TEACHERS' ATTITUDES TOWARDS THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN INCLUSIVE PRIMARY SCHOOLS

by

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Teachers' attitudes towards the use of Information and Communication Technology in inclusive primary schools

I declare that the above dissertation my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

SIGNATURE :

07 October 2022

DATE

DEDICATION

I dedicate this research to my mother Ritah Nyathi who has always believed that if I work hard, I can achieve anything in life.

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This section serves to convey my gratitude as I sing praises to the following people who contributed towards the successful completion of this study:

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ABSTRACT

The integration of ICT remains a major barrier in education, negatively affecting the teaching and learning process in inclusive schools in South Africa. The purpose of the study therefore was to provide a deep understanding about the attitudes of teachers towards the integration of ICTs in teaching and learning in inclusive primary schools. A qualitative approach was used in the research to discover the teacher's perceptions, opinions, and feelings about the use of ICTs in Inclusive primary schools. Purposive sampling strategy was used to select two participants from each of the five inclusive primary schools, which constituted a total of ten participants. The theoretical framework that informed the research was drawn from Lev Vygotsky's social learning theory (1962). Data collection was done through in-depth interviews, which were corroborated by non-participant observations, to triangulate the study's findings. Qualitative thematic data analysis whereby the researcher identified, categorised themes and sub-themes in accordance with the study's sub-research questions was employed. From the findings of this study.it was recommended among others that the ministry of education should be hands -on when it comes to ICT usage in Inclusive primary schools, teachers must be well trained and involved in decision-making and processes for implementation of ICT usage in inclusive primary schools and that there should be adequate technical and administrative support available to teachers during the implementation on ICTs.

Key Terms: information and communication technology, attitudes, inclusive education, primary schools, teachers, integration, implementation

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LIST OF ACRONYMS AND ABBREVIATIONS

ACRONYMS	DESCRIPTION /MEANING.
CDCP	Centre for Disease Control and Prevention
CPD	Continuing Professional Development
D11	District 11
ICT	Information and Communication Technology
MKO	More Knowledgeable Other
SMT	School Management Team
UNISA	University of South Africa
ZPD	Zone of Proximal Development
QDA	Qualitative Data Analysis

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND OF STUDY

The use of technology is a pervasive global practice that has been around since the invention of the computer by Charles Babbage in 1822. However, the use of technology in education really came to the fore in the 1980s when the personal computer first found its way onto the market (Purdue University, 2022). Since then, the use of technology has developed exponentially, taking over almost every facet of daily life (Diamandis & Kotler, 2020).

It can also be stated that the appearance of new technologies into the field of education has had both negative and positive results. The purpose of this study is to provide a deep understanding about the use of Information and Communication Technology (ICT) in school education (Diamandis & Kotler, 2020). Mselle (2012) was of the view that the use of technology tools such as computers and the internet is still in its infancy in most developing countries. This implies that little has been done to integrate technology in education. ICT policies have been put in place globally but technology is not effectively used in African countries (Mselle, 2012). The World Bank (2019) stated that study and teaching materials are very sparse in many developing countries. However, ICT can play a significant role in enhancing teaching and learning if resources were available.

The integration of ICT into education is of paramount importance and a great concern to many African countries. Of particular concern is that ICT tools are provided to teachers without considering their attitude towards using them. The rapid evolution of technology has made it necessary to change teaching approaches to suit technological needs, (Raja & Nagusubramani, 2018). Education is one area where dissemination of information through technology can yield tangible benefits. The learning and interaction of learners increases with the use of technology because it makes the transfer of knowledge easier and more convenient while also being effective (Raja & Nagusubramani, 2018). Information and Communication Technology is defined as a various set of technological

tools and resources accustomed communicate, disseminate and store information. The technologies include computers, the web, broadcasting technologies, radio, television and telephony (Ratheeswari 2018). Livingstone (2012) asserts that ICT “is not suitable for all learners in all situations and for all purposes, and may require some considerable learner training for effective use.” The problems in classroom management, the lack of experienced teachers, choosing the best technological tool matching with course content, finding reliable and acceptable activities for students’ learning styles, the costs of new technological tools, and devices, insufficient physical capacity of classrooms etc. are only certain remarkable issues to be taken into consideration in an inclusive class and when teaching disadvantaged learners.

Education has certainly been affected by the penetrating influence of ICT worldwide and in particular developed countries; and ICT has made a very profound and remarkable impact on the quality and quantity of teaching and learning in educational institutions. This is true because its adoption by the teachers will enhance effective teaching; such as good course organization, effective class management, content creation, and self-assessment, (Kamani *et al.,* 2011). ICT also enhances collaboration learning and task-oriented activities amongst the learners including learners with special needs and disadvantaged ones. Moreover, Taban, Abdullah-Al-Mamun & CheKum (2012) argues that, teachers lack of knowledge and skills in monitoring and managing class performances and grade records was a serious obstacle that is not only seen in primary schools but also in technical and higher educational institutions which needs serious attention.

ICT in the South African school curriculum has become an essential tool for skills development among learners. The 2013 e-Education policy guided and informed by the White Paper on e-Education (Department of Education [DoE], 2004), aims to enhance educational use of technology and sets out the principles of risk assessment, responsibility, regulations and appropriate strategies. Since 1994, the South African Education Department has been promoting the use of ICT. It is important to note that adequate planning is critical for the successful implementation of the use of ICT in

education. Lave (2014) indicated that policy makers and educational planners play a central role in planning and implementation of educational goals.

Although the integration of ICT is now at the centre of education reform efforts, not all countries are currently able to benefit from the development and advances that technology can offer. South African teachers face challenges in using ICT resources because technology is constantly evolving and teachers do not have adequate knowledge on how integration strategies should be carried out. Since teachers are the key implementers of curriculum transformation, it is vital that ICT be used or maybe using a blended mode of curriculum delivery might be more appropriate, (Lave 2014). Unfortunately, most South African classrooms still do not have technological resources although the government seems to recognise the benefits of technology in the workplace. It is important to note that a critical aspect needed for the successful implementation of this approach to education is the planning stage. It is, therefore, in assuming that there are benefits to using ICT that the researcher seeks to investigate the attitudes of teachers towards the use of technology in inclusive education schools.

1.2 STATEMENT OF THE PROBLEM

As already indicated in the background to the study, developing countries such as Zimbabwe, Tanzania, Botswana and South Africa, the integration of communication technology remains a major barrier in education negatively affecting the teaching and learning process in inclusive primary schools (World Bank, 2019). Danneria and Pessu (2013) postulated that the teachers determine how ICTs are used in education, notwithstanding the quantity and quality of available technology in classrooms. It should, therefore, be emphasised that apart from technological competencies, teacher's attitude should be examined too. Rastogi and Malhotra (2013) posited that a combination of competency, skills and attitudinal aspects contribute to success in the learning process. This study therefore sets out to answer the following research questions.

1.3 MAIN RESEARCH QUESTION

What are the teacher's attitudes towards the use of Information and Communication Technology in inclusive primary schools?

1.4 SUB-RESEARCH QUESTIONS

- How do teachers in inclusive primary schools understand the use of ICT?
- What factors determine teacher's attitudes towards the use of ICT in inclusive primary schools?
- How can teachers' attitudes towards the use of ICT in inclusive primary schools be enhanced?

1.5 OBJECTIVES OF THE STUDY

The objectives of the present study are to:

- examine teachers understanding of the use of ICT in inclusive primary schools.
- investigate factors that determine teacher's attitudes towards the use of ICT in inclusive primary schools.
- establish ways in which teachers' attitudes towards the use of ICT in inclusive primary schools can be enhanced.

1.6 RATIONALE FOR THE STUDY

It is essential for the researcher to explicate her personal motivation and to state her aims in pursuing the project taking due cognisance of the presence of multiple paradigms and philosophies at her disposal. The rationale therefore seeks to fulfil this aspect by fully stating the scope of the aim of the research and stipulating the justification for it. The rationale thus provides the research's trajectory.

It is noteworthy that the introduction of e-Learning in South African schools was predicated on offering many options for effective mediation of learning given the multiplicity of tools technology offers. It is on this premise that this research anchors its rationale. Computers can be used as tools to aid learning. However, some teachers in primary schools do not have competency skills to effectively embrace the use of technology. The majority of teachers are still using old teaching strategies that do not incorporate ICT. Experienced teachers have found the changes that are driven by technology within the educational field daunting. As much as technology is being adapted with the objective of improving education, because of a lack of training and inadequate

knowledge, some teachers are facing difficulty in embracing the use of ICTs in the school curriculum. It is against this background that the researcher decided to investigate factors that determine the attitude of teachers towards the use of ICT in inclusive primary schools.

1.7 SIGNIFICANCE OF THE STUDY

The purpose of the study is to explore the attitudes of teachers towards the use of ICTs in inclusive primary schools.

The study's findings will benefit the Department of Basic Education (DBE), and stakeholders such as teachers, learners and policy makers. Policy makers and planners should be clear about educational outcomes that are targeted in order for appropriate technologies to be used. The teachers will acquire knowledge on how to effectively integrate communication and technology in their inclusive teaching and learning environment. The learners will acquire more knowledge of concepts being taught if ICT is used effectively.

To future researchers, the outcomes of this research will be a useful reference and will serve as springboard for those who would like to carry out similar related studies on ICT use in inclusive primary schools.

1.8 **LITERATURE REVIEW**

Ratheeswari (2018: S45) attested that "ICT is a scientific, technological and engineering discipline and management technique used in handling information, its application and association with social, economic and cultural matters". What differentiate aspects of technology is its application and the way it is used by the users. Heick (2022) identified five levels of technology use in the education precinct, namely, presentation, demonstration, drill and practice, interaction and collaboration,

ICT can be used in direct class teaching, school broadcasting, general educational programmes and conducting assessment. This means that it is necessary to change the methods used in the teaching and learning process. Innovative application of technology can change teaching and learning. Schools use a variety of ICT tools to communicate, create, disseminate, store and manage information. Proper application of ICT by teachers

promotes the development of higher-order thinking skills and inculcates independence in students when they demonstrate their understanding. Danner and Pessu (2013) emphasised the key role of the teacher to determine the way in which technology is used in class notwithstanding its quality or quantity.

EWP6 (2001) notes that, inclusive schools should be designated in each district for the implementation of the inclusion model, especially since it is unimaginable how all 29,000 public schools could all provide the full range of physical and material resources required. For example, literature on disadvantaged learners notes that, voice synthesisers, hearing aids and adapted information and communications technologies - and the staff to accommodate the full range of diverse learning needs is all a necessity in an inclusive classroom.

Uses of ICT include the following: delivering content; previewing field trips e.g., exploring locations; using videos for mini lessons; playing podcasts; adapting content; sharing online class calendars; using virtual manipulatives; running learning stations; using online mind maps; gathering feedback; asking student blogs; and implementing game-based learning, (Alpher and Goggin, 2017).

Feng and Jih-Lian (2016) asserted that teachers' approach in the use of technology is a factor that enhances information literacy for both teachers and learners promotes effective lifelong learning skills. Teachers need to use new technologies in schools to improve learning. Zanguyi (2011) argues that teachers must leverage the introduction of technology into educational spaces as an opportunity to enhance the quality of teaching and learning, transforming their practice from being mere dissemination of information to being adept facilitators of the learning process. Teachers' responsiveness and attitude to ICT is driven by environmental factors plus curriculum and administrative ones, (Zanguyi 2011). Environmental factors are factors that must do with placement of learners in schools, ranking of subjects, peer influence, parental influences, learners' feedback, nature of talents and careers. It can, therefore, be said that the environment contains a great influence on the attitude of teachers. Curriculum-related factors include time, professional qualifications of the teachers, in-service training of teachers and professional experience of teachers. According to Huang and Liaw (2015), the implementation of

technology in education is heavily dependent on the attitude of teachers who facilitate learning within those contexts. Teacher attitudes are, thus, key in influencing the nature and impact of the use of technology in learning spaces. Siyam (2019) also underlined the importance of teacher attitudes towards the use of technology to the end that this would provide insights into aspects of usage, acceptance and efficient integration in the teaching and learning environment.

Administrative factors involve investing in resources and ensuring the implantation of policies. Wanjira (2013) postulated that the school administrators have the authority to decide on which resources to include in the teaching programme. It is evident that the trajectory of learning is intertwined with the application of technology; therefore, it is critical to maintain equitable provision or resources that does not discriminate between learners. The aspect of inclusion is an important one and concerns the way classrooms are structured. An equitable and supportive environment that considers all learners in their salient diversities is the hallmark of classroom inclusivity. Peck and Domcott (2011) made the point that an inclusive classroom can only be successful if the learners have a sense of belonging and are comfortable to be part of the school community. Such an environment is only possible through a context that allows open discourse in matters of diversity and the practice of respect and consideration of divergent cultures and backgrounds.

Inclusive education entails delivering information to learners in a way that is appropriate to their individual needs. It is a way of creating a conducive environment for learners that match their learning needs. It is about providing an accessible way for learners to demonstrate their knowledge of the curriculum. In accepting this inclusive approach, we acknowledge that the learners who are most vulnerable to barriers to learning and exclusion in South Africa are those who have historically been termed ‘learners with special education needs,’ i.e., learners with disabilities and impairments. Their increased vulnerability has arisen largely because of the historical nature and extent of the educational support provided, (DOE, 2004). Hence, strategies provided by literature is that of the use of assistive technology for special needs children.

1.9 THEORETICAL FRAMEWORK

The theoretical framework that informed this research was drawn from Vygotsky's (1962) social learning theory. The social learning theory stresses the basic role of social interaction in the development of cognition. Vygotsky believed that the community plays a central role in the process of "making meaning" and emphasised that social interaction involves adult guidance and peer collaboration, (Topciu 2020). Life skills develop through social interaction in what he called the zone of proximal development (ZPD). Vygotsky stated that "learning is cognitive development through social interaction" and stated that cooperative learning, scaffolding and private or inner speech are ways that help learners to internalise knowledge, (Topciu 2020).

Vygotsky was a constructivist theorist who believed that development is predicated on and influenced by social forces that operate within a specific context, (Topciu 2020). Topciu (2020), while acknowledging the importance of context as a factor, argued that the social constructivist theory places a premium on social factors as influencers and catalysts of cognitive and intellectual development in individuals. The level of development is different; hence, every child perceives concepts in a different way. Vygotsky (1962) stated that in most learning situations, there is a more knowledgeable other (MKO), such as the teacher. The teacher has an enhanced cognitive and performance ability in specific tasks or processes as well as conceptual prowess that is superior to that of the learners. To develop the ZPD, the teacher would use the concept of scaffolding whereby the adult interacts with the learner to help them to acquire skills. It should be noted that the MKO could also be a learner. Children should be provided with opportunities to learn with the teacher and more skilled peers.

Gouws (2016) emphasised that the concept of ZPD applies to those skills and concepts that are too complex for the learner to independently without guidance and motivation to create knowledge. If knowledge is formed, learning has taken place. It relates to the difference between what a child currently knows and what they can achieve with guidance and encouragement from a skilled partner. Vygotsky saw the ZPD as the area where the

most specific instruction or guidance should be given. If a child developed skills that they could use, they would be able to develop higher mental functions, (Gouws 2016). It is incumbent upon teachers to proffer effective guidance to learners by demonstrating solutions to problems while retaining control of the learning process. Topciu (2020) stated that the teacher's role is to ensure that the learner takes responsibility for the learning process by motivating the learner to develop an interest in the task at hand, and this can be done by making sure that the task is broken into manageable steps. The role of the teacher in this instance is to provide direction and keep the students focused, thus reducing factors that cause frustration.

According to Vygotsky (1962), environmental factors impact children's learning. Culture is a determinant of the tools used to shape children's intellect and is instrumental in influencing the state of their basic mental functions. Vygotsky's theory thus incorporates ZPD, scaffolding, language and dialogue as cultural tools that aid cognitive development, emphasising that there is no such thing as a general stage of development. Language plays a pivotal role in shaping thoughts (Alves, 2014).

Vygotsky's theoretical framework influenced this study in that when teachers have a positive attitude towards the use of learning tools like computers; this makes it easier for them to transfer their skills of ICT to the learners through social interactions, (Gouws 2016). In the context of Vygotsky's theory, teachers represent the MKO, making them appropriate facilitators of the learning process. They also transmit information to children as mediators of knowledge.

Teachers should have a higher level of ICT competency for them to impart skills to the learners through collaborative learning. Schools should promote social interactions using varied learning tools; for example, computers. Johnson and Golombek (2020) suggested that, based on the main concepts of sociocultural theory, human thinking is mediated. Another major concept reflecting Vygotsky's developmental theories is the concept of behaviour and consciousness. The integration of behaviour and consciousness in

unification of the mind and social interaction is a major characteristic of Vygotsky's developmental theory because it defines precisely what constitutes human development.

Gouws (2016) added the dimension of disadvantaged learners within the South African context as exemplifying the importance of Vygotsky's notion of how learning should be conducted. Poor performance of learners should not be ascribed to the scarcity of textbooks or classrooms but to underdeveloped cognitive functions because of the quality of interactions in dialogue between children and adults. The role of skilled partners in learner development is critical to help them acquire problem-solving skills and attain complex levels of thinking while doing so. Teachers should tailor their instruction to each child's ZPD. Teachers have a responsibility to make learners move to from one developmental level to the next; for example, to move them from a basic understanding of what technology is to what they can do with it. Disadvantaged learners also should have the capacity to learn in an inclusive class. It is, therefore, important that teachers understand the use of ICTs in schools.

It is against this background that the theoretical framework of teachers' attitudes toward the use of technology can be formulated.

1.10 RESEARCH METHODOLOGY

The research methodology covers the research paradigm, approach, design, population and sampling, instrumentation and data collection techniques and analysis.

1.10.1 Research Paradigm, Approach and Design

In line with its qualitative thrust, this study followed an interpretivist paradigm as suggested by Kivunja & Kuyini (2017) who viewed the interpretivist paradigm as a fundamental endeavour to appreciate the subjective world of human experience.Bhattacherjee, (2012) underscores this view by saying in the interpretivist mindset also known as interpretivism, individuals have consciousness, hence they are not merely coerced zombies that react to social forces in the way that positivists mean. Thus different human beings appreciate the same reality in different ways and have individual specific reasons for the motivations to do so. Pervin & Mokhtar, (2022) consolidate the above view by pointing out that the interpretivist paradigm is premised on

the assumption that individuals' perceptions, ideas, thinking and the meanings that are significant to them can be conceptualized through having an insight into their cultures and environments. A comprehensive benefit of the interpretivist mind set is that it has an advantage because the researcher is in direct and close contact to the participants, the situation under focus and phenomenon under study. Thus to round off the above analogy an interpretivist mind set tries to get into the head of the individuals being studied in order to unpack or understand what the individual is thinking or making of the particular context under study, based on their everyday experiences in their unique environments. This study therefore adopted the interpretivist paradigm in order to get into the head and social constructs of inclusive teachers and understand their attitude towards the use of ICT in inclusive primary schools.

The study used the qualitative approach because it sought to discover the teachers' perceptions, opinions and feelings about the use of ICT in inclusive primary schools. Rudestam and Newton (2013) defined qualitative research as, a process or systematic inquiry into the meanings which people employ to make sense of their experience and guide their actions". It is a research approach that is also concerned with behaviours wherein the interest is not meant to prove or test a theory. Becker, Pistrang and Elliot (2019) also postulated that in qualitative research, although the theory can emerge, existing theory is not ignored because it influences how the researcher conducts the study through the knowledge, they acquire from the literature review.

Another important aspect of qualitative research is reflexivity where the researchers' subjectivity is involved. Qualitative research aims to illuminate and clarify the meaning of social actions and situations (Mohajan, 2018). Qualitative research is clinical in nature since the cycle of events includes data collection, reflective interpretation and assessment of accuracy.

When conducting qualitative research, data can be collected through direct face-to-face interactions with participants who are purposefully selected to facilitate an analysis of collective as well as individual social actions, beliefs and perceptions (McMillan &

Schumacher, 2010). Qualitative methods are effective in identifying factors which include social norms, social economics status, gender roles, ethnicity and religion (Mack, 2005).

Goert and Mahoney (2012) described qualitative research as interpretive in nature which means approaching the subject matter or phenomena from a naturalistic perspective. The natural setting in which phenomena evolve thus provides the context used by researchers to make sense of data, interpret it and draw and establish meaning. Qualitative research involves the study, use and collection of a range of empirical material through case study, personal experience, introspection, life-story interviews, observations, and historical, interactional and visual texts that describe routine and problematic moments that have meaning for individuals (McMillan & Schumacher, 2010). In this study, participants were free to express their own perceptions about the use of ICTs in inclusive primary schools.

Qualitative data methods ask open-ended questions and participants have an opportunity to respond in their own words and give detailed information. The data collected thus facilitates knowledge from a human perspective capturing the essence of an issue or topic and identifying contradictory behaviours, establishing, beliefs, relationships and emotions. Exploration of existent but intangible elements such as norms, gender roles, religion and ethnicity can be effectively unravelled using qualitative methods (Mack, 2005)

1.10.2 Population and Sampling

Population is defined by Mohajan (2018) as subjects or individuals who participate in a study. A population is a group of individuals that have one or more characteristics in common that are interesting to the researcher. He defined a sample as a subset of the population or a portion of the population in the research area, which will be a representation of the whole population. A sample is a small portion of population selected for observation and analysis.

In this study the recruitment of participants commenced after the researcher had received an ethical clearance from the UNISA Education Ethics Review Committee. On getting the requisite clearance from the UNISA Education Ethics Review Committee the researcher then sent a request email to Gauteng Province Director Education Research & Knowledge Management. The Gauteng Provincial Director's blanket approval letter dated

30th August 2021 was simultaneously sent to the five School Principals and SGB District 11. The researcher then sent a courtesy bulk request email to the five School Principals requesting for permission conduct the study. It is on this bulk request email that the researcher attached a copy of the letter of the blanket approval from Gauteng Provincial Director Education Research & Knowledge Management. The reference to bulk request email was because it was in this email that the researcher also requested the School Principals for names and contact details of four of their teachers who met the inclusion criteria as these were being requested to participate in this research.

1.11 INSTRUMENTATION AND DATA COLLECTION TECHNIQUES

1.11.1 In-depth interviews

The data was collected through the in-depth interviews with open-ended questions. The interviews gave the analyst a platform for posing open-ended questions about the attitudes of teachers towards the use of technology in inclusive primary schools. Bezuidenhout, Davis and Cilliers (2014) stated that an in-depth interview is a qualitative data collection method which allows the researcher to pose questions to participants with the aim of learning more about their views, opinions and beliefs about a specific phenomenon. In other words, interviews are conversations aimed at obtaining information based on open-ended questions. Open-ended are not necessarily worded in exactly the same way with each participant. With open-ended questions, participants are free to respond in their own words, and these responses tend to be more complex than, “yes or no” (Mack, 2005).

The in-depth mode of interviewing is flexible and encourages the research participants to raise their views and perceptions. In in-depth interview researchers elicit information in order to achieve a holistic understanding of the interviewee’s point of view or situation (Okeke & Van Wyk, 2017). In-depth interviews may probe deeply into a person’s feelings, attitudes and beliefs. Information obtained from in-depth interviewing can only be qualitative in nature. Newby (2017) asserted that in-depth interviews can be particularly

good at exploring feelings and beliefs or at obtaining a rich understanding of how an issue unfolded and what it meant to the interviewee. In this study, interviews were done virtually using Microsoft Teams. These involved one interview session per individual participant to create a relaxed set-up wherein the interviewee was free to share valid and subjective responses

1.11.2 Observations

In this study, the researcher used the non-participant observation method as classroom teachers were teaching in their classrooms, which is their natural setting. The researcher was able to compare the interview notes with teachers' attitudes and experiences in using ICTs in their teaching and learning environment. The researcher made use of observation sheets and note books to take short notes during observations. Non-participant observation was used as a data collection method as it helped the researcher familiarise herself with individuals being interviewed to corroborate the findings from the in-depth interviews. According to Cohen, Manion and Morrison (2018), observation is a process of systematically looking at and noting down information about people, events, behaviours, settings and routines. In the observation process, COVID-19 protocols were adhered to, namely, observance of social distancing, wearing a mask and sanitising of hands. Observations focused on the implementation of the use of technology in inclusive primary schools in an effort to answer the research questions. Observations were used to corroborate the data collected during interviews or to find out if there was consistency between what was said and what was done (Jama, 2014).

1.12 DATA ANALYSIS

Data analysis is a process where the researcher tries to understand what they have studied and to continuously refine his or her interpretation. The gathered data was analysed according to Braun & Clarke, (2006) six phases, which are familiarizing with the data, generating initial codes, searching for themes, reviewing potential themes, defining and naming themes and lastly producing the analysed document. Data analysis used and that it was manual not QDA software based.

In this study, the sub-research questions were used to guide the researcher in conducting the data analysis. Each research question was used as a theme for categorizing information. McMillan and Schumacher (2010) concurred that in qualitative research, data is mainly generated from the transcripts of audio recordings.

The data collected through the in-depth interviews was transcribed verbatim to reveal participant teachers' ideas and viewpoints about the use of ICTs in inclusive primary schools. A list of the identified themes (or a list of patterns of responses) made was in order to look for connections between them; for example, all the excerpts that fitted under the specific theme were identified and grouped together (Malahlela, 2012). The themes were used as headings.

Data was interpreted through synthesizing data into larger coherent wholes (Mouton, 2008). Results were related to the theoretical framework and highlighting the similarities or differences with existing literature.

1.13 TRUSTWORTHINESSS

Trustworthiness of the study is essential to make sure that the findings and interpretations of the study are accurate. Trustworthiness shows that the evidence for the results reported is sound and that the argument made is strong. To ensure the trustworthiness of the study, various criteria were applied, namely, credibility, transferability, dependability and confirmability (Creswell, 2014).

1.13.1 Credibility

Credibility is about establishing that the results of a study are believable. The participants are the ones who judge the credibility of the research. It links the study's findings with reality in order to demonstrate the truth of the research. It focuses on triangulation which involves the use of different data collection methods; for example, using two different populations, interviewing people at different points in time and comparing people with different perspectives (Metzger, Flanagin & Zwarun, 2014).

1.13.2 Transferability

Transferability in qualitative research is the degree to which the results of the research can be applicable to similar situations (Schurink, Fouche & De Vos, 2011). “Transferability is established by providing readers with evidence that the research study's findings could be applicable to other contexts, situations, times, and populations” (Statistics solutions.com, n.d.).

1.13.3 Confirmability

Confirmability refers to ensuring that the data and interpretations of the findings are not fabrications of the researcher’s imagination, but interpretations based on the data (Creswell, 2014). It is an indication that shows that the researcher has avoided bias. De Vos et al. (2018) pointed out that confirmability is an indicator of objectivity. It is usually determined by member-checking where the participants review the presentation of the data and confirm that it is correct.

1.13.4 Dependability

Dependability has to do with the aspect of trustworthiness because it establishes the study’s findings as consistent and repeatable. For data to meet dependability and consistency criteria, an audit trail should be provided for readers to follow (Gay et al., 2011; Moon et al., 2016). This is very important to make sure that there was not anything missed in the study, or the researcher was not sloppy or misguided in their final report. Newby (2017) was of the view that dependability is similar to the idea of reliability in quantitative research. The real test of dependability is whether the researcher explains the context for the research sufficiently for the audience to agree with the conclusions. For this study, the researcher used observation and interviews for analysis with all participants at the selected five schools to ensure dependability.

1.14 ETHICAL CONSIDERATIONS

Ethical issues need to be addressed by the researcher. Saunders, Lewis and Thornhill (2016:72) stated that research ethics are “standards of the researcher’s behaviour in relation to the rights of those who become the subject of the research project, or who are affected by it”. Leedy and Ormrod (2015) declared that most ethical issues in research fall into the following categories: protection from harm, voluntary and informed participation, the right to privacy and honesty with professional colleagues. In this study, every effort was made to follow the above principles. The study was clearly explained to the participants. Gatekeepers were asked for permission to conduct the study, and participants were asked for informed consent and assured of confidentiality and anonymity. The researcher also took cognisance of the use of ethical values in research in order to develop scientifically acceptable research.

Protocols need to respect the participants’ time and have a reasonable chance of yielding meaningful findings. Saunders, Lewis and Thornhill (2016) stated that research ethics are, “standards of the researcher’s behaviour in relation to the rights of those who become the subject of the research project, or who are affected by it”.

1.14.1 Permission

In this study, formal permission was requested first from the university’s Research Ethics Committee under whose umbrella the current study was conducted, from the Provincial Department of Education, the District Office, as well as from the school principals themselves.

1.14.2 Informed Consent

Consent forms were drafted prior to conducting the research to ensure that the individuals participating in the research were respected and protected. Becker, Pistrang and Elliot (2019) stated that informed consent refers to written consent by an individual to participate in a study. Individuals were informed about how their confidentiality would be protected in the event that they participated in the research. Individual participants were

further informed that participating in this study was voluntary and that they could withdraw from the study at any time if they deemed it necessary, without penalty being imposed on them.

1.14.3 Confidentiality and Anonymity

Participants were assured of confidentiality of the data that was collected pertaining to the study. McLeod (2014) advised that the anonymity of research participants and the confidentiality of their shared information needs to be protected from disclosure, unless they consent to the release of personal information. Pseudonyms instead of the participants' real names were used in the research; for example, participants were referred to as 'T-1' and so forth.

1.15 LIMITATIONS OF THE STUDY

The research findings were limited to the five purposively selected primary schools in District 11 (D11), Gauteng Province of South Africa, which means that the results may not be generalised to all the primary schools.

Some teachers rescheduled appointments for interviews due to absenteeism and personal reasons, hence affecting the time-frames for the interviews. Some interviews were conducted after school (after hours), therefore infringing the teachers' personal time (an inconvenience). COVID-19 restrictions dictated that interviews be done remotely using such media as Microsoft Teams. This implied an expense for both the researcher and the interviewees.

1.16 DELIMITATION OF THE STUDY

As already indicated, the research task was confined to five schools that were purposively selected within the perimeters of District 11 in Gauteng Province, South Africa. Therefore, the outcomes of this study may not be assumed to represent what occurs in all primary schools in District (D11). The focus of the study is mainly the investigation of the attitudes of teachers towards the use of ICT in inclusive education primary schools and not on other aspects related to the use of ICTs.

1.17 DEFINITION OF CONCEPTS

1.17.1 Information and Communication Technology

Mohammed, Abubakar, Abubakar and Moses (2019) defined ICT as a global village where people can communicate with others across the world as if they are in the confines of the same room. In the context of this study, ICTs are technology in the educational system that have greatly enhanced the knowledge base of the teachers and their students alike, as well as diversified the ways in which instructional content is prepared and delivered to the learners.

1.17.2 Attitudes

Pryor (2022) stated that attitude is a positive or neutral stance regarding a phenomenon. The concept 'attitudes' in this study refers to the attitudes of teachers towards the use of ICTs in inclusive primary schools.

1.17.3 Inclusive Education

Inclusive education refers to a wide range of strategies, activities and processes that seek to make a reality of the universal right to quality, relevant and appropriate education. It is about changing the system to fit the learners, not changing the learners to fit the system. It locates the 'problem' of exclusion firmly within the system, not the person or their characteristics (Collins, Azmat & Rentschler, 2019). This study focused on inclusive education and the use of ICTs in primary schools.

1.17.4 Integration

Integration is the act of bringing together smaller components into a single system that functions as one (Moore, Johnston & Glancy, 2020). In this study, integration refers to the process of infusing information and communication technologies in the teaching and learning activities for learners in inclusive primary schools.

1.17.5 Implementation

Lutkevich and Ehrens (2022) defined implementation as “the execution or practice of a plan, a method or any design, idea, model, specification, standard or policy for doing something”. In the context of this study, implementation refers to the practical use of ICTs in teaching learners in inclusive primary schools.

1.18 CHAPTER OUTLINES

Chapter 1: Orientation to the study:

This chapter covers the background to the study, statement of problem, aims of study, rationale for the study, research questions, Literature review, theoretical framework, population and sampling, research methodology, ethical considerations, definitions of terms and an overview of the research project.

Chapter 2: Literature review:

The researcher reviews and discusses previous research relevant to the present study.

Chapter 3: Research methodology:

It gives details of the research methodology adopted by the researcher in this study. It elucidates the research approach and design, instrumentation and data analysis.

Chapter 4: Data presentation, analysis and discussion:

In this chapter, the researcher discusses the presentation and analysis of the qualitative data and study findings.

Chapter 5: Summary, Conclusions and recommendations:

This chapter presents a summary, conclusions of the research, the limitations of the research and recommendations.

1.19 CONCLUSION

This chapter covered the following aspects: introduction and background, rationale for the study, significance of the study, theoretical framework, literature review, purpose and

aims of the study, research methodology, trustworthiness, research ethics, limitation and delimitations, definition of key concept and the chapter outlines. The next chapter reviews the related literature.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The aim of the study is to determine the teacher's attitude towards the use of Information and Communication Technology (ICT) in inclusive primary schools. This chapter presents the review of related literature in an attempt to answer the main research question and the study's sub-research questions and objectives as outlined in section 1.4 of Chapter 1. The literature review in this chapter is therefore presented in an endeavour to examine teachers' understanding of the use of ICT in inclusive primary schools, investigate factors that determine teacher's attitudes towards the use of ICT in inclusive primary schools and

establish ways in which teachers' attitudes towards the use of ICT in inclusive primary schools can be enhanced. The gaps to be filled by the present study are highlighted.

2.2 THE ROLE OF TECHNOLOGY IN INDIVIDUAL LEARNING

Modern society is decisively immersed in the use and application of ICT both for knowledge acquisition and the promotion of cultural, social, and economic progress. ICT helps learners to overcome their limitations imposed by learning disabilities. It serves as excellent and real stimulators of knowledge. This promotes effective communication and fosters dialogue in learning spaces.

Individual learning is promoted in the use of technology. Technology caters for individual learning as learners acquire learning at their own pace, assimilate difficult concepts and are offered various opportunities to carry out research. Teachers have at their disposal a variety of options when using technology. Technology gadgets can cater for different learning styles namely, auditory, or verbal linguistic, visual or spatial, logical-mathematical, interpersonal, intrapersonal, musical and bodily-kinaesthetic. Aguti (2016) stated that the twenty-first century thinking dictates that teachers should incorporate ICTs during the teaching and learning process especially since these skills are needed to cope with the modern world which is for the most part information-driven. Application of ICT in the classroom promotes a learner-centred approach within the teaching and learning environment. Sipila (2014) pointed to research that has revealed the relationship between attainment of teaching outcomes and teachers' use of ICT with opportunities that support the teaching process and allow learners to have positive learning experiences.

2.3 TEACHERS' UNDERSTANDING OF THE USE OF ICT IN INCLUSIVE PRIMARY SCHOOL

The presence of computers in school laboratories as well as the use of technology in classrooms to replace traditional methods of teaching does not imply ICT integration. Nkula and Krauss (2014) saw the creative use of technology as key to integration of ICT as well the promotion of ICT skills in learners that are directly beneficial to cognitive skills. ICT is increasingly becoming a part of our social, political, economic and education systems.

Palomino (2018) postulated that ICT in the school context are resources that encourage the development of learners and facilitate learning so teachers should direct their efforts to helping learners acquire and be able to use tools that support these goals. One of the inescapable attributes of the twenty-first century is the teacher's ability to interact with knowledge which is a factor in teacher development as well. Svendsen (2020) advocated for the interaction of teachers and experts to exchange knowledge as part of professional development endeavours.

ICT is a broad concept in the twenty-first century that has the potential to enhance and accelerate teaching and learning. Ballew, Omoto and Winter (2015) stated that ICT facilitates new ways of knowledge acquisition and offers opportunities for users to operate digitally without time or geographical constraints. ICTs, therefore, help to optimise time in the process of upskilling learners and enhancing their learning capacity. Alpher and Goggin (2017) and Khetarpal (2015) argued in favour of an educational system that is invested in the concept of inclusive education and leverages diversity with all its challenges and opportunities, to ensure a profitable and beneficial experiences for learners. ICT promotes scientific and cultural understanding in learners with diverse educational needs. Rodríguez, Almerich, Gargallo and Aliaga (2013) acknowledged the positive attitudes of teachers towards ICT but found that they also exhibited uncertainty on how best to integrate these technological aspects as a pedagogic and didactic element in their teaching.

Teachers understand that technology helps to improve engagement among learners (Halili, 2019). Technology gives learners an opportunity to have more fun and enjoyment while learning. The learners get to participate effectively during lessons. Technology also promotes and encourages collaboration. Learners can practise collaboration through engaging in various online activities.

Teachers understand that ICTs can add value to the learning of key skills in the twenty-first century. ICT use enhances subject learning; for example, ICTs add value to the learning of key learning areas like literacy and numeracy. Kundu, Bej and Dey (2020) suggested that students in schools have high expectations of ICT integration in the

classroom as the modern generation is born and grow up using technology. ICT integration in the classroom has, thus, become very important.

Teachers understand ICT as tools that can help them do effective lesson preparation. According to Ghavifekr and Rosdy (2015), there multiple ways of using ICT that allow both teachers and students to learn. Technology facilitates data storage, information management and access to useful educational databases. Learning can be made more exciting and appropriate using such digital tools such as audio and video recordings, online assessments, presentation tools and tools for collaboration. Basically, technology driven teaching options offer numerous opportunities for creativity which captures the attention of all participants in the learning process.

Integration of technology could be relatively easy if teachers understood ICTs. Ghavifekr and Rosdy (2015) identified teachers' attitudes as key in determining whether or not to implement ICT in schools given the fact that teachers are the drivers of change within their respective educational contexts.

2.3 FACTORS DETERMINING TEACHERS' ATTITUDE TOWARDS THE USE OF ICT

Research indicates that there are various factors that impact teachers' attitudes towards the use of ICTs, namely, self-efficacy in technology, scarcity of software in schools, lack of appropriate and adequate technology and school leaders' interest in the implementation of ICTS. MacCallum, Jeffrey and Kinshuk (2014) asserted that the underutilisation or neglect of the implementation ICT is the responsibility of teachers. Steyn and van Greunen (2014) suggested that barriers to using ICTs are associated with teachers' ways of seeing, doing things, changes in pedagogy, personal preferences, and teachers' attitudes. Mathipa and Mukhari (2014) contended that teachers are the key role players in the successful integration of ICT in teaching and learning and are also agents of change, which, to a large extent, makes the use of ICT dependent on them.

2.3.1 Self-efficacy in technology

Some teachers do not value ICT integration in their classroom activities but are still using their traditional pedagogical practices. Some of the determinants of ICT application are

teacher-driven factors including such things as beliefs, attitudes and demographics which are referred to as “first order barriers” (Ndibalema, 2014:2; Afshoni, Bakar, Luan, Samah & Fooi, 2009:79). Fear of change can impede the usage of technology in classrooms. Hermans, Tondeur, van Braak and Valcke (2008) and Liu (2011) contended that teachers have their own idiosyncratic notions and philosophy of how teaching and learning interactions should be conducted, which include assumptions on how students learn as well as the way instructional contexts need to be managed. In other words, every teacher has their own preconceived ideas about the learning process. Judgements, beliefs and decisions influence teachers’ actions and the positions they take in relation to the facilitation of learning. Beliefs and general attitudes on matters of education and teaching practice are instrumental in motivating teachers either to adopt ICT or ignore it as they evaluate how technology may fit within their learning framework. However, they should realise that available technologies open avenues for them to adopt new and more effective approaches in facilitating learning that are superior to traditional approaches. Failure to employ ICT may hamper advances in the educational space. This places a premium on the use of ICT by teachers if positive educational goals are to be attained.

It is an undisputed role of teachers to give guidance to students so that they achieve their educational goals. Thus, teachers should own this prerogative. Teachers’ attitudes may pose difficulties where the use of ICT is concerned in education. According to Steyn and van Greunen (2014), the teachers’ thought process and not only skill is key to the incorporation of ICT in learning spaces. That notwithstanding, their level of skill plays a part in how successfully ICT is integrated in teaching as well.

2.3.2 Barriers to using technology

The potential uses of ICT have become a consideration in education planning but urban and peri-urban economic differences present a challenge for educational policy makers and planners. Like many other developing countries, the digital divide as well as other impediments work against successful implementation ICT in classrooms although South African urban schools have had reasonable success in this area.

Among the barriers inhibiting proper integration of ICT in teaching and learning, Nkula and Krauss (2014) included a lack of skills, lack of equipment and lack of confidence among teachers who may sometimes regard their learners as more adept in technology than they are. Although the use of ICT in schools is important, teachers feel that lessons and teaching time can be disrupted by learners who are obsessed with using their gadgets during instructional time, thus diminishing the teachers' ability to fully control the teaching process while other learners may simply pretend that their devices are not functional.

The perversive and ubiquitous nature of ICT has presented numerous challenges for teachers as learners are immersed in technology and digital devices, thus overextending the teachers who need to safeguard the learners against cyber risks relating to privacy and general safety among other things. The general expectation is that teachers should employ pedagogical practices that inculcate in learners. problem solving abilities as well as being able to transfer learned skills across various learning contexts. Aguti (2016) asserted that it is a necessity for teachers to introduce learners to digital platforms and devices as early the primary school phase by integrating digital competencies in the learning environment.

2.3.3 Scarcity of software in schools

The digital world offers a myriad of online resources which can enhance the teaching practice if well-used. Teachers have at their disposal several digital options to select in order to upgrade traditional practice and leveraging technology for better learning for students. ICT promotes inclusion of learners with special needs and can enable them to have access to essential material and special ICT tools. Fernández Batanero and Colmenero Ruíz (2016) suggested that there seems to be less use of ICTs in inclusive education classrooms and is concerned about the accessibility of resources.

While the use of ICT in education offers an opportunity for schooling, access is an issue in developing countries and South Africa is not an exception (Steyn & van Greunen, 2014). It is not every school in South Africa that has facilities for ICT use. One of the three main barriers to the adoption of ICT in education identified by the White Paper on E-Education in South African Schools is its integration into mainstream learning processes.

While that is the case, the government still requires that the curriculum integrates computer literacy as an overarching requirement for learners across learning disciplines (DOE, 2004).

Lack of access to ICT resources can impede use of ICTs. This means that quantities and appropriate models of ICT equipment to serve the needs of both students and teachers adequately are not always optimally available (Wilson-Strydom, Thomson & Hodgkinson-Willams, 2005). Access to resources is important if teachers are to ensure ICT is integrated into lessons. However, even if resources are accessible, it does not mean that everyone will use them. Furthermore, it can be observed that in schools' people who use ICT are mainly support structures such as administrators, technologists, and other professionals (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012). Inadequate hardware and software limits schools in their bid to integrate ICT. Teachers must be trained in a constructive manner that provides a non-threatening environment where teachers can gain confidence in using technology.

Dube, Nhamo and Magonde (2018) claimed that school rules on the use of computers in terms of frequency of use and availability are also key factors in the ICT integration discourse. ICTs in most schools are available only for specific subjects. In some schools, the number of computers does not tally with the number of learners. In some cases, laboratories are overcrowded and sharing of computers is a common practice during lessons. Laaria (2013) argued that the provision of ICT infrastructure does not necessarily stimulate good teaching practice, nor does it improve prospects for learners. What is important is how ICT is employed in facilitating education.

2.3.4 Lack of appropriate training and adequate technology

Greer, Koran and White (2016) identified several characteristic barriers in schools which include inadequate instructional time, rudimentary ICT resources, poor training of ICT users, unclarified vision and mission statements as well as lack of adept leadership. Greer et al. (2016) attested that, while these barriers are present and detrimental to ICT adoption and integration, the influence and characteristics of teachers are cardinal in determining the overall outcome of ICT use. The willingness of teachers to integrate ICT is governed

by their own ability and skills and the absence of these skill will doubtless prevent progress in ICT integration in teaching and learning spaces (Agbo, 2015). It can be assumed that teachers are key to the successful use of ICT in the learning context. Hart and Laher (2015) and Tedla (2012) described barriers affecting developing continents such as South America and Africa as a lack of ICT infrastructure and the requisite support for it because of the existence of a digital divide and access constraints as well as endemic poverty, poor training and non-involvement of parents and the community at large. Lack of parental involvement also impedes ICT integration. Fu (2013) suggested that teachers should keep an open mind about integration in classrooms. It is of paramount importance that teachers learn new teaching strategies to adopt when teaching with technology. According to Liu (2011), teachers who uphold a constructivist (learner-centred) view of learning have a better chance of integrating ICT into the classroom activities than those with traditional, teacher-centred views. Ang'ondi (2013) observed that although some teachers have an interest in acquiring ICT skills, others see it as an unnecessary, huge burden and so will either go late to training sessions or may not show up at all. It is almost impossible to convince these teachers to believe that acquiring ICT skills is essential for their jobs. Chigona, Chigona, Kausa and Kayongo (2010) and Cantrell and Visser (2011) contended that teachers often regard the use of technologies as an add-on rather than an integral part of teaching on the modern classroom.

Assan and Thomas (2012) asserted that teachers need multiple skills in classrooms and it is paramount that teachers acquire technological skills to facilitate ICT integration in learning. Furthermore, inadequate time spent in the use of technology is likely to diminish computer self-efficacy in teachers and eventually a lower propensity to use ICT. However, Molotsi (2014) contended in his study that teachers' ICT competencies might be the sole contributory factor to why ICT integration is not well off the ground within the South African education system. The increased use of technology could result in proficiency in ICTs.

2.3.5 School leaders' interest in the implementation of ICT

School leaders should spearhead the use of ICT in schools for them to be effectively successful. Steyn and van Greunen (2014) framed the concept of good leadership as identifiable in competencies that lucidly articulate vision, entrench collective goals, supporting the development of individuals and create a responsive culture to innovation which should then inspire speedy integration of ICT into the cultural ethos of the school. It is therefore of paramount importance that school leadership in all its forms must assimilate technology and be technically adept in the use of ICT and related administrative and management requirements while being sensitive to the social dimensions informing the use of ICT in schools.

2.4 ENHANCEMENT OF TEACHERS' POSITIVE ATTITUDES TOWARDS THE USE OF ICT.

ICT is widely seen as enhancing learning in both schools and homes. Chigona and Mooketsi (2014) asserted that the role and the perspective of teachers have become highly relevant, highlighting them as role players in ICTs. Teachers use technology depending on their perceptions and their trust in the way it can contribute to the teaching and learning process. The availability of ICTs in schools can enhance teachers' positive attitudes towards the use of ICTs. ICTs should not just be seen as tools but should be viewed as important instruments to support new ways of teaching and learning. Using up-to-date hardware and software resources is a key feature to diffusion of technology (Agbo, 2015). Teachers who have computers generally use them for research in their classes where the availability of the devices determines whether computers are used in that context. Generally, the presence of computers and other electronic and technical devices prompts teachers to be more amenable to use them for instruction simply because of ease of access.

2.4.1 Training

Ndibalema (2014) was of the view that for ICTs to be effectively used and challenges to be met, it is important to prepare teachers for rotation of responsibilities in their places of work, thus making them more agile and amenable to accepting the application of ICTs in teaching, especially since the workplace is in a state of constant transformation. ICTs

should be leveraged to empower teachers to be able to navigate activities that were not part of their original training thus effectively adapting to the demands of an evolving work context. For effective implementation of ICT use in education, there is a need for a paradigm shift from essentialist approaches that are inherently instructional to an espousal of constructivist approaches to teaching and learning. The nature and composition of pre-service and post-service training is an obvious determinant of teachers' abilities to apply technological skills that are commensurate to modern societal, educational, and economic demands. Teachers are expected to be able to give proper guidance to learners to assist them in problem-solving as well as readying them for the world of work. Faced by a dynamic and technology-driven era, teachers should conform to the reality that they need upskilling themselves to be able to cope and to improve their skills in the use of technology in classrooms (Cuban, 2013).

Learning institutions should help teachers develop a culture of acceptance of ICTs. Agbo (2015) regarded the importance of teacher-training institutions in availing programmes that advance the understanding of technology and how new technologies can be leveraged cognisant of context, culture and prevailing economic needs. This will capacitate teachers in the use of ICT for education. Parents and community support can enhance ICT use in schools. ICTs improve learning and eradicate traditional methods of teaching and learning.

2.4.2 Time to use technology

There is a need for a systematic approach to create time that allows teachers to use technology in classrooms. Ensaf (2014) made the point that the initiative to use available technological resources in the application of ICT in teaching and learning should be the teachers' prerogative. Pratt (2014) identified a correlation between teachers' application of technology in their practice and enhanced performance of students. ICT offers a myriad of tools that aid information-gathering which helps students in classrooms as well as other diverse learning artefacts such as videos and images that accommodate various learning needs of students. Furthermore, ICT promotes the creation of communities of practice by connecting teachers through messaging platforms and providing professional resource-

sharing that is beneficial to the educational cause. Globalisation and rapid technological changes have led to concepts of a borderless world when it comes to teaching and information dissemination. Through this vision, teachers have developed positive attitudes towards the use of ICT as they are tools that can enhance effective planning and lesson delivery. Mulega, María and Prieto (2018) supported the above views as they were of the opinion that many studies in the field of ICT influenced teachers' acceptance of the usefulness of ICT in their lessons and influenced their integration of ICT in teaching and learning. ICT can be used by teachers for keeping track of learners' progress in learning.

2.4.3 Planning

Mathipa and Mukhari (2014) emphasised the importance of planning prior to the implementation of ICT integration into the curriculum stating that teachers should carefully identify appropriate tools for use in their respective teaching contexts aligning those tools to learning objectives. It is, therefore, very important for teachers to take time to reflect and interact before integrating ICT in teaching and learning. There are several instructional design models that help teachers to integrate ICT into the school curriculum. Teachers need to set objectives that are relevant to ICT integration. Teachers need to reflect on workable protocols for integrating ICT into teaching and learning considering several perspectives in application. Ndibalema (2014) alluded to the fact that some teachers use ICT for teaching in inclusive schools while others are still reluctant to do so. Internet use by teachers is evident in regard to information searches as well as videos that cover applicable concepts for teaching. There should be an alignment between what teachers are taught and the manifest needs in current society. As such, new teaching approaches and tools should be introduced in classrooms and be modelled in such a way that they promote enhanced learning experiences for students.

2.4.4 Access to technology

Computers must be made available in schools so that teachers can explore websites and find information that can help the learners (Ndibalema, 2014). ICT has made it possible

for teachers to take advantage of websites and software to collect information and to establish functional web-based learning contexts. The benefits of ICT for students are evident in that it offers learning experiences in which learners actively engage with learning materials and extrapolate knowledge in a self-directed manner which is good for their cognitive development.

2.4.5 Professional development

Dambudzo (2018) stated that ICT integration must be given careful consideration by the policy makers if the implementation of ICT in the classroom is to be effective and produce citizens with modern skills. The success of technology lies in the professional development of teachers' attitude. Üredi (2013) pointed out that if teachers' attitudes towards a particular situation were positive then the possibility of making the right decision concerning such situation was high. This positive attitude meant that teachers understood the valuable impact of ICT in education. Effective training of teachers to use technology would aid teachers to use ICT in an effective way. Teachers would use technology if they were given more opportunities to practise with technology and learn to collaborate. In other words, teachers that are exposed to technology are likely to use ICT better. ICTs are an inescapable part of what makes up industry and modern society and the range of ICT is evolving rapidly. In addition, Ghavifekr and Rosdy (2015) contended that teachers need to constantly use technology to build confidence and refine their competencies to establish trust in the use of ICT in the education context.

Alignment to aims, purpose and values plays a major role in ICT use in schools. Chapman (2013) posited that where people find it difficult to align and associate with organisation aims, then most motivational ideas and activities will have a reduced level of success. Motivation mobilises people's commitment to work. It further influences both positive and negative aspects in ICT use. If teachers are given more encouragement to use ICTs, they will use them effectively to teach.

Improvement of teaching practice among teachers is impacted significantly by their attitude towards the use of ICTs. Ertmer et al. (2012) suggested that a change in attitude and beliefs is key and can be encouraged by empowering teachers and giving them

knowledge and requisite expertise in the use of ICT and its integration into their daily work.

Teachers need Continuous Professional Development (CPD) in education so that they can use ICTs effectively. Mukhari (2016) ascribed the reason for hesitancy and poor attitudes towards the use of ICT among teachers to poor training or lack thereof. This has the negative outcome of preventing the successful introduction and use of technological resources in classrooms. The absence of training in the use of ICT in special education contexts obstructs effective learning opportunities for students. ICT skills for teachers empower them to successfully navigate the use of technology in teaching and learning contexts.

ICTs can be used to support change and improve existing teaching practice. Digital technologies provide for self-directed and collaborative learning opportunities. There is a growing consensus that ICT use and e-learning have serious implications for teachers and learners.

Teachers understand ICTs as tools that can help them create more 'learner-centric' learning environments. The learner-centred approach can be enhanced with technological gadgets. However, Tedla (2012) decried the reliance on ICT resources as the sole vehicle for enhancing teaching and learning. It is, therefore, necessary to ensure that teachers are intensively taught to use ICT and are guided on the proper integration of such skills into their pedagogical practice and knowledge. As such, it is of paramount importance that teachers receive the requisite training to augment their teaching skills and ensure that there is full integration of ICT skills within their teaching practice.

Achievement of educational goals is an essential ingredient in the acquisition of knowledge, given the new role of tutors in dynamic and ever-changing contexts. Thus, teachers should direct their efforts to helping learners to acquire and be able to use tools that support these goals. One of the inescapable skills needed in the twenty-first century is the ability to interact with knowledge, which is a factor in teacher development as well. Uche et al. (2016) advocated for teachers and experts to exchange knowledge as part of CPD.

2.5 THEORETICAL FRAMEWORK

The theoretical framework for the study is Vygotsky's (1962) social learning theory grounded on social interaction in the development of cognition. Through social learning theory, various teaching practices which aim to improve the cognitive abilities of students by allowing them to engage and solve problems independently play a pivotal role in students' understanding of content. The framework helps to reveal the teachers' interactions with ICTs in the classroom leading to revealing their perspectives and attitudes towards ICTs. Seraji, Ziabari and Rokni (2017) concurred that the issue of attitudes of teachers towards technology is not a new one: it has been around since computers were first placed in the classroom. Positive attitudes towards the integration will improve both teaching and learning outcomes.

For teachers to understand technology it is imperative that they understand that technologies offer new opportunities for promoting knowledge acquisition to enable users to navigate the digital world. Inadequate access to ICTs resources can impede use of ICTs. Teachers cannot interact effectively when using technology if there are scarcity of resources and lack of adequate training. Teacher's positive social interaction with ICTs can be enhanced through teacher's acceptance of ICTs. The effective integration of ICTs into pedagogical practices has the potential to contribute positively to learning at schools (Lim et al., 2013; Ndibalema, 2014; Nkula & Krauss, 2015).

2.6 CONCLUSION

The purpose of this chapter was to provide literature with regard to uses of ICT in inclusive schools. This chapter has reviewed literature related to teachers' understanding of the use of ICT in inclusive primary schools, the factors that determine teachers' attitudes towards the use of ICTS and the enhancement of teachers' positive attitudes towards the use of ICTs. The next chapter discusses the research methodology employed in the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed related literature and in this chapter, the research approach, paradigm and research design was discussed. In this chapter, the desired research approach, paradigm and research design are discussed. As already indicated in Chapter 1, a qualitative research approach was selected as well as an interpretivist paradigm which entails a phenomenological approach to the research project This Chapter will clearly demonstrate the chosen research design including the justification of why such a research design was found to be suitable, the trustworthiness of the study and the ethical considerations.

. 3.2 RESEARCH APPROACH AND DESIGN

The study used a qualitative research approach because it sought to explore the teachers' perceptions, opinions and feelings towards the employment of ICT in inclusive primary schools. Rudestam and Newton (2013) defined qualitative research as, a process or systematic inquiry into the meanings which individuals employ to form sense of their experience and guide their actions. It's a hunt approach that's also concerned with behaviours wherein interest isn't meant to prove or test a theory. Becker et al. (2019) concurred by adding that, in qualitative research, although theory can emerge, existing theory isn't ignored because it influences how one conducts the study using the body of information, they'd have acquired from the literature review. Another important aspect during this qualitative research is that the quality of reflexivity where the researchers' beliefs, judgements, and practices and the way these have influenced the research (Hammond, 2017).

Qualitative research aims to illuminate and clarify the meaning of social actions and situations (Mohajan, 2018). A qualitative research design is an inquiry in which researchers collect data in face-to-face situations by interacting with selected persons and it analyses people's individual and collective social actions, beliefs and perceptions (McMillan & Schumacher, 2010). Qualitative methods are effective in identifying factors which include social norms, socioeconomic status, gender roles, ethnicity and religion (Creswell & Plano-Clark, 2018). In this study, qualitative research design entailed the use of open-ended questions as participants had an opportunity to respond in their own words and provide detailed information about what they had in mind and the reasons for holding their views or opinions. Lutsenko and Sultanova (2018:1) emphasised that "it provides information about the contradictory behaviours, beliefs, opinions, emotions and relationships of individuals". Sutton and Austin (2015) added that qualitative work requires reflection on the part of researchers both before and during the research process, this helps in providing context and understanding for the readers.

3.3 RESEARCH PARADIGM

In line with its qualitative thrust, this study followed an interpretivist paradigm as suggested by Kivunja & Kuyini (2017) who viewed the interpretivist paradigm as a fundamental endeavour to appreciate the subjective world of human experience.Bhattacherjee, (2014) underscores this view by saying in the interpretivist mindset also known as interpretivism, individuals have consciousness, hence they are not merely coerced zombies that react to social forces in the way that positivists mean. Thus different human beings appreciate the same reality in different ways and have individual specific reasons for the motivations to do so. Pervin & Mokhtar, (2014) consolidate the above view by pointing out that the interpretivist paradigm is premised on the assumption that individuals' perceptions, ideas, thinking and the meanings that are significant to them can be conceptualized through having an insight into their cultures and environments. A long term benefit of the interpretivist mind-set is that it has an advantage in that the researcher is in direct and close contact to the participants, the situation under focus and phenomenon under study. Thus to round off the above analogy an interpretivist mindset tries to get into the head of the individuals being studied in order to unpack or

understand what the individual is thinking or making of the particular context under study, based on their everyday experiences in their unique environments. This study therefore adopted the interpretivist paradigm in order to get into the head and social constructs of inclusive teachers and understand their attitude towards the use of ICT in inclusive primary schools.

3.3.1 Assumptions of the interpretivist paradigm

Hiller (2016) opines that the fundamental difference between interpretivism and positivism is that under the umbrella of an interpretivist mindset individuals construct knowledge as they interpret their experiences of and in the world whereas under the the positivist/objectivist mind set knowledge is simply there to be identified and collected. While concurring, Dudovyskly (2018) contends that interpretivism is based on the assumption that reality is subjective, multiple and socially constructed. That is to say we can only understand someone's reality through their experience of that reality, which may be different from another person's shaped by the individuals' historical or social perspective. In rounding up the above Myers (2018) underscores the above analysis by pointing out the interpretive researchers assume that access to given or socially constructed reality is only possible under social constructions such as instruments, shared meanings, language and consciousness. Hence in this study socially constructed reality was only possible under participant consciousness, language and instruments. The following sections discusses the interpretivist paradigm's ontology, epistemology and methodology.

3.3.2 Interpretivist research philosophy's ontology

As it is a study of being, of the nature of existence, meaning it is the study of what exists, what is in reality,, an ontological mindset makes the basic assumption that reality is subjective (Hiller, 2016). Hiller (2016) goes further to say ontological assumptions lay the groundwork for the types of questions an investigator might pursue about how the world works, which, in other words is how people act or interact with each other. Chalmers, Manley and Wasserman, (2015) support the above view by pointing out that the assumption of a relativist ontology means that one believes that the situation studied has

multiple realities, and that those realities can be explored and meanings made of them or reconstructed through human interactions between the researcher and the subjects of the research and among the research participants.

3.3.3 Interpretivist research philosophy's epistemology

Intimately related to ontology (what can be known) is epistemology which Giacomini (2014) says is a theory of knowledge concerning beliefs about how phenomena can come to be known. Pascale (2011) echoes Gianomini (2014) by pointing out that epistemology is concerned with the nature, sources and limits of knowledge and that it provides a justificatory account of the scientific production of knowledge. In other words Pascale (2015) opines that epistemology addresses how we come to know that which we believe we know, by implication this means that as with ontology, an investigator might approach the pursuit of knowledge through a range of different epistemologies. According to Punch (2015) the assumption of a subjectivist epistemology means that the researcher makes meaning of their data through their own thinking and cognitive processing of data informed by their interactions with participants. There is the understanding that the researcher will construct knowledge socially as a result of his or her personal experiences of the real life within the natural settings investigated (Punch, 2015). There is the assumption that the researcher and their subjects are engaged in interactive processes in which they intermingle, dialogue, question, listen, read, write and record research data.

3.3.4 Interpretivist research philosophy's methodology

According to Giacomini (2014) methodology is often referred to as a framework of logically related means and ends to guide research design. Echoing Giacomini's (2014) views Crotty (2018) holds the view that that methodology as a supporting rationale for decisions made in designing methods for data collection and analysis. Univerally methodology articulates the logic and flow of the systematic processes followed in conducting a research project, so as to gain knowledge about a research problem. It includes assumptions made, limitations encountered and how they were mitigated or minimised. It focuses on how we come to know the world or gain knowledge about part of it (Moreno, 2017). Constantino (2018) contends that every research question, every

methodological decision , every procedure and every data analysis has a philosophical and theoretical origin. While research is a product of the researcher its data processes are collected by interviews text messages and reflective sessions. Five types of methodology are ethnography, narrative, phenomenology, grounded theory and case study.

3.4 POPULATION AND SAMPLING

3.4.1 Population

Population is defined by Mohajan (2018) as an entire group of individuals that have one or more characteristics in common that are interesting to the researcher. In this study, the population consisted of a cluster of inclusive primary schools in District 11 of the Gauteng Province South Africa. Bhandari (2021) explained that “in research, a population doesn’t always refer to people but it can mean a group containing elements of anything you want to study, such as objects, events, organisations, countries, species and organisms”. Thus, in this study the population consisted of all the five inclusive primary schools in District 11 of the Gauteng Province in South Africa.

3.4.2 Sample

In this study, purposive sampling was used to select teachers who were to participate in the study. Creswell and Plano-Clark (2018) defined a sample as, a subset of the population or some of the recognition within the research area, which is able to be a representation of the entire population. A sample is a small portion of the population selected for interviews, observation and analysis. In this study, two teachers from each of the five inclusive primary schools were purposively selected, bringing the number of sampled teachers to 10 from the five inclusive primary schools in District 11 (D11), Gauteng province of South Africa. Two teachers in each school participated in the study bringing the sample size to a total of 10 teachers.

3.4.2.1 Recruitment of participants

The recruitment of participants commenced after the researcher had received an ethical clearance from the UNISA Education Ethics Review Committee. On getting the requisite clearance from the UNISA Education Ethics Review Committee the researcher then sent

a request email to Gauteng Province Director Education Research & Knowledge Management. The Gauteng Provincial Director's blanket approval letter dated 30th August 2021 was simultaneously sent to the five School Principals and SGB District 11 Schools. The researcher then sent a courtesy bulk request email to the five School Principals requesting for permission conduct the study. It is on this bulk request email that the researcher attached a copy of the letter of the blanket approval from Gauteng Provincial Director Education Research & Knowledge Management. The reference to bulk request email was because it was in this email that the researcher also requested the School Principals for names and contact details of four of their teachers who met the inclusion criteria as these were being requested to participate in this research.

Two of the Principals were quick to respond positively by sending names and contact details of four of their teachers who met the basic inclusion criteria. However, three of the School Principals, took their time to respond, which meant there were various prodding emails which ultimately resulted in all five School Principals, each providing the names of 4 of their educators who met the basic inclusion criteria for participation in the study. The final two of the School Principals eventually responded after the researcher had phoned and spoken to them personally on their office phone numbers which the researcher obtained from the Gauteng province directory.

After getting eligible teachers' names and contact details from the School Principals the researcher embarked on the third stage which involved the researcher emailing each of the individual ten teachers requesting them to participate in the study. Some teachers promptly responded expressing willingness to participate, while others responded after several request letters had been sent. As the ultimate aim was to get two eligible teachers at each of the five schools in District 11, the search for interviewees ended the moment the researcher attained the threshold of participants at each of the five schools. It is after getting the 10 participants' emails, broken down to two participants per schools that she started scheduling individuals for the online interviews. Overall, the entire process of getting the authority from the Gauteng Province Education Director of Research and Knowledge Management to getting acknowledgement of the eligible teachers' positive response of their willingness to participate took almost two months to be completed.

3.4.2.1 Inclusion criteria

- To qualify for selection the following were the inclusion criteria:-
- First one needed to be a primary school teacher.
- The teacher needed to be teacher at any of the primary inclusive schools in district 11 (D11) Gauteng province of the republic of South Africa.
- The teacher needed to be either male or female, thus anyone who was binary or did not classify themselves as either male or female, would not be included in the survey.
- Five of these teachers needed to be men while the other five needed to be women.
- The other features which the individual participants needed to satisfy was that they should have been working as a teacher in an inclusive primary school setting since 2010. Also the other key feature which participants needed to was that they need to be at a school integrating ICT in its teaching and learning, not resorting to exclusively traditional teaching methods.
- **3.4.2.2 Exclusion criteria**
- Any individual who was not a teacher was excluded from the study.
- Anybody who was a teacher qualified but if they were not part of the 5 inclusive primary schools in the District of Gauteng province, they were excluded.
- Any individual who was a secondary school teacher was excluded, which was also the case if they were a teacher at a primary school which was not inclusive.

3.5 INSTRUMENTATION AND DATA COLLECTION STRATEGIES

3.5.1 Data Collection Procedure

When planning the data collection procedure at proposal stage, Gauteng province was under strict COVID 19 induced lockdown, hence arrangements made with the School Principal specifically stated that data collection was going to be strictly on-line as there

were special lockdown-specific COVID 19 protocols which made face to face interviews impossible to conduct. However, come data collection time in September /October 2021, the COVID 19 lockdown regulations had been relaxed although the COVID 19 protocols like social distancing, sanitizing prior to entering enclosed spaces, wearing face masks still remained in force. Thus the COVID-19 pandemic made it impossible for the researcher to conduct face-to-face interviews with each of the the 10 interviewees who were purposefully selected as data sources in the research.

3.5.2 Observations

In this study, the researcher used the non- participant observation method as classroom teachers were teaching in their classroom, which was actually their natural setting. The researcher was able to compare the interview notes with teachers' attitudes and experiences in using ICTs in their teaching and learning environment. The researcher made use of an observation sheet (Appendix D) and some writing pad or note book to take short notes during observations. Non-participant observation was used as a data collection method as it helped the researcher to be familiar with the classroom environments being observed to corroborate the findings from the in-depth interviews. According to Cohen, Manion and Morrison (2018:542), observation is "a process of systematically looking and noting people, events, behaviours, settings and routines." The Centre for Disease Control and Prevention (CDCP, 2018:2) concurs by defining an observation as "the way of gathering data by watching behaviour, events, or noting physical characteristics, in their natural setting." The CDCP (2018:2) goes further to point-out that observations can be carried in an overt manner, "when everyone knows why they are being observed" and covert "when no-one knows they are being observed, hence observer will be concealed." In this study the researcher notes that as this was a classroom situation, there was no way she could have conducted an observation while concealed, hence she conducted an overt observation as a non-participant observer.

In the observation process, Covid19 protocols were adhered to by the researcher who made sure that every time she visited the classes she wore wear a mask, sanitized before entering a classroom and observed social distancing rules by sitting about a meter from the nearest learner (Appendix L). Observations in this study comprised closely monitoring

and examining the attitudes of teachers towards the use of information and communication technologies in Inclusive Education primary schools in an effort to answer research questions. Observations were undertaken to corroborate the data collected during interviews or to find out if there was consistency to the teachers' deeds (Saunders et al., 2018).

Observations were undertaken following two class visits per-school, from school A to school E and remarks which the researcher was entering on each of the visits to indicate the date and time of visit as well as notes commensurate with findings. The notes and remarks clearly showed, that all schools were visited and findings show two entries per school, some on same date but on different times while other entries show visits to the same school of different dates, indicating the two teachers at each school. Also elaborately indicated were the subjects covered/observed, namely English, Mathematics, for School A, Life Orientation and EMS for school B, Geography and Social Science History for school C, Life skills and English for school D and PSW and Natural Science & Technology for school E. Also recorded by the researcher were the ICT equipment used and the fact that none of the lessons were conducted in the computer lab.

Other issues noted by the researcher during the visits were lesson duration level of teacher understanding of subject, whether teacher used traditional way of teaching or computer based learning, level of learner participation, how well organized the lesson was, teaching method used and the time spent in each class. (Appendix L for observation notes used for this study.

3.5.2 In-depth Interviews

The data was collected through one-on-one in-depth interviews with open-ended questions (Appendix H). The in-depth interviews gave the researcher a platform for posing open-ended questions about the views, opinions and perceptions of teachers towards the use of ICTs in inclusive primary schools. Creswell and Creswell (2018) stated that an in-depth interview is a qualitative data collection method which allows a researcher

to pose questions to participants with the aim of learning more about their views, opinions and beliefs (in this study, about the use of ICT in an inclusive primary school).

Okeke and Van Wyk (2017) posited that an in-depth mode of interviewing is flexible and encourages and probes the research participants to freely articulate their views and perceptions on the subject under discussion. In this study, the researcher used verbatim information in order to achieve a holistic understanding of the teachers' perceptions, views and opinions towards the use of ICTs in Inclusive primary schools in District 11 of the Gauteng Province. The researcher used in-depth interviews deliberately to probe concepts more deeply in order to examine teachers' understanding of the use of ICT, to investigate factors that determine teacher's attitudes towards the use of ICT and to establish ways in which teachers' attitudes towards the use of ICT can be enhanced. Saunders, Sim, Kingstone, Baker and Waterfield (2018) asserted that in-depth interviews can be particularly good at exploring feelings and beliefs or at obtaining a rich understanding of how an issue unfolded and what it meant to the interviewer. In this study, due to the COVID-19 pandemic, interviews were conducted virtually using Microsoft Teams video conferencing software. Table 3.1 shows the schedule for the interviews.

The researcher also noted some disadvantages that came with in-depth interviews, foremost was the fact that in-depth interview were quite time consuming, as there was need to transcribe the data, organize it , analyse it and report on the findings. Steber (2022) expressed the fear that at times in-depth interviews can be relatively costly as compared to other data collection methods. This researcher was lucky because this was the period for the change-over from the COVID 19 induced lockdown period, hence while some participants insisted on face to face interviews others were content with on-line in-depth interviews which reduced the costs markedly. Steber (2022) further points out that some participants expect incentives to participate, this researcher was lucky because this study was precipitated by palpable challenges that these teachers were facing hence, participants expected tangible benefits from this research, the issue of incentive was thus never raised.

Table 3.1: Interview schedule for data gathering by the researcher

Date	Time	School & teacher pseudonym
10/09/2021	1700hrs	School A T-1
11/09/2021	2000hrs	School A T-2
13/09/2021	1800hrs	School B T-1
14/09/2021	1745hrs	School B T-2
15/09/2021	1800hrs	School C T-1
16/09/2021	1700hrs	School C T-2
17/09/2021	1900hrs	School D T-1
18/09/2021	1800hrs	School D T-2
23/09/2021	1900hrs	School E T-1
27/09/2021	1800hrs	School E T-2

Microsoft Teams Video Communications (2016) cited in Archibald, Ambagrsheer and Casey (2019:2) defined Microsoft Teams as a "collaborative video conferencing service offering features including online meetings, group messaging services and secure recording of sessions". While Archibald et al. (2019) acknowledged that there are other comparable platforms like Skype, they felt that Microsoft Teams has several advantages over Skype.

The researcher was then compelled to download the Microsoft Teams software and through phone calls requested the participants to do the same. Thereafter, the researcher took the opportunity to schedule the meetings and as follows, individual interviews were then conducted with each of the 10 teachers on the dates and times indicated on the schedule above. The following issues are worth noting, first the researcher had an unstructured interview guide, which had a common set of questions to guide the researcher during the interviews. This applied to each and every one of the 10 interviews that the researcher conducted. This listed questions served as a general guide and reminder of the pertinent topics and questions that were to be asked. This was consistent with what Creswell (2018) advocated as the advantage of using an unstructured interview

guide, in fact on several occasions a follow up question (not on the list of pre-set questions) would prop and the researcher would ask the interviewee to fill a gap of an idea that would have arisen as a result of the response given by the interviewee.

While on the whole the on-line interviews went on well with the researcher and interviewees using English as the medium of communication, there a few glitches that were listed below; as for the medium of communication English was the main language, there were instances when the interviewer and interviewee would resort to code-switching with the communicators either using isiZulu or Sotho as alternative languages to clarify issues during the interviews or even to consolidate on matters that required to show a common meeting of minds. This is normal in South Africa as it is a multilingual society where code-switching between these three languages transcends the entire social discourse in formal and informal discussions.

As already alluded to them some of the challenges which the researcher faced were as follows, while Microsoft teams downloading went on smoothly .Power cuts would at times disrupt the interviews, which would be help on different days, fortunately this only happened once although the interviewee vented their displeasure at the researcher, luckily they were prepared to soldier on. At times there were network challenges as the connection would be very bad such that the session had to be rescheduled to some other day, this happened twice.

However when the connection was re-initiated one of the interviewees had forgotten about the interviews. The researcher understood this interviewees' frustrations because some of these interviewees were coming in when interviewees were enjoying quality time with their families. The interviews unfortunately were being held after school times and this is where participant's quality time was interfered with. One of the interviewees rescheduled their interviews three times as they said they had had visitors at home. In the end the researcher was glad when the 10 interviews came to finality and the data presentation and analysis process began he researcher made sure that once the meeting had started, she requested permission from the interviewees to record the meeting. The research chose to conduct observations first so that she could ask more about ICTS in Microsoft teams interviews.

3.5.3 Observations

In this study, the researcher incorporated the non-participant observation method to observe teaching and learning activities as classroom teachers were teaching in their classrooms, which were their natural settings. The researcher was able to compare the interview notes with teachers' attitudes and experiences in using ICTs in their teaching and learning environment. The researcher made use of an observation sheet (Appendix I) and a notebook to take short notes during observations. Non-participant observation was used as a data collection method as it helped the researcher to corroborate the findings from the in-depth interviews. According to Cohen et al. (2018), observation is "a process of systematically looking and noting people, events, behaviours, settings and routines". The Centre for Disease Control and Prevention (CDCP, 2018:2) concurred by defining an observation as "the way of gathering data by watching behaviour, events, or noting physical characteristics, in their natural setting". The CDCP (2018:2) pointed out that observations can be carried in an overt manner, "when everyone knows why they are being observed" and covert "when no-one knows they are being observed, hence observer will be concealed". In this study, the researcher notes that as this was a classroom situation, she could conduct covert observations, and conducted overt observations as a non-participant observer.

In the observation process, COVID-19 protocols were adhered to by the researcher who made sure that every time she visited the teachers she wore a mask, sanitised her hands before entering a classroom and observed social distancing rules. Observations in this study comprised closely monitoring and examining the attitudes of teachers towards the use of ICTs in inclusive primary schools to answer research questions. Observations were used to corroborate the data collected during interviews or to find out if there was consistency with the teachers' actions (Saunders et al., 2018). In other words, observations in this study were used to triangulate the data obtained from the in-depth interviews (Webb, 2017). Triangulation refers to the use of multiple tools (e.g., interviews and observations) in studying the same phenomenon for the purpose of increasing study credibility. This means that triangulation is the combination of two or more methodological

approaches, theoretical perspectives, data sources, investigators and analysis methods to study the same phenomenon (Webb, 2017).

3.6 DATA ANALYSIS

Data analysis entails a process where the researcher tries to understand what they have studied and to continuously refine his or her interpretation. In this study, the gathered data was thematically analysed according to the identified themes or list of responses from direct quotes obtained from interview transcripts for example, qualitative methods ask mostly, “open-ended” questions that are not necessarily worded in exactly the same way with each participant. With open-ended questions, participants are free to respond in their own words, and these responses tend to be more complex than, “yes or no” (Creswell & Creswell, 2018). Sekaran and Bougie (2016) stated that in qualitative research, data is mainly generated from the transcripts of audio recordings.

In this study, the sub-research questions were used to guide the researcher in deciding on the themes that were ultimately used in conducting the data analysis. The researcher did the data analyses and deduced the themes manually as she did not have QDA software. The qualitative data collected through online interviews was transcribed verbatim to reveal participant teachers’ ideas and viewpoints towards the use of ICTs in inclusive primary schools.

Each research question was broken down to sub-themes and smaller sub-themes were grouped and used as a major theme to categorize information and under each major themes were sub-themes that helped to answer the research questions. A list of the identified themes (or a list of patterns of responses) was made in order to look for a connection between them, for example, all of the talk that fitted under a specific pattern was identified and grouped (Sutton & Austin, 2015). The themes were used as headings and data was interpreted through synthesizing data into larger coherent wholes (Cohen et al., 2018). Results related to the conceptual framework were also highlighted if there is support to literature or differences.

Data was collected from the participants and thematically analysed until saturation stage was reached. In broad terms, Creswell and Creswell (2018) maintained that saturation is

used in qualitative research as a criterion for discontinuing data collection after no new information can be gleaned from the data or data is consistently repeated. In Fusch and Ness's (2015) view, if data analysis fails to reach saturation, this will negatively impact on the quality of the research being undertaken. Saunders, Lewis and Thornhill (2018) confirmed Creswell and Creswell's (2018:33) definition which says saturation is "a criterion used in qualitative research for judging when to stop sampling the different groups pertinent to a category's theoretical situation." In other words, there would be no need to collect additional data. The researcher adopted the point raised by Saunders et al. (2018) that saturation is a judgement that one makes when they have collected data that is rich and insightful and the analysis of one additional interview adds no more value. Thus, in this study, saturation was monitored continuously throughout the analysis for completeness.

3.7 TRUSTWORTHINESS

Trustworthiness of the study is essential to make sure that the findings and interpretations of the study are accurate. As emphasised by Creswell and Creswell (2018), trustworthiness is a demonstration that the evidence for the results reported is sound and that the argument made is strong. In this study, to ensure the trustworthiness of the study, the view of Ferero, Nahidi, DeCosta, Mohsin, Fitzgerald, Gibson, McCarthy and Aboagye-Sarfo (2015) was adopted, namely that to ensure trustworthiness in qualitative research, one has to apply the four dimensions criteria of truthfulness: credibility, dependability, confirmability and transferability.

3.7.1 Credibility

Credibility is about establishing that the results of a study are believable (Forero, et al., 2018). The participants are the ones who judge the credibility of the research. It links the research study findings with reality in order to demonstrate the truth of the research. It requires triangulation which involves the use of different data collection methods; for example, interviews and observations, as used in this study (Creswell & Creswell, 2018). To enhance the credibility of the study the researcher first conducted a pilot study on this

research and spent time interviewing each participant in the study. The researcher also asked follow-up questions on any new aspect that may have been raised by the interviewee. In this way the lived experiences the teachers of the use of ICT in inclusive primary schools was brought to the fore for analysis.

3.7.2 Confirmability

Confirmability refers to ensuring that the data and interpretations of the findings are not fabrications of the researcher's imagination, but interpretations based on the data (Creswell & Creswell, 2018). It helped the researcher to understand the phenomenon from the perspective of the research participants. It helps to eliminate bias. Creswell and Plano-Clark (2018) pointed out that confirmability captures the traditional concept of objectivity, which stresses the need to question whether the findings of the study could be confirmed by someone else. To ensure confirmability in this study, the researcher used more than one technique, namely interviews and observations. It is of note that during the data collection process, the researcher started with the observations, but as she could not ask questions for clarity, the researcher then took the opportunity during the interview process to ask questions for clarity on issues that may not have been clear during the earlier observation process.

3.7.3 Dependability

According to Forero et al. (2015:3), dependability ensures that the findings of a qualitative study would be similar if the inquiry was repeated under similar circumstances with other participants. In this study, the researcher prepared a detailed interview guide with an auditable and trackable record of the data collection process. This was done through providing an interview protocol and a detailed observation checklist that were based on the research questions.

3.7.4 Transferability

Transferability in qualitative research is that the degree to which the results of the research are often applicable to similar situations of research (Creswell & Creswell, 2018). In keeping with Barnes, Conrad, Demont-Heinrich, Graziano, Kowalski, Neufeld, Zamora and Palmquist (2005), transferability doesn't involve broad claims, but invites readers of research to form connections between elements of a study and their own experience.

3.8 ETHICAL CONSIDERATIONS

For any research, there comes a time when ethical issues have to be addressed. Saunders et al. (2018:72) stated that research ethics are, “standards of the researcher’s behaviour in relation to the rights of those who become the subject of the research project, or who are affected by it”. In this study, ethical issues that needed to be addressed by the researcher were informed consent, confidentiality of data gathered and anonymity of the interviewees in the study. Leedy and Ormrod (2015) maintained that most ethical issues in research fall into the following categories: protection from harm, voluntary and informed participation, the right to privacy and honesty with professional colleagues. Every effort was made to follow the above principles. The study involved human participants so the standards of research ethics had to be adhered to throughout the study to ensure that the study was conducted properly. The researcher took into cognisance the use of ethical values in research in order to develop scientifically acceptable research protocols that took into account the convenience and available time of the participants to have a reasonable chance of yielding meaningful findings.

3.8.1 Informed Consent

Informed consent forms were drafted (Appendices E – G) prior to conducting the research to ensure that the individuals participating in the research were respected and protected. Becker (2017) asserted that ‘informed consent’ refers to written consent given by an individual to participate in research. Individuals were informed about how their confidentiality would be protected. Individual participants were further informed that

participating in this research was voluntary and that they could withdraw from the study at any time they deemed necessary, without penalty being imposed on them.

3.8.2 Permission

To gather data, the researcher started by applying for ethical clearance from the Ethics Committee of the university under whose auspices this research was conducted which assessed the application and gave permission on the 2 July 2021 (Appendix B). With the Ethics Clearance form as the supporting document, the researcher in this study then applied for permission from the District Office of the Gauteng DBE (Appendix C) followed by permission from the school heads of all schools whose teachers were selected to participate in the study (Appendix D).

It is after getting the school principals' permission, the researcher approached the prospective individuals with requests for them to participate (Appendices E, F, G) (Creswell & Creswell, 2018).

3.8.3 Confidentiality

Participants were assured of confidentiality of the data that was collected pertaining to the study. Resnik (2015) was of the view that the research participants and the confidentiality of their shared information have to be kept safe form disclosure, unless they consent to the release of such personal information. The use of pseudonyms/aliases instead of the participants' real names were strictly adhered to in this research; as participants were referred to with their school's name for example School A 'T1' and so forth.

3.8.4 Participants' Protection from Harm

In this study, participants were protected from harm using Microsoft Teams features which included "user authentication and real-time encryption of meetings and real-time back-up facilities on a remote online server". These facilities provided assurance to interviewees

that what they discussed would not be able to be accessed by any other body (Archibald et al., 2019).

3.9 CONCLUSION

In this chapter, the research approach, paradigm and research design were discussed. A qualitative research approach was selected as well as an interpretivist paradigm which focused on a phenomenological research design. The chapter spells out the processes that were followed to ensure trustworthiness of the study. An outline of the ethical considerations was provided. The next chapter presents, analyses and discusses the data.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter presents the analysis of the data. The analysis is done in accordance with the research questions in Chapter 1. The study's objectives from which the main themes were formulated are: (1) to examine teachers' understanding of the use of ICT in inclusive primary schools; (2) to investigate factors that determine teachers' attitudes towards the

use of ICT in inclusive primary schools; and (3) to establish ways in which teachers' attitudes towards the use of ICT in inclusive primary schools can be enhanced.

4.2 PARTICIPANTS' BIOGRAPHIC INFORMATION

Demographic details form a background to the context of the research. Thus, according to Saunders, Lewis and Thornhill (2012), it is essential for the demographic data to be analysed in as this will ensure that the key demographic attributes about the study's participants are exposed to scrutiny. The idea behind the analysis of demographic details is to ensure that some of the emerging trends can be explained from in terms of the demographic characteristics. Thus, in this analysis, the various attributes to be discussed are age, gender, number of years' teaching experience in an inclusive school, highest qualification, grade and the subjects taught.

In this study, the identification of participants is coded as follow: T1 refers to Teacher 1, whereas T10 refers to Teacher 10, and so forth.

Table 4.1: Participants' biographic details

School	Participant code	Age	Gender	Numbers of years teaching	Teaching experience in an inclusive school	Highest qualification	Grade and subject taught
A	T1	45	F	17	7	Post Graduate Diploma in inclusive Education	History and Geography Grade 4 and 5
A	T2	37	M	10	6	Bachelor's Degree in Inclusive Education	Life –skills and EMS
B	T3	30	M	7	5	Higher Certificate in Inclusive Education	Mathematics Grade 5
B	T4	33	F	10	6	MEd Degree in Inclusive Education	Natural Science and Technology Grade 4 and 5
C	T5	49	M	20	8	Higher Certificate in Inclusive Education	Assignments and quiz
C	T6	46	M	20	8	Postgraduate Diploma in inclusive Education	Mathematics
D	T7	52	F	20	5	Bachelor's Degree in inclusive Education	Grade 7 English
D	T8	49	M	23	7	Postgraduate Diploma in inclusive Education	English
E	T9	40	F	15	5	Bachelor's Degree in Inclusive Education	Life skills - PSW
E	T10	28	F	7	5	Honours Degree in Inclusive Education	Mathematics

Source: Primary Source (the researcher in this study)

Before the commencement of interviews, teachers were asked questions concerning their gender (though a difficult question to ask), highest qualifications, teaching experience, subjects taught and the Grades they were teaching. Table 4.1 indicates the variables and attributes of teachers. The table indicates that a majority of teachers from the five schools who participated in this study had a bachelor's degree in Inclusive Education or a Postgraduate Diploma in Inclusive Education while a few held other qualifications such as Honours Degree in Inclusive Education and Higher Certificate in Inclusive Education. Only one teacher held a Master's in Inclusive Education. Male and female teachers were interviewed, with ages ranging from 28 to 52 years old.

4.3 DATA PRESENTATION AND ANALYSIS

Data presentation refers to putting across all collected data into a clear and concise manner (Saunders, Lewis & Thornhill, 2016). It also involves arranging data in such a way that it can be studied. In this chapter, the researcher analysed the data collected from teachers using thematic analysis. Various themes emerged from the recorded and transcribed data and are outlined in this chapter in accordance with the study's objectives and sub-research questions. The data presented below was collected from the in-depth interviews, followed by the data collected from the observations of participants in the classroom settings where technological equipment was used to support learners with diverse learning needs.

The below table presents the themes and sub-themes,

Table 4.2: Themes that emerged

Themes	Sub-themes
Teachers' understanding of the use of ICT in Inclusive Primary Schools.	1. Availability for ICT tools in inclusive class. 2. Knowledge of use of ICT. 3. Shortage of ICT tools in schools
Factors that determine teachers' attitude towards the use of ICT.	1. Scarcity of software in schools. 2. Lack of appropriate training and adequate technology.

	3. School leaders' interest in the implementation of ICT.
Enhancement of teachers' positive attitudes towards the use of ICTs.	1. Benefits of ICT in an inclusive set-up. 2. Teacher competency. 3. Need for ICT ongoing training or refresher courses. 4. Consistent workshops for teachers.

Source: Primary Source (the researcher in this study)

4.3.1 TEACHERS' UNDERSTANDING OF THE USE OF ICT IN INCLUSIVE PRIMARY SCHOOLS

Teachers seemed to be knowledgeable about various ICT tools, stating that they used technological equipment on an ongoing basis, which included among others, the overhead projector. Some teachers indicated that their schools had no ICT tools, but the challenge went further because they did not even have any ICT tools at home, making it difficult for them to teach in an inclusive school. A smart phone was the only ICT tool some teachers had at home.

4.3.1.1 Availability for ICT tools in inclusive class

The following verbal quotes reflect what the teachers said:

> *I have a desktop and a cell-phone which I am using for* Social Sciences videos and *e-Learning* work sheets which I use for teaching. I also use these gadgets for furthering my studies*. I am also using it to give my learners current information relevant Formulas (T1, Sch-A).*

> *I do not have any device I just have a smart phone; I use this smart phone to google various concepts in my subject so as to give learners the most recent notes and examples (T8, Sch-D).*

I have a laptop and desktop, and cell phone for internet browsing and internet communications like sending emails also use my desktop to type notes which then print out for my learners to read (T9, Sch-E).

We don't have much technology at school as it is a quintile 2 school, we have laptops to type and print out worksheets. We does not use technology in classes as most classes do not cater for whiteboards etc. (T10, Sch-E).

4.3.1.2 Knowledge of use of ICT.

The teachers further highlighted that they had been using the ICT tools for more than two years. Their responses to the question on the extent to which they made use of the ICT tools that they had in class are reflected below:

I use the projector approximately three times a week. I use the projector to display notes for easy note taking by my learners. I explain the slides one by one while learners take notes. It offers my learners a better interactive experience (T1, Sch-A).

I use my smart phone for communication, teaching and learning in such a way that I research through my smart phone and type using word my lessons (T2, Sch-A)

There are no ICTs such as computers or even projectors in the in Classroom (T3, Sch-B).

I use the projector very often by projecting slides of summarised notes to make students to understand better (T5, Sch-C).

I use the desktop very often for planning my lessons and typing (T 7, Sch-D).

To a lesser extent, I use my laptop at home not at work to google various content of the subject am teaching (T8, Sch-D).

I do not use any ICT devices in the classroom. In my class, there are no projectors or even computers (T9, Sch-D.

When asked about the type of training they went through, the teachers responded as follows:

I did not receive any training in ICTs (T1, Sch-A and T9 Sch-E).

I self-trained, no formal training was done even the zoom meetings during this Covid 19 I trained myself (T2, Sch-A).

I did not receive any training in ICT I self-trained (T3, Sch-B).

We receive training two times a year, normally during school holidays (T4, Sch-D and T6, Sch-C).

No formal training, I get assistance from colleagues (T5, Sch-C and T7, Sch-D).

I have attended ICT workshops at district and school levels on the use of smart boards (T8, Sch-D).

4.3.1.3 Shortage of ICT tools in schools

The findings from one of the schools indicated that the School Management Team (SMT) had initiated the use of ICT, even though the school itself did not have adequate funds. When asked which ICT tools were introduced at the school by the SMT, the teachers shared the following views:

The SMT has purchased an overhead projector (T8, Sch-D).

The school administrators have laptops that they use to capture marks, (T9, Sch-E).

The findings of the study revealed that most of the teachers had positive attitudes towards the use of ICT and would appreciate it if their learners could have ICT tools such as iPads and smart boards to enhance teaching and learning. Teachers shared the same sentiments as reflected below:

I think if learners could have iPads and smart board that can be useful in the classroom (T1, Sch-A and T3, Sch-B).

Quiz helps learners get instant feedback, and it is fun for learners (T6, Sch-C).

I think tools like projectors, chrome books and iPads could be useful in the classroom (T8, Sch-D).

In three schools, teachers had a challenge using technological equipment and the tools listed below were found to have been used on a limited basis, especially in the inclusive teaching and learning environment.

Computers are not adequate for all learners at school (T1, Sch-A and T3, Sch-B).

Quizzes and assignments are easy for the learners to use, but we do not have much time to teach learners using these tools (T4, Sch-B).

The school has no ICT devices hence I cannot identify those with limited use (T9, Sch-E).

Blogging and video gaming in my school are used limitedly (T10, Sch -E).

4.3.2 FACTORS THAT DETERMINE TEACHERS' ATTITUDE TOWARDS THE USE OF ICT

Various sub-themes or categories that brought to the surface the teachers' attitudes towards the use ICT emerged from the transcribed data that was collected through the in-depth interviews. These include scarcity of software in schools, lack of appropriate training and adequate technology and school leaders' interest in the implementation of ICT.

4.3.2.1 Scarcity of software in schools

It was found during the interviews with teachers in the selected inclusive primary schools that the main hindrance in using ICT in teaching and learning was scarcity of software, which makes teachers develop feelings of inadequacy and limited desire or lack of

confidence to engage with ICT tools in their classrooms. The statements below were the shortcomings teachers noted with the ICT tools.

> *Learners need to be monitored so that technology tools are effective in the inclusive classroom (T1, Sch-A).*

> *I was not familiar with the use of YouTube videos, in terms of selecting them from the internet, because we do not have enough equipment (T4, Sch-B).*

> *Unfortunately, my school has no ICT devices (T9, Sch-E).*

4.3.2.2 Lack of appropriate training and adequate technology

During the in-depth interviews, it was clear that even though some of the schools could provide enough technological tools, if the teachers are not trained to use them in inclusive school settings, it would still be difficult for them to accomplish the schools' main purpose in providing technological tools. The quotes below bear reference to what teachers have said.

> *Equipment like smart boards, lack of adequate knowledge in utilising them, students at times become hard to manage due to excitement induced by the visuals on the screen (T8, Sch-D).*

> *It is time consuming to research, interpret, install and manoeuvre software that aid in the use of these white boards (T9, Sch-E)*.

When asked which ICT tools they found it difficult to use in an inclusive set-up, teachers shared their feelings as reflected in the statements below:

> *None. I think the ICTs work well in the classroom if learners are being monitored (T1, Sch-A).*

> *Personally, I feel we can use ICT tools but it is not easy to monitor learners effectively (T2, Sch-A).*

> *I need more training in Information literacy skills, because all learners enjoy these (T5, Sch-C).*

4.3.2.3 School leaders' interest in the implementation of ICT

When asked how ICT was being implemented and supported by school leaders, the responses from the interviewees generally indicated that, in most cases, the school stakeholders that showed most interest in the implementation of ICT usage were the SMTs, administration staff members and the school-based support teams. The following verbal quotes indicate what the teachers said:

> *Yes, our school leaders, the principal and SMT are very much interested in seeing us implement the use of ICTs because the submission of the electronic mark sheets to the Department of Education becomes easier (T2, Sch-A).*
>
> *Computers, I was very happy about receiving them from the SMT (T4, Sch-E).*
>
> *They were introduced during the pandemic; they were well received because they enabled us to continue with our work (T5, Sch-C).*
>
> *Everyone was thrilled when we receive these tools (T6, Sch-C).*

In some schools where the interviews were conducted with the selected teachers, it was clear that the school leaders received suggestions from the teachers but nothing had been implemented by them, indicating a negative attitude. This had generally caused negative attitudes among the teachers as well because they were not considered in decisions that affect their teaching and learning activities.

> *Teachers just accept what is offered to them as long as it makes their teaching easier (T2, Sch-A).*
>
> *Teachers are using one computer to record marks and this is a bit discouraging to them (T3, Sch-B).*
>
> *Teachers are engaging on teaching learners how to use these tools effectively, but without much confidence (T4, Sch-B).*
>
> *I feel as an educator I need training if there are new ICTS being introduced (T5, Sch-C).*

Teachers have not been given ICT devices (T9, Sch-E).

Training on how to use the different platforms to make lessons more interesting for learners has not yet been given to us (T10, Sch-E).

4.3.3 ENHANCEMENT OF TEACHERS' POSITIVE ATTITUDES TOWARDS THE USE OF ICTS.

Teachers were further asked question to determine how to enhance their positive attitudes towards the use of ICT tools in an inclusive setting. The following sub-themes emerged as the transcribed data was analysed and coded.

4.3.3.1 Benefits of ICT in an inclusive set-up

When asked to elaborate why they perceived that ICT tools were necessary to enhance teaching and learning in an inclusive set-up, teachers aired their views as reflected in the statements below:

ICT tools are useful because they make abstract concepts easier to understand (T1, Sch-A).

They make teaching and learning easy as I can use power points slides to explain concepts (T2, Sch-A).

I find ICT tools suitable to use in the classroom because they cater for various learning styles, for example, auditory and visual (T4, Sch-B).

The ICT tools enhance learning because they make the lesson more interesting and create real life experiences and draw learners' attention (T6, Sch-C).

The internet is not always available; hence, limits the use of smart boards in the classroom. TVs and Radios are more reliable and cost efficient (T8, Sch-D).

There are no specific ICT tool devices I can deem as suitable at the school because they are no ICT devices. I think ICT devices if available can help learners master abstract concepts (T9, Sch-E).

I would say YouTube classroom or google classroom but unfortunately my school does not provide any resources (T10, Sch-E).

Teachers explained the unique benefits they personally derived from the use of each of the ICT tools. The following extracts show what the teachers said:

ICT tools are useful because they make learners easily access information, they provide fun opportunity and make difficult concepts easy to understand for example, a video (T1, Sch-A).

ICT tools make it easy for me to provide teaching and learning for my learners, easy communication, minimise cost and save time, cost-efficient (T2, Sch-A).

The benefits of using these CT tools are that they make lessons more interesting and create real life experiences by drawing learner's attention (T4, Sch-B).

It makes learning fun for learners, it allows individualised curriculum, it equips learners with 21st century skills (T5, Sch-C).

A smart board- firstly, learners become fully engaged and hands-on in the learning process. It offers an interactive experience. Secondly, it cultivates learners' interest in learning. Thirdly, it enhances learners' learning experience. Fourthly, as an educator you have access to online resources (T8, Sch-D).

4.3.3.2 Teacher competency

When asked how efficient and skilful they were in using ICT tools, teachers had a feeling of inadequacy and a lack of confidence in operating them and using them as tools to enhance teaching and learning in an inclusive learning environment. The statements below reflect the teachers' feelings.

I feel that a projector has a limited use as compared to a smart board (T1, Sch-A).

I feel l need comprehensive training to be able to use the tools effectively (T5, Sch-C).

With regard to spreadsheets, I feel l need comprehensive training to be able to use the tools effectively (T7, Sch-D).

I feel that a Chromebook has a limited use as compared to a smart board (T9, Sch-E).

We do not use any ICT tools in the classroom (T10, Sch-E).

4.3.3.3 Need for ICT ongoing training or refresher courses

To be competent, teachers reported that they needed to get ongoing training or refresher courses. They shared their opinions as follows:

I need to be trained of various computer skills for example, drawing Pie charts and graphs because l teach Mathematics (T1, Sch-A).

I need training in any new technology that comes into any given period as technology is the only way to go in the modern world and time (T2, Sch-B).

I have very limited knowledge of ICTs I believe an in-depth training will benefit me and my learners (T4, Sch-B and T5, Sch-C).

If given a chance l would love to be trained in many ICT devices (T9, Sch-E).

4.3.3.4 Consistent workshops for teachers

Some teachers indicated that for them to be competent in using ICT tools in their inclusive classrooms, should they outsource teachers who have knowledge about ICTs from nearby schools, to come and workshop them. The following verbatim quotes reveal what the teachers said:

Yes, when setting Tests and Examinations I get support from colleagues whom we outsource from nearby schools (T1, Sch-A).

Yes, as I tend to increase my knowledge in computers as I share with fellow teachers (T2, Sch-A).

Yes, in sharing with other teachers I have been introduced to different uses of ICTs that I was not aware of (T5, Sch-C).

The section above has presented and analysed the data collected from the in-depth interviews. The subsequent section presents and analyses the data obtained from non-participant observations.

4.4 DATA COLLECTED THROUGH OBSERVATIONS

Observations are the systematic description of events, behaviours, and artefacts in the social setting chosen for study (Marshall & Rossman, 2019). It can be noted that observations enabled the researcher in this study to describe the existing situation to complement the results recorded from the interviews and to triangulate the research findings. Triangulation is the combination of data methods so that different views or standpoints about a specific topic have meaning. In other words, it is the mixing of data types. It involves the blending of methodologies, for example, mixing an observation with an in-depth interview can be used to provide triangulation (Williamson, 2018). Nightingale (2020) agreed with the above definition as he states that triangulation involves analysing results of different methods for the purposes of validity. Therefore, the observations were noted by the researcher to corroborate the findings from the in-depth interviews.

Table 4.2: Findings from observations

School & teacher	ICT equipment used	Comments
School A, Teacher-1	Projector	The teacher used the projector effectively in the lesson. Geography notes were displayed clearly for the learners to write and work on their classroom activity.

School & teacher	ICT equipment used	Comments
School A, Teacher-2	Laptop	The teacher used a laptop to facilitate learning in the classroom. The school is very well equipped because the learners were using iPads. The lesson was presented using the lecture and group discussion method. The educator coped well when using the laptop.
School B, Teacher-3	No ICT equipment for learners, except the desktop computer used by the teacher	A traditional way of teaching was used in the classroom. The teacher taught the lesson through the inquiry-based method and group-discussion method. The school has no ICT equipment except for a desktop computer used to record marks at the school. All teachers used the desktop to record marks. The learners did not use any ICTs.
School B, Teacher-4	Laptop	The teacher had good knowledge of using ICTs like a laptop. The learners were keen to contribute, asking relevant questions and debating the topic with enthusiasm. Learners interacted productively among themselves as well as with the educator using tablets.
School C, Teacher-5	Projector	The lesson was presented using a projector. The learners were able to follow all aspects of the lesson. The learners were asking relevant questions and debating the topic with enthusiasm. The teacher seemed to have not been trained to use ICT devices. The teacher only started using ICT devices during the COVID-19 pandemic.
School C, Teacher- 6	Smart board, YouTube video and Chrome book	A smart board was used to present the lesson. A YouTube video was used to present different states of water in the Natural Sciences lesson. The teacher seemed not to have been trained to use the smart board. The teacher was constantly checking the learners' Chromebooks to ensure that the learners were opening the correct textbook pages.
School D, Teacher- 7	Smart board and video	The lesson was very well organised and the educator demonstrated her knowledge of the use of the smart board. The smart board was used as a learning aid. A video was shown to the learners and questions were asked about it. The learners answered the questions correctly after watching the video. The

School & teacher	ICT equipment used	Comments
		subject being taught was Personal and Social Well Being – under Life-Skills.
School D, Teacher - 8	Quiz tool	The lesson was not very well organised. It was an English lesson. The educator struggled to present the lesson well. There was no class control and discipline. The lesson was not well organised. The learners failed to cope with the quiz aspect of the lesson.
School E, Teacher- 9	No ICT tools used	The teacher only used flash cards as learning aids. The school had no ICT devices therefore no ICT devices were used to teach. The school used the traditional method of teaching.
School E, Teacher- 10	No ICT equipment at school	The school did not have any ICT devices; hence the teacher did not use any ICT devices. Only traditional teaching was done. The lesson was very well presented using the lecture method.

Table 4.2 shows that out of five inclusive primary schools that were selected for this study, only three had ICT equipment that could be used by teachers during their interactions with learners in the classrooms. Two schools were found to be without proper ICT tools to enhance teaching and learning of the diverse learners in the classroom. The study's findings from the observed education settings were found to coincide with what some of the teachers said in the interview sessions, stating that although they had some ICT equipment in their respective schools, they still needed training on how to operate it to support learners with diverse learning needs. It is, however, worth noting that some of the teachers observed confirmed what they said during the interview sessions by demonstrating the ability to use ICT and had a positive attitude towards their use of ICT tools during lesson presentations.

The section above has presented the study's findings in detail supported by the verbatim quotes from the participants, and the data collected from non-participant observations. The next section presents a discussion of findings.

4.5 DISCUSSION OF FINDINGS

In this section, the research findings of this study are discussed with reference to the study's sub-research questions and objectives as reflected in Chapter 1. The findings are also discussed with reference to the theoretical framework that was selected to be the lens through which the study's outcomes were critically analysed.

4.5.1 Teachers' understanding of the use of ICT in Inclusive Primary Schools

The findings of this study indicate that teachers have a minimal understanding of the use of ICT in inclusive set-ups. It was also revealed by the findings that teachers do not have ICT tools at home, making it difficult for them to further their knowledge on the use of those tools. In addition, teachers who had computers generally used them for research in their classes where there was a correlation between availability of computers and computer use. This study's results are in line with Cuban (2013) who stated that a teacher's role is to guide students to apply their knowledge in solving real-world problems. With continuously growing technologies, teachers must understand the need for improvements in the ways of using technology in the classroom. With reference to Vygotsky's sociocultural learning theory which reveals that when teachers have a positive attitude towards the use of learning tools like computers, it will make it easier for them to transfer their ICT skills to the learners through social interactions.

It was revealed in this study that ICT tools assist in ensuring that effective learning takes place and that teachers have a responsibility to make learners move to their highest possible developmental level. It is, therefore, important that teachers understand the use of ICT in schools.

The findings of this study have revealed that integration of ICT in teaching and learning involves the use of technology which is aligns with the findings of Nkula and Krauss (2014), who found that the integration of ICT in teaching and learning involves the use of technology creatively and skilfully to promote teaching and learning in such a way that learners develop ICT-related cognitive skills. Dube et al. (2018) were of the view that a key factor in determining the integration of ICT in schools are the rules set by the school

on how and when to use computers. This study found, however, that some schools did not even have any ICT resources and some school leaders hindered the implementation of ICT.

4.5.2 Factors that determine teachers' attitude towards the use of ICT

The study revealed that there was a lack of ICT tools in some schools. This concurs with the findings of Steyn et al. (2014) who maintained that, despite the opportunities of ICT in education, there were still schools in South Africa that did not have access to ICTs. Schools with limited hardware and software have few opportunities to integrate ICTs. Teachers must be trained in a constructive manner that provides a non-threatening environment where teachers can gain confidence when learning computers.

This study revealed that teachers train themselves and they have not received any formal training. This aligns with findings by Cozar (2015) who reported that one of the root causes behind teachers' negative attitudes towards the use of ICT stems from shortcomings in training.

It was found in this study's interviews and observations that teachers lack adequate training in the use of ICTs. The study's findings are that inadequate time, insufficient resources and lack of training can be barriers to effective use of ICTs. In the same vein, Greer et al. (2016) advocated that lack of instructional time, lack of ICT resources, inadequate ICT infrastructure, lack of effective training, inappropriate organisation, technical problems, lack of vision and mission about the significance of ICT in teaching learning and poor leadership are characterised as school level barriers. Steyn and van Greunen (2014) agreed that leadership should be competent enough to identify and articulate policy, vision, promoting acceptance of group goals, providing individualised support and strengthening school culture could influence the integration of ICT.

The theoretical framework that informed the research findings was drawn from Vygotsky's social learning theory (1962). The social learning theory stresses the basic role of social interaction in the development of cognition. Vygotsky believed that the community plays a central role in the process of "making meaning" and, thus, emphasises that social

interaction involves adult guidance and peer collaboration. Potential life skills result from social interaction in what he calls the zone of proximal development (ZPD). Vygotsky stated that “learning is cognitive development through social interaction”. Alves (2014) was of the opinion that language plays a powerful role in shaping thought. Vygotsky’s theory posits that continuous development takes place through ZPD, socially transmitted knowledge, cooperative learning, scaffolding and private speech as ways that help learners to internalise knowledge. It is against this background that the theoretical framework of teachers’ attitudes toward the use of technology has been formulated.

4.5.3 Enhancement of teacher’s positive attitudes towards the use of ICTs

Teachers in this study revealed that their views were not considered in improving ICT use in their classroom, suggesting that if they were considered, it could change their pedagogy in teaching. This concurs with Chigona and Mooketsi (2014) who found that the role and the perspectives of teachers have become highly relevant, and are key role players in the integration of ICT in the curriculum.

The teachers in this study indicated that they were reluctant to use ICT, since in the schools wherein they teach they did not have any ICT tools bringing about a negative attitude towards teaching using ICT. The same sentiments were shared by Ndibalema (2014) who found that there was enough evidence that some teachers in inclusive schools used ICT as a pedagogical tool while others were reluctant to use it. In a nutshell, this study’s results show that if school leaders, teachers, learners and parents work hand-in-glove they can enhance the proper use, teaching and learning of ICT in inclusive primary schools. This coincides with Dambudzo (2018) who found that ICT integration must be given careful consideration by policy makers if the implementation of ICT in the classroom is to be effective and produce citizens with twenty-first century skills.

This study revealed that ICT tools are useful because they make abstract concepts easier to understand. ICT makes learning fun for learners by allowing individualised curriculum and equipping learners with twenty-first century skills. This notion is in line with Pratt (2014) who held that the use of ICT to facilitate teaching has great potential to enhance

student achievement in learning. Thus, ICT benefits learners in gaining adequate effective learning.

This current study revealed that to be competent, teachers need to get ongoing training or refresher courses. There is need of training in any new technology that comes into any given period as technology is the only way to go in the modern world and time. This is in line with Ghavifekr (2012) who contended that teachers need to be confident and competent in using various ICT tools to build their trust in technology.

4.6 CONCLUSION

This chapter presented analysed and interpreted data that was collected from teachers in inclusive primary schools regarding their towards the use of ICT. The data was taken from the interviews and observations respectively. The objectives and sub-research questions were used to analyse the data that was collected from the teachers. The next chapter presents the summary, conclusions and recommendations of the study.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this study was to find out teacher's attitudes towards the use of Information and Communication Technology in inclusive primary schools. In this chapter, the extent to which the objectives were achieved is outlined and conclusions are reached. This chapter provides the key findings and contributions of this study by focusing on summaries of previous chapters. Major findings, conclusions and recommendations are presented in this chapter, which include areas for further research.

5.2 SUMMARY OF THE THEORETICAL FRAMEWORK

This section provides a summary of the research findings in presenting key scholarly and empirical findings. More so, this section of the chapter attempts to answer all the research questions satisfactorily. The major aim of the study was to reveal teachers' attitudes towards the use of ICT in inclusive primary schools.

The study was structured along the following research objectives:

- Examine teachers' understanding of the use of ICT in inclusive Primary Schools.
- Investigate factors that determine teachers' attitudes towards the use of ICT in inclusive Primary Schools.
- Establish ways in which teachers' attitudes towards the use of ICT in inclusive Primary Schools can be enhanced.

Vygotsky's (1962) social learning theory was used as the theoretical framework for this study. The researcher used a qualitative research approach as it sought to explore the teachers' perceptions, opinions and feelings towards the use of ICT in inclusive primary schools. The study participants were free to express their own perceptions, views and opinions towards the use of ICTs in Inclusive primary schools. Thus, what was deduced entailed their own attitudes towards and views of the use of ICTs in their own natural settings, clearly attempting to make sense of phenomenon under study in their own

environment, which was the classroom. Ten teachers were purposively selected from a sample of five inclusive primary schools in District 11 (D11), Gauteng Province in South Africa. Due to the COVID-19 pandemic, the in-depth interviews were done virtually using Microsoft Teams video conferencing software. Also, the researcher used the non-participant observation method as classroom teachers were teaching in their classrooms. The researcher was able to compare the interview notes with teachers' attitudes and experiences in using ICTs in their teaching and learning environment. All the COVID-19 protocols were adhered to by the researcher.

Below are the key scholarly and empirical findings of the study:

This study was guided by Vygotsky's social development theory. The theory posits that continuous development is facilitated through zone of proximal development (ZPD), where socially transmitted knowledge, cooperative learning, scaffolding and private speech help learners to internalise knowledge. Gouws (2016) stated that the zone of proximal development (ZPD) refers to the skills that a learner finds too difficult to master on their own but can be done with guidance and encouragement of an MKO to enhance their knowledge. According to this study, learners tend to understand better when teachers apply and teach using ICT tools. Thus, the appropriate assistance given by the teacher to assist the learner requires that an instructor shows an example of how to solve a problem, while controlling the learning.

The study revealed that, to enhance teacher attitudes, there is need to increase teacher competency. There is need for CPD in education so that teachers can use ICTs effectively. Mukhari (2016), alludes that the basic causes behind teachers' negative attitudes towards the utilization of ICT stems from shortcomings in training, which constitutes a barrier that stops these technological resources from being successfully introduced within the classroom setting.

5.3 SUMMARY OF THE LITERATURE REVIEW

The use of ICT is vital in the modern world and recognised by many governments across the globe as an increasingly part of our social, political, and economic and education systems. Nkula and Krauss (2014) supported the above idea as they concur that

integration of ICT in teaching and learning involves the creative and skilful use of technology to promote teaching and learning in such a way that learners develop ICT-related cognitive skills. ICT helps learners to overcome their barriers imposed by learning disabilities. According to Ballew, Omoto and Winter (2015), ICTs offer new opportunities for promoting knowledge acquisition and enable users to navigate the digital world unlimited by time and place. ICT is a broad concept in the twenty-first century that has the potential to enhance and accelerate teaching and learning.

The use of various ICT tools can help teachers to create a more learner-centred environment. It is of great importance that teacher acquires skills in using ICTS. In the same vein, Sipila (2014) stated that research findings reveal that ICT as a teaching tool in the classroom provides teachers with opportunities and support for their teaching which culminates in enabling learners' understanding of what they are taught while teachers are assured of achieving their educational outcomes. In using ICT, teachers are faced with challenges, for example, lack of infrastructure such as buildings, fear of knowing less about ICT than their learners, lack of confidence and a lack of ICT skills, which constitute barriers that inhibit the integration of ICT in teaching and learning. Steyn and van Greunen (2014) suggested that barriers in using ICTs are either associated with teachers' ways of seeing and doing things, changes in pedagogy, personal preferences and attitudes. Teachers' attitudes may pose difficulties in the classroom regarding the use of ICT.

The South African White Paper on E-Education identified the integration of ICT into learning and teaching as one of the three main challenges associated with ICT adoption in South African schools. Nonetheless, the national curriculum requires learners to become computer literate and for schools to integrate ICT across the curriculum (DOE, 2004). Greer et al. (2016) suggested that lack of instructional time, lack of ICT resources, inadequate ICT infrastructure, lack of effective training, inappropriate organisation, technical problems, lack of vision and mission about the significance of ICT in teaching learning and poor leadership are school-level barriers. Teachers must be trained in a constructive manner that provides a non-threatening environment where teachers can gain confidence when learning to use ICT.

The availability of ICT in schools can enhance teachers' positive attitudes towards the use of ICTs. Agbo (2015) was of the opinion that ICTs should not just be seen as tools but should be viewed as important instruments to support new ways of teaching and learning. Using up-to-date hardware and software resources is a key feature in the diffusion of technology. Time needs to be made available for teachers to be able to effectively use technology. Pratt (2014) was of the view that the use of ICT to facilitate teaching has great potential to enhance student achievement in learning. Ertmer et al. (2012) suggests that the best way to encourage teachers to implement and integrate ICTs is through increasing their knowledge and skills which, in turn, can change the attitudes and beliefs of the teachers. If teachers were given more encouragement to use ICT, they would use them effectively to teach. The enhancement of teachers is affected by their attitude towards computers.

5.4 LIMITATIONS OF THE STUDY

Challenges were experienced in conducting this research. The research findings were limited to the five purposively selected primary schools, which may not be generalised to all the primary schools in District 11 (D11), Gauteng province of South Africa.

Some interviewees rescheduled appointments for interviews due to busy schedules and personal reasons, hence affecting the time-frames for the interviews. Most interviews were conducted after school (after hours), therefore infringing into the teachers' personal time (an inconvenience). Entering schools for observation was also a challenge due to COVID restrictions. Due to COVID-19 restrictions, the researcher was obliged to conduct online interviews, especially on Microsoft Teams and this may have had financial implications for both the researcher and the interviewees.

Getting the ethical clearance letter from the university and getting permission from Department of Education and sampled schools took a long time. Some interviewees had busy schedules and they took a long time before they made themselves available. The other limitation was that of the pandemic we are currently facing. The COVID-19 pandemic which impacted many processes, such as moving around, meeting with people

and doing some face-to-face interviews. However, the researcher followed all the Government's COVID-19 regulations.

5.5 CONCLUSIONS

The main research question of this study was: what are the teachers' attitudes towards the use of ICT in inclusive primary schools? This section of the study states the conclusions as answers to the initial research questions also, based on the evidence produced in this study, and thus, the researcher will answer the sub-questions first.

It is of great importance to note that the research was a success as all aspects of the research questions were addressed. From the analysis of the research findings, the below conclusions emerged.

5.5.1 How do teachers in inclusive Primary Schools understand the use of ICT?

The first research question revealed the degree of teachers' understanding of the use of ICT tools in inclusive primary schools. The study revealed that teachers seem to be well versed about various ICT tools. With some teachers indicating that their school has no ICT tools, the challenge goes further because they do not have any ICT tools at home, making it difficult for them to teach in an inclusive school. Furthermore, the findings indicate that the School Management Team (SMT) had initiated the use of ICT, even though the school itself did not have adequate funds for purchasing ICT tools.

More so, the study revealed that most of the teachers had a positive attitude towards the use of ICT but the lack of ICT tools in their school had hindered their progress in the utilisation if ICT tools. Thus, some teachers indicated that they would appreciate it if their learners could have ICT tools such as iPads and smart boards to enhance teaching and learning.

Teachers' understanding of ICT tools was also limited by the fact that their schools had inadequate ICT tools. Moreover, teachers had a challenge using technological equipment and the tools such as computers, blogging and video gaming which were found to have

been used only to a limited extent, especially in inclusive teaching and learning environment.

5.5.2 Which factors determine teacher's attitudes towards the use of ICT in inclusive Primary Schools?

From the findings presented in the previous chapter, the second research question explained the factors determining teachers' attitudes towards the use of ICT in inclusive primary schools. Themes of scarcity of software in schools, lack of appropriate training and adequate technology and school leaders' interest in the implementation of ICT were revealed by the participants.

Several teachers expressed the main hindrance towards the use of ICT in teaching and learning as scarcity of software, which made them develop feelings of inadequacy and a limited desire or lack of confidence to engage with ICT tools in their classrooms.

It was clear that lack of appropriate training was another factor revealed by the participants. Even though the schools could provide enough technological tools, if the teachers were not trained to use them in inclusive school settings, it would still be difficult for them to accomplish the schools' main purpose of providing such technological tools. For instance, lack of adequate knowledge in utilising ICT tools, like projectors and smart boards and managing students at times due to the excitement induced by the visuals on the screen. Thus, ICTs work well in the classroom if learners are monitored.

The study also revealed that, some teachers are traditional because they do not value ICT integration in their classroom activities; thus, they are still using their traditional pedagogical practices. Such attitudes were observed in that there was a negative attitude, for instance, when teachers had to use one computer to record marks. This was a bit discouraging to them.

In addition, the study clearly revealed that school leaders received suggestions from the teachers but nothing has been implemented by them, indicating that they had a negative attitude. This has generally led to negative attitudes from teachers because they were not considered in decisions that affected their teaching and learning activities.

5.5.3 How can teachers' attitudes towards the use of ICT in inclusive Primary Schools be enhanced?

The last research question sought to unveil how teachers' attitudes toward the use of ICT in inclusive primary schools can be enhanced. The study revealed that the use of ICT in an inclusive classroom benefits learners as it makes abstract concepts easier to understand; for example, teachers can use PowerPoint slides to explain concepts, cater for various learning styles. Auditory and visual learning styles make the lesson more interesting and create real life experiences and draw learners' attention.

The study revealed that, teacher competency is vital in enhancing teachers' attitude towards the use of ICT tools in the classroom. Teachers had a feeling of inadequacy and unconfident in operating ICT tools and in using them as tools to enhance teaching and learning in an inclusive learning environment. It is, thus, paramount that teachers receive training in any new technology that is introduced as technology is so vital in the modern world. In addition, some teachers in this study indicated that they were not that competent in using ICT tools in their inclusive classrooms; they suggested that schools should outsource teachers who had knowledge about ICTs from nearby schools, to come and share their ICT knowledge and skills with them.

5.6 RECOMMENDATIONS

The following recommendations are made, based on the findings of the study.

5.6.1 Governance Level

Recommendation 1: Different government departments and non-governmental organisations should work together to find ways and means of addressing the shortage of ICT tools in inclusive primary schools. This can be done by promoting the use of ICT tools not only on paper but by providing each school with adequate ICT tools.

Recommendation 2: There should be collaboration between the Department of Basic Education and the schools. The DBE should make ongoing visits to schools to conduct

workshops and refresher courses on the use of different ICTs that are used in inclusive primary schools.

Recommendation 3: The DBE should be hands-on when it comes to ICT usage in inclusive primary schools.

5.6.2 Institutional Level

Recommendation 4: Schools should involve teachers in the decision-making process when adopting new technologies and offer teachers training on the integration of ICT knowledge, pedagogical knowledge, and content knowledge.

Recommendation 5: The SMT should ensure that adequate technical, administrative, and peer support is available to teachers during the implementation of ICT tools in inclusive primary schools.

5.7 AVENUES FOR FURTHER RESEARCH

For future research, it is suggested that a similar but longitudinal research be conducted over a longer period so that more comprehensive knowledge can be gained about the use of ICTs, not only in inclusive primary schools, but across all levels of education.

For future research, it is recommended that a comparative study be undertaken on the use of ICT tools between rural schools and urban schools.

Since the study was limited to inclusive primary schools in semi-urban areas around District 11 in Gauteng province, further research could be undertaken in inclusive primary schools in rural areas to establish how the ICT integration is done there.

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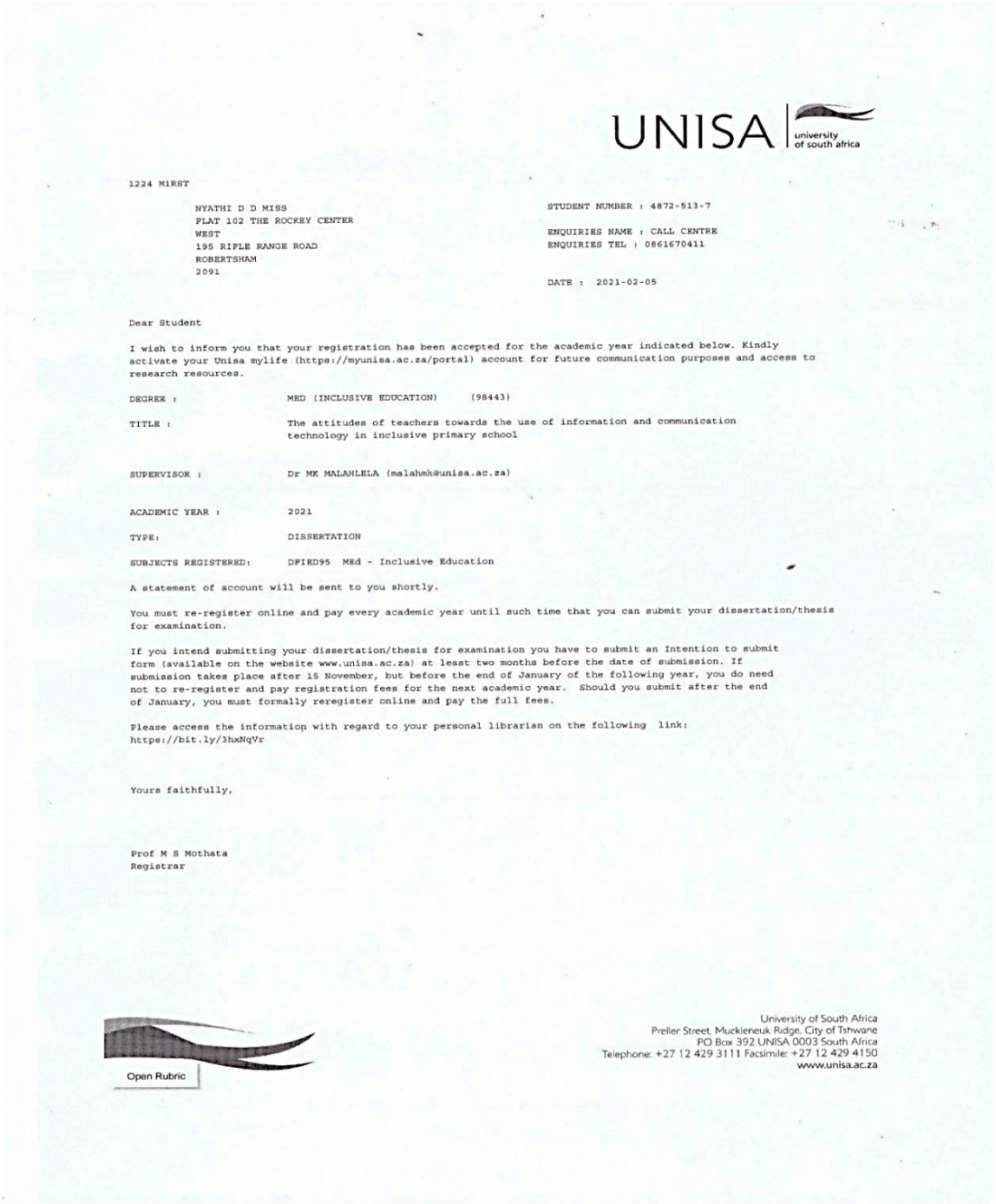
APPENDIX A: PROOF OF REGISTRATION



UNISA university of south africa

1224 M1RST

NYATHI D D MISS
FLAT 102 THE ROCKEY CENTER
WEST
195 RIFLE RANGE ROAD
ROBERTSHAM
2091

STUDENT NUMBER : 4872-513-7

ENQUIRIES NAME : CALL CENTRE
ENQUIRIES TEL : 0861670411

DATE : 2021-02-05

Dear Student

I wish to inform you that your registration has been accepted for the academic year indicated below. Kindly activate your Unisa mylife (https://myunisa.ac.za/portal) account for future communication purposes and access to research resources.

DEGREE : MED (INCLUSIVE EDUCATION) (98443)

TITLE : The attitudes of teachers towards the use of information and communication technology in inclusive primary school

SUPERVISOR : Dr MK MALAHLELA (malahmk@unisa.ac.za)

ACADEMIC YEAR : 2021

TYPE: DISSERTATION

SUBJECTS REGISTERED: DFIED95 MEd - Inclusive Education

A statement of account will be sent to you shortly.

You must re-register online and pay every academic year until such time that you can submit your dissertation/thesis for examination.

If you intend submitting your dissertation/thesis for examination you have to submit an Intention to submit form (available on the website www.unisa.ac.za) at least two months before the date of submission. If submission takes place after 15 November, but before the end of January of the following year, you do need not to re-register and pay registration fees for the next academic year. Should you submit after the end of January, you must formally reregister online and pay the full fees.

Please access the information with regard to your personal librarian on the following link:
https://bit.ly/3hxNqVr

Yours faithfully,

Prof M S Mothata
Registrar

Open Rubric

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

APPENDIX B: ETHICAL CLEARANCE CERTIFICATE

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2021/05/12

Ref: **2021/05/12/48725137/30/AM**
Name: Ms DD NYATHI
Student No.:48725137

Dear Ms DD NYATHI

Decision: Ethics Approval from 2021/05/12 to 2024/05/12

Researcher(s): Name: Ms DD NYATHI
E-mail address: dorcas.nyathi@yahoo.com
Telephone: 078 0790742

Supervisor(s): Name: DR MK. MALAHLELA
E-mail address: Malahmk@unisa.ac.za
Telephone: 012 481 2755

Title of research:

Teacher's attitude towards the use of Information and Communication Technology

in inclusive primary schools

Qualification: MEd Inclusive Education

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above-mentioned research. Ethics approval is granted for the period 2021/05/12 to 2024/05/12.

*The **low-risk** application was reviewed by the Ethics Review Committee on 2021/05/12 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.
2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date 2024/05/12. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

   Note:

   The reference number **2021/05/12/48725137/30/AM** *should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,

Prof AT Motlhabane	**Prof PM Sebate**
CHAIRPERSON: CEDU RERC	**EXECUTIVE DEAN**
motlhat@unisa.ac.za	Sebatpm@unisa.ac.za

APPENDIX C: LETTER OF APPROVAL FROM GAUTENG DISTRICT

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	**30 August 2021**
Validity of Research Approval:	**08 February 2021– 30 September 2021** **2021/244**
Name of Researcher:	**Nyathi D**
Address of Researcher:	**195 Rifle Range Road.**
	102 Rocky Centre West
	Robert sham
Telephone Number:	**078 0790 742**
Email address:	**dorcas.nyathi@yahoo.com** , **dorcasnyathi5@gmail.com**
Research Topic:	**The attitudes of teachers towards the use of information and communication technology in inclusive primary school**
Type of qualification	**Master of Education (Inclusive Education).**
Number and type of schools:	**5 LSEN Schools**
District/s/HO	**Johannesburg East, Johannesburg South**

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

30/08/2021

The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

1. *Letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.*
2. *The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.*
3. ***Because of COVID 19 pandemic researchers can ONLY collect data online, telephonically or may make arrangements for Zoom with the school Principal. Requests for such arrangements should be submitted to the GDE Education Research and Knowledge Management directorate. The approval letter will then indicate the type of arrangements that have been made with the school.***
4. ***The Researchers are advised to make arrangements with the schools via Fax, email or telephonically with the Principal.***
5. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.*
6. *A letter / document that outline the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.*
7. *The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.*
8. *Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.*
9. *Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.*
10. *Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.*
11. *It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.*
12. *The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.*
13. *The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.*
14. *On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.*
15. *The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.*
16. *Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.*

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

.....

Mr Gumani Mukatuni
Acting CES: Education Research and Knowledge Management

DATE: 30/08/2021

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

APPENDIX D: REQUEST FOR PERMISSION TO CONDUCT RESEARCH TO THE PRINCIPAL

College of Education

P.O. Box 392

Pretoria, South Africa

0003

26/02/2021

The principal

Johannesburg

Re: **Request for permission to conduct research.**

TITLE: TITLE: The attitudes of teachers towards the use of information and communication technology in inclusive primary schools.

Dear Sir/Madam.

I, **DUMISIWE NYATHI** am doing research under supervision of Dr M.K. MALAHLELA, a lecturer in the Department of Inclusive Education towards a MASTER OF EDUCATION at the University of South Africa. I request teachers to participate in a study entitled**. The attitudes of teachers towards the use of information and communication technology in inclusive primary schools.**

The aim of the study is to establish the attitudes of teachers towards the use of "Information and Communication Technology in Inclusive Education schools within Gauteng District 11.The objectives of the present study will be; examine the teachers understanding of the use of ICT in inclusive Primary Schools, investigate factors that

determine the Teachers' attitudes towards the use of ICT in Inclusive Primary schools and establish ways in which the use of ICT in Inclusive Primary Schools in Johannesburg (D11) can be enhanced.

The benefits of the will be to establish different attitudes that teachers have towards the use of ICTs in inclusive primary schools which in turn will benefit teachers and Department of Education at large on strategies to enhance ICTs in inclusive education.

Potential risk is time. The interviews may be time consuming for some participants.

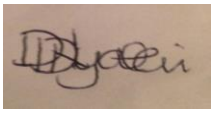
There will be no reimbursement or any incentives for participation in the research.

Feedback procedure will entail contacting participants to inform them of the research findings.

Yours sincerely

DUMISIWE NYATHI.

THEO WASSENAAR PRIMARY SCHOOL.



APPENDIX E: PARTICIPANT INFORMATION SHEET (INFORMED CONSENT) FOR TEACHERS

College of Education

P.O. Box 392

Pretoria, South Africa

0003

26/02/2021.

TITLE: The attitudes of teachers towards the use of information and communication technology in inclusive primary schools.

DEAR PROSPECTIVE PARTICIPANT

My name is **DUMISIWE NYATHI** and I am doing research under the supervision of **Dr M. K. MALAHLELA**, a lecturer in the Department of Inclusive Education towards Master in Education at the University of South Africa. I request teachers to participate in a study entitled**; The attitudes of teachers towards the use of information and communication technology in inclusive primary schools**

WHAT IS THE PURPOSE OF THE STUDY

The aim of the study is to establish the attitudes of teachers towards the use of "Information and Communication Technology in Inclusive Education schools within Gauteng District 11. The objectives of the present study will be; examine the teachers understanding of the use of ICT in inclusive Primary Schools, investigate factors that determine the teachers' attitudes towards the use of ICT in Inclusive Primary schools and establish ways in which the use of ICT in Inclusive Primary Schools in Johannesburg (D11) can be enhanced

WHY AM I BEING INVITED TO PARTICIPATE?

You are invited because the researcher requires information from teachers who have been teaching since the implementation of Department of Education White Paper 6 on Inclusive education in 2001.

I obtained your contact details from the school principal. In this study, there will be 10 participants from five different school.

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

The role of the participant will be to participate in an interview and the researcher will observe one or two lessons.

The study involves audiotaping, semi-structured interviews and observation of lessons. Open-ended questions will be asked during the interview. Interviews will take a minimum of 45 minutes per session and there might be 3 sessions or so. The researcher will come for a minimum of two lesson observations.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participation in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

The possible benefits of taking part in this study are for the participants to be informed on possible lack of information on the implementation of ICTS in inclusive education.

ARE THERE ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

There is no risk of harm in this study.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

You name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings.

Anonymous data may be used for other purposes, such as research report, journal articles and conference proceedings. A report may be submitted for publication, but individual participants will not be identifiable in such a report.

HOW WILL THE RESEARCHER PROTECT THE SCURITY OF DATA?

The researcher will store hard copies of your answers for a period of five years in a locked cupboard/ filing cabinet at UNISA for future research or academic purposes; electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. Hard copies will be shredded and electronic copies will be permanently deleted from the hard drive of the computer with a relevant software programme.

WILL I RECEIVE PAYMENT FOR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There will not be any costs incurred by the participant. No payment or incentive will be received.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

This study has received written approval from the Research Ethics Review Committee of the College of Education, UNISA. A copy of the approval letter can be obtained from the researcher if you so wish.

HOW WILL I BE INFORMED OF THE FINDINGS/ RESULTS OF THE RESEARCH?

If you would like to be informed of the final research findings, please contact DUMISIWE NYATHI on 0780790742 or email **dorcas.nyathi@yahoo.com** The findings are accessible for five years.

Should you require any further information or want to contact the researcher about any aspect of this study, please contact the researcher on the above contact details.

Should you have concerns about the way in which the research has been conducted, you may contact Dr M.K MALAHLELA on 0027 124812755 and email: malahmk@unisa.ac.za.

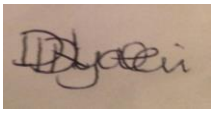
Thank you for taking time to read this information sheet and for participating in this study.

Thank you.

Yours sincerely

DUMISIWE NYATHI.

THEO WASSENAAR PRIMARY SCHOOL. (TEACHER).



CONSENT TO PARTICIPATE IN THIS STUDY (RETURN SLIP)

I, _____, confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty.

I am aware that the findings of this study will be processed into a research report, journal publications and conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the interview and observation notes.

I have received a signed copy of the informed consent agreement.

Participant Name & Suriname (please print)

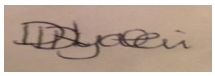
_____

_____

_____

Participant signature Date : _____

Researcher's name & Surname: Dumisiwe Nyathi.



Researchers' signature

Date_____

APPENDIX F: PARENTAL CONSENT FOR PARTICIPATION OF MINORS IN A RESEARCH PROJECT

College of Education

P.O. Box 392

Pretoria, South Africa

0003

26/02/2021

Dear Parent

Your child is invited to participate in a study entitled**. The attitudes of teachers towards the use of information and communication technology in inclusive primary schools.**

I am undertaking this study as part of my master's research at the University of South Africa. The aim of the study is to establish the attitudes of teachers towards the use of "Information and Communication Technology in Inclusive Education schools within Gauteng District 11. The objectives of the present study will be; examine the teachers understanding of the use of ICT in inclusive Primary Schools, investigate factors that determine the teachers' attitudes towards the use of ICT in Inclusive Primary schools and establish ways in which the use of ICT in Inclusive Primary Schools in Johannesburg (D11) can be enhance. I am asking permission to include your child in this study because I will be observing teachers during lessons. I expect to have many other children in different classes participating in the study.

If you allow your child to participate, I shall request him/her to be part of the class to be observed.

Any information that is obtained in connection with this study and can be identified with your child will remain confidential and will only be disclosed with your permission. His/her responses will not be linked to his/her name or your name or the school's name in any

written or verbal report based on this study. Such a report will be used for research purposes only.

There are no foreseeable risks to your child by participating in the study. Your child will receive no direct benefit from participating in the study; however, the possible benefits to education are finding the different experiences of teachers in the implementation of inclusive education thereby determining if there is need to change policies or to support teachers in implementation of inclusive education hence accommodating all learners in the classroom. Neither your child nor you will receive any type of payment for participating in this study.

Your child's participation in this study is voluntary. Your child may decline to participate or to withdraw from participation at any time. Withdrawal or refusal to participate will not affect him/her in any way. Similarly, you can agree to allow your child to be in the study now and change your mind later without any penalty.

The study will take place during regular classroom activities with the prior approval of the school and your child's teacher. However, if you do not want your child to participate, an alternative activity will be available. Your child can be asked to sit in the next class for the duration of the lesson observation.

In addition to your permission, your child must agree to participate in the study and you and your child will be asked to sign the assent form, which accompanies this letter. If your child does not wish to participate in the study, he or she will not be included and there will be no penalty. The information gathered from the study and your child's participation in the study will be stored securely on a password locked computer in my locked office for five years after the study. Thereafter, records will be erased. The benefits of this study are to observe the use of ICTS in inclusive education by teachers in inclusive education schools.

There will be no risks involved. There will be no reimbursement or any incentives for participation in the research.

If you have questions about this study, please ask my study supervisor, Dr M.K. Malahlela, Department of Inclusive Education, College of Education, University of South Africa or me. My contact number is **0780790742** and my e-mail is **dorcas.nyathi@yahoo.com**. The e-mail of my supervisor is **malahmk@unisa.ac.za**. Department of Education, school principal and the Ethics Committee of the College of Education, UNISA, have already given permission for the study. You are making a decision about allowing your child to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. You may keep a copy of this letter.

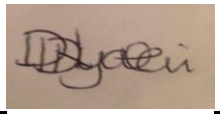
Name of child: _____

Sincerely

_____ _____

_____

Parent/guardian's name (print) Parent/guardian's signature Date:

DUMISIWE NYATHI.  26/02/2021

Researchers name (print) Researcher's signature Date:

APPENDIX G: LEARNER ASSENT FOR PRIMARY SCHOOL LEARNERS TO PARTICIPATE IN A RESEARCH PROJECT

College of Education

P.O. Box 392

Pretoria, South Africa

0003

Date: 26/02/2021

Dear learner.

My name is **DUMISIWE NYATHI** and would like to ask you if I can come and watch you learn and do some class activities with your teacher. I am trying to learn more about how children do activities with their teachers in class.

If you say **YES** to this, I will come and watch you when you are with your teacher doing activities in class. I will not ask to you to do anything that may hurt you or that you do not want to do.

I will also ask your parents if you can take part. If you do not want to take part, it will also be fine with me. Remember, you can say yes or you can say no and no one will be upset if you do not want to take part or even if you change your mind later and want to stop. You can ask any questions that you have now. If you have a question later that you did not think of now, ask me next time I visit your school.

Please speak to mummy or daddy about taking part before you sign this letter. Signing your name at the bottom means that you agree to be in this study. A copy of this letter will be given to your parents.

Regards

Researcher: DUMISIWE NYATHI.

Your Name			**Yes, I will take part TICK (√)**	**No, I don't want to take part (X)**
Name of the researcher			**DUMISIWE NYATHI.**	
Date	**26/02/2021**			
Witness				

APPENDIX H: INTERVIEW SCHEDULE/QUESTIONS

Semi- structured interview schedule.

The following questions will be asked during interviews:

1.

Teachers' understanding of ICTs in inclusive education

What is your understanding of inclusive education with regard to the use of ICTs?

2. Factors that determine teacher's attitudes towards the use of ICTs.

- What teaching methods do you use in the classroom and do they facilitate the use of ICTs?
- Do you use technology as a tool for learning in the class? Explain
- What is your understanding of the use of ICTs?
- How best can you use ICTs in the classroom.
- What steps can you take to fully utilize ICTs in teaching?

3.

Establishing ways in which ICTs can be enhanced in Primary schools.

- How can ICTs be deployed to enhance teaching and learning?
- What academic challenges do you face when teaching using ICTs?
- How effective are the strategies you use in teaching using ICTs.
- what are the challenges you face in applying ICTs as supporting tools in your teaching?
- what is your view concerning the use of ICTs in your classroom, in accommodating the diverse learners?
- How does applying ICT Skills make teaching better?

- What type of technological devices do you have and what are they mostly used for?
- Describe your experience in using ICTs?
- Do you think you ICTS are good tool for learning?
- Do you prefer traditional teaching or advanced learning like the use of ICTs?
- What are some of the challenges, if any, that you experience in using ICTs?
- Do you think ICTs as a learning tool can overcome these challenges?
- Does the skills you acquire through the use of ICTs applications assist you in your ability to function successfully in this modern society?

APPENDIX I: OBSERVATION SHEET

GENDER (tick)

Female	
Male	

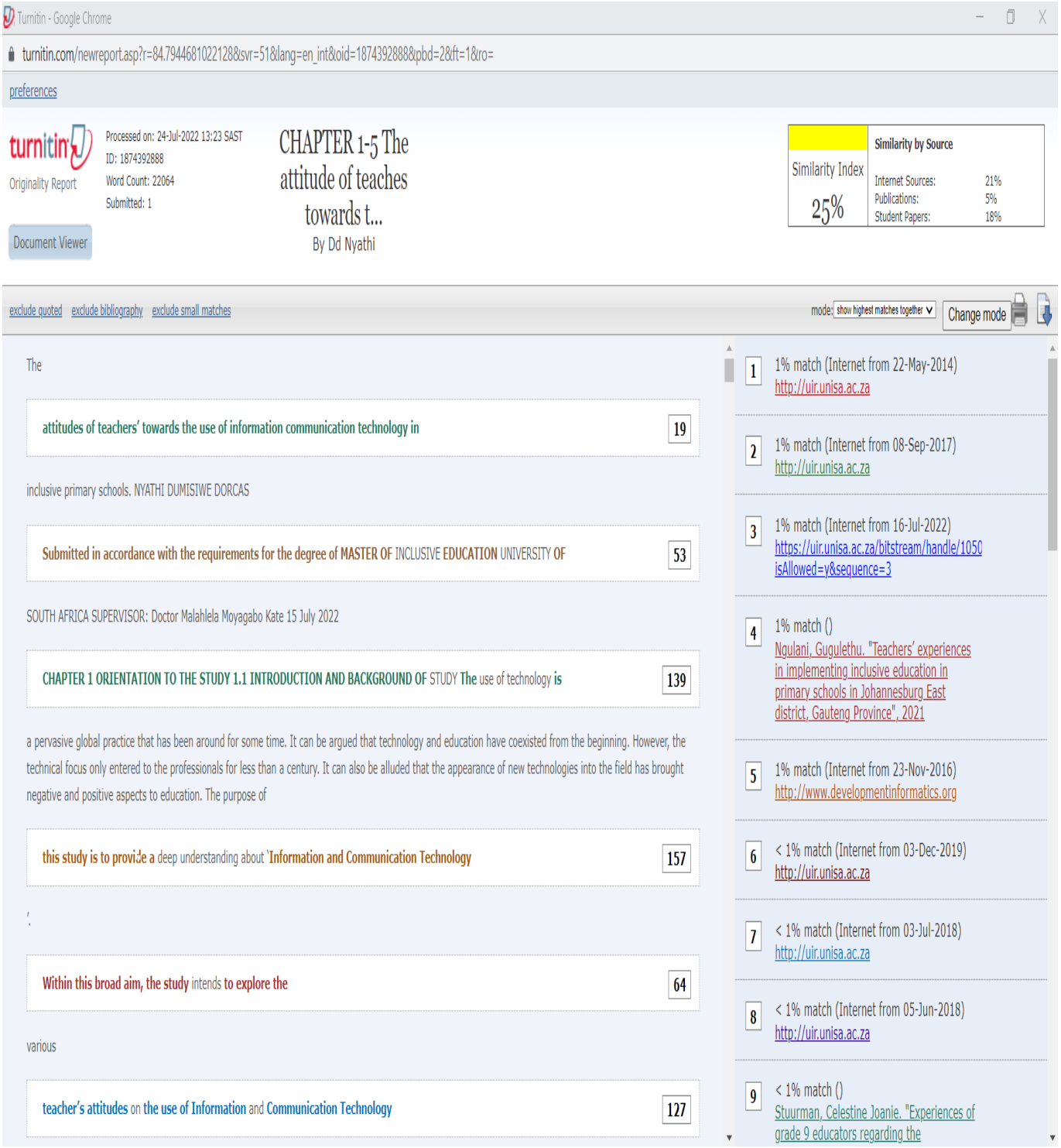
Teacher			

	YES	NO	COMMENT
Teachers' understanding of the use of ICTs in Inclusive Primary schools.			
Ability to differentiate lessons to accommodate various learning styles in the classroom. Are teachers confident in using ICTs in inclusive education Primary Schools?			
Making use of varied teaching styles in the classroom to accommodate various learners' needs.			
Ability to manage learners with various educational needs in the classroom.			
Enhancement of the use of ICTs in inclusive education: Does the classroom have enough space to allow individual attention of learners? (Overcrowded or not overcrowded)			
Access to running water----------			

Table 3.3 Observation sheet for support in terms of resources

	YES	NO	COMMENT
Support by Department of Basic Education (DBE)			
Availability of resources at the school to enhance the use of ICTs inclusive education: Does the school have assistive devices to enhance use of ICTs in inclusive education, e.g. • Computers, • Braille equipment, • Projectors, • Talking electronic devices, • Pencil grips • Magnifier, • Speech software			

APPENDIX J: TURNITIN RESULTS



APPENDIX K: PROOF OF LANGUAGE EDITING

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16 September 2022

Declaration of professional editing

Teachers attitudes towards the use of Information and Communication Technology in inclusive primary schools

by

NYATHI DUMISIWE DORCAS

I declare that I have edited and proofread this thesis. My involvement was restricted to language usage and spelling, completeness and consistency and referencing style. I did no structural re-writing of the content.

I am qualified to have done such editing, being in possession of a Bachelor's degree with a major in English, having taught English to matriculation, and having a Certificate in Copy Editing from the University of Cape Town. I have edited more than 400 Masters and Doctoral theses, as well as articles, books and reports.

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APPENDIX L: Observation NOTES for the use of information and communication technology in inclusive primary schools

Date	School	Grade	Teacher	Subject observed	Time	Classroom Space	ICT devise	Teaching Style	Enhancement of ICT Devises	
2021-09-01	AA	4	T1	English	11:00a.m-11:45a.m	Adequate space covid regulated	No ICT devise used in the classroom	Direct Instruction	No ICT devise was used the Educator used a chart as a learning aid.	
2021-09-04	A	6	T2	Mathematics	09:00-09:45a.m	Adequate covid regulations of distance observed.	Laptop	Direct Instruction	Learner were shown a video based on ordinal and cardinal number-the devise was utilized adequately.	
2021-09-05	B	7	T3	Life orientation	10:00am-10:30am	Adequate covid regulations of distance observed.	The school has no ICT device	Group discussion	Learners were shown a video based on peer pressure-Devise effectively utilized	
2021-09-05	B	5	T4	Social Science History	13:00pm-13:45Pm	Adequate covid regulations of distance observed.	The school has no ICT devices	Co-operative learning	No ICT devise utilized traditional method of teaching educator used flash cards as learning aids.	
2021-09-07	C	7	T5	E.M.S	09:00-09:45a.m	Adequate covid regulations of distance observed.	Smart board	Inquiry based	There was an effective use of the smartboard.Learners watched a video with instructions on how to complete their written class activity.	
2021-09-08	C	6	T6	Geography	08:00-08:45a.m	Adequate covid regulations of distance observed.	Smart board	Direct Instruction	Visual on the smart board were used to use to show different types of settlement-used appropriately	
2021-09-08	D	3	T7	Natural science and Technology	10:00am-10:30am	Adequate covid regulations of distance observed.	No ICT devise in the classroom observed.	Inquiry based method	No ICT devise was used to enhance learning learners were given instructions and they followed the instructions in groups to carry out their project.	
2021-09-04	D	5	T8	Life-Skills - PSW	11:00a.m-11:45a.m	Adequate covid regulations of distance observed.	Projector	Direct Instruction	Effects of peer pressure effectively projected.	

2021-09-08	E	4	T9	English	12:00p.m-12:45p.m	Adequate covid regulations of distance observed.	IPad	Group discussion	Learners read comprehension given and discussed questions to answer work with educator. Learning was effective utilizing the ICT devise	
2021-09-09	E	6	T10	Social Sciences History.	14:00pm-14:45pm	Adequate covid regulations of distance observed.	Ipad	Individualized instruction	The Case study given on devise was read and learners answered quiz questions and self marking was done through devise application .The devise was effectively used to enhance learning.	

Table 3.2 Findings from observations

School & teacher	ICT equipment used	Remarks

School A ,Teacher-1 Date 01/09/2021	Projector	The Teacher used the projector effectively in the lesson. Geography notes were displayed clearly for the learners to write and work on their classroom activity. -Time covered 1100hrs to 1145hrs -full lesson 45 minutes
School A, Teacher - 2 Date 04/09.2021	Laptop	Subject-Mathematics The teacher used a Laptop to facilitate learning in the Classroom. The School is very well equipped because the learners were using iPads. The lesson was presented using the Lecture and group discussion method. The educator was coping well when using the laptop. -Time covered-0900hrs to 0945hrs -full lesson 45 minutes
School B, Teacher- 3 Date 05/09/2021	No ICT equipment for learners, except the Desktop computer used by the teacher.	A traditional way of teaching was used in the classroom. The teacher taught the lesson through inquiry based method and group discussion method. The school has no ICT equipment only the Computer Desktop used to record marks is available at the school. All teachers use the Desktop to record marks. The learners do not use any ICTs. Time covered 1000hrs to 1030hrs

		-30 minutes
School B, Teacher- 4 Date 05/09/2021	Laptop	The teacher has good knowledge of using ICTs like the Laptop. The learners were keen to contribute, asking relevant questions and debating the topic with enthusiasm. Learners were interacting productively among themselves as well as with the educator using Tablets. Time covered 1300hrs to 1345hrs -full lesson (45 minutes)
School C, Teacher- 5 Date 07/9/2021	Projector	The lesson was presented using a projector. The learners were able to follow all aspects of the lesson. The learners were asking relevant questions and debating the topic with enthusiasm. The teacher seemed to have not been trained to use ICT devices. The teacher only started using ICT devices during the covid19 pandemic. Time covered 0900hrs to 0945hrs -full lesson (45 minutes)
School C, Teacher- 6 Date 08/09/2021	Smart board, YouTube video and Chrome book.	A smart board was used to present the lesson. A YouTube video was used to present different states of water in the Natural Sciences lesson. The teacher seemed not to have been trained to use the Smart board. The teacher was constantly checking the learners chrome book

		to ensure that the learners are opening the correct textbook pages. Time covered 1000hrs to 1030hrs -full lesson (45 minutes)
School D, Teacher- 7 Date 08/09/2021	Smart board and video.	The lesson was very well organized and the Educator demonstrated her knowledge about the use of the smart board. The smart board was used as a learning aid. A video was shown to the learners and questions were asked about it. The learners answered the questions correctly after watching the video. The subject being taught was PSW –under Life -skills. Time covered 1000hrs to 1030hrs -30 minutes
School D, Teacher - 8 Date 08/09/2021	Quiz tool	The lesson was not very well organized. It was an English lesson. The Educator struggled to present the lesson well. There was no class control and discipline. The lesson was not well organized. The learners were failing to cope with the quiz aspect of the lesson. Time covered 1200hrs to 1245hrs -45 minutes
School E,Teacher- 9 Date 04/09/2021	No ICT tools used.	The teacher only used flash cards as learning aids. The school has no ICT devices therefore no ICT devices were used to teach. The school uses the traditional method of teaching.

		Time covered -full lesson 45 minutes
School E, Teacher- 10 Date 29/09//2021	No ICT equipment at school.	The school does not have any ICT devices hence the teacher did not use any ICT devices only traditional teaching was done. The lesson was very well presented using the lecture method. Time covered 1400hrs to 1445hrs -full lesson 45 minutes