners develop key skills, which include lifelong learning and working cooperatively and collaboratively with others. Foundation Phase teachers need to identify proper teaching strategies which employ ICTs to achieve the outcomes stated above. The ICTs will also enable them to scaffold learning during teaching using appropriate technological tools. That way, they supplement traditional methods to promote skills needed for their development in learning.

Traditional teaching materials such as the textbook and chalkboard tend to limit teachers, as they are static, and they are bound to promote monotonous content delivery that may not attract and benefit learner attention. However, introducing ICTs in the Foundation Phase could be beneficial, as these tools can help and provide a clearer understanding of concepts.

Furthermore, traditional teaching approaches are no longer sufficient to prepare learners to meet the needs of the industry and other contemporary issues that are bedeviling the world (Cox, 2014).

Foundation Phase learners are more interested in hands-on activities than sitting and listening to a teacher. Thus, they learn best when learning is active, when they are engaged in hands-on classroom games and activities that involve them in what they are learning (Cox, 2014). According to Thaba-Nkadimene (2020) if these activities are integrated with ICTs, then they can aid in language development and improve mathematical thinking of the learners.

ICTs have the capability to offer an environment that can sustain learner interest. These technologies provide an array of powerful tools that can help in transforming teacher-centred and text-bound classrooms into technology-enriched, learner-focused, and interactive knowledge environments (Rastogi, 2013). Therefore, these digital devices have a significant role in promoting a conducive learning environments for teaching and learning in the Foundation Phase.

Foundation Phase teachers should be provided with the necessary skills, resources, and learning content as this may later determine successful learning. If ICTs are introduced in the Foundation Phase, there is a greater chance that learning can improve in later years (Maaga, 2008). To attain optimal goals of learning using ICTs, teachers should be competent in using digital technology for teaching and learning.

1.2 Background

In the Foundation Phase, the Foundation for a learner's educational journey is set. In South Africa, the Foundation Phase comprises Grades 1 to 3 and during this period the learners are ideally taught in their home language. The main subjects are Home Language, First Additional Language, Life Skills, and Mathematics (McNulty, et al 2021). The South African ICT in Education policy and the White Paper on e-Education regard ICTs as vehicles to increase access to learning opportunities and to redress the injustices of the apartheid regime (Department of Education, 2004). The e-learning policy goal set out by the DoE is that every learner, including those in the Foundation Phase, should be ICT competent (DoE, 2004). Furthermore, the DoE posits that learners and teachers should be able to function in a knowledge society through using appropriate technology and mastering communication and collaboration skills (DoE, 2004). This expectation is still to be achieved in the Foundation Phase as these grades are not prioritised in the ICT project implementation.

Naude and Meier (2019) argued that the challenges that learners face in later grades are due to a lack of foundational knowledge and skills in the early grades. The Department of Basic Education (DBE) needs to pay more attention to the introduction of ICTs in the Foundation Phase because the early introduction of ICT in the early grades has the potential to enhance learner-learning experiences and skills. Most of the available ICT research focuses on older children or secondary school learners (Chou, Chang, & Chen, (2017) and there is therefore limited scholarship shared at the lower levels. It becomes the initiative of the individual school or teacher to introduce ICTs in their teaching. This has left most primary schools continuing with traditional methods of teaching.

"A survey conducted in South Africa revealed that 80% of Grade 4 learners cannot read (Chambers, 2017)". What we know is that 78% of SAs Grade 4 learners cannot read for meaning as revealed by the 2016 Progress International Reading and Literacy Study (PIRLS) literacy test. It is therefore hoped that the integration of ICTs in the Foundation Phase could help improve learner literacy and reading skills. This, for example, can be achieved by using media forms such as visuals and audio to play alphabet sounds during classroom interactions as well as sing- along with the teachers to promote the mastering of basic concepts.

There is limited resource provision in primary schools and yet, there is a historical reluctance amongst Foundation Phase teachers to use digital technological tools (Thaba-Nkadimene, 2020). Amongst many other reasons, the teachers do not have explicit guidance on how to go about using these devices for teaching and learning of learners in this phase. Hence, this study was interested in finding ways of making explicit how Foundation Phase teachers could adopt the use of technology to enhance their teaching.

1.3 Problem Statement

Most schools across South Africa, specifically in the Gauteng province, have received computers to bolster learner performance through the integration of ICTs in classrooms over the past five years. According to Mdlongwa (2012), South African secondary schools have been offered full infrastructural technological transformation, including the complete overhaul of classrooms to create space for paperless classrooms to facilitate the use of ICTs in teaching and learning.

Although the DBE has proclaimed that, all learners should be ICT capable, most primary schools' Foundation Phase in particular have not been offered these digital resources. Therefore, it is difficult for teachers to introduce ICT into teaching and learning. The national

e-Education policy currently exists as an invisible policy within these school contexts (Vandeyar, 2013). While teachers may implement school-based policy, they react to the national e-Education policy hence they find it difficult to integrate ICT (Vandeyar, 2013). Teachers need to be guided if they are to use ICTs effectively.

1.4 Purpose of the Study

The purpose of this study was to explore how a teacher uses ICTs in a South African Foundation Phase classroom. It sought to make explicit how these digital devices can be used to supplement teaching and learning in this phase. It is envisaged that the findings of this study will provide Foundation Phase teachers with guidelines on how to utilize ICTs to enhance teaching and learning.

1.4.1 Objectives

- To determine the teacher's perceptions on ICT pedagogical integration into the Foundation Phase.
- To describe how ICTs are used by the teacher to enhance teaching and learning at the Foundation Phase level.
- To establish how ICTs can be used to enhance teaching and learning of Foundation Phase concepts.

1.5 Research Questions

The main research question is stated thus:

- How can ICTs be used to enhance teaching and learning in the Foundation Phase?

1.5.1 Sub-research questions

- What are the teacher's perceptions on integrating ICT into teaching and learning in the Foundation Phase?
- How does the Foundation Phase teacher integrate ICTs into teaching and learning?
- How can ICTs be used to enhance teaching and learning in the Foundation Phase?

1.6 Significance of the Study

The current South African educational policies promote the use of ICTs for teaching and learning. However, they do not specify how Foundation Phase teachers should use these digital

technologies in the classroom (Gauteng Department of Education [GDE], 2011). The introduction of these digital technologies has only focused on secondary schools which are located in the Gauteng province (Msila, 2015; Ndlovu, 2016; Mlotshwa, 2019). There is a need to investigate how using ICTs at Foundation Phase level would add value to the learning experience. The study is significant because it gives a nuanced look at how a teacher is using ICT and how others can benefit and to inform best practices. The findings of this study should contribute to this gap by providing insights into how a specific teacher is integrating ICTs in a Foundation Phase classroom to enhance teaching and learning. In addition, teachers in schools might be encouraged to adopt ICTs and use appropriate tools to promote their efficiency in delivering the curriculum.

1.7 Limitations and Scope of the Study

In this case, the researcher's focus was on understanding what it means to integrate ICTs with an emphasis on how the technologies can be used to improve teaching and learning at the Foundation Phase level. One Foundation Phase teacher and his learners in the Gauteng Province in South Africa participated in this study. This could be a limitation in the sense that the results were based on one case. If the population was larger, then the findings could be generalisable to all Foundation Phase classrooms in South Africa.

1.8 Conclusion

The chapter described the research problem in the context of using ICTs in teaching and learning at the Foundation Phase level. It started by giving background information on teaching and learning and how the use of ICTs contributes to teaching and learning. The research problem was then stated, and the research questions were given. The focus of the study was outlined, and the limitations of the study were stated. The next chapter discusses literature relevant to the research focus.

Chapter Two: Literature Review

2.1 Chapter Overview

The first chapter introduced the study. It also presented the problem statement, the research questions, and the purpose of the study. In this chapter, the focus shifts to a discussion and review of literature on the use of ICTs in the Foundation Phase classroom.

This chapter begins with a discussion of ICTs in teaching and learning in the Foundation Phase prior to discussing the perceptions of educators on digital technology use. Later, an overview of learning theories, which includes behaviourism, cognitivism, constructivist theory and lastly, the conceptual framework.

2.2 Teacher perceptions on ICT use

Teacher perceptions of technology are also key to ICT adoption. To that end, Ertmer (2012) and Ndlovu (2016) argue that the beliefs of the teacher and the use of ICTs should align if they will be used effectively. Ertmer et al. (2012) went on to add that if the teachers do not believe in the use of ICTs for teaching, they can become the biggest obstacle to the integration of ICTs into teaching and learning. This is supported by Ghavifekr et al. (2014), who found in their study in Malaysia that if teachers are not receptive to ICT use, then they will resist their introduction. On the other hand, Ndlovu (2016) discovered that the perceptions of teachers who integrate ICTs effectively were aligned with the enactment of ICTs. These teachers' perceptions were informed by their pedagogical beliefs (Ndlovu, 2016). It is, therefore, important for efforts to be made in educating teachers with a view to changing their perceptions of ICT that they may have.

2.3 Teachers' knowledge of ICTs

Teachers must have knowledge about the use of ICTs in teaching and learning. Kennah (2016) opined that Foundation Phase teachers, just like all teachers, should not only have content and pedagogical knowledge; they should also have knowledge about the use of ICTs in teaching and learning. In the 21st century, three areas of knowledge (pedagogy, content, and technology) should be inexorably linked if the education system is to produce learners who have skills required by the industry. As Bhattacharjee and Deb (2016) point out, integrating ICT knowledge and pedagogical content helps teachers to deliver content in a way that is

meaningful to Foundation Phase learners. Current learners are mostly considered as technology natives and are very comfortable with using ICTs and thus would be very comfortable using ICTs in class.

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2018) came up with an ICT Competency Framework for Teachers (CFT) which provides guidelines on teacher competency levels. The UNESCO (2018) framework focuses on knowledge acquisition, knowledge deepening, and knowledge creation. These competency standards focus on the knowledge and skills teachers should have if they are to develop in their use of ICT for teaching. It is hoped that the standards such as those indicated in the framework can help to improve the Foundation Phase teachers' integration level of ICTs and their understanding of using ICTs in teaching and learning and the value that these ICTs bring. These standards should be incorporated when preparing teachers for meaningful ICT integration.

De Silva et al. (2016) noted that teachers need better designed professional development opportunities so they can plan lessons where ICT can be purposefully selected and aligned to instructional outcomes. This is particularly important because some of the teachers started teaching before the use of ICTs in teaching became paramount and as such, their training did not equip them to use ICTs in teaching and learning.

2.4 Use of ICTs in the Foundation Phase

Kerckaert et al. (2015) stated that there is very limited literature on the integration of ICTs into teaching and learning at the Foundation Phase level. A study in Malaysia concluded that when ICTs are introduced into teaching and learning at primary school level, learners acquire 21st-century skills early in their lives. This makes it possible for them to contribute meaningfully to development imperatives while taking advantage of the boom in global information (Ghavifekr et al., 2014). The learners grow up confident in the use of ICTs not only for learning purposes but for application in other facets of life.

Ghavifekr and Rosdy (2015) said that when ICTs are introduced and integrated into teaching and learning the school environment becomes dynamic and innovative, making it possible for the students to be more motivated and creative. The use of ICTs increases the range of information to which the learners are exposed since they will have access to the internet. The wider access to information will foster the development of a more global approach to education and information. Students in the process of learning will become more adept at processing

information more efficiently and effectively. Learners can, in the process, develop attitudes and capacity for life-long learning that can be established at this early age.

According to the White paper on e-Education Policy (DoE, 2004), the integration of ICT in the curriculum is of immense benefit to learning. Ermeley et al. (2014, p.793) opines that, *"Using computerised learning methodology, enhances and speeds up the teaching process"* and that the use of ICTs enhances teaching and learning while at the same time speeding up the process of teaching and learning. Traditional teaching requires more paperwork and less interaction between teachers and learners. Therefore, the use of ICTs has the potential to effectively bring about change in how learning is conducted. When technology is used properly in the Foundation Phase classroom, it leads to greater and better engagement with content as they collaborate with fellow learners.

Bhattacharjee and Deb (2016) assert that ICTs add an extra dimension to the play activities of young children. This may well include giving immediate responses to instructions and thus sustaining learner attention. The attention span of learners in the Foundation Phase is short, making it difficult to cover meaningful scheduled content. De Silva et al. (2016) postulated that the use of the interactive whiteboard can be an effective tool to sustain the concentration levels of the learners, yet it remains largely underutilised. The use of these technological tools can be fascinating to the Foundation Phase learners as they are able to view colourful objects in motion displayed on the interactive whiteboard, thereby increasing their short concentration span. Therefore, learning with visuals become the core of learning development in Foundation Phase learners.

2.4 Learning with visuals in the Foundation Phase

Visuals can stimulate learning and knowledge processing (Anwariningsih & Ernawati, 2013). A computer is described as an ideal learning medium as it has remarkable characteristics that can be used to interact with learners in the Foundation Phase. For instance, learners respond accordingly to the stimulus of visual concepts displayed on the screen (Anwariningsih & Ernawati, 2013). An activity presented to learners using ICTs is likely to receive a positive response from learners. Furthermore, Gawade et al. (2015) stated that the main impact of using ICTs as learning media is that they can make Foundation Phase learners active and help them interact with information that they can access from them. Anwariningsih and Ernawati (2013) added that when visuals are used during teaching and learning, they stimulate the learners' interest and as a result, they are then able to describe the concepts that are material and their

learning experiences become concrete. Lant and Lawson (2016) state the benefits of using the interactive white board (IWB) as:

- Interactivity (they can facilitate active learning rather than passive reception of information).
- IWB facilitates cooperative learning.
- Accessibility (especially for young children and individuals with a visual or physical impairment).
- The information can be recorded, meaning that even after class the learners will still have access to it.

Most schools in the Gauteng province in South Africa have interactive white boards (IWB) as delivery digitals tools. The IWB technology consists of three elements: a digital board, a computer, and a projector (Lant & Lawson, 2016). According to Lant and Lawson (2016). interactive whiteboards have been a novel teaching tool of great interest in the classroom environment for a few decades. It would, therefore, be a suitable technological tool to effectively display images (visualisation) rather than sticking them on the chalkboard or classroom walls, which can be time-consuming during the learning process. An IWB is, therefore, a useful tool from a pedagogical perspective, as it promotes learning through visualisation.

2.5 Use of games in learning and teaching in the Foundation Phase

The use of ICTs in teaching and learning allows teachers to seamlessly integrate games during class. One of the important simulations that can take place in the Foundation Phase classroom is the use of games. Homer and Kinzer (2015) argued that games are a complex genre of learning environments that cannot be understood by taking only one perspective of learning. Integrating ICTs will allow teachers to use different methods of teaching in enhancing the learning of taught concepts and ICTs make it easier to introduce gaming to Foundation Phase learners. Homer and Kinzer (2015) said that when concepts are taught using gaming, they improve aspects such as motivation in learning concepts. In the process, the learners get a better understanding of theoretical concepts and also gain cognitive, affective, and socio-cultural skills which are important in dealing with everyday challenges that the learners encounter.

Through games, motivation becomes automatic, more especially when learners are engaged in educational games. The introduction of games through ICT in the Foundation Phase is likely to enhance learners' higher order thinking skills through cognitive abilities.

When learners are playing games, they learn to solve problems, explore, and acquire new skills and knowledge. Playing games in the Foundation Phase may help learners' cognitive development. Piaget (1962) asserted that play in children is integral to stages of cognitive development and further argued that play becomes more abstract, symbolic, and social as they mature. Learners in the Foundation Phase will more likely be able to learn rules and instructions through game participation and this can only be achieved when Piaget's cognitive stages are fulfilled through play. In this regard, ICTs help to make a variety of games available to learners which can either be online or offline and learners can play as individuals or teams.

2.6 Learning Theories

Learning theories are important because they inform and help understand how learning takes place. This section starts by looking at behaviourism theory by Skinner. The second theory is the cognitivist theory as propounded by Piaget. Lastly, the section ends with Vygotsky's social constructivist theory that underpins this study. Since the use of ICTs in the classroom involves learning and there is no general agreement by scholars as to how learning takes place, hence the need to look at more than one theory, before focusing on the chosen theory for this study.

2.6.1 Behaviourism theory

Behaviourism theory is based on the notion that the way people behave is a result of their response to a stimulus from the environment (Moll, 2013). Skinner (1904; 1990) posited that the behaviour of children changes after it has been reinforced. For instance, behaviour followed by positive reinforcement is likely to be repeated. Children repeat good behaviour if it is rewarded as positive reinforcement and they will perform to the best of their abilities during the process of learning. Similarly, if the behaviour is not rewarded then it is unlikely to be repeated. According to Skinner, operant conditioning, or instrumental conditioning is when the consequences of a response determine the probability of it being replicated. Thus, a behaviour that is rewarded is likely to be repeated while behaviour that is punished is likely to not be repeated (McLeod, 2018).

Learning in the Foundation Phase is centred on behaviourism as there should be evidence that there is an understanding of a concept through a behaviour change. A learnt activity can be assessed through automated multiple-choice questions or quizzes given to learners in

anticipation of their responses and is regarded as a way of shaping or correcting the behaviour as postulated by Moll (2013). Therefore, Foundation Phase teachers can reinforce desired responses by using web 2.0 ICT tools that are interactive and that can provide them with immediate praise, for instance as a reward.

2.6.2 Cognitivist theory

This theory is an extension of behaviourism in the sense that it focuses on cognitive processes or what happens in the mind in the learning development. Piaget (1962) proposed cognitive development stages that children go through as they grow and develop that would determine the level of their construction of knowledge. According to Mcleod (2018), the intelligence of a child changes as they grow. He pointed out that cognitive development is not only about acquiring knowledge but is also about the child creating a mental model of the world. Thus, cognitive development comes about as a result of the interaction between the innate capabilities that children possess and environmental events. Piaget (1965) therefore made three assumptions about children:

- Children construct their own knowledge shaped by their lived experiences.
- Children learn about many things on their own without the help of older children or adults.
- Children are intrinsically motivated to learn and do not need positive reinforcement from adults to motivate learning (Nilamsari & Fitriyani, 2021).

Piaget (1965) believed that children go through four stages namely: the sensorimotor stage which is the period from birth up to two years. During this stage, the children learn to speak a language that helps with social and intellectual development. The second stage, which Piaget (1965) called the preoperational stage, is between the ages of two and seven. During this stage, the child is not able to learn in abstract terms and will therefore need concrete physical situations in which to learn. The third stage is called the concrete operational stage and is the period between seven and 11 years of age. During this stage, the child is now able to create logical structures and solve abstract problems. The last stage is called the formal operation stage and is from 11 years onwards. During this phase, the child is now able to solve problems logically and systematically (Lefa, 2014). This means that when a teacher is planning and delivering lessons, cognisance must be taken of the stage that the learners are at and that every learner goes through the four phases albeit at different rates.

This study focuses on learners in the preoperational and concrete operational stages. ICTs can therefore assist them manipulate technology as they learn new concepts. This helps learners to learn skills that are useful in the real world. The students can also build knowledge that is shaped by their lived experiences and to learn about many things on their own without the help of older children or the teacher. The internet is a fountain of information that learners can tap into if they have the right ICT skills.

2.6.3 Constructivist theory

When using the constructivist approach, the teacher facilitates and mediates learning as they scaffold learning. The term constructivist is often used to refer to learner-centred teaching and learning, wherein during learning in the classroom there is teacher-learner and learner-learner collaboration, and the construction of knowledge is possible (Orlando, 2013). Vygotsky (1987) viewed this interaction as promoting the construction of knowledge. Vygotsky (1987) illustrated this process by presenting the Zone of Proximal Development (ZPD) that denotes learner movement from what they know before learning to what they do not know. During this mediation phase, psychological tools or artefacts are used to promote the learning process. Kerckaert et al. (2015) argued that learners can use technological tools in realistic and imaginative socio-dramatic role-plays while learning the correct vocabulary and learning to use different forms of ICT. As they do, the gap between what they know and what they do not know is closed.

Foundation Phase learners are more likely to require mediated learning, given their short attention span that various ICT resources can sustain during the integration process. During the integration of ICT at the Foundation Phase, mediated learning is important because the learners are still too young to learn without assistance from the teacher due to the learners' age and how they perceive things. Due to their age and low concentration span the learners are not left on their own – the teacher uses ICTs to help learners to understand the concept that is being taught. The teacher, therefore, plays the role of mediator or facilitator of learning

Luneta (2014) mentions and discusses three types of knowledge that form the basis for teaching Foundation Phase, which are physical, logical-mathematical, and social.

- ***Physical knowledge*** is acquired through hands-on interaction with the environment. Foundation Phase learners could gain knowledge when they interact with ICT tools that they are exposed to during the learning process.

- ***Logical-mathematical knowledge*** is abstract reasoning that is applicable beyond physical interaction with a concrete stimulus. While physical knowledge is discovered, logical-mathematical knowledge is created through actions. It can only be gained by repeated exposure and interaction with multiple settings for mental structures to be modified and created. ICTs can provide simulations where these learning opportunities can supplement explanations and give learners experiences that help concretise their understanding of concepts.
- ***Social knowledge*** can only be gained through interaction with others. This type of knowledge is culture-specific, and its acquisition is based on actions rather than the physical perception of objects. Foundation Phase learners are likely to enjoy collaborating with their peers and exchanging ideas socially through and with ICT objects as they concretise their understanding of concepts. This can be achieved using virtual platforms like Zoom, Google classroom, WhatsApp, and Microsoft Teams (Luneta, 2014).

The knowledge of these stages help the Foundation Phase teacher to create a learning environment that is conducive for the age groups. Therefore, ICTs can be used to supplement the learning experience. The question is, therefore, how does the teacher facilitate this learning in a way that will enhance the mediation of new knowledge.

2.7 Laurillard Conceptual Framework

Laurillard (2002) believed that the main goal of teaching is not to impart knowledge but rather to create an environment that makes learning possible. Her conversational framework is constructivist in nature. The constructivist philosophy is premised on the notion that learners construct their own meaning and knowledge of the world via their experiences and how they reflect on those experiences. As Shah (2019) posits, constructivist learning is seen as being highly authentic and helps learners to learn collaboratively. Therefore, it becomes imperative for Foundation Phase teachers to scaffold and mediate lessons to help learners understand subject content and concepts in the learning process as they lead the conversation in the Foundation Phase classroom.

Laurillard's (2002) conversational framework describes the learning process, and it makes visible the conversation that takes place in the classroom. Its advantage is that it can be applied to any grade level or subject (Laurillard, 2002). While the conversational framework focuses on the interaction between the teacher and the learner, such interactions are seen as collaborations and are necessary for constructing knowledge in the Foundation Phase.

Conversations are part of social interaction and this tallies with Vygotsky's thinking. Vygotsky (1987) viewed this interaction during the conversation as promoting the construction of knowledge. He (1987) illustrated this process by presenting the Zone of Proximal Development (ZPD) that denotes learner movement from what they know before learning what they do not know. During this mediation phase, psychological tools or artefacts are used to promote the learning process. Kerckaert et al., (2015) argued that learners can use technological tools in realistic and imaginative socio-dramatic role-plays while learning the correct vocabulary and learning to use different forms of ICT. As they do, the gap between what they know and what they do not know is closed.

This framework makes explicit the interaction in what happens in the classroom with the guidance of the teacher and active involvement of the learner. As shown in Figure 2.1, the roles of the teacher and the learner are clearly delineated, with the roles of the teacher being among others to set goals, to re-describe the concept, and to provide feedback. The roles of the learners include inter alia to reflect on the concept in the context of their experiences and to give their own conception of the context. Thus, there is communication between the teacher and the learners that is two-way. The role of the teacher becomes being the mediator of the learning process.

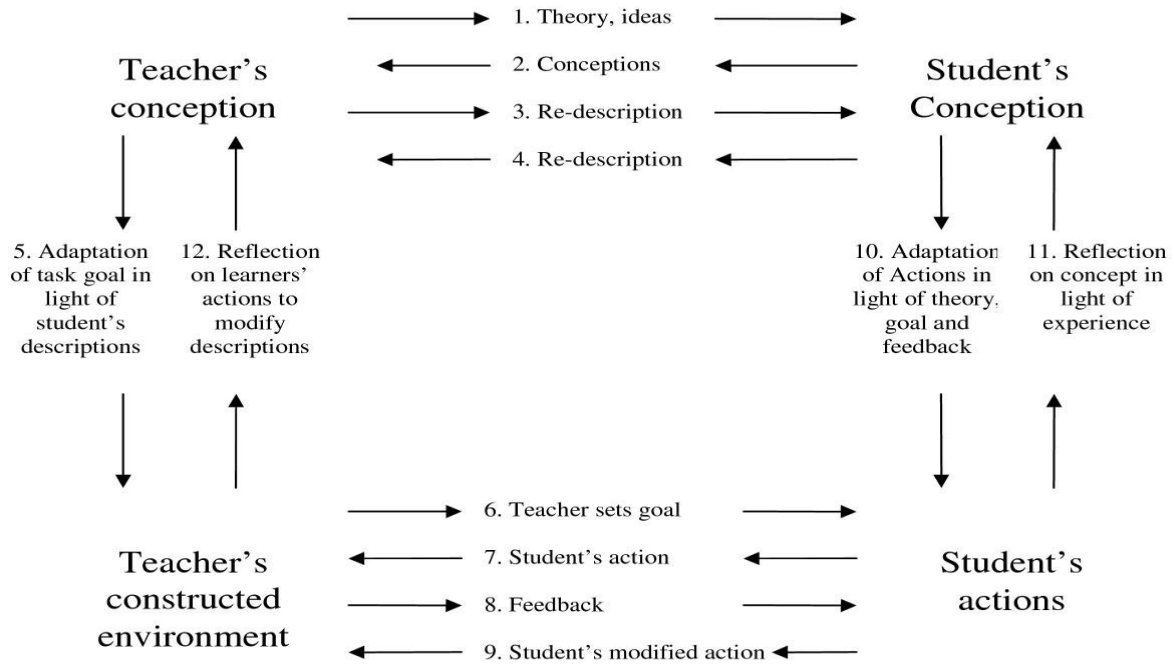


Figure 2.1: The conversational framework (Laurillard, 2002, p. 87)

Figure 2.1 summarises the conversational framework and outlines the supported media forms which are:

- The ***discursive process*** is represented as a series of activities by the teacher and learners at the level of descriptions of topic goal, describing and re-describing each participants' conception of it (activities 1-4).

- The ***adaptive process*** is represented as activities 5 and 10, internal to both teacher and learner, each of whom adapts their actions at the task level in light of the discursive process at the description level.

- The ***interactive process*** is represented as a series of activities (6-9) by the teacher and the learner at the level of the task environment, setting and aiming to achieve the task goal, giving, and acting on feedback in the light of the task goal.

- The ***reflective process*** is represented as activities 11-12, internal to both teacher and learner, each of whom reflects on the interaction at the task level to re-describe their conceptions at the end of descriptions of the topic goal (Laurillard, 2002).

Learners can develop and demonstrate their knowledge on what they have learnt and display the acquired knowledge in different settings or environments. In the Foundation Phase, knowledge can be demonstrated via remembering facts and solving problems that are pitched at the cognitive level of the learners. The conversational framework acknowledges interaction in the learning process. The teacher uses feedback to adapt the classroom conversation while guiding the learner systematically. As the conversation goes on, the learner receives feedback from the teacher and uses it to adapt to their own understanding of the world. The learners arrive at this through a reflective process that is guided by the suggestions that the teacher would have made and the sense that the learners make of the world that they live in (Ndlovu, 2016).

In the Foundation Phase, learners are also able to use the acquired knowledge to build new knowledge and apply it in other situations to arrive at creative solutions. This is in many ways similar to scaffolding which involves the educator supporting the learners to enhance learning and to help them become adept and, in the process, help them to master tasks. The teacher achieves this by methodically building on students' experiences and knowledge as they are learning new skills (Gonulal & Loewen, 2018). The teacher can use ICTs in teaching and learning, especially in terms of communicating and re-calibrating the outcomes of the lesson as ICTs can enable the teacher to monitor learning and give instant feedback. Instant feedback

is particularly important at the Foundation Phase level because of the limited concentration span of the learners. The learners also feel validated since their views and their experiences are taken on board during class thus promoting the construction of knowledge.

2.8 Technological Media Forms

Anwariningsih and Ernawati (2013) described media as human material or events that result in an environment that enables learners to acquire knowledge, skills, and attitudes. Media can be seen as the carriers of messages. These can be a human being or an inanimate object that transmits the message to the intended receiver of the message. If the medium carries information that has instruction, then it qualifies to be called a medium of learning. Anwariningsih and Ernawati (2013) added that learning media includes instruments that can be used in the teaching and learning process both inside and outside the classroom. In this study, media refers to ICT tools and both will be used interchangeably.

According to Laurillard (2002), media emphasises both digital and non-digital resources. She groups media based on the role they play during the teaching and learning experience or activity. In other words, the selection of media used is associated with the concept taught. Media forms deal with all the communication and information media and that includes the printed word, sound, and the moving images, delivered through any kind of technology. Educationally, media forms tend to denote the existence of the pedagogical value of ICTs in the learning process. Laurillard (2002) categorised ICT media into the following types:

- ***Interactive*** **–** This media form includes hypertext and hypermedia. Multimedia includes web-based resources and internet-delivered television (Laurillard, 2002). Interactive media when used in the Foundation Phase could play an important role as this media allows learners to interact with the content and the teacher. Interactive media enables the teacher and the learners to view multiple activities on interactive whiteboard tablets and laptops, use networks to search for educational videos, download rhyming songs and many more. The technology, in this case, provides instant response and feedback in the process of learning.
- ***Communicative*** – Communicative media align themselves with conversations that happen when teaching a lesson (Ndlovu, 2016). Learners can discuss what they think about a certain topic digitally with social media. The communication can take place outside of the formal classroom since learners can use virtual and synchronous applications like Zoom, Google Classroom and Microsoft Teams, with chats or

asynchronous applications like discussion forums to learn cooperatively outside the four walls of the classroom.

- ***Adaptive Media*** – Adaptive media are computer-based media capable of changing their state in response to the user's actions (Laurillard, 2002). Using computer-based media in the Foundation Phase is interesting as learners are always keen to receive their feedback after their positive actions, be it from the teachers or the computer. Such initiatives stimulate and improve their learning, for instance, playing puzzle games and tutorial programmes. As they do, they are exposed to concrete ideas that help them adapt their understanding.
- ***Productive Media*** – Ndlovu (2016) argued that productive media are technologies that can be used by learners to display their ideas and understanding. In this regard, a constructivist way of learning can be employed in the Foundation Phase, as learners can be given opportunities to create and illustrate their understanding of the world.
- ***Narrative Media –*** Narrative media are the linear presentation media that include print, text, and graphics (Laurillard, 2002). Although this study was concerned about the usage of ICT in the Foundation Phase, the narrative media is of utmost importance in presenting subject content using multimedia. Classwork books, textbooks, wall charts, and worksheets are not entirely replaced but form part of the newly designed methodology of teaching that helps make connections and structure of concepts visible.

Knowledge about media forms calls for the teacher to be deliberate in selecting appropriate technologies that can enhance learning. However, without the understanding of the affordances they offer, the teachers are bound not to maximise the use of ICTs.

2.9 ICT Affordances

In defining affordances, Ndlovu (2016) differentiated between actual and perceived affordances. Actual affordances are the entire set of design features or functions that ICTs can provide for their users to perform certain tasks. For example, the affordances that a cell phone offers a user is the ability to make calls, browse the World Wide Web (www) and take pictures. Perceived affordances are dependent on the knowledge and experience of the person using the ICTs.

When using ICTs for teaching and learning, teachers need to know what in the digital tool they are using is likely to promote the desired outcomes. In other words, what are ICT affordances or what are the tools able to do in the teaching and learning experience? According to Conole and Dyke (2004), there are 10 (ten) ICT affordances which are: accessibility, speed of change,

diversity, communication and collaboration, reflection, multimodal and non-linear, risk, fragility and uncertainty, immediacy, monopolization, and surveillance.

This study adopted the following five ICT affordances as adopted by Ndlovu (2016) – multimodality, immediacy, diversity, collaboration, and reflection, to explain the pedagogical value of the use of ICTs in the Foundation Phase classroom. These affordances contribute to a more systematic application for ICT use in teaching and learning (Ndlovu, 2016).

2.10 Adapted Conceptual Framework

2.10.1 Media forms as a pedagogical value in the Foundation Phase

A conceptual framework aids in laying the pathway for the research. The study adapted the conceptual framework in Figure 2.2, proposed by Ndlovu (2016). The framework was used to identify and describe what was of pedagogical value in the use of ICTs by seven South African secondary school teachers. The framework by Ndlovu is an adaptation of Laurillard's conversational framework which was discussed in section 2.3.

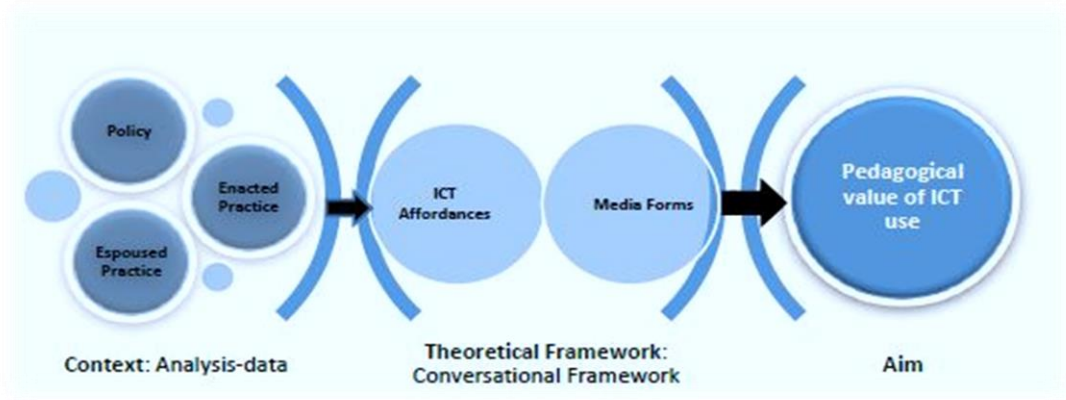


Figure 2.2: Conceptual Framework (Ndlovu, 2016, p. 43)

Since policy was not relevant in this study, it was left out. Thus, the only two concepts that were deemed applicable for this study were ICT affordances and media forms. The concepts helped to identify and describe the pedagogical value of ICT use in the Foundation Phase classroom.

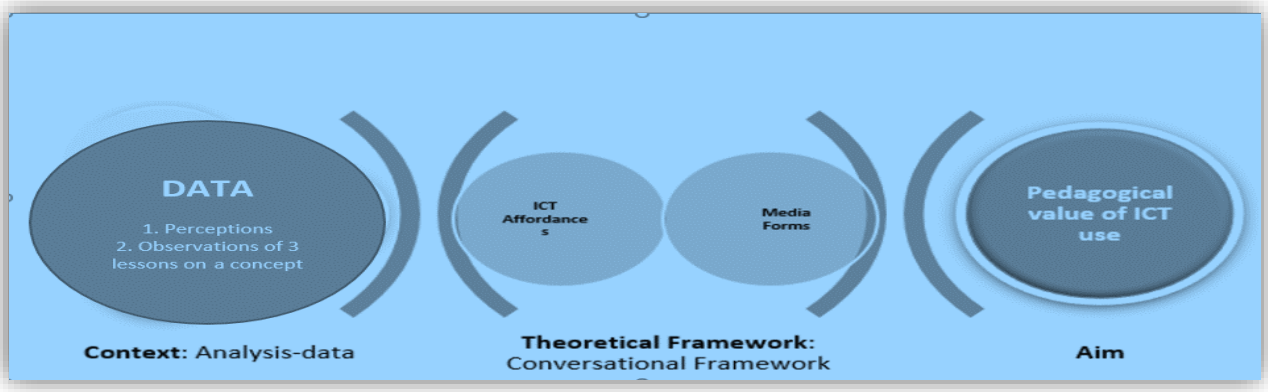


Figure 2.3: Revised conceptual framework (Author's own conceptualisation)

The study focused on perceptions and observations of three lessons that focused on one concept. Both data sets were analysed using the analytical framework developed by Ndlovu (2016) that helped make clear how ICT affordances were used by the teacher helped enhance her teaching and learning. In other words, the study sought to determine the pedagogical value of the teacher's use of ICTs.

According to Ndlovu (2016), the analytical tool determines the usage of ICT and the pedagogical value it brings. The researcher used the analytical framework to determine the value of ICTs in a Foundation Phase classroom environment. The framework used five principal media forms which were: narrative, interactive, communicative, adaptive, and productive (see Table 2.1). The table below demarcates what and how pedagogical value was derived from the use of ICTs or specific media forms. The different media forms offered different affordances, and the researcher provides evidence from the interview and the three lessons observed to show the affordances that the media forms afforded the teacher. Based on the evidence, the pedagogical value that these media forms offered is then summarised.

Table 2.1: Analytical Framework

Media forms	**Affordances**	**Evidence**	**What pedagogical value does it**
Narrative	Non- Linear	Multimodality	Apprehending structure/ connections
Interactive	Immediately	Immediate feedback	Exploring: misconceptions amended

Communicative	Collaboration	Discussion: class/group	Re-descriptions of concepts
Adaptive	Diversity	Reproduction experiment/role play	Concretising theory: practice
Productive	Articulation	Product: animation/model	Knowledge construction

Source: Adapted from Ndlovu (2016, p. 123)

2.13 Conclusion

The chapter dealt with the literature review. It presented a conceptual framework that guided the study as well as looked at what other scholars have written about the integration of ICTs into teaching and learning. The conceptual framework was discussed because it ensured that the research questions were answered and gave proper guidelines on the limitations of the study.

Chapter Three: Research and Design Methodology

3.1 Chapter Overview

In this chapter, the focus is on presenting the research methodology which guided the study. The chapter deals with the research method and the philosophical underpinnings, before justifying the selection of the research design. Attention then shifts to research methods used in this study.

The teacher who was interviewed for the purposes of this study had 10 years' teaching experience and has been using ICT's in teaching and learning for more than five years. The teacher has a diploma and an honours degree in education. The teacher's details are summarised in Table 2.3

Table 3.1: ***Teacher information***

Teacher	*Subjects teaching*	*Teaching Experience*	*Experience teaching with laptops & smart boards*	*Qualification*
X	Afrikaans Additional, English Home Language, Mathematics & Life Skills	10 years' experience	5 years	Teachers Primary Diploma, ACE certificated & BEd Honours

The respondent is 49 years of age and has been teaching Grade 3 and also the head of department. The educator had been teaching Grade 3 for approximately 10 years and was the head of the ICT committee at school and very well advanced in using technological tools. Under the leadership of the respondent. The school was chosen as the most successful school in the district for using a digital library in the Foundation Phase. The respondent understood that using ICTs at the Foundation Phase level acts as a mediator and was likely to influence the learners' behaviour when learning. Assessments were automated and the feedback was given timeously and areas to improve on were clearly indicated, thereby increasing learners' performance.

3.2 Research Method and Paradigm

This study adopted a qualitative research method. Qualitative research captures what people have to say in their own words and describes their experiences in detail and give insight into the reasoning and feelings that motivate people to act or believe in a particular way

(DeJonckheere & Vaughn, 2019). DeJonckheere and Vaughn, (2019) added that a qualitative method provides greater richness in detailed information about a smaller number of participants. The study aimed to provide detailed descriptions of a Foundation Phase teacher's use of ICTs to enhance teaching and learning.

Qualitative research was chosen for this research because it afforded the researcher the ability to study the integration of ICTs into teaching and learning through the voice of the teacher. The strength of qualitative research lies in the fact that it enables the researcher to collect information that is relevant culturally and information that considers the values, viewpoints, behaviour, and the social context of the population under study (Mwita, 2022).

Qualitative research is anchored in the interpretivist research paradigm. Kivunja and Kuyini (2017) stated that the central tenet of the interpretivist paradigm is that people experience the world subjectively and that there is no objective and universal truth. As Lincoln and Guba (1985) pointed out, the interpretivist admits that the world cannot be understood from one individual's perspective as there are multiple truths. There is a belief that the multiple realities are socially constructed. The researcher is not neutral as there are interactions between the researcher and the research participants. When interpreting the world, context is important, and all knowledge is value laden. The interpretivist accepts that it is critical to understand the individual rather than seek to come up with universal laws. From an interpretivist perspective, cause and effect are not mutually exclusive (DeJonckheere & Vaughn, 2019). Given the above, the interpretivist axiology holds that all social research is value-laden, and it is not possible to separate the researcher from what is being researched with the consequence that research becomes subjective (Levers, 2013). This is true of this study as it relies on the interpretation of subjective data from the participants and the researcher. It sought to explore the integration of ICTs into teaching and learning at a particular school and focused on a single class and one teacher. The research did not seek to generalise the results but to get detailed knowledge.

3.3 Research Design: Case Study

According to Krusenvik, (2016) a case study is a research design that is widely used. It is often viewed as a useful tool for the preliminary exploratory stage or a research project. Moreover, case study research focuses on strategy and empirical inquiry that investigates a phenomenon within a real-life context. Krusenvik (2016) goes on to say that a case study offers insights that might not be achieved with other approaches. This study used a case study design to investigate real-life experiences happening in a school environment as it examined how Foundation Phase

learners and their teachers interacted with ICT. It focused on capturing and analysing data on the exemplar teacher that can be used to inform best practices in the use of ICTs for teaching.

The case study approach was chosen because it allowed the researcher to carry out analysis on a qualitatively complex event while at the same time taking cognisance of the many variables at play. The case study approach allowed the researcher to explore the integration of ICTs into teaching and learning (Krusenvik, 2016; Starman, 2013). In this study, the researcher focused on a teacher/educator who was interviewed and observed while teaching three lessons. The subject being taught was English Home Language at Foundation Phase level.

3.4 Sampling

This study used purposive sampling. Purposive sampling is a technique widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Kakilla, 2021). Purposive sampling involves identifying and selecting individuals or groups that are especially knowledgeable about or experienced with a phenomenon of interest (Creswell & Plano-Clark, 2011). The study selected one Foundation Phase teacher from a primary school in South Africa in the Gauteng province along with the learners they teach. The participant was selected based on availability and willingness to participate in the study. The selection of the school and the teacher was based on the teacher's usage of ICT and the facilities that were available at the school, over and above the reasons articulated above. Convenience sampling was used. The school was chosen because of its proximity to the researcher and because the researcher was known at this school it was easy to obtain access.

3.5 Trustworthiness

Reliability and validity are concepts that are applied when evaluating the quality of research. The two show the extent to which the method employed in research measures the variables under study (Middleton, 2021). Reliability measures the degree to which the results can be replicated when the research is repeated under similar conditions. Qualitative research is generally not concerned with reliability and seeks to focus on trustworthiness whose aim is to determine the extent to which the results really measure what they are supposed to measure (Creswell, & Plano-Clark, 2011). Lakshmi et al (2013) argues that trustworthiness is the consistent and accurate representation of the total population that can be produced under a similar methodology, therefore, the research can be considered reliable.Lakshmi & Mohideen (2013).

In this study, a set of semi-structured interview questions were asked, and responses were recorded and later transcribed without altering in any way the responses that the respondent gave to the questions that the interviewer asked (Lakshmi & Mohideen, 2013).

3.6 Research Instruments

3.6.1 Semi-structured interview

To carry out interviews an interview guide was developed. The interview consisted of questions that were linked to the research questions. The interview helped collect data on the perceptions that the educator had about integrating ICTs at the Foundation Phase level and to also be able to probe for clarity where necessary.

The researcher developed questions systematically and presented them to the Foundation Phase teacher, thereafter probing questions were asked thereby creating a discussion. The researcher prepared an observation schedule template that entailed the use of ICT in a Foundation Phase classroom. This research study used qualitative methods such as semi-structured interviews and observation to collect data; as a result, the responses and observations pointed to the perceptions of the participant on ICT integration.

A semi-structured interview was chosen because they offered the following advantages:

- They are appropriate for carrying out in-depth conversations, thus allowing the researcher to gain deep insights.
- The researcher can ask follow-up questions in order to interrogate issues to the full.
- When carrying out the interviews, the interviewer can bring in flexibility by synthesising several different themes. Thus, it is possible to collect data on various topics with multiple themes (DeJonckheere & Vaughn, 2019; Kakilla, 2021).

3.6.2 Observation

The second data collection method used was direct observation. The teacher was observed while teaching the Foundation Phase class. The subject that was being taught was English Home language and a total of three lessons were observed.

The observation approach was used because it offered the following advantages:

- The approach requires very limited technical knowledge to implement.

- The teacher and the learners are observed in their natural setting (classroom) and the process is not disruptive to the everyday programme of the subjects.
- The data collected via observation is much more reliable and is likely to produce accurate results, unlike interviews or experiments.
- The observation method is appropriate when studying children like Foundation Phase learners who cannot express themselves well and are not fully knowledgeable about research.
- The process of observation only requires that the subjects be in their natural settings and not to actively cooperate with the researcher. Thus, if done well the observation method is not obtrusive (Kawulich, 2012).

3.6.3 Data analysis

The interview was recorded using a voice recorder after which the interview was then transcribed (see Appendix 9). The data was then coded, and themes were generated. From the coding, a total of five themes emerged and the results are presented based on the themes. The researcher relied on grounded theory by Berleson (1952) to identify themes that suggest open coding and analysis of words. The techniques used to determine the themes for this study were proposed by Ryan and Bernard (2003) who stated that disciplines such as social science which rely on interviews by the researcher can use keywords in context (KWICK) as a technique to identify themes. Using KWICK the following themes were identified:

- Teacher ICT Competence
- Teaching with ICTs
- Foundation Phase learning with ICTs
- Benefits of the lockdown in promoting ICT use in the Foundation Phase
- Staff development opportunities

The data was then analysed using the analytical framework proposed by Ndlovu (2016). The focus was on the media forms used by the teacher, their affordances, and the pedagogical value that the ICTs add to teaching and learning.

3.7 Ethical Considerations

The participant personal information together with the identity of the institution were kept confidential during the study. The researcher issued consent forms and information sheets to

parents. Since learners were below the age of 18 years, learners were only asked to fill in an assent form (Appendix 3).

Participants were informed that all data collected would be kept in a secure cloud storage that is only accessible to the researcher. Pseudonyms were used in the reporting and the name of the school has not been revealed. The teacher and the learners who participated in this study were not in any way coerced. The researcher clearly indicated that they were free to leave and be excluded from the study should they choose to do so. The teacher was informed that they did not have to answer questions that they were not comfortable with and could opt out of the research at any given time. Participants were informed on how their information would be used. The data collection only commenced after the ethical clearance had been received from the university. The protocol number of the researcher is **2020ECE086M.**

3.8 Conclusion

This chapter focused on the research methodology employed in this study. The constructivist research philosophy which underpinned this study was outlined before the focus shifted to the research design and the research methodology. The qualitative approach employed in this research was explained with a special focus on the case study approach. The semi-structured interview and observation approaches to data collection were discussed in the context of this study. Lastly, the ethical considerations were delineated.

Chapter Four: Data Presentation

4.1 Chapter Overview

In this chapter the researcher presents the results from the interview and the lesson observation respectively. The study incorporated analytical tool in Figure 2.1. Before the results are presented, the background of the school is briefly presented.

4.2 Background of the School and Teacher

The school that was chosen for the case study is situated in Johannesburg and is a primary school that caters for Grades 1-7 learners. The school is well-resourced in terms of ICT. All the classrooms have smart boards installed that are connected to the internet. The school has a reliable wireless network that is available for use by educators daily. Table 4.1 below summarises the availability of ICTs at the school. The school comprises of teachers varying between the ages of 30 to 55. The teacher that was interviewed and observed while teaching for purposes of this study was responsible for teaching one of the Foundation Phase classes (Grade 3).

Table 4.1: Summary of ICTs available at the school

Total number of smartboards	*Teacher laptops*	*Connectivity*	*Number of teachers*	*Other technological tools were used.*
6	6	Fibre network connectivity. Status (Strong)	6	Tablets, Smartphones, television.

4.3 Presentation of the Semi-Structured Interview

The semi-structured interview focused on whether the teacher used ICTs and how they integrated ICTs into teaching and learning.

4.3.1 Presentation of results

The teacher's responses were colour coded using the media forms from the analytical tool as indicated in Appendix 9, below used from the observation and interview schedules. The study classified the media forms that were being used by the Foundation Phase teacher and highlighted the affordances they brought. For instance, narrative media allowed the teacher to

display content that was in different formats (video, text, etc.) and the pedagogical value that it added included the fact that learners decode and encode concepts taught. Communicative media on the other hand made it possible for learners to collaborate among themselves as well as with the teacher. Applications such as Zoom and google classroom made it possible for learning to take place away from the classroom, as was the case when the country was under lockdown.

4.3.2 Findings from the semi-structured interview

The teacher commended her school for securing ICT infrastructure, and this enabled her and other teachers to adopt the tools for teaching. In her description of the available resources, she said,

> *The smartboard is always connected to a very much strong wireless network. The school has installed a fibre network, which connects all the available technological tools, which requires network connection. All Foundation Phase teachers have laptops which they use to plan for lessons, research for much interactive classroom activities.*

These resources form a conducive environment for delivering content that requires interactivity that is desired in the Foundation Phase.

The following themes emerged from the data: teacher ICT competence; teaching with ICTs; Foundation Phase learning with ICTs; benefits of the lockdown in promoting ICT use in the Foundation Phase; staff development opportunities.

Teacher ICT Competence

The teacher confirmed that this school has made provision for teachers to have ICT resources and teachers in the Foundation Phase are using them to teach. She therefore said,

> *…This implies that Foundation Phase teachers are all computer (sic) advance, hence the school is moving forward in ensuring that learners are afforded and trained at an early age on how to learn effectively using the technological tools.*

In all the responses that the teacher provided, there was an emphasis on the notion that all teachers in school used ICTs and that the teachers had advanced ICT skills which made it possible for them to integrate ICTs into teaching and learning.

Teaching with ICTs

The teacher highlighted that ICTs are used in all aspects of teaching and learning. The teacher mentioned that she uses the laptop for planning purposes and that she can even use the laptop when she is not at work. The smart board is interactive allowing the class to access the internet and the teachers to search for information. The teachers also use applications like Zoom and Microsoft Teams to facilitate teaching and learning. The teacher explained how she uses available resources to teach her Foundation Phase class.

> *The teacher uses a smartboard to conduct her lesson; the smartboard is connected to a C3 computer board that supports the smartboard, to view online pictures, you-tube videos, learner's games, learners reading storybook and many other useful Foundation Phase resources.*

The teacher uses visuals in the form of pictures, simulations (games) and other resources that help in the incorporation of Foundation Phase teaching strategies. The teacher emphasised the importance of using the smart board and other resources and alluded to the fact that having smartboards in each class has allowed her and her colleagues to co-teach. This implies that a teacher who is more knowledgeable to teach a concept on the day could teach all three classes at once, regardless of the classroom the teacher is physically located in.

To supplement her teaching, she also uses resources online as follows:

> *Yes, we do teach our children online. For examples. Let's say we are teaching the life skills, the life skills lesson, our topic for today, we are talking about different types of food groups. So, we will go online and then we Google that topic on them on the computer.*

This is done through using applications like Zoom or Microsoft Teams. The teacher believed that without her personal laptop ICT usage may not be achieved as at times, she uses the laptop after work for typing activities and attending virtual meetings. The teacher uses the laptop to respond to parents' emails and to store information and activities. The teacher noted that it is imperative to own a laptop to respond to the demands that need the presence of technology and to keep abreast of all communications.

Having noted that all Foundation Phase classrooms are fully installed with smartboards and network connections, teachers are able to send Zoom or Microsoft applications login details for the class to log in so that the lesson can begin. In instances where some teachers are absent, one teacher can oversee two classes. The assistant teacher in the other class would be responsible for the supervision of the learners while the lesson is being delivered remotely and

simultaneously to the two classes. During the lesson, learners can see the teacher on their smartboard and hear the teacher as the board has built-in speakers – this allows the teacher conducting the lesson to interact with other learners from the two classes virtually. Constructive learning occurs, as learners can interact with the teacher through the smartboard.

Foundation Phase learning with ICTs

The teacher highlighted that there are many ICTs that learners can use and these aid in learning. The internet for example is used to find information. Instead of the learners relying solely on the teacher for information they can now easily use search engines to find information

> *So that because the learners they learn in different ways, some they learn very well, when they see; some they learn very well will when they hear. So we'll go to our smartphone, and then we'll Google that topic*

The school has a digital library that can be accessed after logging in. Via the digital library, books are accessed which can be read loudly to the class through applications like SORA, which make it possible to teach reading skills to Foundation Phase learners. The access that the school has to the internet has made it possible for Foundation Phase teachers to work together and help each other when one or more teachers cannot come to work.

The teacher mentioned that they use ICT to teach all four Foundation Phase subjects daily, which are, English, Afrikaans, Mathematics and Life skills, to introduce new subjects.

> *They* [teachers] *need to use or visit educational website with relevant content, such as YouTube to watch videos, use SORA application to conduct reading and that can only be done through using technological tools;*

Therefore, the teacher believed that they have adopted ICT in teaching all their Foundation Phase subjects.

The teacher valued YouTube because she thought that it has proper videos or content for the young children. It was evident that the teacher's perceptions of using technology influence the media forms that she uses to engage learners in her lessons. The teacher believed that using different teaching styles with ICT integration has helped her learners develop their reading, counting, and proper use of language through listening to narrative audio from the website.

Access to the internet makes it possible for the teachers to "google" for information as necessary. This according to the teacher has helped learners to grasp concepts:

So we'll go to our smartphone, and then we'll Google that topic. And then it's gonna (sic) *show us those different pictures of people food groups that we have. And then we'll start by integrating with the children through the picture that they're seeing, or we will ask them the question what they see. And then it makes our life easier when we come to teaching because they will be able to understand very well what we are teaching about.*

There is evidence that the use of ICTs advanced the teaching strategies for this phase as the desired resources were readily available.

Effects of lockdown in promoting ICT use

There seems to be advanced teaching and learning in this school. The teachers believes that this is a result of the COVID 19 lockdown that forced all schools to acquire ICT infrastructure to use for teaching and learning. Teachers therefore were forced to develop themselves with ICT skills. The teacher further explained:

Yes, it's been so interesting this thing started during the time of lockdown, if we can remember, during the time of the lockdown, some of the learners they were not able to come to this school.

During the lockdown, the resources were not only used for teaching and learning, but for communication with parents.

What we do we just sending the link to the parents, while they're at home, they can connect that link at school they can be able to learn from home while we're at school.

The second response showed that ICTs were used to facilitate remote teaching and learning and that this has been made possible by the cooperation that the teachers are getting from the parents. Links were sent to parents who then facilitate the learners' connection to the online classes. Online classes were necessitated by the national lockdowns that were occasioned by the Covid-19 pandemic.

Staff development opportunities

The teacher's ICT competence was a result of the district-based training. She asserted the following:

Okay, we are so fortunate because of our school before they take us for workshop. On how we are going to use ICTs, the smartboard and the internet and everything. We

spent like almost the whole day at that workshop for the smartboard. And then we also attended the other workshop for the Teams on how we can use Teams in our school. It started from half-past eight and then it finished at two o'clock in the afternoon.

The assertion by the teacher showed that the workshops she attended piqued her interest in effectively using ICTs for her teaching. The training that they received makes it possible for them to keep abreast of changes in technology and to appreciate the pedagogic value that the ICTs bring. The teacher also highlighted the importance of continuous professional development and assistance from authorities and subject advisors as pivotal to the effective use of ICTs in teaching and learning.

4.4 Lesson Observation Results

The researcher observed three lessons that were taught to the Grade 3 learners by the same teacher who was interviewed for this research study. The subject that was taught was English Home Language with three concepts.

The first lesson was on how learners combine words (blending) to build sentences, reading and naming the object. As shown in Figure 4.1, the teacher used the smart board as an interactive and communicative tool to deliver all three concepts.

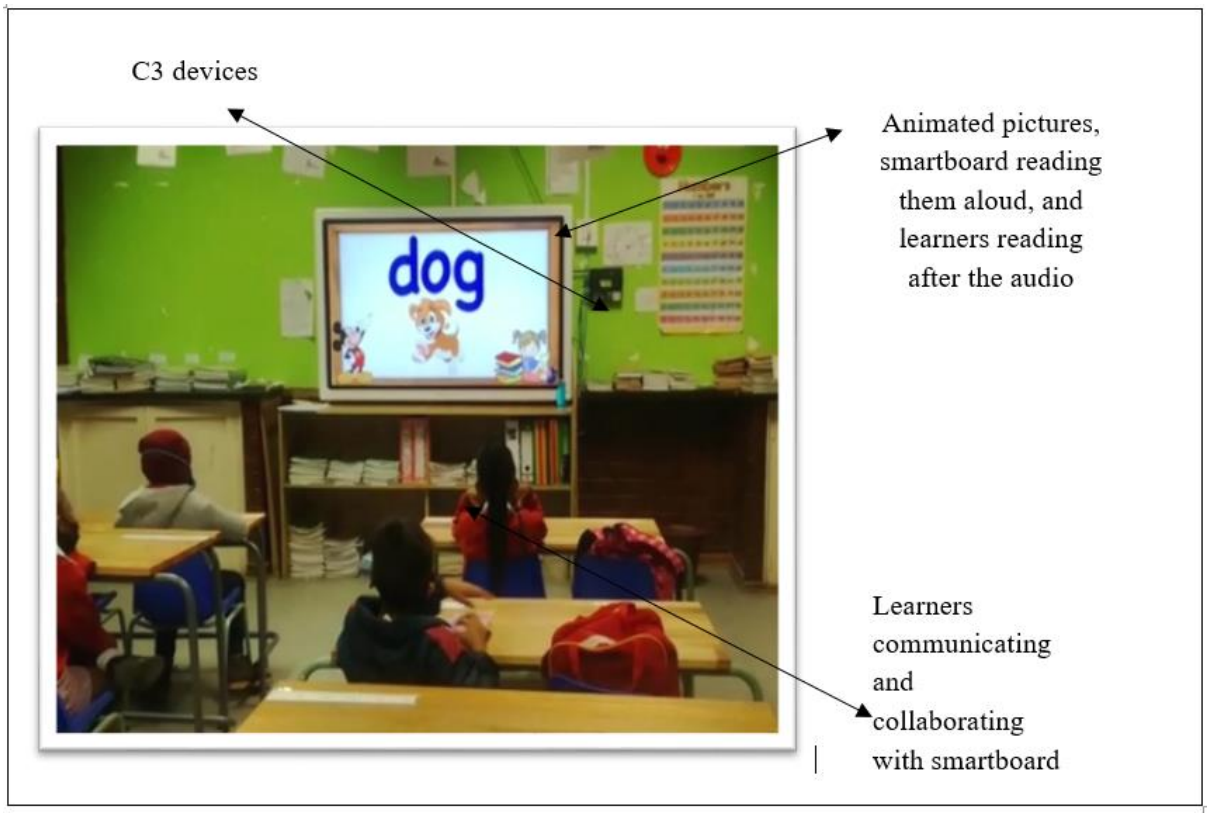


Figure 4.1: Communicative and collaborative technology used during the Grade 3 English Home Language lesson (photograph by researcher)

The picture shows the setting of the classroom and the technologies that were used during the reading lesson. The picture shows the smartboard on which animated pictures were being shown. The reading application (SORA) would then read the words out aloud and the learners would then repeat the words. This shows that the teacher was using ICTs that are interactive and communicative in the sense that the learners were not passive in the learning process.

The researcher was given a lesson plan to check the integration of ICT, how learners were involved in a lesson, and the resources used. The researcher was then able to follow what the teacher was teaching during the particular day using the lesson plan. The details of the lesson that was taught are given below to show how SORA and ClassDojo helped the teacher to meet the learning outcomes of the lesson and how the learners not only interacted with the ICTs and the teacher but also with the content presented.

4.4.1 Lesson Topic 1: Blending of letters to make meaningful words

Lesson Outcomes:

- *Learners to write meaningful words.*
- *Learners to spell words aloud.*
- *Learners to write spelling tests.*

Lesson 1: Introduction

Resources ICTs used – Smartboard and smart phones used with internet

1. Learning outcome shared with learners
2. Teacher "googled" blended activities as portrayed in Figure 4.1
    a. She played a video that provided concepts taught using three representations of content. It displayed pictures of different objects with the Foundation Phase **Junior Font** method of writing, in order for learners to master how alphabets are written in Foundation Phase grades; in traditional teaching, this method is normally put on classroom walls and are called word walls, however, by using technology, the teacher can store, send, and convey or deliver this information at any given time.
    b. She kept pausing the video to give learners an opportunity to read aloud and offer feedback after each picture; this would lead to learners being able to understand words and their **meanings and pronunciation.**

c. The learners were engaged through reading aloud the words depicted by the pictures to enhance their understanding of how words are constructed and formed. The transition of pictures was communicative and interactive, as the machine would read loudly and the learners would follow suit in order to adapt to the content delivered by the technological tool, though the teacher was the mediator in the lesson taking place. The learners interacted with the smartboard as the text was displayed on the board and the technological device made it easy for learners to communicate and interact through **reading aloud** the learners imitated the process thereby learning how to **decode**, **recall**, and **adopt** new words. The interaction was three-way, as it included the teacher, the learners, and the concept that was mediated through the smartboard.

4.4.2 Lesson 2: Reading aloud

The second lesson (see Figure 4.2**)** focused on how learners read aloud and make meaning with the help of SORA and ClassDOJO applications. Both ClassDOJO and SORA are applications developed by OverDrive, Inc and contain educational material that teachers and learners can use in ICT to enhance teaching and learning.

Learning outcomes:

- *After the lesson, learners should be able to read aloud*
- *Identify punctuation marks in sentences and paragraphs*
- *Read with understanding and meaning*

As shown in Figure 4.2 on page 38, the teacher used the reading application called SORA and stories from Monkey Pen, to read aloud to the learners. The application works the same way as an audio book reader. This helps because the learners see the words as they are read out loud.

Lesson 2: Introduction

The teacher introduced the lesson by giving guidelines and explaining what was expected and what would be learnt.

a. The smartboard was used as it stores different multiple stories, and through the application called SORA and using Monkey Pen, the “Crocodile” story was chosen and

read by the learners in order to identify sounds in words, to memorise, and to read with understanding.

b. As the smart board is built with effective technology, the teacher was able to navigate, pause and "google" words to understand the terminology used and concepts taught.
c. Questions prepared on a story were stored in a folder as a word document on the smartboard itself, once the learners were done reading the story. The teacher displayed questions using a smartboard and learners had to write answers in their books. This ICT technique saved time as the teacher managed to deliver other concepts; additionally, the learners were able to access the information any time they needed as their teacher gives them access through login details or unique credentials to the applications used.
d. Skills learnt from this concept included but were not limited to **comprehension**, **sentence, and paragraph construction**, **reading with meaning and understanding** and being able to differentiate **parts of speech, such as nouns and verbs and spoken language** in particular.

As shown in Figure 4.2 on the following page, the teacher also used the reading application called SORA, used along with Monkey Pen to access different kinds of stories, such as fiction and non-fiction.

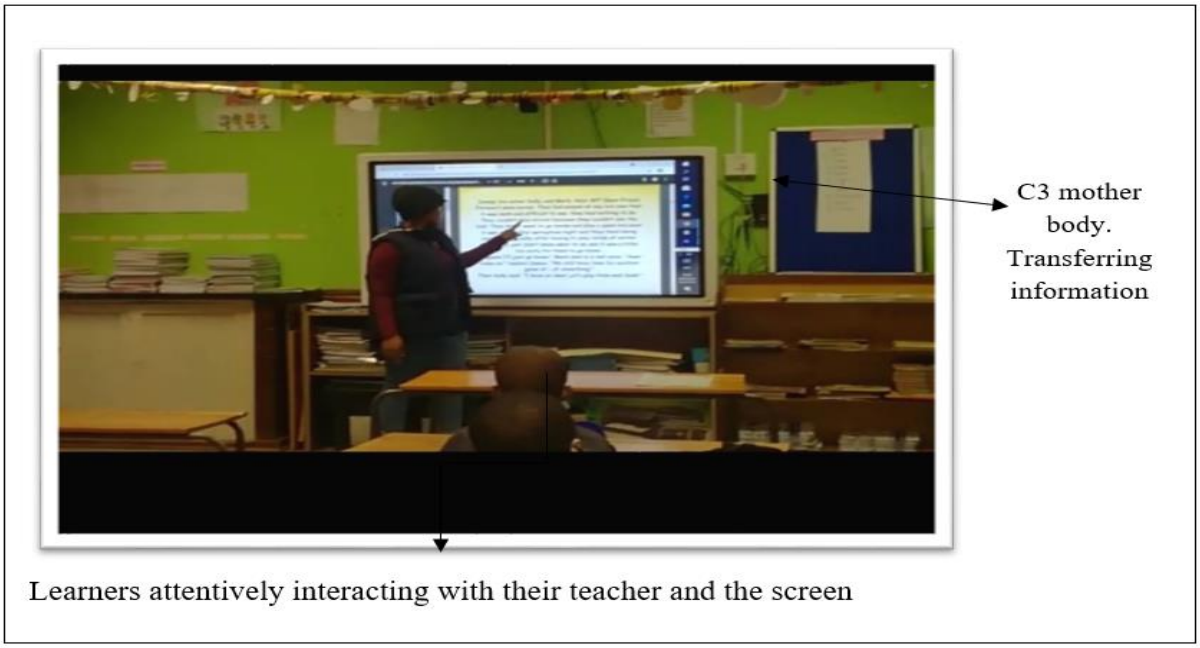


Figure 4.1: Using a smart board and reading application as learners listen (photograph by researcher)

Computer programmes are used such as **SORA** and **Monkey Pen** for reading (English home language).

4.4.3 Lesson 3: Topic: Reading with speed and fluency

The last observed lesson (see Figure 4.3**)** the teacher taught was on how to read with speed and fluency also called Shared reading in the Foundation Phase language of teaching; different activities were introduced using technological devices to enhance teaching and learning.

Lesson Outcome:

- *Reading fluently*
- *Reading with comprehension*
- *Speed reading*

Lesson introduction:

The teacher prepares learners to settle and correctly outlines the lesson. This concept relies on how learners can read given the time, speed, and fluency set by the application SORA with the help of Monkey Pen accessed on Google. The first step the teacher does is to arrange learners according to their cognitive abilities (Sideeg, 2016) and use different activities for different learners in order to meet their level of understanding.

a. The teacher will then start the reading machine by clicking the start button on the smart board, and the group selected then reads the words as fast as they can as the words disappear within seconds. Learners should identify and remember words and sentences, be able to build meaningful sentences and also create **word banks**, **dictionary vocabulary** and lastly prepare themselves for **spelling tests**. This activity integrates and covers various concepts – not only do learners acquire or are taught the ability to **read fluently** with **speed** and **comprehension** but it advances their cognitive abilities, as it involves their short- and long-term memory which is vital in preparing them for the following concept to be taught.
b. At the end of the lesson, learner and teacher goals are reviewed through open-ended questions, and feedback is modified accordingly. Learners are able to give their own perspective in constructing sentences and improving their level of reading fluently.

Figure 4.3 on the following page depicts learners' involvement (collaboration) along with the ICT used in this Foundation Phase classroom. The setting shows that the classroom is connected to the internet and that the teacher can easily download information from the internet then project it onto the smartboard. The learners are then able to view the animations or activity based on the concept and listen to the activity conveyed, which is made possible by the

application used. The application is able to read out loud and learners read back what the application conveys to the learners through the audio. The only drawback noted was that it is only the teacher who manipulates the ICTs devices. The smartboard was central to all the teaching as it was the medium that was used to convey information to the learners.

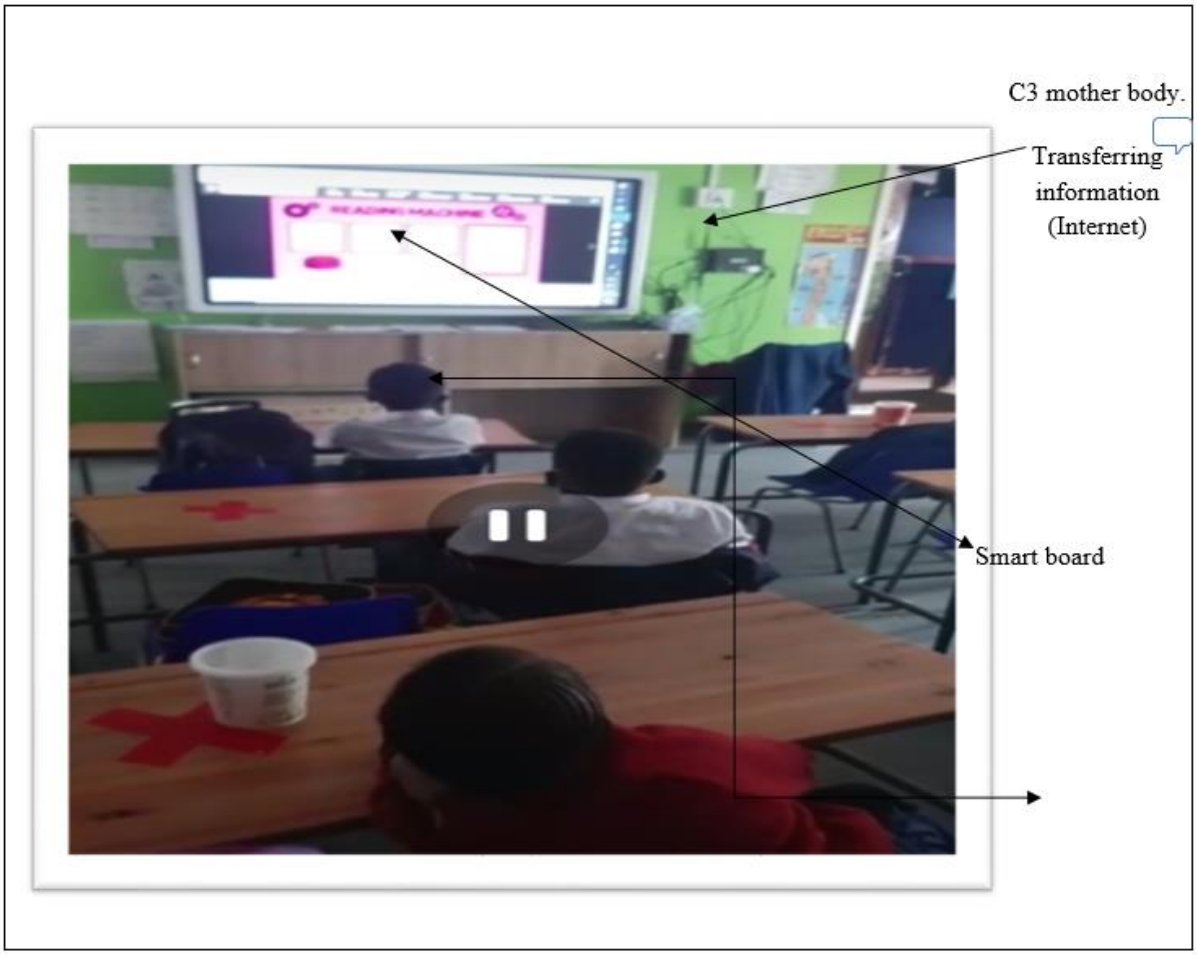


Figure 4.3: Communicative and collaborative technology used during the Grade 3 English Home Language lesson (photograph by researcher)

The lessons observed demonstrated an enactment of the teacher's perceptions. The researcher witnessed **Foundation Phase** teaching sessions where the teacher in all lessons utilised ICTs to teach in a way that helped achieve her learning outcomes.

In the following section this report interprets both data sets (the teacher's perceptions on the use of ICTs and lesson observations) by reverting to the constructs in the analytical tool and uses media forms to understand how teaching with ICTs was of pedagogical value.

Interactive Media

The teacher believes that for ICT integration to be fostered, ICT resources should be available and used multimedia, hypertext and internet to create interactive media. Interactive media

allowed immediate feedback between the teacher and the learners thereby creating a much more effective teaching and learning. As an affordance the immediacy is the "speed with which information can be exchanged through web and email" Conole & Dyke (2004:120). Multiple stories were shared and read loudly using different reading application such as **Sora and Monkey Pen**, thereby ensuring that corrections of pronunciations are corrected by the teacher. Learners are able to identify and use simple sentences in leading them to creative writing and paragraphs. YouTube, google classroom, were used for deliberations and responding to misconceptions in directing and leading to pedagogical value of the usage if ICT in Foundation Phase Classroom.

Narrative Media

This Foundation Phase teacher, used ICT resources to narrate and deliver content, given that Foundation Phase learners are not fully experienced to use the resources practically. The use of videos from YouTube as stories were narrated and concepts explained enhanced the teaching and learning experience. Software such as Classroom DOJJO was instrumental in making explicit new concepts in the classroom conversation that the teacher had during her teaching. therefore, technological resources allowed learners to receive immediate feedback, whenever they engaged the activity.

Communicative Media

The participant depended on communicative media, to convey proper and valid instructions which includes applications such as zoom, Google classroom and Microsoft teams moreover, such ICT resources were able to help the teacher in bringing new concepts immediately and timeously. Learners were able to read aloud and along with the resources presented to them allowing them to acquire knowledge on how words are pronounced and read in English language. Communicative media assisted the teacher, in giving proper feedback and responses which aligned to the taught concepts learnt, collaboration was seen among learners in teachers in solving concepts problems, thereby assisting learners to also acquire higher order thinking skills.

Adaptive Media

Adaptive Media form were used, to deliver and collaborate, such as tutorials Programmes and games for stimulation. The application such as the MonkeyPen and SORA for reading machine tutorial programmes were viewed as learning games, as much as learners were taught to read,

during learning and teaching. The reading machine application made it easier to guide learners and leading them to proper acquisition of skills through immediate feedback.

Productive Media

The researcher indicated that productive media had a lesser impact in fostering the usage of ICT by learners. Lesser usage was due to the fact that learners used less paper for instance worksheets and textbooks. While the productive media in this class did not use technological devices such as computers, other traditional resources can be used, in order to achieve a similar purpose (Luarillard, 2002). The teacher partly used classwork books, to allow learners to write their answers and to practice Handwriting in particular and other activities such as spelling test and language usage, however, ICT resources were mostly used to deliver content. In doing so, the learners were able to construct new knowledge and ideas with non-digital resources.

4.5 Conclusion

The results clearly showed that the teacher is integrating ICTs into teaching and learning. The ICTs have made it possible for the teacher to use a range of activities which include lesson planning and lesson delivery. The teacher was aware of the benefits of using ICTs in teaching and learning. The results showed that the teacher does not only use the ICTs because they are available but uses them in order to add pedagogical value in making teaching and learning more effective. Laurillard's (2002) conversational framework is seen in the process of delivering lessons and concepts. As teacher and learner goals are set through learning outcomes, feedback is created and modified through learners' actions and understanding, and the pedagogical value have been realised through ICT usage. The next chapter discusses the results.

Chapter Five: Data Analysis and Results

5.1 Chapter Overview

This chapter discusses the results that were presented in the previous chapter. It outlines and links data presented in Chapter Four and the discussion is mainly centred on the media forms and their affordances and the pedagogical value that ICT contributes to the Foundation Phase. Furthermore, a revised analytical framework and tool are discussed in detail (Ndlovu, 2016), giving thorough guidelines on what media form is, ICT affordances, and the pedagogical value add towards the teaching and learning in the Foundation Phase.

5.2 The Analytical Framework

The research study concluded on the following assumptions and findings of the study, after the semi-structured interview and the observations which aligns to the adapted analytical framework concepts. An extra column had to be added to include how ICTs are used to enhance learners' learning and thus demonstrate the pedagogical value.

Table 5.1: Revised Media forms

			ICT Pedagogical Value	
Media Forms	Affordances	e-Resources	Teaching	Learning
Narrative	Accessibility	e-Book YouTube	Structure	Enhancement (concepts)
Interactive	Access	e-Books smart board SORA application DOJJO MonkeyPen	Correction of misconceptions	• Reading loudly from smart board, using SORA application • Remembering • Recognition of letters • Language structure
Communicative	Collaboration	Lesson shared Zoom MS Teams MonkeyPen	Accessibility & effectiveness	Accessibility
Adaptive	Diversity	Games/ simulation	Concretise concepts	Understanding concepts
Production	Articulation	Internet	Research	Construction of knowledge – non digital

The next section elaborates the contents in Table 5.1

5.3 Media Forms

During the English Home language observation, the researcher noted that the teacher adopted and used suitable ICT resources to engage learners. The teacher used ICTs that included the smart board, internet, an application called SORA, and the digital library. The teacher therefore used multiple media forms to achieve learning outcomes. In response to interview questions, the teacher showed that she was highly appreciative of the need to use ICTs in teaching and learning. The teacher was particularly appreciative of the smartboard, which has a basket of applications (media forms) that make it possible for the teacher to explain and emphasise concepts taught.

The first column in Table 5.1 which shows media forms, explains the different types of media forms that inform how ICT integration can take place in the Foundation Phase classroom. Media forms act as tools indicating ICT roles of each usage, for instance, how media forms such as narrative media add pedagogical value in delivering Foundation Phase concepts. The media that the teacher used fell under narrative, interactive, communicative, and adaptive media forms. The media forms bring pedagogical value by making it possible for the teacher and the learners to re-describe concepts, explore misconceptions, and concretise theory and practice.

This tallies with the assertions of Laurillard (1998) who defined media forms as print, audio, video, and computers, which can be compared and contrasted for the contributions they make to support different aspects of teaching and learning. As shown in Table 5.1 four of Laurillard's (2002) media forms groups were applied and used to display the information that was being taught during the lesson. It is therefore evident that if ICTs are to be used effectively as in the case of this teacher media forms will be infused in a lesson as the teacher seeks to make explicit concepts and develop required learning skills for this phase.

5.4 ICT Affordances

As shown in Table 5.1, the narrative media is linear presentational media that includes print (text and graphics) audio, and audio vision (audiocassette talk accompanied by some material). These presentational media share the core property that they are non-interactive and that learners cannot respond to the enquiry or misunderstanding if expressed (Ndlovu, 2016). In this class, these media forms allow Foundation Phase learners to use different learning materials to make sense and create meaning from information, in turn, acquiring reading skills

with the help of the teacher or through mediation as proposed by Vygotsky (1968). However, the media forms add pedagogical value to learners' learning, as stories are narrated, and learners are able to receive and make proper assumptions from the stories thereby improving their cognitive development. In these media forms, a teacher can introduce new learning concepts and learners can interact, and various technologies can be introduced during the lesson to help enhance learners' understanding, such as videos or audio radio to narrate the concepts taught.

When using interactive media forms, the teacher in this study was the sole operator of the technological tools, with learners engaging in the process of learning as postulated in the conversational framework. The fact that this media form was presented to Foundation Phase learners, made it easier for them to understand concepts as they were displayed, rather than when taught traditionally. In this part of learning, knowledge is built upon using the information received from the interactive media forms. The teacher in this study gave feedback through interacting with the learners. The most common ground is to understand the concept delivered in the process of learning through the teacher being the mediator.

The main advantage of using interactive technology is that it allows the teacher to give immediate feedback. Das (2018) posits that immediacy refers to the speed at which information can be exchanged, for example via web and email. In this Foundation Phase classroom, three dimensions could affect the effectiveness of acquiring knowledge. Instant involvement in producing pictures and information requires learners to have listening, visual, and observation skills as learning are delivered, therefore, the immediacy of the interactive media form is of utmost importance in ensuring proper content reaches the learners immediately. The question arises – what is the pedagogical value in adapting the interactive media form? The pedagogical value is that misconceptions detected from the lesson, which may affect learners' knowledge, are able to be solved in time. The interactive media form, through web-based, allows the teacher to gather pertinent content to help in creating understanding (Ertmer, 2012; Ndlovu, 2016).

During the interview as well as during the lesson observations there was an agreement between what the teacher said during the interview and what the teacher did in class. The lesson observations helped to see in action what the teacher did with the technologies that were available and did not only rely on the responses given by the teacher during the interview. The researcher could then corroborate what was said in the interview as well as gain new insights which helped to answer the research questions.

5.5 ICT Pedagogical Value

In accepting the use of ICTs in teaching and learning, the teacher's pedagogical beliefs are important. When looking to improving and understanding educational ICTs, it is important to consider the teachers' beliefs, practices, and attitudes because they are important for their entire improvement process. The beliefs are closely intertwined with the strategies that the teachers use to cope with the obstacles that they encounter daily in their professional lives. The beliefs are important because they shape learners' learning environment and impact learner motivation and achievement (Saputri, Fajri & Qonaatun, 2019). Pedagogical beliefs are likely to affect the teachers' practice on ICT integration, for instance, literature has indicated that some teachers view the integration of ICTs as time-consuming and that they would rather stick with the textbook and the chalkboard which they are used to (traditional teaching). Eickelmann and Vennemann (2017) echoed the same sentiments but added that there is a need for further professional development and training if the belief barriers are to be overcome. In addition, others view ICT integration as an advanced way of teaching. Assessment activities are effective and accomplished on time, lessons are delivered, and learners comprehend concepts easily; additionally, collaboration and engagement of learners are observed. The respondent in this study was not averse to using ICTs to aid in teaching and learning.

There are two dominant learning theories, namely constructivist and behaviourist theories that informs teaching and learning, At the core of the constructivist approach is the notion that there should be teacher-learner and learner-learner collaboration. Vygotsky (1978), who is constructivist theorist, believed that for learners to construct knowledge, they should collaborate, and that the teacher should as much as possible leave the learners to work on their own while taking up the role of mediator in the learning process. Using ICTs can help the teacher in the facilitative role as it becomes possible for learning to take place away from the four walls of the classroom. Using applications like Google Classrooms, Microsoft Teams and Zoom made it possible for collaborative learning and to take place. Teachers using ICTs should ensure that with the use of these ICTs, there is a learning pathway that has clearly delineated phases of learning in line with the conversational framework that was proposed by Laurillard (2002). The main advantage of the conversational framework is that it facilitates different phases of learning pathways.

For ICT integration to take place, there should be resources. Having a fully resourced ICT school may change teachers' perceptions positively. Therefore, the resources are an integral part of ICT integration. This was confirmed by the Foundation Phase teacher under study when

she said that she believed it had been easy for her to integrate ICTs because they are available at the school. As indicated previously, one of the tools used in Foundation Phase classrooms is smartboards. A smartboard can perform multiple actions, as it can act as a writing board, store information, act as a screen when watching videos, and search for pertinent websites, in order to help learners, understand concepts and deal with any misconceptions. The smart board offers three advantages. The first one is that with a smart board it is possible to jump from pages on the screen to the internet methodically and smoothly. This capability of the smart board mimics the associative organisation of the learners' brains and adds to the organisation and clearness of the lesson. Secondly, the smart board serves as a cognitive tool that expands the learners' minds and aids in joint thinking. Students can engage in higher order thinking due to the transferring of some of the mental load to the smart board. The third advantage is that the use of the smart board makes it possible for the learners to engage and interact with content both in and out of the class (online) and amongst themselves (Davidovitch & Yavich, 2017). Mun et al. (2019) added on and said that the smart board blends well with constructivism because it lets the learner build their knowledge while at the same time, learning more advanced thinking skills. They contended that when the smart board is properly integrated with teaching it facilitates active learning which is necessary if learners are to master skills (Mun et al., 2019).

The teacher was the only one who operated the technological devices as they were used to deliver content in the classroom. Learner and teacher interaction was significant as there was collaboration and engagement to find answers to complex activities that were presented via videos. According to the observation schedule, the most dominant device used was the smart board. The smart board was used to present content and other activities, however, learner and teacher interaction was seen, most of the time, as the teacher strived to explain concepts in detail. The researcher noted that the videos presented at times were too long and time-consuming. The learners lost concentration and the teacher jumped in to mediate the process of learning after noticing that the learners were becoming restless. Abel, Tondeur and Sang (2022). said that in some instances, the teacher is responsible for the digital devices in the classroom and cannot, therefore, allow the learners to operate the ICT devices. In addition, the longevity of the devices is ensured. They, however, pointed out that in an ideal world, the learners should also be allowed to operate the devices so that as they are learning, they also get the skills to operate the devices which will hold them in good stead when they leave school (Ghavifekr & Rosdy, 2015).

It is evident that the use of ICT tools creates collaboration and positive dialogue among learners. Collaboration and dialogue among learners are necessary, as learners learn from each

other. Research indicates that children learn best from their peers; although their teacher is present, they can encourage collaboration and dialogue. This is in line with the thinking of Laal et al. (2014) who stated that in the 21st century, there is an increasing need for people to think and work in collaboration on important issues. When people collaborate, there is movement from individual efforts to group work and from independence to the community. Constructivist theory methods are seen as the cornerstone as the teacher mediates and scaffolds these learners. Learners collaboratively construct ideas to solve concepts. As Harati (2012) said, for collaboration to work the learning should be structured. The process of collaboration is better if ICTs are integrated. During the process of learning, the smart board is also seen as an important tool used to present instructions and activities; however, the teacher mediates the process to clarify the instruction and allows learners to converse to find proper answers to a presented concept. Laurillard's (2002) conversational framework is instrumental in defining the learning process and in ensuring all the phases of engagement are successful.

Foundation Phase learners are always engaging with the taught content and attempting to meet the learning outcomes set by the teacher. The concepts are presented to learners by the teacher, and learners make meaning out of them and always strive to reach the goals set by the teacher. Classwork and multiple activities are given to them including summative assessments are some of the interactions a learner is involved in. The ICTs help the learners to engage with the concepts taught. As Ghavifekr and Rosdy (2015) pointed out, the use of technology assists to take learning out of the classroom thus affording the learners more time to engage with content. The use of platforms like WhatsApp and Zoom may assist the learners to work together.

When the teacher was asked why she was fluent in using ICTs, she responded that it is because they are afforded training opportunities as part of continuous professional development. She cited two workshops that she had attended. That the school has an ICT committee that is headed by the respondent also points to the fact that integrating ICTs into teaching and learning is taken seriously at the school.

According to Dlamini and Mbatha (2018), if there are to be meaningful changes to education that are brought about by ICTs. Teachers must be given opportunities to go through meaningful and effective ICT teacher development activities. The staff development programmes help teachers to become digitally fluent and to meaningfully integrate ICTs to improve the pedagogic values that these ICTs bring. Ghavifekr et al. (2014) added their voice and stated that in Malaysia, while a significant number of teachers know how to use computers and other ICTs, very few use them efficaciously for teaching and learning. The teachers often use

computers for personal issues. In the same study, they opined that those teachers should always be ready and well-equipped in terms of ICT competencies and positive attitudes, to provide ICT-based learning opportunities for students to improve their learning quality (Ghavifekr et al., 2014). In South Africa, it is possible that some teachers started teaching before ICTs became commonplace and consequently, the only way that such teachers may be helped to appreciate the value that ICTs bring to teaching and learning is by affording them training. If teachers are not properly trained, they will not have a clear understanding of the value that the ICTs bring and will therefore miss on the affordances that are proposed by Laurillard (2002). In some instances, teachers may be using ICTs as administrative tools, negating the value that they bring to pedagogy and the understanding of concepts.

5.6 Major Findings of Research Based on Interviews and Observations

In this section, the researcher outlines the results of the research; this study was a case study therefore contextual text is used to explain major findings. Major findings were derived from the observation schedule and interviews; however, they were not limited to the research questions of the study as they were used as a guide. Research questions also ensure that the findings of a study are of value. Similar studies undertaken played an integral part in the findings of this study. Therefore, this study advocates for teacher-learner centred approach in identifying the perceptions of using ICTs to deliver teaching and learning.

The research problem of this study related to traditional teachers in the Foundation Phase showing a reluctance to use ICT tools. Ten condensed interview questions were structured in preparation for the interview; all the questions relied on the concept of ICT integration. It was evident that the teacher teaching Grade 3 in the Foundation Phase was aware and advanced in teaching using ICT integration. The table below (Table 5.2) gives a summary of interview question findings that was informed by the analytical tool, which indicates the teacher's perceptions on ICT integration.

The researcher identified three dimensions to determine the level of usage and how ICT was perceived by the teacher. Although this was not part of this study's outcome, it is intended to endorse this teacher's high level of ICT pedagogical competence. ***Excellent*** was the first dimension that specifies how media forms were used and how they added pedagogical value. The second dimension was ***moderate***; moderate implies how the teacher used ICT, however, media forms and value of pedagogy were not fully exercised. The third dimension was ***not used;*** this dimension clearly indicated that the ICT media form was not used although the resource was available at the school.

Table 5.2: Summary of findings

Media forms used	Teacher usage and perceptions			Pedagogical value
	Excellent	Moderate	Not used	
Productive	✓			Knowledge construction: Animation model.
Narrative	✓			Apprehending Structure: Non-Linear, Multimodality.
Interactive	✓			Exploring: Misconceptions and amend immediate feedback.
Communicative	✓			Re-description of concepts: Collaboration, discussion.
Adaptive	✓			Concretising theory and practice: Diversity, reproduction.

The findings further elaborated that the Foundation Phase teacher in this study used ICTs in day-to-day teaching and learning and understood the contribution made to the pedagogy of learning and the impact it has on the Foundation Phase learners. The teacher used the ICTs in a manner that was productive, interactive, and communicative. The teacher was able to adapt

the technologies to suit the learning that was taking place. The rating that the teacher was awarded was based on the responses given during the interviews and what was observed during the English Home language session. The ratings might be subjective because the researcher used their own experiences as an educator.

As shown in Table 5.3 it is possible for a teacher to utilise a plethora of technologies and each of these technologies adds value in its own unique way. For example, YouTube can be used to bring learning to life. In Natural Science and Technology, for example, YouTube can be used to show the learners relevant videos. ClassDOJO has the advantage that it can be used to give homework to the learners thus extending the classroom online learning.

Table 5.3: ICT tools and their pedagogical value

ICT Tools	***Pedagogical value added***	
	Utilised	
SMART board	✓	Effective feedback, learning, displaying of concepts**.**
Digital library	✓	Contributes to learners' individual reading and group guided reading. Different reading applications are used such as SORA and Monkey Pen.
Google websites	✓	Contributes to teacher preparation of lesson plan and enhances taught concepts.

You-tube	✓	Allows the teacher to use pertinent videos in order to enhance learners' learning.
ClassDOJO	✓	Allows teachers to give learners homework and other taught activities online.
Zoom	✓	Zoom application is used to teach learners, especially when the teacher is absent, another teacher can take over the classroom through Zoom.
Microsoft teams	✓	Microsoft Teams works the same as Zoom, and teachers will alternatively use it.

As shown in Table 5.4 on the following page, the teacher used technologies in a way that was consistent with the **conversational framework**. The table highlights the media forms used and their affordances (pedagogical benefit).

Table 5.4: The integration of ICTs in the Foundation Phase classroom and the value brought

The Integration of ICTs in Foundation Phase Classroom			
	Description of ICT use/ Modality	***Media form used***	***Comment/ Pedagogical benefit***
Introduction/ shape and space (concept)	Lesson is introduced Theory of ideas shared during the lesson.	YouTube, Google pictures and class DOJO used. (Animation by the teacher)	Enhances learners' understanding.
Learning goals shared	Collaboration and re-description of concepts, effective feedback.	Showing video clips to help explain concepts in detail. Displaying the content visually.	Learners can relate to and understand the concept presented to them.
Connections to curriculum area and prior learning	Curriculum teaching policy is followed, prior learning is observed.	CAPS website was visited for downloading CAPS document policy and lesson plans.	More time is reserved for teaching. Teaching materials are available online.
Connections made to curriculum area	There is a clear transition of	Smart board can store and retrieve previous	Reference from previous work is possible as previous work can be

and previous learning	previously taught concepts, and the current taught concept and is done through reflection.	illustrations done therefore reflection and connections of other subjects are related.	stored on the smart board creating pedagogical value.
Teacher demonstration	The teacher uses learning pathways (Conversational Framework) to demonstrate concepts taught.	Smart board is used, to display videos of the content taught. The teacher also demonstrated concepts, enforced, and enhanced learners' understanding.	Learners can make connections towards their learning. Pictures of concepts are shown thereby increasing learners' conception in learning.
Teacher/ learners working together – activity	Emphasis on collaboration is made on a particular concept taught to level misconceptions.	Narrative activities are displayed on the smart board.	Learners can figure out correct ways of solving concepts problems.
Learners' task: ***Individual &*** ***group work***	Individuals are then given tasks.	Activities are displayed on the smart board.	Learners complete the activities.
	Group work (activities) is given for reinforcement purposes.	Enforcement activities are displayed on the smart board.	Learners engage and learn from each other as they converse on the concept taught.

Conclusion	Informative feedback is given to the learners.	The feedback is displayed through a video or summary written on a particular learning website or stored on the smart board.	Learning is achieved and learners could easily describe and solve misconceptions of concepts individually.

When the lesson was being observed, one of the key findings was that it was only the teacher who was operating the electronic gadgets. While the teacher showed mastery in using the gadgets, the same could not be said of the learners. There was also no evidence to suggest that the learners were adept at using electronic devices. For ICT integration to be complete two key things need to happen: all teachers should be able to use and adopt the ICTs and secondly, all learners should also be able to use the gadgets. If the learners become good at using the ICTs, it will be a skill that they can use in the future. With the advent of the 4th industrial revolution, everyone must be fluent in using ICTs since the world has become ICT driven (World Economic Forum, 2019).

It is not good that a few teachers use ICTs in teaching and learning while the other teachers continue to neglect the same. Thus, there is a need for all teachers to be trained in using and integrating ICTs. The teacher said that there were continuous professional development opportunities that are afforded teachers by the DoE, and it is possible that these opportunities could include training on integrating ICTs. There is also room to include ICTs in education as part of the curriculum that is taught by institutions that train teachers so that by the time the new teachers join schools, they will be adept at using the ICTs and they will also have a thorough appreciation of the value of integrating ICTs when teaching. This is supported by Ghavifekr and Rosdy (2015) who stated that continuous training is paramount to the adoption of ICTs in teaching and learning. It is also possible to give financial incentives to the teachers who adopt ICTs.

The government can also help by making sure that all schools get computers, not only for teachers but the learners as well. The schools should have internet connections and efforts should be made to reduce the digital divide between township schools and suburban schools and between urban and rural schools. The digital divide can be defined as the gap between the

people who have access to ICTs and those who do not. The divide can also be reduced if the government could whitelist educational resources so that parents would not have to pay for data costs that are associated with accessing the internet (Srinuan & Bohlin, 2011).

5.7 Conclusion

This chapter discussed the results that were obtained in relation to the research questions of the study. The results were compared with what other scholars have written on the same subject. The results of the research by and large tally with what other scholars have written in that ICTs are important at all levels of education, and learners must have access to the ICTs as well. This will foster engagement with content as well as engagement among the learners, thus taking learning outside of the classroom. The findings showed that the teacher understands the use of ICT and that ICTs are being used to enhance learning. The findings depicted in Tables 5.1 and 5.2 showed that the teacher uses different media forms of ICT in their day-to-day teaching and learning. Moreover, the findings of this chapter indicated that not all long-serving teachers are still focused on traditional teaching methods. Some of the teachers in the Foundation Phase understand the use of ICTs and the impact they have on learning – with ICT integration, learning becomes effective, for instance, lessons and content taught can be prepared timeously. Information and communication technology (ICT) learners can learn effectively independently, without the presence of their teacher, therefore it is hoped that the findings of this chapter will encourage Foundation Phase teachers from other districts in South Africa to adopt this learning strategy.

Chapter Six: Summary, Conclusion, and Recommendations

6.1 Chapter Overview

In this section, a summary of the research in this study is given together with the recommendations that emanated. The recommendations of this study are derived from the problems and positive initiatives observed during the researcher's data collection.

6.2 Summary/Conclusion

The research showed that the teacher used ICTs in teaching and learning and that the ICTs are adding value to teaching and learning. Learning is taking place in a manner that is learner-centred and technology-mediated. The research also showed that the way the teacher used the ICTs has pedagogic value. From the three lessons observed, it was clear that both the teacher and the learners had a full grasp of the technologies that were being used. The main technologies used were computers, smartboard and Foundation Phase software such as the SORA reading application, and animation. The ICTs added value.

There are many uses of ICTs in teaching and learning which *inter alia* include interaction with the learners, planning for classes, homework preparation, correcting misconceptions, and providing immediate feedback. The main conclusion that can be drawn is that when teachers are given proper training and guidance, they can become adept at using ICTs for teaching and learning. Secondly, this study confirms that teacher perceptions determine the extent to which they use ICTs for teaching and learning. Thirdly, ICTs can advance the learning of Foundation Phase learners if relevant resources are made available to the teachers and appropriate training is offered. Fourthly, while the pandemic had devastating impact in our lives, it promoted the adoption and innovative uses of delivering the curriculum in the Foundation Phase that had been side lined by the ICT in Education initiatives.

6.3 Contribution of the study to the education sector

The purpose of this study was to contribute to the present technological discourse on ICT pedagogical integration. The use of smart boards in schools is vital especially in Foundation Phase classrooms, given the nature of the learners and their limited concentration spans. The study demonstrated how Foundation Phase teachers can integrate ICTs to enhance teaching and learning. The use of ICTs in primary schools cognitively develops desired skills in children and allows the construction of knowledge to take place. There are lessons for the Department of Education and School managers on how to create environments that support the successful

use of ICTs in the classroom. Software that Foundation Phase teachers can use to teach specific knowledge and skills have been identified.

6.4 Limitations of the Study

The study focused on one school in a district in Gauteng. Since it was just one district, the results or conclusions made in this study do not necessarily reflect what happens in other districts or make assumptions about them. The findings of this study have limited generalisability and there is a need to conduct more quantitative studies to arrive at a holistic picture of how ICTs can be integrated into the Foundation Phase. However, the results are trustworthy because the researcher has met all the requirements in ensuring that observations and the interview were conducted with fairness and in a respectful manner to the participant in question.

6.5 Reflection and Challenges

The sudden occurrence of the Covid-19 pandemic had a major effect on the collection of data of this study and in turn, delayed the process of the whole research project. When South Africa went into lockdown all schools were closed; even after the schools re-opened it was difficult to visit the school due to restrictions that had been imposed. The relief came when the president of the country announced level one lockdown in 2021 and thus data collection commenced. The learning institutions opened making it possible for the researcher to collect data, with strict preventive measures taken into consideration. The researcher had intended to collect data in another school and permission was denied citing Covid-19, the main reason being to prevent the influx of persons visiting their school or classrooms. The researcher then went further to seek permission elsewhere at the primary school situated in Johannesburg.

The researcher's initial target was to find a school with fully integrated ICT resources, following the objective of the study; and the school which granted permission was well resourced. The enthusiasm from the teacher was overwhelming and the teacher was ready and willing to take part in the study. The teacher understood what was expected from them and what also helped was that the school had a functional ICT committee led by the Foundation Phase head of department. Upon the researcher's reflection, conducting research and collecting data was difficult and needed patience and in-depth studying of different articles to find relevant articles relating to the study. According to the findings of this study, integrating ICT in the Foundation Phase is possible and requires positive teachers' attitudes regarding their perceptions, the resources, and methods of implementation. The study has detailed ways in

which teachers could use media forms or analytical tools proposed by Laurillard (2002), to implement and integrate ICTs in Foundation Phase teaching and learning**.**

6.6 Recommendations

This study does not seek in any way to disregard or invalidate traditional teaching. While the researcher believes that traditional teaching is still viable and is widely used across the country there is a need to modify it so that it stays relevant to the dictates of the 21st century. The 21st century dictates that everyone is competent in ICT and the Foundation Phase is a good place to introduce ICTs into teaching and learning. With the use of ICTs, it is possible to equip the learners with 21st-century skills, which include problem-solving, critical thinking, and lifelong learning. Therefore, integrating ICTs in the Foundation Phase affords the learners with technological skills to compete globally which is necessary for doing well in the workplace and life in general. When Foundation Phase learners exit primary grades and are beginning to start secondary school level, they will be ready to learn using technological tools.

Teachers across South Africa have an obligation to change and be innovative in how they deliver concepts in their day-to-day teaching and learning. At the beginning of this research, the researcher noted problems with the South African education system. One of the problems identified was that learners tend to read without comprehension and such problems can be overcome if teachers use an application such as SORA and the digital library of Monkey Pen to influence reading. Providing digital libraries is therefore important and it is recommended that every primary school in South Africa should have a digital library, where multiple different books are accessible to learners. Teachers also need to be afforded opportunities to take part in continuous professional development so that they can keep track of changes that are occurring in the educational circles around the districts and provinces of South Africa and thus change their teaching approaches to suit the new realities.

6.7 Research Conclusion

The chapter focused on summarising the research and bringing finality to the research process. To achieve that, the chapter gave a reflection of the research process from the view of the researcher and how Covid-19 impacted the research. Focus then shifted to the limitations of the study before moving to the contributions, both practical and theoretical. The recommendations and conclusions that arose from the research were then highlighted.

The results showed that the teacher who was observed and interviewed for the study was aware of the need to integrate ICTs into teaching and learning. The teacher showed proper understanding of the value that ICTs add to teaching and learning. The use of ICTs added pedagogical value to the learning process and helped in the cognitive development of the learners. The teacher used the ICTs in a manner that brought value to learning. The ICTs used were varied and this helped the learners to keep track of learning and keep their concentration levels high.

There is a need to widen the study and maybe adopt a quantitative approach with a view to finding the extent to which ICTs are being integrated into the Foundation Phase in South Africa. There might be a need to review policies and curricula at the national level so that the policy curriculum statements reflect the current reality. There is a need to roll out ICTs to learners at the Foundation Phase level so that they do not only learn how to use ICTs but also become adept at using the same. ICT fluency is important in the 21st century.

It might also be necessary to revise the curriculum at institutions of higher education that train prospective teachers to include the use of ICTs so that upon graduating, they will be able to use ICTs in teaching and learning. Technology is constantly evolving and it is incumbent upon the responsible authorities to afford teachers opportunities for continuous professional development so that they not only keep abreast of technological changes but also keep track of approaches to incorporate technologies into teaching and learning.

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Appendices

Appendix 1: Letter to Principal



My name is Thinashaka Muremela. I am a Master in Education student (MED) at the Wits School of Education in the University of the Witwatersrand, Johannesburg. The title of my study is, **Integrating Information and Communication Technology (ICT) in the Foundation Phase: A case study of a South African teacher**. I humbly request permission to conduct research at your school with one of the Foundation Phase teachers and his or her learners.

This study aims to understand how teachers can use Information and Communication Technology (ICT) to enhance teaching concepts in Foundation Phase. I intend to interview a Foundation Phase Foundation teacher. The main objective of this study is to identify appropriate ICT teaching methods in the Foundation Phase classroom. The use of ICT in Foundation Phase has a potential to enhance the understanding of complex concepts in numeracy and literacy. Therefore, this study is significant in helping Foundation Phase learners learn effectively through ICT integration.

Prior to collecting data, I will seek consent from the teacher after issuing him or her with the participation sheet that outlines this study and its intentions. I will also do the same with the parents of the children who will be participating as learners. If any parent objects to their child's participation in this study, I will exclude their child in the data analysis and presentation. The study will collect data from three lesson observations to see how concepts are taught using ICT tools. In addition, 2 interviews will be conducted with the teacher, before and after the teaching

of the 3 lessons. The lessons do not have to happen on the same day, but whenever the teacher is available for this study. The interviews will be audio recorded and transcribed later. The lessons will be video recorded and transcribed as well. The recording of the data sets is so that nothing is missed that would assist in the thick descriptions needed to understand how the use of ICTs in the classroom enhances understanding of the content. In the data presentation, the teacher and the learners' faces will be blurred in the videos, so they are not identifiable.

Participants together with their institution will be kept anonymous throughout the study. Participant's privacy and all information gathered in your schools about this study will be confidential. During and after collection of the data, my personal computer will be used as storage and for safety measures; I will use a password so that I am the only one who can access it. All data researched will be destroyed after 3 years but not later than 5 years after completion of the research project.

Participation in this study is not mandatory therefore; the participants may withdraw their participation at any time during the course of the study.

For further enquiries, you may contact me on the contact below. Thank you

Yours faithfully

…….

Thinashaka Muremela **Supervisor :** Dr Nokulunga,

1910493@students.wits.ac.za 0625094108 Nokulunga.ndlovu@wits.ac.za, 082 220 04487

Appendix 2: Letter to the learners



Letter to the learner

Dear Learner

My name is Thinashaka Muremela. I am a student at Wits school of Education at the University of Witwatersrand Johannesburg.

I am doing a research on the use of computers for teaching and learning. I am asking you if you can allow me to be in your class when your teacher is teaching three (3) lessons. I will video record the lessons. Since you will be in the classroom, I might include you in the recording as you participate in the lesson. You need not worry though because I will change the way your face looks so no one can tell if it is you when writing my research.

I will not use your name, surname, your teacher's or school's name. Instead I will use name I have made up, so no one knows I am writing about you, your teacher or your school. In other words, I will respect your right and privacy; your name will not be used. All Information about you, will be kept confidential. Information collected will be kept safely for a maximum period of 3-5 years thereafter it will be destroyed.

Your parents have been given a consent letter. However, you are the one who must decide to participate in this research.

I am looking forward to working with you.

If you have questions to ask, you can contact me. See the contact below. Thank you

THINASHAKA MUREMELA

0625094108

Appendix 3: Assent Form to learners



LEARNER ASSENT FORM

Title: Integrating information and communication technology (ICT) in the Foundation Phase: A case study of a South African teacher.

Dear Mr **Thinashaka Muremela**

I ……. (Learner's full names)

(Please circle the relevant options below)

I agree to participate in this research as a learner **YES / NO**

I am aware that my real name will not be used in this research **YES / NO**

I agree that the researcher may use what I have said without using my name **YES / NO**

report.

I agree that the lesson observation may be video recorded **YES / NO**

I agree that what I say or do can be used anonymously after this project has ended, for academic purposes by other researchers subject to their own ethics clearance. **YES / NO**

…….
(Signature)

…….
(Name of participant)

…….
(Date)

Researcher

Name: Thinashaka Muremela, 1910493@students.wits.ac.za, +27 62 509 4108

Supervisor

Dr Nokulunga, S. Ndlovu, nokulunga.ndlovu@wits.ac.za, +27 82 220 04487

Appendix 4: Information letter to parents



PARENT INFORMATION LETTER

Title: Integrating Information and Communication Technology (ICT) in the Foundation Phase: A case study of a South African teacher

Dear Mr **Thinashaka Muremela**

I ……. (Parent/ Guardian) give permission to Mr. Thinashaka Muremela to conduct his research project in the classroom where my child ……... will be learning. I understand that this study will need the participation of his/ her teacher (teaching) and her classmates (learning) and I agree to the following:

(Please circle the relevant options below)

I am aware that the participation of my child will remain anonymous. **YES / NO**

I agree that the researcher may use anonymous quotes in his/her research **YES / NO**

Report form my child.

I agree that the lesson observations may be video recorded while my

child is learning **YES / NO**

I agree that the information collected may be used anonymously after this **YES / NO**

project has ended for academic purposes by other researchers

through their own ethics clearance.

…….

(Signature)

…….

(Name of participant)

…….

(Date)

Researcher

Name: Thinashaka Muremela, 1910493@students.wits.ac.za, +27 62 509 4108

Supervisor

Dr Nokulunga, S. Ndlovu, nokulunga.ndlovu@wits.ac.za, +27 82 220 04487

Appendix 5: Information letter to the teacher

TEACHER INFORMATION SHEET

TITLE: *Integrating Information and Communication Technology (ICT) in the Foundation Phase: A case study of a South African teacher*.

I, …… (Teacher), agree to participate in this research project. The research has been explained to me and I understand what my participation will involve.

I agree to the following.

I agree that my participation will remain anonymous. **YES / NO**

I agree that the researcher may use anonymous quotes **YES / NO**

In his/her research report.

I agree that I be interviewed **YES / NO**

I agree that the interview be audio recorded **YES / NO**

I agree that three of my lessons be observed **YES / NO**

I agree that the observed lessons be video recorded **YES / NO**

I agree that the information I provide may be used anonymously **YES / NO**

after this project has ended for academic purposes and by other

researchers.

…….

(Signature)

…….

(Name of participant)

…….

(Date)

Researcher

Name: Thinashaka Muremela, 1910493@students.wits.ac.za, +27 62 509 4108

Supervisor

Dr Nokulunga, S. Ndlovu, nokulunga.ndlovu@wits.ac.za, +27 82 220 04487

Appendix 6: Letter to teacher



Teacher's Letter

My name is Thinashaka Muremela. I am a Master in Education student (MED) at the Wits School of Education in the University of the Witwatersrand, Johannesburg. The title of my study is, **Integrating Information and Communication Technology (ICT) in the Foundation Phase: A case study of a South African teacher**

This study aims to understand how teachers can use Information and Communication Technology (ICT) to enhance teaching concepts in Foundation Phase. I intend to interview a Foundation Phase educator. The main objective of this study is to identify appropriate ICT teaching methods in the Foundation Phase classroom. The use of ICT in Foundation Phase has a potential to enhance the understanding of complex concepts in numeracy and literacy. Therefore, this study is significant in helping Foundation Phase learners learn effectively through ICT integration.

I am humbly requesting that you participate in my study. Your participation will entail responding to two thirty-minute interviews. In the first one, I will be seeking to have your understanding of ICT pedagogical integration and in the second one after the last lesson you will teach for this study, I will be seeking clarification on what I did not understand. The interviews will be audio recorded and transcribed later. Secondly, I am asking that you allow me to observe three of your lessons so I can learn from you how this phase should be taught with ICTs. I am asking that I video record the three lessons so I do not miss anything that you will be doing while teaching with ICTs. The lessons do not have to happen on the same day, but whenever you are available for this study. In the data presentation, you and your learners' faces will be blurred in the videos, so you are not identifiable.

You, your learners together with their institution will be kept anonymous throughout the presentation of the study. Participant's privacy and all information gathered in your school about this study will be confidential. During and after collection of the data, my personal computer will be used as storage and for safety measures, I will use a password so that I am

the only one who can access it. All data researched will be destroyed after 3 years but not later than 5 years after completion of the research project.

Participation in this study is not mandatory therefore; you may withdraw your participation at any time during the course of the study.

For further enquiries you may contact me on the contact below. Thank you

Yours faithfully

…….

Thinashaka Muremela **Supervisor :** Dr Nokulunga,

1910493@students.wits.ac.za 0625094108 Nokulunga.ndlovu@wits.ac.za, 082 220 04487

Appendix 7: Letter to the school governing body



SCHOOL GOVERNING BODY (SGB) CNONSENT FROM

***Title:* *Integrating Information and Communication Technology (ICT) in the Foundation Phase: A case study of a South African teacher*.**

Dear Mr **Thinashaka Muremela**

I ……. (SGB Chair) give permission to Mr. Thinashaka Muremela to conduct his research project in this school. I understand that this study will need the participation of teachers and learners in my school and I agree to the following

(Please circle the relevant options below)

I am aware that the participation of my teachers and learners will

remain anonymous **YES / NO**

I agree that the researcher may use anonymous quotes in his research **YES / NO**

Report from the data collected

I am aware that the interview and lesson observations may be video or **YES / NO**

audio recorded

I agree that the information collected may be used anonymously after this **YES / NO**

project has ended, for academic purposes by other researchers

subject to their own ethics clearance

…….

(Signature)

…….

(Name of participant)

…….

(Date)

Researcher

Name: Thinashaka Muremela, 1910493@students.wits.ac.za, +27 62 509 4108

Supervisor

Dr Nokulunga, S. Ndlovu, nokulunga.ndlovu@wits.ac.za, +27 82 220 04487

Appendix 8: Ethics Clearance Certificate

WITS SCHOOL OF EDUCATION

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

SCHOOL OF EDUCATION ETHICS COMMITTEE

CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: 2020ECE036M**
PROJECT TITLE	Integrating ICT's in the foundation phase. a case study of a South African teacher
INVESTIGATOR	THINASHAKA MUREMELA MUREMELA
SCHOOL/DEPARTMENT OF INVESTIGATOR	WITS SCHOOL OF EDUCATION
DATE CONSIDERED	14 September 2020
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	Date of submission of the project report

ISSUE DATE OF CERTIFICATE 16 September 2020 **CHAIRPERSON** (Dr Paul Goldschagg)

cc: Supervisor: Dr Nokulunga Ndlovu

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** emailed to the Ethics Office: Mabole.Mabela@wits.ac.za .

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix 9: Interview transcript

Narrative	
Interactive	
Communicative	
Adaptive	
Productive	

Interviewer: Good afternoon, ma'am. How are you? I'm okay. Thank you for agreeing to meet me. Say your views.

Respondent: Okay.

Interviewer: The purpose of this interview is to help us to explore the integration of information and communication technology, ICT in the Foundation PhaseFoundation Phaseclassroom, it' should take you not more than 30 minutes of your time with ma'am we spent twenty-three minutes.

Respondent: Yes.

Interviewer: Question number one. Do you have a personal computer that we use for educational purposes? For example, for teaching or planning?

Respondent: Yes, I do. I'm using my own computer for teaching and training.

Interviewer: Okay. Okay, Each time if you are done answering, please just say thank you. I know that you are you're done. Okay.

Question number two. What ICT is do you use to teach in the classroom?

Respondent: Okay, we've got a laptop, and then we've got a smartwatch, that is having an internet on it. And then we also use the projector. Yes thank you.

Interviewer: Do you teach your subject online?

Respondent: Yes, there are some. There are some activities that we get it from online. For example, let's say today we are learning about the learning about life skills. And then they are

some of the pictures that we get it from online that we have to show our learners so that they can we have an idea what is it that we are talking about? Thank you.

Interviewer: We didn't introduce each other. I think I'm sorry about that. It's

Respondent: Its ma'am Nevhondo gared three 2

Interviewer: Okay. Okay. All right. You have said that you use for do you teach your notes online? He said you do?

Respondent: Yes, we do teach our children online. For examples. Let's say we are teaching the life skills, the life skills lesson, our topic for today, we are talking about different types of food groups. So we will go to line and then we Google that topic on them on the on the on the computer. So that because the learners they learn in different way, some the learn very well, when they see some the learn very well will when they hear. So we'll go to our smartphone, and then we'll Google that topic. And then it's gonna show us those different pictures of people food groups that we have. And then we'll start by integrating with the children through the picture that they're seeing, or we will ask them the question what they see. And then it makes our life easier when we come to teaching because they will be able to understand very well what we are teaching about. Thank you

Interviewer: How do you teach them online, if you do.?

Respondent: If you do, okay, for example, like Las I told you, we go to their YouTube, YouTube, it has got the very educational, educational lessons that are there. So what I did, I go to YouTube, and then I google the like the topic of the day. And then we watch that video together with the learners. And then using the smartboard using the smart part is because our smartphone is connected with an internet and why we've got our Wi Fi at school. So that Wi Fi it helped us a lot because when we use the YouTube it's very much easier for the learner to see the pictures in the videos on the smartphone on the smartboard Yes.

Interviewer: Okay, thank you very much. How many computer are used by learners in the school

Respondent: you mean the computers are like each class it has got one computers which is connected to the SMART Board. And then we also do this to let's say for example, the other teacher is not at school today. So I can able to teach like two classes at the same time

Interviewer: using zoom using? Can you take me thorough how do you do that?

Respondent: Okay, so I'll go to my smart board. And then we have already downloaded the zoom. And then I will just take a what we call it the password for the teacher that is maybe not at school that's smart board and then we connected it with our we put it on our as a password as a password on our smartboard. And that is going to show everything that I'm teaching here in the classroom to the other classes. So the learner they will be on the other classes. There will be someone who's just sitting there to just to supervise them but I will be teaching over my classroom while the other classroom they are waiting. And in that manner, they can be able to ask the question. And then when they ask the question, I'm just going to point them through my classroom, they can able to hear, they can able to answer the question that they have from their classroom. Thank you

Interviewer: so interesting.

Respondent: Yes, it's been so interesting this thing started during the time of lockdown, if we can remember, during the time of the lockdown, some of the Learners they were not able to come to this school. What we do we just sending the link to the parents, while they're at home, they can connect that link at school they can able to learn from home while they're while we're at school.

Interviewer: How many? Okay, a question that one, what are the number of computers connected to the internet?

Respondent: With the grade three, we've got three computers that are connected to the internet for the grade three, but each and every teachers, they've got the laptops and smartphones that are connected to the internet. If I'm talking about the Foundation Phase, the Foundation PhaseFoundation Phasewill put grade one we've got from grade R up to grade three. And then each class they've got three teachers that means is three is three laptops and three smartboard. Per aach classroom which is connected to the internet.

Interviewer: How many hours of ICT professional development have you completied? Hours meaning attending workshops teaching using ICTs.

Respondent: Okay, we are so fortunate because of our school before they take us for workshop. On how are we going to use ICTs, the smartboard and the Internet and everything. We spent like almost the whole day at that workshop for the smartboard. And then we also attended the other workshop for the Teams on how we can use teams in our school. It was it started from half past eight and then it finished at two o'clock in the afternoon.

Interviewer: What is your understanding of ICT pedagogical integration? I think you alluded to that when you're teaching life skills. It is what happens. Can you please take me through when teaching any subject or what happens through that stage?

Respondent: Okay. So what is happening is like this is not like, remember during our time, so the teacher will just come and teach traditional teaching, if you understand that traditional teaching, so yes. He has any chalkboard. So this one is an advanced teaching. It made like a teaching very, very, very easy for us. Because we don't need to like to copy everything on the board. What we can do, we have got a Surah, we've got a Surah, Surah is a reading app. So every day in the morning, we open a surah app where the learner they come from quarter to until eight o'clock. They just read from the from the smartboard. Even during the break when the learner they're busy eating their food, we use Surah for them. And then the Surah is the app that that helping our learner to gain interest in reading. Yes, it has got a lot a lot, a lot, a lot, a lot of books, different books. We also asked the parents to download it from home. Yes, we also asked the parents to download it from from home it has got a personal password, a personal laptop pass password, where the learner they have got to put a library code for them to access those book.

Interviewer: Do Use as it is to teach all the Foundation PhaseFoundation Phasesubjects?

Respondent: Yes, we do teach all the Foundation PhaseFoundation Phasesubjects. we've got four subjects Foundation Phase, we've got a maths, we've got English, life skills, and then Afrikaans. I also teach Afrikaaans. so we use this ICT to teach all those subjects because this smartboard it also works as a chalkboard because I can able to write my notes while the learners are also writing from the smartboard and it also save time and then also you can even zoom it in like I've got a challenge with one of my learner here. If she cant see from from the back. I can able to zoom it so that the word more bigger. Yes, yeah, unlike the chalkboard, you can't but see I can zoom it to make the word more bigger so that they can able to see

Interviewer: please describe when and how you use ICT is to teach Okay. Times

Respondent: fortunately in our school we use it Every single day, every single day, we use our ICT to teach like, like, for example, I told you about the chalkboard, I use it everyday, like internet, I use it everyday to Google the topic or the lesson for the learner for the day, so I use it like every every single day.

Interviewer: Thank you very much. We've come to the end of our interview. Okay. Yeah, it was so so so, much.

Respondent: Thank you so much for having you here. You're more than welcome. If you need like any more than more information, you can contact me you can. You can come to school.

Interviewer: Okay, thank you very much.