

UNIVERSITY OF KWAZULU NATAL

**EXPLORING EXPERIENCES OF TEACHERS LEADING TEACHING AND LEARNING IN
THE ERA OF ADVANCED TECHNOLOGY: A CASE STUDY OF TEACHERS IN TWO
RURAL SCHOOLS**

BY

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**A dissertation submitted in partial fulfilment of the requirement for the degree of Masters in
Education in the discipline Educational Leadership, Management and Policy, School of education,
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DECLARATION

I Sindisiwe Jabu Msweli, declare that:

- (i) The researcher reported in this dissertation, except where otherwise is indicated is my original work.
- (ii) This dissertation has not been submitted for any degree or examination at any other university.
- (iii) This dissertation does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
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SUPERVISOR'S STATEMENT

This dissertation is submitted with my approval

Signature:



Date: 12 March 2020

Dr. SB. Blose

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DEDICATION

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ABSTRACT

The aim of the study was to explore the experiences of four teachers leading teaching and learning in the presence of technology in rural setting at UMkhanyakude district. This study aimed to understand how these teachers cope with teaching experiences under this context. Yet, rural context is known for lagging behind in terms of technology. This study intends to find the experience of teachers under this context. This includes the success and challenges. Again, study intended to find the role played by teaching in leading teaching. Also, how are these teachers devised strategies resulted from challenges they experienced. In order to understand this study of teachers leading teaching in the presence of technology, transformational leadership and teacher leadership theory was used to strengthen the study. With regard to methodology, interpretive paradigm was used and is subjective to person life experiences. Again, the study adopted case study research methodology which form the guideline to engage with the experiences of teachers leading teaching and learning in rural settings. Two methods were used to generate data, namely semi-structured interviews as primary source and classroom lesson observation as secondary source. The participants interview was recorded, transcribed before analysed. The transcribed are analyse and put thematic to respond to the research questions. The teachers teaching in rural context were found in this study doing some attempts in order to lead teaching with technological resources in their school. These attempts were planned strategies that respond to challenges they experience. Among the challenges they experience include shortage of devices; time as a factor hindrance them for leading teaching in the manner they planned; poor signal and teacher lacking skills. Moreover, these teachers were not tempted by the challenges instead certain measures were done to provide quality learners learning. Finally, study indicated two rural schools where data was generated. These schools were chosen according to availability of technology under the context.

LIST OF ABBREVIATIONS

CAT	Computer Application Technology
CTTS	Current Trends in Technology and Sciences,
DoE	Department of education
DPSA	Department of Public Servant and Administration.
HoD	Head of Department
ICT	Information communication and technology
INEE	Inter-Agency Network for Education in Emergencies
KZN	KwaZulu-Natal
LTSM	Learner-teacher support material
MDG	Millennium Development Goals
NCES	National Centre for Education Statistics
NEA	National Education Association
NEPAD	New partnership for Africa's Development
NZ	New Zealand
OECD	Organisation for Economic Co-operation and Development
PAM	Personal Administration Measures
PGCE	Postgraduate Certificate in Education
SA	South Africa
SASA	South Africa School Act 84 of 1996
SASN	South Africa School Net
SMT	School Management Team
SONA	State of Nation Address
TVWS	Television White Space
U. S	United States

UKZN	University of KwaZulu-Natal
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISA	University of South Africa
USB	Universal serial bus

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CHAPTER ONE

BACKGROUND AND ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Teachers play an important role of equipping the nation with knowledge. In doing this, they use numerous resources including technological devices. In support of this, Mereku and Mereku (2015) declare that technology in teaching and learning is more than supplying computers and internet; it also involves immediate learning activities with educationally informed use of technology tools. This study focused on the experiences of teachers using technological resources in leading teaching and learning in schools. In developing the chapter, the study background, rationale and motivation, research objectives and research question are discussed. Lastly, detailed clarification of the key concepts and the outline of chapters are presented.

1.2 BACKGROUND OF THE STUDY

In the past decades South African has seen numerous changes in terms of education transformation. This transformation was geared towards rectifying the imbalances of the past apartheid era. Apart from this, we have also seen a lot of technological transformation, which has led the education sector to introduce technology in teaching and learning. These technological resources include interactive white boards, tablets, smart phone, laptops, projectors and computers. In addition, teachers also use Compact disks and e-books for teaching and learning (Assan & Thomas, 2012; Batchelor & Olakinmi, 2015; Govender & Govender, 2014; Krauss, 2014; Mereku & Mereku, 2015; Molotsi, 2014; Mooketsi & Chogona, 2014; Lorenz, Banister & Kikkas, 2015; Padayachee, 2016; Tamim, Borokhovski, Pickup & Bernard, 2015). These devices are helping teachers in leading teaching and learning. I found this in line with what is required or specified by the Norms and Standard of Educators Act, No. 82 of 2000. This policy directs that competent teachers should demonstrate in the school and classroom. Since this study explore the experiences of teachers leading teaching and learning in the presence of technology, the study focused on teachers and their experiences of leading teaching and learning in the presence of technological devices. In understanding their experiences, the study explored both their successes and challenges of integrating technology into their teaching.

South African schools are far behind in terms of technological developments to maintain teaching and learning. In order for a school to perform well, human and non-human resources are needed. There are, however, challenges that hinder teachers from accomplishing their teaching objectives. The literature finds

and identifies a number of challenges that teachers experience in teaching with technological resources, especially in rural contexts (Hare, 2007; Mike, 2003; Tinio, 2002 & Schiller, 2003). Among the challenges are poor infrastructure, slow network connection, insufficient teacher training and many more.

1.3 RATIONALE FOR THE STUDY

Personal

In the late eighties, I attended school in a rural area in the UMkhanyakude district. The school had many learners and we were overcrowded in classrooms. There was only one primary and one high school in the area and both schools were surrounded by informal settlements. I remember that there was no record of written work done as the portable chalkboard needs to be erased for every new period. In this way, there was no track of traceable classroom activities and homework. The telling method was mainly used by teachers during teaching and learning. Teachers used to tell us what to do. There were no supporting teaching aids except the use of chalk and board. At times, teachers would instruct us to carry bottle tops, maize or bean seeds and we used these for counting and these were the teaching aids in maths lessons. We also used brittle portable chalkboard for writing. As learners we used to enjoy our learning and we knew nothing about technology. With the advent of technology, more and more resources to improve teaching and learning were introduced. Since technology is now widely available in schools, I pursued this study to explore teachers' experience of leading teaching in the presence of technological resources, especially in rural schools.

Practical

I have been a teacher for about sixteen years and I have taught in three schools. I remember when I got the first job, I was very confident because I thought teaching was an easy job that required no sweating, instead, you provide quality education to learners. Being a novice qualified teacher at that time, I experienced something different from what I expected. Firstly, I found children who came from child-households and these children will sometimes come to school on empty stomachs. There was an extreme level of poverty in the area which left children suffering in many ways. This called for multiple roles on my side as I had to be a teacher and a counsellor to my learners. Secondly, the classroom that I taught had many learners. This condition made me to struggle and I could not use computers as they were not enough for my learners. This experience made me to realize that rural schools are facing challenges in terms of technology setbacks. In the light of this experience, I wondered how other teachers are coping and maintain teaching in the presence of technology in rural schools. Thus, this study was conducted.

Social

In reviewing literature, I realised that there is a reasonable amount of literature focusing on how teachers use technological resources to enhance teaching and learning. The literature I read has mostly focused on universities (Mahat, Jamsanderkar & Nalavade, 2012). Little research has been done on school-based teachers using technologies in classrooms for teaching and learning especially in a rural context (Tinio, 2003). In the study that was conducted by Britland (2013) it was revealed that using technology in teaching and learning improves learner performance and it also prepared them for tertiary institutions. The scholar further elaborates that most of the university teachers use technological devices in their teaching since it is widely available. Since teachers' voices have not been heard, this study is significant because its findings may show how rural school teachers experience teaching with technological resources in their context.

1.4 SIGNIFICANCE OF THE STUDY

This study is important as it will help us understand what it means to lead teaching using technological resources in school setting in this 21st century. Again, the study focused on the experiences of teachers. The findings of this research can assist the departmental authorities by providing ideas on how to handle the challenges experienced by teachers and also in developing strategies that can be used in rural contexts with regards to technology. The relevant stakeholders can also learn techniques they can adopt leading teaching and learning using technology resources in rural contexts. In addition, the findings of the study could also be useful to teachers teaching in rural settings as they can draw from the strategies used by other teachers to accomplish their teaching objectives. They can learn from the experiences of other teachers and apply different teaching strategies.

1.5 OBJECTIVES OF THE STUDY

The main objectives of the study are to:

- Explore the experiences of teachers leading teaching and learning in the era of technology in rural schools.
- Make known the strategies that teachers apply to respond to the challenges they experience.
- Explore the role of teachers leading teaching and learning in the presence of technology.

1.6 QUESTIONS TO BE ANSWERED

1. What are the experiences of teachers leading teaching and learning in the era of technology in rural area?
 - What are the successes of teachers leading teaching and learning?
 - What are the challenges of teachers leading teaching and learning?
2. How do teachers respond to the challenges they experience in terms of leading teaching and learning in the era of technology?
3. What are the roles of teachers in leading teaching and learning in the presence of technology in a rural area?

1.7 DEMARCATION OF THE STUDY

The study will be conducted in two schools in UMkhanyakude district of KwaZulu-Natal. These schools were selected because they are in a rural setting and I have knowledge that teachers in these schools do use technological tools for teaching and learning. This study is a small-scale study and does not represent the whole district. Therefore, the findings may not represent all rural schools in South Africa.

1.8 KEY CONCEPTS

1.8.1 Teacher

A teacher is a person who is normally found in educational settings, like schools, colleges and universities. Teachers incorporate formal education, informal knowledge, non-formal learning, permanent learning, incidental learning and workplace learning. Jeff and Smith (2016) understand a teacher as a person who normally distributes knowledge to achieve a specific objective. Similarly, Bell and Gilbert (1996) explicate that a teacher's effort is always directed towards making children to learn. Teachers are the ones who teach learners how to behave both inside and outside the learning environment. Therefore, they teach learners completely and they give guidance on how learners can face the challenging world. For that reason, teachers should care about pupil or learners needs, experiences and feelings (Kelly, 2002). Moreover, teachers themselves should continue learning in order to learn new strategies and approaches. In a similar view of Knight (2001) declares that teachers' learning as never ending, like a religious struggle to escape sins. Steyn (2008) agrees that it is important for teachers to continuously acquire new knowledge to enhance their learners learning.

1.8.2 Rural area

The word rural came from Latin word “ruralis”. This means a countryside where people live in rural areas depend on farming, fishing, and forestry. It is the place or is a geographical area that is located outside towns. The majority of rural areas do not have all the necessary infrastructure. As a result, the schools in such a setting experience the same difficulties (Sign & Mans, 2002). Rural areas are underprivileged and they lack the basic economic infrastructure; actually, there is limited access to amenities like electricity, banks, internet and shops in a rural context (Ellis, 2009; Makahamadze & Tavuyanango, 2013). In a similar vein, Nkosi and Msimang (2008) believe that rural schools are without electricity, libraries, sanitation and laboratory. There are few scholars who describe the term rural area and all their explanations seem to take the same direction. In the study conducted by Seroto (2004), a rural setting is understood as isolated areas where few people live in.

1.9 OUTLINE OF CHAPTERS

There are five chapters that make this study report and are outlined below:

Chapter one

This is an introductory chapter that provides an outline of the study. The chapter discusses the background of the study, rationale and motivation, and the significance of the study. This chapter further presents the research objectives, research questions that the study intended to answer and also the clarification of key concepts.

Chapter two

Chapter two provides the review of literature in detail that relates to the experiences of teachers leading teaching and learning with the use of technological resources in a rural setting. In addition, the theoretical framework that underpins the study is discussed.

Chapter three

In this chapter, the research processes that guided data generation and analysis is presented. This includes the research paradigm, research design and research methodology. Furthermore, the research methods that were employed in the study are also discussed; namely sampling methods, the methods of generating data as well as the method of analysis. The issues of trustworthiness as well as ethics consideration are also discussed.

Chapter four

In this chapter, analyses of the findings are presented. Thematic analysis was used to analyse data and the findings are discussed in themes.

Chapter five

Chapter five is a concluding chapter; in this chapter I draw conclusions from findings presented in chapter four. Furthermore, I make recommendations based on the findings.

1.10 CHAPTER SUMMARY

The chapter presented the introduction and background of the study. The purpose and the rationale were also discussed. Again, the objectives as well as the key questions of the study were outlined. The following chapter presents a literature review and the theoretical framework that underpinned my understanding of the experiences of teachers leading teaching and learning in the presence of advanced technology in a rural setting.

CHAPTER TWO

REVIEW OF LITERATURE AND THEORETICAL FRAMEWORK

2.1 INTRODUCTION

The previous chapter provided the background and motivation of the study. This chapter presents a discussion of literature relating to studied phenomenon. The discussion of literature captures national as well as international perspectives. Subsequent to literature discussion, the transformational leadership and teacher leadership as the theories constituting the theoretical framework underpinning this study are discussed. In developing the chapter, I began by presenting the literatures. Thereafter, the theoretical frameworks of the study are discussed.

2.2 REVIEW OF RELATED LITERATURE

2.2.1 LEADING TEACHING AND LEARNING

Teaching and learning are two words that are applicable in every sphere of life. In this study, teaching and learning refer to practical or theoretical work done by the teacher with learners (Abbat & McMahon, 2000). This construct is further supported by Kolb (1984) and Zhenhui (2001) who suggest that teaching and learning is knowledge by acquaintance where, through direct experience, teachers use teaching and learning resources to help learners in different learning styles to acquire knowledge. Furthermore, Hormy (2000) eludes that teaching is the activities of educating or instructing activities that impact knowledge and skills. This means that teaching a person in school should acquire a specific training in order to develop knowledge and skills. Teaching is more than a technique; good teaching comes from identity and integrity of the teacher (Palmer, 1998). Teaching is the way teachers go about experiencing, acquiring knowledge, showing interest, and concern for people. According to Beere (2012) teachers need to be present as people in classrooms or learning environment. In this study teaching is used by instructors leading learners learning with the use technological resources.

At the same time, learning is a lifelong journey that can never be completed. The study that was conducted by Bell and Gilbert (1996) understands learning as a lifelong cycle in motion. These researchers further said learning leaves us with experience. Learning also are things happened in history and those things can take place inside and outside school, private sector, home and other. In addition, learning includes skills and attitudes, and not only facts and knowledge. This can happen when learners do not only consume knowledge but also acquire some different skills like computer literacy, and with these skills, they are able to “stand on their feet” and face the world. Below illustration copied from McKinney (2008) of Bonk and

Zhang’s Phase of R2D2 available from <http://www.publicationsshare.com> shows how teaching and learning process occurred.

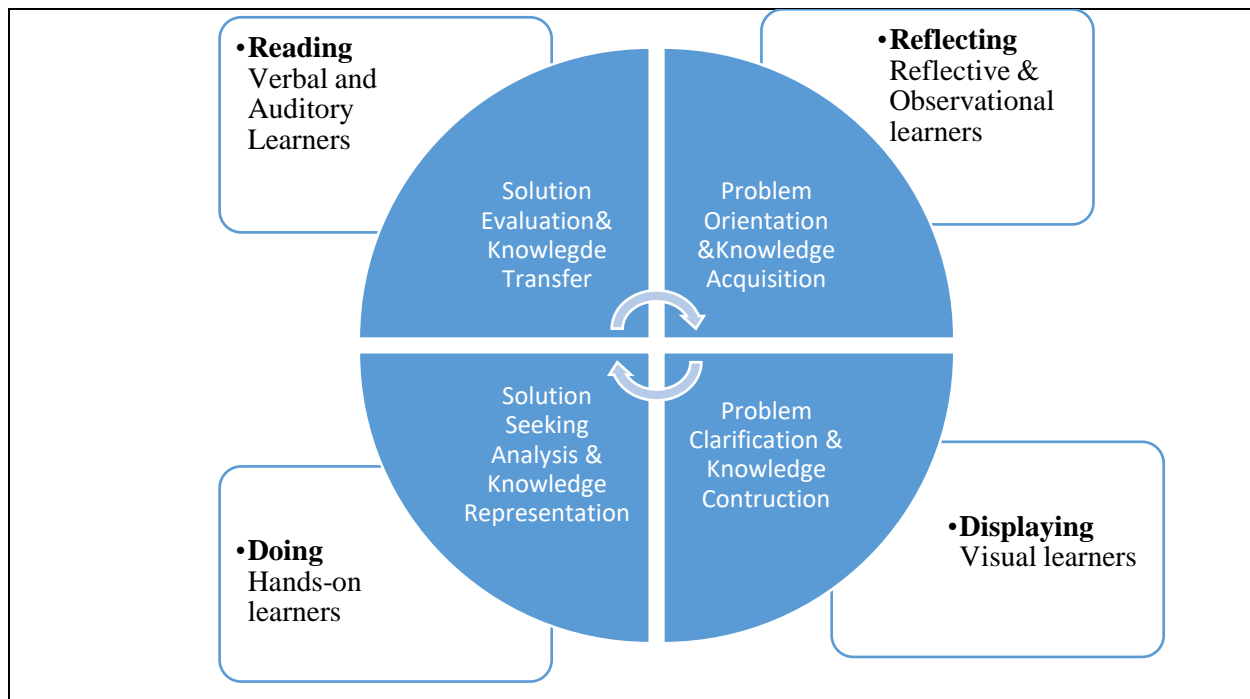


Figure 2.1: Mc Kinney (2008) ’s illustration of teacher learning

2.2.2 TECHNOLOGICAL RESOURCES USED FOR TEACHING AND LEARNING

This study explores the experiences of teachers leading teaching and learning in a rural setting with the use of technological devices. Naicker, Chokoko and Mthiyane (2013), who view the importance of human resource in school as assets. I believe that teachers played a vital role in teaching practice, in order for this role to be effective, non-human resources are essential for teaching which includes resources such as technological resources. These advance technological resources found in schools are regarded as white boards, computers, tablets, overhead projectors, audio visual, data projectors, copying as well as printing machines. Apart from advanced technologies there are also digital technologies like television, audio visual, and video and more (Bhattacharya & Sharma, 2007; Sanyal 2001; Sharma, 2003). All these technological devices available in schools have resulted from the transformation in education in the past two decades with an aim to address the imbalance of the past. Such transformation has also led to the introduction and the use of technological resources for teaching and learning by teachers in schools where they teach. The literature exposed that teachers use different technological resources in order to develop an interest as well as to explain clearly the lesson in such a way that it is understood by learners (Enginda, 2011). From the above discussions, we are learning that it is important for teachers to select suitable devices for the subject they teach. Technology in education is seen as the greatest thing that has happened in this century, however, the gap I have observed is that teachers do not use technological resources for teaching

and learning in schools. In confirming this sentiment Broekhuizen (2016), explains that teachers are not actively using technologies for learning in spite of technologically well-equipped computer-labs and classrooms.

2.2.3 THE IMPACT OF TECHNOLOGY ON TEACHING AND LEARNING

The introduction and use of technology in teaching and learning in rural context have received special attention from scholars around the globe. However, most scholars who explored teachers using technologies for teaching focused mainly on the universities and excluded how technology impacts in school contexts. Thus, this study intends to explore teachers' experiences using technology in rural settings. Teachers remain important when measuring the impact of technological resources in school, since they come into contact daily with teaching practices.

In most cases, there are no traceable studies that stand alone on the impact of technology in teaching and learning in schools in our country. However, Voigt and Matthe (2012) conducted a study around Gauteng schools on tablets with restricted mobility examining the user acceptance in a South African mathematics mobile learning project. The project was carried by Ericson and was named "Connect to Learn" which was informed by Mobile learning acceptance theoretical framework. Their main focus was to find out how teachers and learners use and accept tablets in mathematics classrooms. This tablet was having restricted mobility (MobiPads) which only allow educational activities. The findings were similar to other scholars that tablets were alike and forms part of e-learning in every learning environment, again, findings revealed that tablets prove to be important for both users and mathematics content and I am of the view that these tablets is deemed to be suitable for learners learning as it made it easier for teachers to teach mathematics and has the capability to explore and represent the contents of the mathematics curriculum.

Viewing from an African perspective, Yebouh and Ewu (2014) conducted the study on the impact of WhatsApp messenger usage on learners' performance in Ghanaian secondary schools. In their study, which involved fifty learners from five schools found this social platform does not fulfill its aim, instead of making communication easier and faster by effective communication between teacher and learner, it impacts negatively on the performance of study time and result in lack of participation during teaching as learners were disturbing one another. Further findings displayed learners fail to balance online activities and academic preparation. I therefore, suggest that technologies used for teaching and learning in school should have restricted educational programme that can expose learners to academic activities only in order to respond to the challenge they experience with these technological resources.

From international context, Chauhan (2016) conducted a study on meta-analysis of the impact of technology on learning effectiveness of elementary students. The study was quantitative with two hundred

and thirteen samples and encompassed one hundred and twenty-two peer-review academic papers. The study was examined through the description of variables: domain subject, application type, intervention duration and learning environment. Chauhan's (2016) findings revealed that technology was found leading to the learning effectiveness of elementary students across all variables. The success of technology was determined by the recommendation that is best for science, mathematics and lacking effectiveness for social studies.

Another study which explored the use of educational technologies in primary education: teachers' perception of mobile technology learning impacts and applications used in the classroom conducted by Domongo and Gargante (2016), applied Application Learning theory as a theoretical underpinning the study and was a survey with the sample of one hundred and two teachers of thirteen different schools in Spain. Finding of the study was similar of other researchers that technology facilitates access to information and increase engagement with learning. It was found from the study that the impact of mobile technologies in classrooms has been extensively studied, however, less is known about teachers' experiences of how mobile technologies impacts on learning and the application and the use of it in the classroom. With these findings, I suggest more studies need be done that can portray the impact of technologies and teacher experiences leading teaching and learning in their context where they teach.

There are different studies conducted by researchers revealed that technology in teaching and learning impacts positively. Furio, Juan, Segui and Vivo (2015) revealed that development of technological resources in teaching and learning has changed the teaching methods to the extent that it offers active learning environments to students. This includes student becoming critical thinkers and developing problem solving skills (Voogt & Roblin, 2012). Technology has the ability to produce learners who are confident, motivated, independent, and dig to find more information (Balanskat, 2006; Siddiqui cited in Dzimiri & Mapute, 2013). In particular, learners of today learn better when they view what they learn (Taskm & Kandemir, 2010). Pine (2015) and Infodev (2015) expand on Taskm and Kandemir's (2010) opinion that today's younger generation is known as the generation of technology. Again, technologies develop learners to be actively engaged in the classroom and work collaboratively with other learners (Bukaliya & Mubika, 2012; Eze, Adu & Rumarayi, 2013; Miller, 1997). Students learn to work collaboratively as they share resources and information (Danny, 2017; Hew & Bush, 2014; Livingstone, 2009; Mikre, 2012; UNESCO, 2011). As a teacher I have witnessed learners share learning spaces. Teaching using technological resources enables learners to network computing facilities and produce a distributed environment where they can share learning and work space. In this regard, sharing learning space can enable students to approach their studies apart from requiring teacher direction. With these studies, I see a relationship with my study as I also intend to study the experiences of teachers using technological resources in leading teaching in their school settings. What they experience and how

technology impact on their teaching will change the way teachers approach their teaching practice. Teachers will remain important in this study; thus, the impact of technologies is measured through learners.

2.2.4 TEACHERS PERCEPTION OF TECHNOLOGY IN TEACHING

There are unlimited studies expressing teachers' perceptions using technologies in teaching and learning in rural settings. What I have observed is that scholars spent time researching success, difficulties, what need to be done and other aspects, but failed to explore teachers' insight about the use of technological tools in teaching and learning specifically in a rural context. I have also observed that factors and barriers are used as perceptions of teachers for technology tools used in teaching and learning. In understanding perceptions this is supposed to be taken into consideration, that teachers are divided into two generations. This includes information haves and information have-nots (Salehi and Salehi, 2012). Some teachers are comfortable when teaching using technological devices, whilst, some are not comfortable due to lack of computer literacy.

However, literature opened up the understanding that teachers are of the view that technological resources in teaching and learning creates the interaction between them, devices and keeps learners engaged (Clark, 2004; Hennessy, Ruthven & Blindley, 2004). This was further confirmed by the study that was conducted on the perception of teachers which sees teachers as instructional leaders as a reason, they are able to bring learners, and devices to interact with the curriculum together (Halverson & Diamond, 2015; Mestry & Pilly, 2013). The study focused on the teachers' views on using technological resources in teaching and learning. The findings were similar that new generation teachers like to use technological resources compared to older generation teachers. Furthermore, it stated as the reason that the new generation are regarded as information haves. Given this, technology creates the world whereby young people learn differently and develop high thinking skills as their minds are changing physically, become rewired as well as motivated. I suggest more needs to be done to assist teachers in developing technological skills in order to exercise their role and integrate technology devices in their teaching and support is needed from schools.

Sangra and Gonza`lez-Sanmamed's (2010) study was conducted in Europe based on the teachers' perception of technology in improving teaching and learning in primary and secondary schools. Their study focused in analyses the integration of technology in school and also examined teachers' perception whether technology can remain useful to improve teaching and learning. The study was addressed by the question: 'how is technology contributing to the development of teaching and learning process?' The findings revealed teachers have a positive estimation which includes improved student attention skills, and creation of better learning conditions. However, dissimilar finding arose from teachers who assert that expression and communication are the least valued items, perhaps because they considered the use of technology as

the one-way, where students act as receivers. What I found from this study is that not every teacher appreciates technology integration. Therefore, it calls for the Department of Education to assist and motivate their teachers through find some ways on how they can integrate technology in teaching practice.

Drawing from African context, Hennessy, Harrison and Wamakote (2010) conducted a study on the perceptions of teachers use of information and communication technology in primary and secondary schools in Sub-Saharan Africa. Their study was a survey with the sample of two hundred and ten teachers that focused on the internal factors of influence on teachers' lack of use of technological resources in the classroom and perceptions as well as beliefs about technology. These scholars found a number of educational suggestions for initial teacher education and professional development to bring schooling within development contexts into the 21st century. I suggest that these suggestions can be shared and used by education officials so that they can respond to the challenges they experience and in order for teachers to deliver quality education can improve.

The researcher is of the view that teachers who use technology in teaching and learning in their classrooms are demonstrating and providing numerous opportunities for their learners to competently work in an information age. The sentiment was acknowledged by Buabeng-Andoh (2012) who noted that schools of 21st century are obliged to teach with technologies in order to develop skills and knowledge that learners need for their future work place and everyday life by restructuring their curricula and educational facilities in order to bridge the gap in the teaching and learning process. This was further expanded by Wamakote, Ang'ondi and Onguko, (2010), who state another teachers' perception that adoption of technological resources in classroom can provide learners with adequate knowledge of specific learning areas, consequently promoting meaningful learning as well as enhancing professional productivity. These studies focused more on the challenges and beliefs in which these teachers have about using technological resources. I feel that more studies need to be conducted about teachers' perception in technology integration in teaching and learning in a rural context.

2.2.5 LEADING SUCCESSES OF TECHNOLOGY IN TEACHING AND EARNING

Harris (2010) revealed technology as motivation that changes the learning experience. Students have access to new learning opportunities. Echoing the similar sentiment Dowling, More and Brow (2005), argued that technological resources create a different learning experience that is based on doing, hearing, and seeing. Students learn how to collaborate across teams, with the teacher and sharing resources (Lee, 2001; Lim & Chai, 2008 Oliver, 2012). In such a way technological device have the ability to attract friends, families, and peers to support and encourage learners within or out of school and become connected. From a different perspective, Manohar (2010) says theory knowledge of learning can develop learners to become bored.

There are studies that reveal that technological resources in learning environment promote interaction (Wang & Woo, 2007). These devices permit teachers and learners to interact and exchange their thoughts on a certain topic (Manning, 1999), in a way that teachers may use any form of social networking to communicate with learners. I found this in the study that was conducted by Ford and Botha carried by IST-Africa conference (2010) which focused on how social networks can benefit learners as well as teachers, and it revealed social networking like Whatsapp make it easier for learners to access and communicate learning activities via this platform. Again, mobile technologies assist them in creation of collaborative learning teams especially in rural contexts (IST-Africa conference, 2010). With these findings, I assume mobile technologies platforms could be supported and can become a communication learning remedy between teachers and learners after school hours.

Technology allows student to access the up to date information quicker and easier (Birch & Sankey, 2008; Tattnall, 2008). In a similar view, Maguire (2005) regards technology as a desire for academics to answer the students' needs for greater access, flexibility, and convenience when using ICT for learning purposes. Today, teaching and learning with technological resources is more understandable. With technologies, I strongly believe that learners become confident in their learning, as they are able to access information easily through using search engine "google" to find information as I regard this searching as a learning experience.

The literature revealed that the use of technologies in teaching correctly can lead learners to choose the correct careers (Wheeler, 2001). The argument on career selection, noted by Masonta, Ramoroka and Lysko (2015), understood that technologies can assist in the continuity of studies and career selection and progression. In a similar view Pine (2015); Television White Space (2015), revealed that learners use of information and communication technology to develop skills for progress in their careers. In different literature I have read most findings declared a similar positive understanding as various scholars have stated. I believe technologies use can assist learners to choose a career that is aligned with their dreams. Learners who used to learn with technological resources are more likely to choose information and technology or else science related careers. They will choose the career because of their confidence with technology.

2.2.6 LEADING CHALLENGES IN TEACHING AND LEARNING

The South African perspective, case studies such as those revealed numerous challenges in the research conducted by Herselman (2003), titled "ICT in rural area of South Africa". The researcher focused on the rural schools in terms of utilising technology in teaching and learning. However, these different case studies revealed that infrastructure such as electricity facility is a problem faced the rural school context. From the

findings, the researcher suggested recommendation to be taken into account. Among the recommendations was one to provide funding for schools to access and upgrade electrical services.

This lack of infrastructure such as electricity is the major obstacle in integrating ICT in education in rural areas (Korte & Husing, 2007; Sustainable Village Africa, 2002; Tinio, 2002). Schools in rural contexts are struggling or do not have these technological resources due to unavailability of electricity (Acacia, 2000; Becta, 2005). A similar understanding was repeated by Vandeyar (2015), Role and Role (2013), who advocate for urgently addressing the lack of support in terms of infrastructure like electricity in rural schools. I have a feeling that since South Africa is one of the developing countries, it experiences the similar situation as the rest of developing countries. In that case, I recommend government intervention for electricity upgrade.

The Zimbabwean researchers Tusubira and Mulira (2015) conducted a study with an aim of developing the framework to monitor development through ICTs in South African rural areas which focused on how successful teachers integrate technology into teaching and learning in rural areas. However, it revealed that although many schools have few technology resources, teachers do not use them for teaching and learning. In addition to these findings, teachers are still with the old traditional methods of teaching, which is teacher centred. Apart from teacher centred approach, the study also identified that the framework used has failed the project. Tusubira and Mulira's finding contradicts with what Tazvishaya (2014) has identified. Tazvishaya stipulated that infrastructure challenge and the use of technology was at a development stage in Zimbabwe.

The study of Msila (2015) revealed that teachers are lacking skills on how to integrate technology in teaching and learning. The lacking of skills was also noted by Selwyn (2008), who asserted that teacher need to be prepared, for the production of material used, for learning to be effective. Herselman (2003) confirms that 70% of teachers are lacking skills. Echoing a similar opinion was Buabeng-Andoh (2012), who agreed on the lack of teacher technological skills, including confidence. Gray et al. (2010); Watt and Ashcroft (2005) revealed that African teachers should be equipped with technological skills. While Wilson, Strydom and Thompson (2005) argue that African teacher training should be face-to-face instruction, National Education Association (NEA) felt that teachers need to be trained in order to respond to the challenge they experienced. From the different point of view, Lim and Khine (2006) oppose the issue of teachers acquiring ICT skills and training. These researchers argue that government should separately appoint technology specialist to assist teachers and learners with computer skills and problems. However, I am of the view that specialist should have the necessary qualification to assist both teachers and learners. Again, I strongly agree that student teachers have little opportunity to do teaching practice in the context where most will be teaching. This sentiment was acknowledged by Maklina (2014) who echoed that the closure of colleges of education in townships also contributes to this challenge. Therefore, educators who

join the rural schools from urban teacher training institutions come without relevant skills. As these teachers lack the skills that will help them to be effective in the context they are in.

Lack of support is identified as a challenge in teaching with technological resources (Vandeyar, 2015). Many scholars revealed that teachers experience lack of practical support in the teaching space (Hadley & Sheingold, 1993; Unal & Ozturk, 2012; Winnan & Brown, 1992). Teachers are not getting support in schools on how to use technological devices in instructional teaching and learning processes (Rosen & Weil, 1995). Support is not a new activity in schools, as Stagers (1995); Robbins (1998) in their studies suggested that school leaders are to be empowered to choose the individuals with knowledge and relevant skills to support teachers in the integration of technology in teaching. In addition to this sentiment, Blose (2013) suggested that teachers in school context where they teach have a need to be assisted because of the challenges they experience in terms of leading teaching and learning using technological resources. This comes to my suggestion that there should be classroom assistants who are successful technology integrators, working next to the teacher to observe, evaluate, and guide computer integration.

Teacher belief was found as another challenge that hinders teachers to use technological resources in teaching. Ngcaba (2012) reveals that teachers are stereotyped. Most of the teachers believe in traditional teaching and learning (Buabeng-Andoh, 2012). This belief has hampered their progress of integrating or using technology in teaching and learning (Albirini, 2006). I found out that teachers' belief in teaching using technological resources depends on teacher emotion and attitude in general. Again, some teachers may have strong beliefs on how his or her subject should be taught.

Eze (2016) conducted a study on views and beliefs on the innovative techniques for effective teaching and learning. The study focused on one hundred and fifty teachers from fifteen secondary schools of Ebonyi state in Nigeria. The study posed five questions aimed at intending to understand views and beliefs of teachers based on technologies use in the teaching and learning process. The findings were that teachers have different views and beliefs on using technologies in teaching and learning and using technologies can result in positive achievement. In the meanwhile, some teachers show a negative attitude towards technologies (Adomi, Okiyo & Ruteyan, 2003). Findings revealed teachers' belief that technologies are for those who are leaving the field of education and aiming to enter the field of administration (Etiubon 2011; Nneji & Otaru, 2016).

There are some cases where literature outlined that high expectation was found as a problem in developing countries. South Africa, being a developing country was included. In the work of Mumba and Isabirye (2015), it was revealed that the country had failed to meet expectations. Keeping this in mind, South Africa government made a promise to the nation. In his speech the State President, Mr. Cyril Ramaphosa claimed that by 2020, all school will be using eBooks (State of Nation Address, 2019). From a different perspective, user expectations are too high. In most cases, teachers expect wisdom from learners learning using

technology resources (NEPAD e-School Project, 2006). Furthermore, they believe that learners become fast thinkers when using technology resources for learning (Mareco, 2017). United Nation has set Millennium Development Goal on information communication and technology in education (Wertlen, 2008).

2.2.7 LEADING TEACHERS AS CHANGE AGENT OF ICT

Teachers are the important components in the field of education, especially in schools. Being important as they are, teachers need to adapt to an ever-changing curriculum (McDonald, 2003). As a result, changing curriculum demands teachers to be the agents of change (Jansen, 1998). A change agent is person from inside or outside the organisation who helps an organisation transform itself by focusing on such matters as organisational effectiveness, improvement, and development (Study.com, 2015). Fullan (2005) regarded teachers as agents of change, as a result, change in the curriculum and resources used for teaching require teacher to change (Jansen, 1998; McDonald, 2003). Studies were done on teachers as agents for change. An international perspective study, which was conducted by Pince and Valli (2005), reflected that teachers become the agent of change which focused on teachers adapting to change as a result of introduction of technology in teaching and learning. The study found teachers experience tension and challenges with regard to technological resources use in schools where they teach. Moreover, these teachers and pre-service teachers, face challenges as they attend to the changing learning and teaching process (Priestley & Nieween, 2011). From a different point of view, Zhao, Plugh, Seldom, and Bayers (2002) contend that teachers who use technological resources in education and instruction should have skills to embrace change plus social awareness.

2.2.8 LANDSCAPING TECHNOLOGY INTERGRATION AND DIGITAL DIVIDE

Every stakeholder around the globe embraces technology and its great benefits. According to Jackson (2004) technological devices can bring capacity to decrease relegation as well as empower people by giving access to information. Government, companies and Non-Governmental Organisation (NGOs) have undertaken some specific measures to bridge the information gap among schools and community (Crede & Mause, 2004). Some of these measures are observed in community technology centres where information is accessed. The increase in information technology is considered as the significant aspect to relieve poverty (Stat SA, 2010). This is seen when South Africa government made funds available for rural school in order to equip them with technology (Sigh, 2010). According to World Bank cited in Castell (2000, p.7), South Africa was a country that emerged from apartheid. Again, resources were unequally distributed (Langa, Zakes & Roberts, 2006), as a result, South Africa is falling behind in terms of education, information,

science and technology (Pressly, 2009). This unequal resource distribution is regarded as a digital divide. In exploring the term in more detail, digital divide is simplified “gap analysis between those who can and do access and use ICT and those who can’t and don’t access ICT at home, country either global” (NTIA, 1999 cited in Gunkel, 2003, p. 501). According to Linda (2006), digital divide is training gap where teachers, school leaders and learners lack access to technology. These gaps are normally in developing countries where access of technology is not as supposed to be (James, 2007, p. 284). This means researchers have gone into the same direction in explaining the term. As a result, I am of the view that digital divide is the gap between information haves and have-nots.

South Africa is a developing country where education is challenged by many difficulties which include overcrowded classroom (Emmer & Stou, 2010; Oliver, 2006; Willson, 2010). The recent challenge a country experiences is information technology gap in rural school experience by teachers. In a rural school context, teaching and learning do not include technological resources. According to DPSA (2001), ten-year plan was formulated for government deployment in order to have global access to technology. However, I have observed different communication technology centres in rural context as the means of accessing technology information. Kelles-Viitanen (2003) has a point when she observes improvement in technology access in a rural context. Similar view propounded by Tinio (2002), who articulated that there should be an increase in technology availability and access in order for teachers to lead teaching, learning and to produce the quality education.

Information and communication technology is gradual in South Africa. According to Cape Digital Foundation (2017), approximately 28% of schools make use of computers, and 12, 3 % digital devices, in order to improve teaching and learning (Department of Education, 1999). Meanwhile UNESCO (2015) researched Sub- Sahara Africa analyses of Basic E-Readiness in Schools. The findings showed that only thirteen countries had an ICT policy and national plan in education. South Africa was among the counties that had an ICT policy and national plan. However, there is little impact in e-learning in our country’s education system.

Since the ninety’s technology has been making its way into South African classrooms (Education, 2011). The computer labs were built and were equipped with technological resources (Kim, Hagashi, Carrillo, Gonzales, Makay, Lee & Garate, 2010). The technological resources were computers, overhead projectors, printers, and white boards, copiers and many more. Currently, technology is being developed now and again and this leads to the introduction of mobile technologies. The table 2.1 shows computer usage in school per provinces below:

Provinces	Schools with computers	Computers usage in schools
Eastern Cape	8.8%	4.5
Free State	25.6%	12.6
Gauteng	88.5%	45.4
KwaZulu-Natal	16.6%	10.4
Limpopo	13.3%	4.9
Mpumalanga	22.9%	12.4
Northern Cape	76.3%	43.3
North West	30.5%	22.9
Western Cape	82.4%	56.8
National	39.2%	26.5

Table 2.1: Computer usage in provinces (Pandor, 2004)

The table shows school gradual increase the adoption of computers in 2000 to 2002 in South Africa. Provinces like KwaZulu Natal, Eastern Cape, Free State and Limpopo have tried in terms of computers usage in schools despite the well-known challenges teachers experienced. However, Asmal (2003) stated that they use technological resources effectively for teaching and learning in primary and secondary.

According to Cape Digital Foundation (2017), Nigeria was among the countries that have neither of the above compared to South Africa. There are challenges in their education that was acknowledged by Okebukola (1997), cited in Aduwa-Ogiegbaen and Iyamu (2005), who declared that ninety percent of Nigerian schools do not have computers as part of their classroom technologies. The researcher further narrates the challenges, like shortage of ICT resources and more. NEPAD e-School initiative asserts that five percentage of learners within the continent, including Nigeria, Algeria, Burkina Faso, Cameroon, Republic of Congo, Egypt, Gabon, Lesotho, Mali, Mauritius, Mozambique, Rwanda, Senegal, South Africa stated they do not have experience in computer usage. African school environment provides neither opportunity nor training in using technological resources, and seventy-five percent of responding teachers have no or very limited experience and expertise regarding ICT educational applications.

Mexico focuses on access to basic education (Santi-banez et al., 2005). Children attending school is 97, 2% (Inter-Agency Network for Education in Emergencies, 2007). According to the Organisational for Economic Co-operation and Development (2006), less than twenty percent of the population in Mexico have internet at school and at home, compared to other OECD countries that have more than 40% and is said more than 80% of students' access internet at school and home in USA, Europe and Asia-Pacific countries. Becta (2009) confirmed that internet is being used by half of the primary schools in United Kingdom.

In California, technology is more than fifteen years old. However, Californian technology access is 13.2% in primary schools compared to national of 22.9% (INEE, 2007). California is a state that invests its technology in primary schools. This was confirmed by National Survey (2011) that revealed that two third of schools operate slower 25 mbps in rural United State of America compared to one fifth in 2015. This means there is improvement in terms of internet speed. Becker (2000) revealed 50% nationwide educators have internet access to meet instruction demands. However, National Center for Educational Statistics (2002) agreed that 99% of American school has internet access.

Smarick (2015) revealed that there are challenges in rural America. Only 40 % of rural Americans owned Smart phones in 2013. The researcher confirmed that the American population stands at 26 000 000, but 70% are without internet in rural areas. From the work of Mikre (2011) it can be said that 77% of Swiss students use technology several times in a week. While 90 % use technology in Canada, Finland and New Zealand. Finland is the best country in the world to use technological resources in teaching practice (OECD, 2002).

Zimbabwean researcher Becker (1998) confirmed that computers are in computer labs not in classrooms. In middle school, classrooms equipped with computers estimated to be 40% (Becker, 1998). Zimbabwean education oversteps other African countries in terms of computer allocation in schools as I have noticed. Trotter (1999) opposed the percentage of computer usage in Zimbabwe. The researcher asserted that 40% of teachers deny the use of computers in teaching and learning as a result, teachers mentioned that students use computers one hour per week.

South Africa's action plan 2019 revealed that the education department approved technology-enhanced learning. However, South Africa is still struggling in terms of using technology in classrooms (Department of Education, RSA, 2015). In that case, guidelines give little direction on how teachers may integrate technology in an African context learning classrooms (Du Plessis & Webb, 2012; Nieuwound, 2015).

United Kingdom spent more than 2, 5 billion pounds in 2008-2009, while in 2009 United States spent 10, 7 billion US dollars and New Zealand spending 410 million NZ dollars every year in preparing schools with technology. In 2014-2015 South Africa has grown from 13,6 billion rand to 15 billion rand in 2017-2018 on ICT according to research firm BMI-T 's 2015 ICT in government report.

In Europe, 70 % and 60 % of learners in Romani plus Lithuania are taught by teachers who obligatory partake in ICT training, compared to 13 % of students in Italy, Austria, and Luxembourg (European Commission, 2013). The gap identified by researcher show no recent statistics shows how far South Africa is in terms of technology usage in schools. The research study done by Tazvishaya (2014) follows the same path as other scholars has researched. Researchers need to research on percentage statistics to show on-going use of technology integration in South Africa rural schools and around the world.

2.3 THEORETICAL FRAMEWORK

In this study two theories were identified to form the framework, namely transformational leadership theory and teacher leadership theory. Scholars are using different theories to forward the image of change in education. According to Yammarino and Dubinsky (1994) the information knowledge is made upon individual understanding of experiences. In recommending the statement, the researcher believes that exploring the experiences of teachers will portray the actual image on how teachers cope in leading teaching and learning with the use of technological resources.

2.3.1 TRANSFORMATIONAL LEADERSHIP THEORY

For the purpose of understanding the experiences of teachers leading teaching and learning in the presence of technology devices in their schools, I chose transformational leadership theory. Leng's (2008) suggest that the theory backs the effort of James McGregor (Burns, 1978). The theory therefore was developed through a series of empirical studies of its nature and effects by Bernad Bass (Lend, 2008, Liethwood & Jantzi, 2000). Transformational leadership stems from Downton's (1973) study of rebel leadership, and its charismatic nature is considered to emanate from Weber (1947). Yammarino and Dubinsky (1994) trace transformational leadership theory as a theory based on individual differences. This is seen when transformational leaders will have direct and indirect positive effect, mediated through trust and value congruence on the followers.

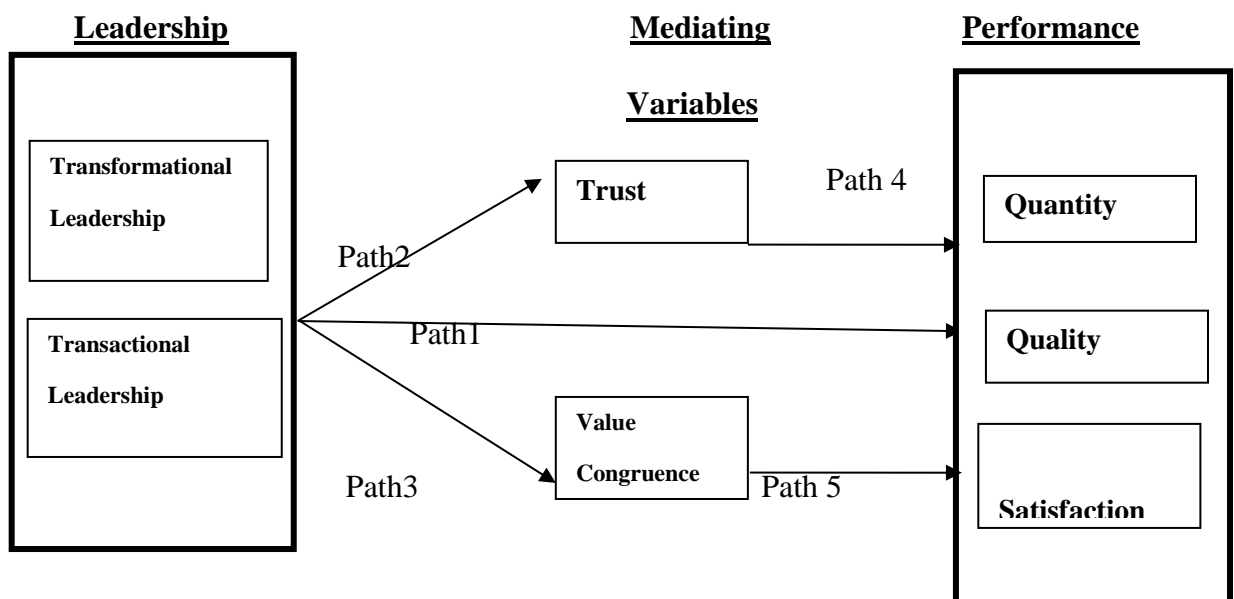


Figure 2.2: Phases of transformational leadership

Bass (1985) put forward the transformational leadership original model which is trust and value congruence as variables to be considered when evaluating this type of leadership on follower development as well as

performance. In addition, the sentiment was confirmed by Meglino et al. (1989), transformational leadership theory has a supportive role that values congruence as well as trust plays in the leadership. This theory determines to be the individual level theory bounded by individual perceptions and not holding a high level of analysis. In this study, the experiences of teachers using technology in teaching and learning are explored. Since teachers teach in various contexts, the researcher will in particular explore teachers teaching in rural contexts. The aim of the study is to understand their experiences on how they are able to teach in time where technology is widely used. With this, I intend to hear teachers' voices and to know how they cope in rural context. In addition, transformational leadership theory aims to foster capacity development and a high level of personal commitment to organisational goals (Bass, 1985; Burns, 1978; Conger & Kanungo, 1987; Gardner & Avolio, 1998).

Apollo, Bass and Jung (1991) identify five primary factors of transformational theory namely, intellectual stimulation, management by perception (active and passive), charisma, contingent reward, and individual consideration. In the meantime, Liethwood and Jantzi (2009) assert that some of the models characteristic remains that providing support through moral and material, by encouraging teachers for their determinations and contributing opportunities to grow further. According to Saddler (1997), outline the characteristics of transformational leaders that is "having a vision and strong values, courageous and, believing in people" (p.43). Avolio (2000) adds that the characteristic is based on shared trust. In addition to the characteristic of transformational leaders are inspirational, this means that a leader can resolve issues, inspire everyone towards finding the better ways of goal achievement. It can also mobilise the group of people to work (Bass, 1985). Thus, this theory has the ability to keep the teachers motivated. The transformational leaders are able to handle and resolve disagreements within and outside school.

Transformational leadership theory also speaks of change (Bass, 2008). In this study, teachers are transformational leaders. This means teachers should play the role of transformational leaders in order to ensure that technological resources are used in learners learning. Bush and Middlewood (2013) suggest that teachers are supposed to change their teaching and learning style in order to achieve teaching goals. Therefore, this confirms that teachers are the agent of change (Fullan, 1993). Teachers are the ones who have to facilitate change, and as the facilitators of technology, should introduce learners into new different technological resources (Price & Chahal, 2006). Consequently, teachers are supposed to integrate a technology in their teaching and learning in their school setting and support is needed from school (Cravens & Hallinger, 2012, p.159).

2.3.2 TEACHER LEADERSHIP THEORY

The concepts of teacher leadership have been screened by numerous researchers. Norms and Standards for Educators (2000) stipulate that teacher leadership comprises the seven roles in respect of South African policy perspective. Among the roles teacher should play are: the role of the leader, being manager and administrator, designer and interpreter of programmes for learning including material being used for teaching and learning. These roles should be acquired or played by the teacher in leading teaching and learning in the era of advanced technology. Teacher leadership has been broken down by Silva, Gimbert and Nolan (2000) in according into waves as indicated by the below table

Teacher leadership evolution	Focus of wave
First wave	Administrative leaders, namely head teachers, master teachers, and departmental heads.
Second wave	Instructional leaders, namely resource providers specialists, curriculum experts, mentors, and school leaders.
Third wave	Team leaders, change agents, advocates of collaborative and shared leadership.

Table 2.2: Evolution of teacher leadership Silva et al. (2000)

Silva, Gimbert and Nolan (2000) discusses each wave. Teachers were performing the roles of administrative leader such as that one of master teacher, departmental head in the early 80s as the first wave. This sentiment is confirmed by Oduro (2003) and Adomi (2006) who elude that appointment in seniority position or rank is based on teaching experience in the African countries like Nigeria. In about late 80s second wave arose to portray the role of instructional leadership. In the second wave, teachers were the roles of instructional leaders such as that one of curriculum experts, team leaders, teacher facilitator, and middle manager. Thereafter, Office for Standard in Education (1994) identifies the third wave that is still prevailing across the world. This wave originated in the 90s and is aiming to develop the profession. Third wave also aims to work collaboratively and shared leadership practices for the development of the organisation. Given this, the third wave stills function until today.

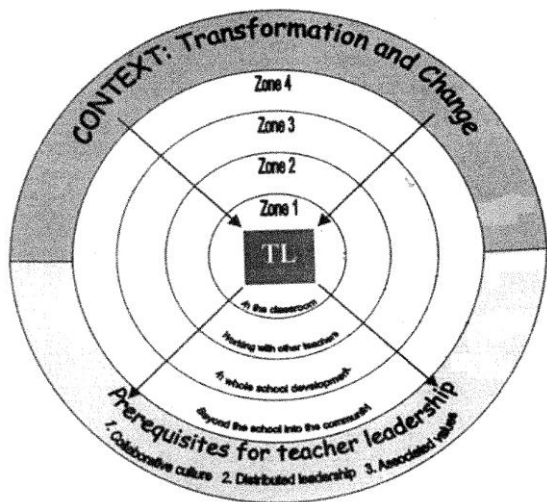
Teacher leadership may be viewed as an ability to encourage colleges to change, to do things they would not ordinarily consider without the influence of the leader (Wasley, 1991, p. 21). From a similar point of view Katzenmeyer and Moller (2001) view teacher leadership as leaders who plays leading roles inside and outside the classroom environment, identify with and contribute to the community of teacher learners as well as leaders, and has ability to drive all the stakeholders involved towards the common educational goal (p. 17). Teacher leaders are classroom teachers who share expertise in different ways (Nappi, 2014).

Therefore a teacher leader is a teacher who can work with other people in school to achieve the organisational goal (York-Bar & Duke, 2005).

Harris and Lambert (2003) view teacher leadership as a leadership model which incorporate staff in different levels within the school to take a lead and aiming to enhance teaching and learning. This is seen in schools where teacher leadership is functioning; those schools do not encounter difficulties in all educational aspects. As a result, teachers are hands-on in running the daily activities within the institution. Teacher leadership is given authority towards decision making and practice leadership roles within or without the classroom for the school benefit and community (Danielson, 2006; Harris & Mujs, 2005; Nappi, 2014). In this regard, we learn that there should be collaboration between all the stakeholders, teacher leaders, the community as well as school management team for the achievement of the school vision. Leadership is exercised when a teacher takes a role in leading teaching and learning with technology in their school. Sometime, teacher leadership acquire formal and informal roles such as subject coordinator, peer coaching, ICT champion, committee leader either committee chair, catalyst for change, data coach, mentor, learning facilitator, classroom supporter and role player (Katzenmeyer & Moller, 2001, Killion & Harrison, 2006; Mujs et al., 2013; York-Bar & Duke, 2004).

The school benefits if teacher leadership is obtainable within the institution. Among the advancing stakeholders who benefit are learners, staff teachers and School Management Team (SMT). Barth (1988) supported this claim when saying if schools can empower teacher leadership, there will be no aspects that can hinder in teaching, learning as well as day to day activities. Teacher leaders help other teachers and become teacher trainers, peer coaches and curriculum specialist and forms a partnership with other schools or teachers so as to develop advanced teaching material (Katzenmeyer & Moller, 2001).

The following show how the school principal can benefit from teacher leadership. Firstly, leadership teacher fills the blind spots. This happens when effective principal identifies gaps where they need the most help and then interview a teacher who show interest in leadership (Muijs & Harris, 2006). Secondly, when principal delegate some teacher to perform part of the workload (Muijs & Harris, 2006). This is when principal shares administrative responsibility with instructional team leader such as to compile learner statistics. Thirdly, improve relationships to improve student achievements (Louis et al., 2010). Leadership is about promoting good relationship and cultivation of mutual trust among the stakeholders within the institution. Lastly, leverage the benefit of collaboration. This is when professional learning communities are created by effective principal and teachers working together in supporting of shared vision of the school (Nappi, 2014; Reeves, 2010). For the aim of exploring the experiences of teacher leading teaching and learning in the era of advanced technology in rural school setting. Teacher leadership theory is used as second theory in order to strengthen the study. Grant' (2008) model of teacher leadership assisted. As a result, I understand the role played by teachers in leading teaching and learning in rural settings in the



presence of technology. In addition, teacher leadership model has four zones. Firstly, it takes place in the classroom. Secondly, it takes place outside the classroom in curricular and extra-curricular activities. Thirdly, it takes place outside the classroom in the whole school development. Lastly, take place outside the school in engagements with neighbouring school. This illustration indicates the zones where teacher leader can lead teachers and learners (Grant, 2008).

Figure 2.3: Teacher leadership zones

First level of analysis: Four Zones	Second level of analysis: Six Roles
One In the classroom	One Continuing to teach and improve one's teaching
Two Working with other teachers and learners outside the classroom in curricular and extra-curricular activities	Two: Providing curriculum knowledge
	Three: Leading in-service education and assisting other teachers
	Four: Participating in performance evaluation of teachers
Three Outside the classroom in whole school development	Five: Organising and leading peer reviews of school practice Six: Participating in school level decision making.
Four Between neighbouring schools in the community	Two: Providing curriculum development knowledge Three: Leading in-service education and assisting other teachers.

Table 2.3: Grant's model of teacher leadership (Grant, 2008, p.93)

2.4 CHAPTER SUMMARY

This chapter presented the review of literature. The chapter intended to provide an understanding of the work done by other scholars in the research study phenomenon. The reviewed literature portrays national and international perspectives in teachers leading teaching and learning in rural settings with the use of technology. Transformational and teacher leadership theory were presented as the theoretical framework underpinning the study. The following chapter will present research design and methodology that informed the study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter presented the review of literature relating to the experiences of teachers leading teaching and learning in rural settings. In addition, the chapter presented the theoretical framework underpinning the study. The theoretical framework underpinning this study comprises the transformational leadership and teacher leadership theories. This chapter focuses on the research design and methodology. The chapter aims to present the approaches and tools that guided the generation and analysis of data. In developing the chapter, the methodological elements were discussed individually. These elements include, research paradigm, research design, research methodology, sampling, data generation methods, data analysis method as well as the issues of trustworthiness and ethics. Lastly, the chapter is concluded by indicating the limitation of the study.

3.2 RESEARCH PARADIGM

Research paradigm is explained as “a loose collection of logical related assumptions, concepts, or propositions that orient thinking and research” (Bogdan & Biklen, 1998, p. 92). In addition, Govender (2011), Jonker and Pennick (2010) describe paradigm as a set of fundamental assumptions and beliefs about how the world is understood and this understanding serves as a thinking structure that underpins the actions of the researcher. There seems to be an agreement between researchers in terms of viewing the research paradigm as a frame of reference that shapes our thoughts and perceptions as researchers (Babbie, 2007).

There are four dominant research paradigms, namely interpretivist, positivist, post-positivist and critical paradigm (Christiansen, Bertram & Land, 2010; Mackenzie & Knipes, 2006). For the purposes of this study, I located myself within the interpretivist paradigm. Interpretivists usually pursue studies to understand the behaviour and humanistic connection internally (Maree, 2007). Interpretivists assume that “there are multiple and socially constructed realities and they focus on what is specific and unique in order to generate, understand and interpret meanings from participants” (Brayan, 2008; Wahyuni, 2012). Since the interpretive position is based on many truths (Crotty, 2000; Mark, 2010; Pring, 2000), this study explored teachers’ experiences of leading teaching and learning in rural settings in the era of technology. These teachers experience this phenomenon differently, thus it is assumed that their experiences will present multiple truths (Denzin & Lincoln, 2011). The interpretive researcher allowed me, through

interviews, to capture participant experiences in order to understand what it means to teach in rural school in the presence of technology. In this way, I was exposed to multiple truths and realities (Creswell, 2014). In the interpretive paradigm, the researcher came into contact with the participant in order to find the truth on the research case (Grix, 2004). These sentiments are also echoed by Cohen, Manion and Morrison (2007, p. 21) who claim that “dominant effort in the background of the interpretive paradigm remains understanding the subjective creation of human practice”. Furthermore, these scholars postulate that there is no single truth on the experiences of teachers teaching in rural settings. This understanding made me to listen to their views because they understand their experiences better. I located myself within the interpretive paradigm because it enabled me to hear the voices of teachers and also to see their world in terms of the research phenomenon. The aim of the interpretive paradigm is building up greater thoughts of how individuals make sense of the world in which they live and work (De Vos, Strydom & Foucher, 2005; Tracy, 2013).

3.3 RESEARCH DESIGN

Research design stipulates how the study will be conducted. The research design aims to provide evidence on how research questions will be used by the researcher to draw valid as well as credible conclusions. There are three types of research designs, namely, qualitative, quantitative and mixed methods. This study is guided by the qualitative research design. Creswell (2008, p.2) understands qualitative research design as “an inquiry process of understanding a social or human problem based on building a social or holistic complex picture formed with words, reporting detailed views of informants and conducted in natural setting. This design focuses on human behaviour and experiences”. Nieuwenhuis (2007) views qualitative research design within the interpretivist paradigm. In this study, I adopted qualitative research design to generate advanced and thick data from teachers teaching in rural contexts with an aim to gain their insight about their practices. Maree (2007) explains that a qualitative researcher uses face-to-face contact with participants in their natural setting. Likewise, in this study I met my participants and we dialogued on a face-to-face basis in their preferred spaces.

The qualitative design aims to understand social life and the meaning that people attach to their everyday life (De Vos, Strydom & Foucher, 2002). The qualitative design is also viewed as the way to understand the daily life experience of a particular group in their natural setting (Cohen, Manion & Morrison, 2011; Denzin & Lincoln, 2011). This design allowed me (the researcher) to gain a deeper understanding of the experiences of teachers (Corbin & Straws, 2008). Qualitative studies aim to produce a rich description of the investigated phenomena (Holiday, 2007). This research design considered to be suitable to this research study because it enabled me to understand more on the experiences of teachers through interacting by them.

3.4 RESEARCH METHODOLOGY

Research methodology is viewed by Cater and Little (2007) as a technique that makes available justification of the information. From the different perspective, Cohen et al. (2011) explain methodology as the theoretical analysis of methods used in the study. The methodology links the principles that the researcher uses and it forms guidelines for the study. Given this background, this study adopted the case study methodology to engage with the experiences of teachers leading teaching and learning in rural settings. The case study methodology is defined by Yin (1984) as “an empirical enquiry within the real life context, particularly when boundaries between the phenomenon and context are not clearly evident and in which multiple sources of evidence are used” (p. 23).

In the similar vein, Bauer and Gaskill (2003) explain the case study methodology as an inquiry that happens on natural scenery. Punch (2009) expands this description by highlighting that case studies aim to explore the in-depth research case in its natural setting. The case study methodology is an “in-depth, multifaceted explorations that make use of qualitative research methods to understand the single social phenomenon” (Black & Champion, 1976, p. 89-94). This methodology also provides the rich insight of a particular situation, event, classroom or person (khoza, 2013; Rule & John, 2011; Thomas, 2011; Yin, 2003). In this study, the case was constituted by four teachers teaching in two schools located in a rural setting. Through the case study methodology, I was able to explore the real life environment of these teachers in terms of using technological tools in teaching and learning in schools located in rural areas.

Qualitative case studies make available thick descriptions about the particular subject that other kind of scientific methods would not achieve (Cohen et al., 2011). The case study methodology has the ability to provide large amount of information essential for the study. Neuman (1994) confirms that case study researchers generate a large amount of data on a single case. In this study, the case study was used in order to understand the experiences of four teachers teaching in rural setting in the era of technology.

3.5 SAMPLING OF PARTICIPANTS

Sampling is a method used by a researcher to nominate participants of the study (Maree, 2007). According to Cohen et al. (2000), assert “sample size depends on study determination and population environment on which the researcher is researching” (p. 9). This means that there is no exact set number that must be adopted by all researchers. Qualitative studies normally utilise non-probability sampling methods. The non-probability sampling methods are employed in small scale studies which are studies with smaller participants. There are numerous non-probability methods, this include, snowball, purposive, convenient and criterion sampling method (Patton, 1990). This study adopted the purposive and convenience sampling methods to select participants.

First, the purposive sampling is explained as a process whereby the researcher decides what needs to be known and then hand-pick people who can or are willing to provide the required information (Bernard, 2002; Lewis & Sheppard, 2006). Purposive sampling is viewed by Betram and Christian (2014) as well as Maree (2007) as a method of selecting participants and who have the knowledge to answer the research question. Likewise, I handpicked four teachers to participate in this study; these teachers were selected based on their relevancy and interest in the study. The chosen teachers were willing and they volunteered to participate in the study. Apart from the participants, I paid special attention to the selection of schools, thus I selected schools based on the availability of technological resources since these recourses form part of the study context.

Second, the convenience sampling is a method whereby the nominated population elements are based on the point that they are easily as well as conveniently available (Cohen et al., 2007; Maree & Pietersen, 2007). In a similar vein, Ilker, Sulaiman and Rukayya (2016) are of the view that schools should be convenient to the researcher, that includes accessibility, willingness to participate and geographical vicinity. Therefore, in employing convenience sampling I chose two rural schools that are closer to me; in this way, travelling costs were inexpensive.

3.6 DATA GENERATING METHOD

The study made used two methods of generating data. These methods are semi-structured interview and observation. These methods will be explained below:

3.6.1 Semi-structured interview

An interview is known as a two-way conversation where the interviewer asks questions to a participant and the participant in return answers the questions (Cohen, Manion & Morrison, 2007; Maree, 2007). The interviews are done in order to understand more a research phenomenon. In this study, I employed the semi-structured interview to generate data. This type of interview allows a researcher to probe in order to get more information (Greeff, 2002; Sarantakos, 2005).

According to Denscombe (2005); Rule and John (2011) a semi-structured interview allows for flexibility, this means that it allows researcher to give a participant example for the sake of clarity, especially, if the participant does not understand the research question. Normally, semi-structured interviews have a potential of being quick and easy to conduct, again they have a high degree of engagement (De Vos, 2002; 2005). This is confirmed by Maree (2007) who views the semi-structured interview as in-depth method of generating data that is specific to the research topic. Cohen, Marion and Morrison (2011, p. 267) contend

that the semi-structured interview allows an interviewer and an interviewee a moment to discuss the ideas of the world in which they live from their personal experiences. The semi-structured interview was used in this study in order to understand teachers' perceptions and their experiences of teaching using technology in rural context.

3.6.2 Observation

The second method of generating data was observation; this method is regarded as a powerful tool to witness participants' behaviours and actions in their natural setting (Spradley, 2016; Whisker, 2001). In this study I got a chance to witness teachers' actions when leading teaching and learning within the classroom with the use of technological tools. The observation method is also viewed by Creswell (2012) as the process where the researcher observes actions in the particular setting and takes notes without interrupting the participant. In this study, I visited two rural schools with an aim to observe four teachers delivering lessons in action. This was done to observe the behaviour of participants in the classroom when teaching using technological tools. One of the advantages of observation as identified by Cohen, Manion and Morrison (2011, p. 456), is that the researcher gets a chance to acquire data as it occurs naturally in a social institution. According to Maree (2012) the observation is a powerful technique to achieve an insight of the actual situation. The observation method of generating data also allows the researcher to interact with a situation, thus a direct insight is gained by the researcher of what happens in the field or research site (Christianson & Bertram, 2010; Creswell, 2012; Maree, 2012; Tucson & Simpson, 2002). From a different point of view Fink (2008) warns researchers that observation is time consuming; again the observed persons sometimes change their behaviour. In order to mitigate the impact of this limitation in this study, the observation is used to supplement the semi-structured interview which was the primary method of data generation.

3.7 DATA ANALYSIS

Zide (2013) points out that analysis is a method of inspecting, transforming, cleansing as well as modelling of information with the purpose of discovering helpful information. According to Mayan (2001); McMillian and Schumacher (1997) data analysis is the process of observing patterns in the generated data; asking questions of those patterns and interpret as well as reporting those patterns appearing from data. Echoing the similar sentiments are Biklen (1998); Fossey, et al. (2002, p.728); Regenysis (2003) hold a view that data analysis is practice of reviewing, synthesising as well as interpreting data with an intention to describe and explain the phenomena or social worlds being studied.

This study used thematic analysis to analyse data. Cohen, Manion and Morrison (2011) state that thematic analysis involves coding, create meaningful categories into which unit of analysis are grouped. The first step in thematic analysis is coding of data; this is when data is categorised according to themes and patterns (Braun & Clarke, 2006; Mc Millan & Schumacher, 2011). These themes are grouped according to related responses or if permitting to the critical questions (Braun & Clarke, 2006). In addition, the thematic analysis is common approach that is used by qualitative researchers to analyse data (Percy, Kostere & Koster, 2015).

In this study, data that was generated through semi-structured interviews and observations were analysed using the thematic analysis. The thematic analysis enabled me to understand the hidden meaning and manifesting themes observable from the data (Boyatzis, 1998). According to Braun and Wilkinson (2003), thematic analysis is associated with qualitative research. The interview sessions were recorded and transcribed verbatim. After the transcription process, the transcripts were shared with the participants to ensure accuracy. Thereafter, the data were analysed. This process involved a close examination of data which led to the identification of themes or topics and the combination of similar responses of participants.

3.8 TRUSTWORTHINESS

According to Lincoln and Guba (1985), qualitative researchers create trustworthiness of their findings by ensuring that findings are credible, transferable, dependable and confirmable (p. 290). Likewise, I employed these criteria to defend the trustworthiness in this study.

3.8.1 Credibility

Credibility refers to a researcher attempts to reveal that the correct image of the occurrence is presented (Shenton, 2004). In this study, I ensured credibility by recording and transcribing interview sessions. After transcribing, data was shared with the participants to check whether it reflected what they have said. Carlson (2010) confirms the argument raised by Shenton (2004) by arguing that credibility shows the process of data generation, the research setting, analysing process, and the recruitment of participants. Multiples sources of generating data were used in order to put forward the evidence (Lincoln & Guba, 1990). Multiple sources of data is known as triangulation. Triangulation is used in the study to boost trustworthiness, and as a consequence, the use of more than one method of generating data brought more than a single view of experience.

3.8.2 Transferability

Transferability means to provide sufficient details of the context of the field work for the reader to be able to decide whether or not to transfer the findings of the study to another context (Shenton, 2004). This means

that the findings of one study could be used to understand the similar phenomenon in a similar situation (Yin, 2014). This notion is, however, opposed by Lincoln and Guba (1985) who posit that it is not the duty of the researcher to provide the degree of transferability. In ensuring transferability in this study, I provided all information about participants and their school contexts. Any researcher or reader will then decide whether to use the information in another situation similar to that of this study (Shenton, 2004; Carlson, 2010).

3.8.3 Confirmability

Confirmability means data must be confirmed by someone other than the researcher (Conran, et al., 2011). In a similar vein, Betram and Christiansen (2014) are of the view that study findings must be confirmed in order to maintain objectivity by another person. Lincoln and Guba (1985) suggests that is a way of addressing concerns about researcher's influences. In this study, confirmability was ensured by sharing the transcripts and also the findings with the participants.

3.8.4 Dependability

Dependability means the study is consistent, reasonable, and stable over time across researchers and methods (Miles & Huberman, 1994). A similar view was declared by Lincoln and Guba (1985) who suggest that dependability is whereby the researcher evaluates the whole process of data collection and analysis. To ensure dependability is difficult for qualitative work. However, dependability is consistency in quantitative research (Lincoln & Guba, 1985). In this case, dependability was ensured through using the semi-structured interviews and observations to generate data. In addition, the data produced was discussed with critical reader since dependability stipulates assessment of the quality of integrated process of data gathering and analysis (Lincoln & Guba, 1985). Dependability can be ensured if the researcher at least strives to enable future researchers to repeat the study.

3.9 ETHICAL CONSIDERATIONS

Ethics means the application of moral rules and professional codes of conduct to the collection, analysing, reporting, and publication of information about teachers teaching in rural setting using technology (Kitchener, 2000). This is similar to the sentiments of Koocher and Keith-Spiegel (1998) who view ethics as an evaluation of behaviour in terms of right and wrong according to principles and guidelines. Ethics in research are significant, if research includes individuals and animals (Christiansen, et al., 2010). This means

the researcher has to follow the ethics principle in the field so as to protect participants' rights (Cohen et al., 2011).

Cohen, Manion and Morrison (2007) suggest that any researcher has to undergo ethical obligations in order to seek informed consent from relevant gatekeepers. I therefore firstly, made an application to the ethics committee of the University of Kwa-Zulu Natal for the ethical clearance of the study (see appendix B). Then the ethics committee will in writing grant me the ethical clearance (see appendix B). The reason of applying permission is that research cannot be conducted by anyone and anywhere. Secondly, the researcher made a request to the Department of Basic Education to conduct research in schools (see appendix C). In return, department will give me the permission to research the nominated schools (appendix C). Thirdly, the researcher wrote letters to school principals requesting permission to conduct the research in their schools (see appendix D). Subsequently, the principals granted the permission to conduct research in their institutions (see appendix E). Finally, letters were drafted to participants requesting their consent of participation (see appendix F). Participants agreed to participate in the research through signing the consent form being found in the letter. Again, the researcher took into account the three principles as noted by (Durrheim & Wasser, cited in Christiansen, et al., 2011). These principles are discussed below.

The first principle of autonomy is where the researcher must ensure personal autonomy and protect the rights to be fully informed. The important issue of protecting participants on any data generating is to use pseudonym. The pseudonym will protect him or her from the identity issue by using an anonymous name (Bettini, 2009). Therefore, interview conversation is private and confidential. The participants in the study were volunteers and were treated in a confidential manner. In addition, participants were free to withdraw from the research at any time without any negative consequences (McMillan, 2014).

The second principle is non-maleficence; this is where the researcher may not cause harm to participants (Rule & John, 2011). The ethic in the field includes respecting participants alike, allow him or her to withdraw from data generation if they wish so. Non-maleficence aims at the researcher not causing harm to a participant (Cohen, Manion & Morrison, 2011). As a researcher, it is not allowed to invade participants' privacy. This includes me not to ask sensitive things that remind participants of the past.

A researcher must inform the participant of everything regarding their rights. In addition, the researcher must also respect, be honest, and sympathetic to all participants. Similar views on participant protection were raised by Cooper and Schindler (2003) who declare that a participant may not be harassed, embarrassed, or physically harmed, and privacy loss is supposed to be avoided when doing research.

Third is the principle of beneficence whereby the research conducted can contribute to the public. This means that the public or people are supposed to benefit from the research conducted. In terms of benefit and feedback, the researcher will organize a presentation where I shall present the findings of the study to

the participants. In addition, an electronic version of dissertation available to participants for their perusal; and the hard copy will be available in the University of KwaZulu-Natal library.

3.10 LIMITATION OF THE STUDY

Like any research study, limitations are found. Limitations are taken as factors that weaken the study (Creswell, 2008). The aim of identifying limitations is to explore the gaps that need to be researched. The limitation in this study was that it took place at UMkhanyakude district, as a result, it lacks generalisation as I focused on only four participants. The findings may not necessary represent all rural schools in the country.

3.11 CHAPTER SUMMARY

This chapter has presented the research design and methodology that guided the research process. The chapter presented the interpretive paradigm, qualitative research design and case study methodology as methodological elements that shaped the study. In addition, the chapter also discussed research methods which are sampling methods, data generation and data analysis methods. Finally, the trustworthiness issues, ethical considerations and limitation of the study were discussed. The next chapter will present the discussion of findings.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION

4.1 INTRODUCTION

The previous chapter presented the research design and methodology that informed the research process. In doing this, the chapter presented among other things, the research paradigm, research design and research methodology, data generation and analysis methods. This chapter focuses on the data presentation and discussion of findings. The chapter aims to present discussion of data and the findings that emerged upon data analysis. In developing the chapter, I would begin by presenting the profiles of the participants and profiles of schools in which the participants work, thereafter, discussion of findings is presented thematically.

4.2 PROFILES OF PARTICIPANTS

Four participants were used to generate data in this study. These participants are from two different schools in a rural setting. In order to protect their identity, pseudonyms were given to participants and also their schools. Table 4.1 below shows names of participants and those of their schools.

Name of participant		Name of school
1.	Mr Ngwekazi	Zilethe High School
2.	Miss Nogumedana	
3.	Miss Mdletsheni	Ngodini Primary School
4.	Mrs Mlungu	

Table 4.1: List of participants

4.2.1. Mr Ngwekazi

The first participant is Mr Ngwekazi who is a teacher and a science departmental head at Zilethe high school. He is between the ages of 40-45 years. Mr Ngwekazi teaches maths as well as physics in grades eleven and twelve. He studied chemical engineering at the University of Zululand and obtained a bachelor's degree. His teaching career started as a substitute teacher and while he was a substitute teacher, he registered for a post graduate certificate in education (PGCE) with the University of South Africa (UNISA) which he completed successfully. Mr Ngwekazi now has a service of twenty years in the teaching profession and has taught in several schools. He was promoted to departmental head post in Zilethe high and has been a departmental head for nine years. His school, Zilethe high is a public school located in a rural area of UMkhanyakude district and is ranked at quintile two. Zilethe high is a no fee school which was established in 1999 and was rebuilt in 2015. Now the school has modern buildings and modern technologies for teaching and learning. At the moment, the school enrolment is one thousand two hundred and forty-five learners, this includes grade eight to twelve learners.

4.2.2 Miss Nogumedana

The second participant is Miss Nogumedana who is a teacher at Zilethe high school. She is between the ages of 25- 30 years. Miss Nogumedana teaches Computer Application Technology (CAT) in grades ten, eleven and twelve. She studied information technology at Durban Computer College and obtained a diploma in information technology. Miss Nogumedana obtained her first job at Ensengweni consultancy which is an organisation that runs learnership for information technology graduate students. She was a facilitator and while she was a facilitator, she registered for a post graduate certificate in education (PGCE) with the University of South Africa (UNISA) which she completed successfully. Miss Nogumedana now has a service of three years in the teaching profession at Zilethe high. Her school, Zilethe high is a public school located in a rural area of UMkhanyakude district and is ranked at quintile 2. Zilethe high is a no fee school which was established in 1999 and was rebuilt in 2015. Now the school has modern buildings and modern technologies for teaching and learning. At the moment, the school enrolment is one thousand two hundred and forty-five learners; this includes grade eight to twelve learners.

4.2.3 Miss Mdletsheni

The third participant is Miss Mdletsheni who is a teacher at Ngodini primary school. She is between the ages of 30-35 years. Miss Mdletsheni teaches Social sciences and English in grades four and seven. She studied financial management in Richtech College and obtained a financial management certificate. Her

teaching career started as an accounting teacher and while she was an accounting teacher, she registered for a bachelors' degree in education (B Ed) with the University of South Africa (UNISA) which she completed successfully. Miss Mdletsheni now has a service of twelve years in the teaching profession and has taught in several schools. She is a teacher representative in school governing body (SGB). Her school, Ngodini primary is a public school located in a rural area of UMkhanyakude district and is ranked at quintile 2. Ngodini primary is a no fee school which was established in 1982 and was rebuilt in 2011. Now the school has modern buildings and modern technologies for teaching and learning. At the moment, the school enrolment is eight hundred and eighty-nine learners, this includes grade R to seven learners.

4.2.3 Miss Mlungu

The fourth participant is Miss Mlungu who is a teacher and deputy principal at Ngodini Primary School. She is between the ages of 40-45 years. Miss Mlungu teaches Technology and Life Orientation in grade seven. She studied administration at the University of Zululand and obtained a bachelor's degree. Her teaching career started as a school governing body paid teacher and while she was a teacher, she registered for a post graduate certificate in education (PGCE) with the University of South Africa (UNISA) which she completed successfully. Currently, she is proudly holding a Bachelor of Education honours degree with the University of Pretoria. She is currently an enrolled student at university of Zululand where she is studying towards her Master of Education degree. Miss Mlungu now has a service of twelve years in the teaching profession and has taught in several schools. Her school, Ngodini primary is a public school located in a rural area of UMkhanyakude district and is ranked at quintile 2. Ngodini primary is a no fee school which was established in 1982 and was rebuilt in 2011. Now the school has modern buildings and modern technologies for teaching and learning. At the moment, the school enrolment is eight hundred and eighty-nine learners, this includes grade R to seven learners.

4.3 DATA PRESENTATION AND DISCUSSION

The findings are presented in five themes that emerged from data. Below each theme is presented individually.

4.3.1 TECHNOLOGY DEVICES USED BY TEACHERS FOR TEACHING.

The transformation in education in the past two decades has resulted to teachers' use of technological resources for teaching and learning. In this study, I also found teachers using different technological devices

to teach learners in a rural context. The participating teachers mentioned computers, tablets, overhead projector, laptop, printers, copiers, laser pointer, cell phone and loud hailer as some of the resources they use to enhance their teaching. Although they teach in a rural context, their schools have acquired these technological devices to make teaching and learning easier. For instance, Miss Mdletsheni believes that a device like a tablet is an essential resource for internet search in her subject and, she ventilates:

In my school we have laptops, computers, overhead projector, printers, CompuServe and photocopying machine. I normally use a tablet connected to an overhead projector for teaching grade seven. I teach Social sciences. Map skill topics such as volcanoes, earthquakes and floods require more internet searching. With the background where I am teaching, I provide learners with my tablet so they can search for more information from the internet (Miss Mdletsheni).

Apart from the tablet that is used by Miss Mdletsheni for internet connection, Miss Mlungu believes that a computer is an important teaching resource for her grade. She uses a computer to teach her learners and she downloaded specific programmes such as Encarta kid 2009 which she uses for teaching. This is what she said:

Devices that are found in my school are laptop, computers, overhead projector, printers, and photocopiers. I normally use a computer and I connect it to a data projector so that learners can see. Computers have necessary built-in educational information programme named Encarta kid 2009 that I use to teach life skills. When I teach bullying, learners see the video and description notes based on the lesson. There are many computer programmes with information on life orientation, religions, cultures, life and social sciences as well as business studies. This makes it easy for learners to access information (Miss Mlungu).

Miss Nogumedana also shares similar sentiments with her colleagues in terms of the usefulness of technological devices. She indicates that technological devices are supplementing the teaching resources for her subject and for other teachers in her school context. This is what she said:

I teach computer application technology. The subject that I teach requires ICT a lot. I use desktop computers; each learner has his or her own desktop. A projector is used for learners to see what I am teaching. Lessons are displayed on the projector and I use a laser pointer to point on a displayed screen. I also use a printer to print hand-outs and also assessment tasks. We also have tablets and loud hailer for loud hearing purpose. I also use laptop for my teaching. To me technology devices supplement the teaching resource since CAT is a new subject and we do not have enough learners' books. Also, teachers use

computer and projector to teach their subjects since learner- teacher support material is not enough for learners in our school (Miss Nogumedana).

Mr Ngwekazi uses a television monitor additional to the devices used by other teachers. Mr Ngwekazi highlights:

Technology devices in my school are laptops; desktop computers; white board; printers; copiers; tablets; television; projector where we can project something from computer so that learners can view the lesson from a big screen. The school has a television monitor which is a flat screen television. I download and save information from internet; this includes informative texts and videos to flash compact disk or a universal serial bus. I then use the television monitor to display this information for my learners during my lessons (Mr Ngwekazi).

The above extracts show different technological devices that teachers in rural contexts make use of in leading teaching and learning. In some cases, the school in which these teachers work does not have enough technological resources, however, these teachers go to an extent of providing their own devices in order to enhance their teaching and their learners' learning. The practices of these teachers display passion for their profession and a drive to go an extra mile. Passion is viewed by Fenzel (2016) as a desire or interest of a teacher to improve and motivate student learning experience. Again, the extra mile was observed from Miss Mdletsheni while she was using her own tablet for practical demonstration of the lesson. I found this in line with what Pillay (2014) has said that teachers should go an extra mile for the benefit of their learners.

Drawing from different literature on the experiences that work for teachers leading teaching and learning in rural settings with the presence of technological devices, the literature propounds that the introduction of technology in teaching has a potential of improving education of learners (Bladergroen, 2012; Enginda, 2011; Koale, 2013; Mji, 2014; Sangra & Gonza'lez-Sanmamed, 2010; Wong & Li, 2008; UNESCO, 2011). In this study, the participating teachers appeared to hold this notion as they made several attempts to integrate technology in their teaching with an intention to improve their learners' learning in a rural setting. Drawing from Grant (2008), Miss Mdletsheni, Mr Ngwekazi, Miss Nogumedana and Miss Mlungu are reflecting zone one of teacher leadership theory whereby they enhance teaching and learning inside the classroom with technological resources.

4.3.2 IMPACT OF TECHNOLOGY ON TEACHING AND LEARNING IN RURAL SCHOOLS

Technological resources have been indicated by teachers as a positive contributor to teaching and learning in rural settings. In this study, teachers were found to embrace technology as a mechanism or tool that can

impact their teaching positively. Among other things, teachers indicated that learners get interested in learning, they grasp the information quicker and perform better, they remain motivated again and their participation in lessons improves. Mr Ngwekazi postulates:

When I use a projector, my lesson gets very interesting. Technological devices enhance learners' interest to a lesson. Laptop and projector ignite the interest of learning on learners, again, the taught knowledge stays longer in their mind. (Mr Ngwekazi).

Miss Mdletsheni shares the same sentiment as Mr Ngwekazi when she claims that technological devices have good impact on teaching and learning, moreover, it creates conducive learning environment and good experience for learners in her school context. This is what she said:

The use of technology in my teaching arouses learners' interest to my lessons as they get a hands-on learning experience. In my school learners get an advantage and privilege of finding information from the first hand sources. This builds their confidence and they feel proud as these devices bring a positive atmosphere in a learning room. When I give them projects or tasks for instance, they use a computer to explore the given activity deeply. Exposing learners to these technological devices makes them to be familiar with technology because their background deprives them access to these devices (Miss Mdletsheni).

For Miss Nogumedana, technology forms a key component of her teaching because her subject is about technology. Miss Nogumedana explains:

I cannot teach Computer Application Technology (CAT) without technological devices. When I teach learners how to use a printer, I must show them. It is a good experience for learners to see what I talk about. It makes my work easier, because what I teach is seen by learners through the projector. Learners who are exposed to technology can know that even a smart phone is a valuable resource for knowledge (Ms Nogumedana).

Miss Mlungu indicated that information taught using technological devices stays in the minds of learners and she also believes that technology improves quality instruction as well as classroom attendance. Miss Mlungu highlights:

Teaching in the presence of any digital resources improve quality instruction. The technological resources help me to create an environment conducive for learning, again it allows for a productive learning. I have seen that using digital devices promote interest in learning as well as self-learning (Miss Mlungu).

From the data excerpts, it appears that technological devices have various impact reflected by teachers in leading teaching and learning in their setting. The participating teachers indicated that technological

resources in teaching have positive impacts. Among the positivity impacts observed, include the embracement of technology into learners learning. In this study, teachers were found showing dedication and determination to work hard in order to obtain rewarding outcomes. This includes Mr Ngwekazi as well as Miss Nogumedana who use technological devices to teach learners after school and also spend time teaching during weekends. This shows dedication to their work as I have found out that they offer additional lessons in order to enhance learners learning in their school context.

Drawing from the different literature that explore the impacts of technology in teaching and learning in rural school context, it appears that technology impacts positively on teaching and learning as it makes learners to be actively engaged, again, it fosters collaborative working and also improves eagerness to learn (Bukaliya & Mubika, 2012; Das, 2019; Eze, Adu & Rumarayi. 2013; Mapute, 2013; Siddiqui cited in Dzimiri & Mapute, 2013; Shapely et al., 2013). Likewise, Newman (2002); Wheeler (2000); Mdletshe (2013) echo that technological resources improve learning process through providing interactive educational material which increase learner motivation and also facilitate the easy achievement of basic learning skills. As a result, a student-centred approach is promoted through the use of technology (Yusuf et al., 2013). This was also observed during lesson observation that learners enjoyed to be hands-on with the computer device and they were fully participating in the lessons. This result to positive learning environment in the learning rooms and it was impressive.

4.3.3 THE ROLE OF TEACHERS LEADING TEACHING AND LEARNING IN THE PRESENCE OF TECHNOLOGY

Although technology in teaching and learning has a positive impact, the teacher's role still remains important in the school context. Participating teachers highlighted that they select technological devices suitable for their lessons, they promote information literacy and they integrate technology in the curriculum. Mr Ngwekazi indicates that his role is to choose suitable devices for teaching his learners. He expounds:

My role as a teacher is to identify gadgets that are suitable for my lessons or that will make my learners understand the content better. Again, I normally use technological gadgets to consolidate the information taught (Mr Ngwekazi).

Apart from Mr Ngwekazi, Miss Mlungu explains that her role is to promote information communication technology in and outside her school context. This is what she said:

As I teach in a rural setting, my role is to make sure that information and communication technology is promoted within the school. This is important as learners need to be prepared for the new world where jobs are not guaranteed. Apart from this, I also have a

role of leading teaching and learning in the community service centre after school (Miss Mlungu).

Miss Mdletsheni has an additional role on how she uses and teaches in the presence of technological devices. Her role is to give guidance and monitor the proper use of devices for learning. This is what she said:

My role is to give instructions and guidance through demonstrating how to use technological devices for teaching and learning. After guidance, I monitor learners whether devices are properly used for the prepared educational activity. Additionally, I use my educational disc which covers lots of topics and I display the information through the overhead projector to be viewed by all learners in the class. (Miss Mdletsheni).

The above extracts show the roles of teachers in integrating technology in leading teaching and learning in their context. It appears that teachers integrate technology with teaching regardless of the context in which they teach. Again, Miss Mdletsheni indicated that technological resources are used to prepare learners not only for the current but also for the future. In the light of these sentiments, I come into realization that the role of a teacher is significant because the teacher must be able to identify relevant devices for his or her lesson, again the teacher must provide guidance to learners in terms of using the technological gadgets.

Drawing from literature review, I learnt that different scholars view technology as a tool to improve quality education and instruction. Various scholars share a belief that integration of technological devices in teaching and learning depend on teachers as crucial role players in this process (Dina, Ciornei & Hismanoglu, 2013; Mikre & Oladosu, 2011; Sangra' & Gonzalez-Sanmamed, 2010; Teo, 2006). In addition, Wheeler (2000); Chan (2003), also assert that the integration of technology strongly relies upon teacher attitude, perception and beliefs. Teacher attitude in this study was found to be positive, since Mr Ngwekazi, Miss Nogumedana and Miss Mdletsheni all showed concern for quality teaching and learning. It was clear from the study that, information and communication technology cannot substitute teacher's role in teaching learners. While, Bukaliya and Mubika (2011) notices the role of ICT in teaching lies upon the context where it is practiced. The teachers' role in integrating technology in their teaching reflect zone one of teacher leadership as Grant (2008) posits that teacher leadership also takes place within the classroom.

4.3.4 CHALLENGES EXPERIENCED BY TEACHERS IN USING TECHNOLOGY IN TEACHING AND LEARNING

Although technology positively impacts on teaching and learning, the participants pointed out numerous challenges during data generating. These challenges included learner ratio proportion towards devices or

inadequate devices; time factor; poor signal, internet connection; teacher training; skills lacking. Most of the interviewed participants agreed on the shortage of devices in their school. Miss Nogumedana claims:

There are twenty computers in the computer lab. It makes difficult for CAT learners because in grade ten learners are twenty-six. This means computers are not enough. Six learners will have to share. During examination we have two sessions for learners. The first fifteen learners will write in the morning session and the remaining learners will write in the afternoon (Miss Nogumedana).

Miss Mdletsheni and Miss Mlungu share a similar challenge as Miss Nogumedana has said on computer learner ration proportion. She elucidates:

We had thirty-five computers and some of them are not working. Apart from this, six computers were stolen. You find that learners are seated in group of three to four and the computer will be operated by one learner. This opens up for disagreement and arguing among learners and it can be strenuous because I fail to control the class (Miss Mdletsheni).

Miss Mlungu adds more on computer learner ratio. This is what she says:

The school enrolment keeps increasing every yearly, however, computers remains the same. As a result, I cannot estimate the number of learner enrolment in the class on a yearly base. In some other time, learners are more than computers (Miss Mlungu).

Mr Ngwekazi has experience different the shortage of devices in his school. He ventilates:

We don't have enough devices in school to cater for all. You find that devices are occupied by another colleague when I need it. Therefore, I have to use this one laptop moving from one class to another class and is used by all teachers. It would be better if classrooms have whiteboard, only to bring projector, laptop and connect. I have to move with devices, change it into other class and put work for that class, and it challenging sometime (Mr Ngwekazi).

The above discussions show challenges that teachers come across when integrating technology into their teaching in rural settings. The data shows that the schools sometimes do not have enough technological resources to match the number of learners. Therefore, it appears from data that some of the teachers use overhead project for their lesson to continue. While other teachers indicated that the shortage of devices hampers their teaching, I found this in line with what Berner and Milman (2016) and also Tearle (2004) observation that most of rural schools are under-resourced and have limited infrastructure. Such challenge makes it difficult for teachers to lead teaching and learning in rural schools.

The study conducted by Mathevula and Uwizeyimana (2014) revealed that schools have plans for increasing the use of computer by teachers and learners in order to access information. According to National Centre for Education Studies (2000) ninety-nine percent of United State of American public schools have computers and internet access within the premises. In South Africa this is still a dream since it is a developing country.

The second challenge that was identified by participants is the time factor. Most of the participants mentioned the issue of time as a hindrance when teaching with technological devices. Miss Nogumedana expounds:

Preparation for the subject takes a lot of time as other devices are kept in locked strong room. After finish using it, I must return devices back and bear in mind that the period is one hour. The next period gets disturbed due to the whole process and this result in curriculum content coverage incomplete. Sometimes time allocated for a lesson will never be enough for others learners. Therefore, I sometime find myself in the position where I have to assist and give special attention to a learner individually (Miss Nogumedana).

Mr Ngwekazi shared a similar sentiment as Miss Nogumedana on time taken. His concern is to connect devices for lesson demonstration in the learning room. He articulates:

It is time consuming to connect this gadget as the period is one hour. Once more, it is very embarrassing trying to connect devices in front of learners all to find out that is not connect or takes longer time than it is expected (Mr Ngwekazi).

Miss Mdletsheni has mentioned time as a challenge that hampers teachers to use technological devices in teaching and learning in her school context. This is what she explains:

Time becomes a factor since some teachers and learners are not familiar with modern devices available in school. Learners' background does not allow them to have technologies like computers in their homes. Therefore, it takes a lot of time to assist them as well as to develop computer skills and leave behind what I intend to teach with computers (Miss Mdletsheni).

What is emerging from the above extracts is that time is one of the challenges of teachers in integrating technology into their teaching. These teachers claim that preparation and connection of devices is time consuming. However, these teachers appeared not to be demoralized by this challenge, instead they allocate more time in order to fulfil their learners teaching. From the literature I have reviewed, it became clear that time constrain is noted as the huge challenge that affects learning as well as formal school system (Devadason, 2014). With this challenge, it requires a teacher to fully supervise learners during learning

when using technology, as students may use it for leisure and visit unwanted sites. Again, less time to learn and study can occur (Mikre, 2011).

Thirdly, poor signal that result in slow internet connection was also mentioned by participants as another challenge they experience in a rural context. Miss Nogumedana and Mr Ngwekazi indicate that connection of device towards internet is very poor in their context. This is what she said:

Poor signal in my school area challenged me when using devices for teaching. For mobile devices to function, signal respond is needed. Therefore, in my school it is difficult to access signal. I had to move out with learners in order to access signal where it responds. Poor signal result in slow network that supposed to support the mobile devices and sometime it ends up not connected at all (Miss Nogumedana).

Miss Mlungu shares an additional voice about poor internet connection on what Miss Nogumedana has said. She ventilates:

When I use tablets, internet connection sometimes poses a problem in rural surrounding. I find it hard to connect to the internet as rural areas have the problem of signal tower copper stolen. Another issue is the high cost of data bundles which hamper me to use internet on the other time. With the network that I use for data bundle, I find it challenging to connect to the internet.

Miss Mdletsheni has another challenge resulting from poor signal. She suggests that school should have Wi-Fi, so as to connect all the technological devices available in school. This is what she explains:

Schools should have Wi-Fi for internet connection of all devices available within. We have no free Wi-Fi or hot spot at school. This challenge creates a problem when learners need to research school activity. Learners do not have access to internet as at home. I ended up making sacrifices with my tablet and data bundle for learners to access internet and is quite expensive (Miss Mdletsheni).

From the above discussions, it is deduced that teachers teaching in rural context experience difficulty when they intend to use internet for leading teaching and learning. These teachers highlighted poor internet connection as a hindrance in their context. Although poor and lack of internet connection does hamper their teaching, love for learners and the passion are attributes that drive the teachers under this challenge. This is in line with the sentiments of Neito (2003) who asserts that passionate teachers lead teaching and learning despite encountering challenges in their schools.

Drawing from the literature that explore the practices of teachers leading teaching and learning with technological devices in a rural school setting. Yousef and Dahmani quoted by Mikre (2011) indicate poor

internet in rural context as the challenge facing information and communication technology in teaching as well as learning activities. In this study, teachers were found having internet challenges and are undertaking certain measures to respond to the challenges. Like Miss Mdletsheni was witnessed using her device and data bundle for internet access of her learners. Brakel and Chiseuga (2003) as well as Hassan and Clerment (2002) suggest that teachers teaching in deep rural areas should be able to buy whatever resource (device or data bundle) for the benefit of learners learning. However, this notion was rejected by Farrell and Isaac (2009), when they say among many only few schools have internet since government has not introduced or implemented the affordable standard e-rate policy that will give discounted rate for schools when using internet.

Fourthly, inadequate teacher training and skills lacking were found as the challenge that prohibit teachers from using technological devices over teaching and learning regardless of their context. Most of the participants have indicated that inadequate knowledge on how to use technological resources in the school creates a challenge for teachers. Participant like Mr Ngwekazi and Miss Nogumedana shares similar sentiments. Mr Ngwekazi indicates:

Training is needed for teachers. Insufficient knowledge on how to use the gadget leads towards the lack of use of it in teaching and learning. Among different devices found in school only few teachers use it for learners teaching. As for myself, I was trained in that time where these devices were scarce and unavailable. Therefore, using devices for teaching gives me a hard time. Technological devices require a teacher to have basic skills or knowledge background. That knowledge can be used to catch up with the changing devices (Mr Ngwekazi).

Miss Nogumedana has another additional challenge with regard to teachers lacking computer skills. This is what she said:

I am used to technology as my subject demands technological devices in teaching. Being used to technology gives me a hard time as colleagues bring their marks to be captured in the computer system. When I am busy capture their marks, mine will wait. I ended up doing double work due to their lack of computer skills. Their inadequate skill has led them not to use technological devices for teaching (Miss Nogumedana).

Miss Mdletsheni, in her school, she mentioned that teachers do not use computers for teaching. However, teachers use computer for administrative purpose, learners' achievements and personal use. This is what she said:

Teachers do not use computer for teaching. They are not able to use these devices for teaching and learning. They only enter learners' marks. To make the things

worse, they even ask another teacher to open the device and to log in into SASAMS. Moreover, some teachers write their personal assignment, lesson preparation. In most cases, projector is used for playing movies in my school (Miss Mdletsheni).

The data suggests the need for training as teachers are not trained on how to use technological resources and also to integrate these resources to learning. The participants mentioned that the few teachers who can use technological resources find themselves having to assist other teachers. From the observation sessions, I noticed that participants took long to connect devices and they were assisting each other. This showed that teachers are not clear on how to connect gadgets like laptops to projectors.

From the literature perspective, case studies research conducted by Tinio (2002) reveals teachers lacking competence in using technologies in teaching and learning. In addition, Lau and Sim (2008); Tinio (2003); Msila (2015) found the gap, the literature claims that even though technology was introduced teachers are struggling. Through this study, teachers were found hesitant to use technology in education. As a result, skills lacking was identified as a challenge in their teaching profession (Miller, Nadioo & Van Belle, 2006). This challenge was noted by Selwyn (2008), who asserts that teacher need to be trained, prepared, in the production of material used, for learning to be effective. Miss Mdletsheni; Miss Nogumedana and CAT learners were only participants who display normal skills for computer use, based from what I observed.

4.3.5 STRATEGIES DEvised BY TEACHERS TO RESPOND TO THE CHALLENGE

It emerged from the data generated that teachers experienced challenges in teaching in the presence of technology in rural settings. These teachers react to the challenges by devising strategies. All the participants who were participating raised common responses in terms of responding to the challenges they encounter. In most circumstances' teachers testified that they use a data projector to respond to the shortage of gadgets, and again they offer afternoon or weekend classes to ensure that learners get enough time to learn through and interact with technological gadgets. Miss Nogumedana ventilates that she teaches over weekends. She explains:

I teach during weekend; school holidays and do afternoon classes. In school we do have a timetable for afternoon classes. Learners used to share devices. Also, I have to move with learners to find where the network coverage is better. For the malfunctioning devices, we do have a school technician. It is only a matter of reporting to the managers of the school and the problem is solved (Miss Nogumedana).

Miss Mdletsheni shares a similar sentiment as Miss Nogumedana when she propounds on extra classroom learning. She ventilates:

I do extra classes so as to complete the syllabus. Sometime I do morning or afternoon classes it depends. Sometime, I use to invite learners over weekend to catch up curriculum content coverage. They attend and collaborate with scheduled classes because they like to learn with computers despite of their time taken. In terms of devices, I use one computer connect it to data projector as to demonstrate via big screen to be viewed by all learners. However, learners don't get it. They want to be hands-on to use the computer themselves (Miss Mdletsheni).

Mr Ngwekazi as well Miss Mlungu have additional opinions about how teachers respond to the challenge, they experienced in terms of teaching using devices. They postulate that teachers need a kind of training. Mr Ngwekazi suggests:

I take other teachers' periods when they are not at school for completion of the syllabus. With regards to devices, I take learners to the computer lab where computers are; they have to share the computer. Although, they cannot view direct from the computers because are limited. I also used to project the lesson so that it can be viewed by everyone (Mr Ngwekazi).

Based on the information from the participating teachers, it is acknowledgeable that these teachers are positive and have shown their best interest to overcome challenges they experienced in connection with teaching practices and using technologies in their school context. Participants have revealed different measures they use in their school to address the challenge they encountered. These teachers have made sacrifices so as to fulfil their professional duties to the extent that they do extra classes in this study. In doing this, participating teachers show how they admire their work and even compromise for their learners. What I noticed during their lesson presentation, Miss Mdletsheni learners collaborate with others, eager to learn, have confidence about themselves and all arrived in due time as expected. There was a positive atmosphere in the learning room and I found this in line with Cossa and Cronje (2004); Kozma (2003); Porcarco (2011), who advocate the benefits technologies offered in education which include superior learner attendance if teaching in presence of technology.

From the literature I read that, in order to overcome the challenges teachers experienced in teaching with technological resources Chetty (2015); Clarke and Robson (2005) suggest that teachers should be continuously developed to ensure quality teaching and learning. While Tearle (2004) emphasizes that principals are key component that should admire the value of technology in their school. This confirms what Grant's (2008) model advocates of teacher leadership in zone three.

4.4. CHAPTER SUMMARY

This chapter has presented the discussion of data and the findings. The answers to the three critical questions were presented in five themes. The themes were, technology devices used by teachers for teaching, impact of technology on teaching and learning in rural schools, the role of teachers leading teaching and learning in the presence of technology, challenges experienced by teachers in using technology on teaching and learning, and strategies devised by teachers to responses to the challenges. The following chapter is a final chapter and it presents conclusions and recommendations of the study.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The previous chapter presented the discussion of data and findings. Five themes developed from data were each used to present the findings of the study. These themes were, technology devices used by teachers for teaching; impact of technology on teaching and learning in rural schools; the role of teachers leading teaching and learning in the presence of technology; challenges experienced by teachers in using technology in teaching and learning; teachers responses to challenges experienced in leading teaching and learning. This is the final chapter and it focuses on the conclusions and recommendations derived from the findings and of the study.

5.2 SUMMARY OF THE STUDY

This study explored the experiences of teachers leading teaching and learning in the presence of technology in rural schools. The report of the study is presented in five chapters. Below I briefly explain the contents of the chapters.

Chapter one provided an overview to the study with an aim to introduce the study. In developing this chapter, the background, rationale, problem statement, research questions and aims and objectives of the study were discussed.

Chapter two presented the review of literature. The chapter intended to discuss and to present a landscape of the literature on the experiences of teachers teaching in the presence of technology in rural settings. In addition, the chapter discussed the transformational leadership and teacher leadership theories as the theoretical framework that underpinned the study.

Chapter three presented the methodology components that informed the study process. Firstly, the interpretivism paradigm as my worldview was discussed. Secondly, qualitative design which I used to understand teachers' qualitative experiences was presented. Thirdly, the case study methodology was discussed. Fourthly, the purposive and convenience sampling, semi-structured interview and observation as well as thematic analysis were discussed as research methods used in this study. Lastly, the issues of trustworthiness and ethics as well as limitations of the study were also discussed.

Chapter four presented discussion of findings. The chapter started by presenting participants, profiles and schools where the participants teach. Thereafter, five themes that were developed from data were presented thematically.

5.3 CONCLUSIONS DRAWN FROM FINDINGS

Below the conclusions drawn from the findings of the study are presented. The three research questions are presented below to remind the reader as conclusions are presented around these questions.

Key question one

What are the experiences of teachers leading teaching and learning in the era of technology in rural areas?

- What are the successes of teachers leading teaching and learning?
- What are the challenges of teachers leading teaching and learning?

Key question two

How do teachers respond to the challenges they experience in terms of leading teaching and learning in the era of technology?

Key question three

What are the roles of teachers in leading teaching and learning in the presence of technology in rural areas?

5.3.1 THE EXPERIENCES OF TEACHERS USING TECHNOLOGY IN TEACHING AND LEARNING

The education system in our country has been evolving in the past two decades and is continuing to evolve. This evolution has led our schools moving from traditional teaching methods to modern, where technology is integrated into teaching. The advent of technology has seen South African classrooms changing. The integration of technology in education is part of 2020 vision set by the Department of Education in South Africa. This vision says all teachers and schools regardless of the background context should be using e-learning when teaching is taking place. As a result, this study explored experiences of teachers leading teaching and learning in the presence of technology in rural school contexts, in this way I was able to detect the progress with regards to the 2020 vision.

This study found teachers doing some measures to ensure that technological devices form part of their teaching. These teachers have done exceptional work which showed their passion for teaching. They were found using different technological resources in order to enhance their learners' learning. Among the

resources, were television monitor, desktop computer, laptops, tablets, copiers and printers and this depend on a school where they teach. Miss Mdletsheni was found using her tablet as an important resource for internet search in social science subject she teaches. Such actions displayed by this teacher indicated passion for her profession and her learners learning. Likewise, Miss Mlungu used computers to download specific programme like Encarta Kid2009 which in has an important programme for life orientation, religious culture, gaming, life and social sciences used in her teaching for her learners to explore the lesson deeper. Miss Nogumedana was found using devices like data projector as she taught computer application technology since this subject cannot be taught in the absence of technology devices. Again, her colleagues used a projector to supplement learner-teacher support material as there is not enough in her school. While Mr Ngwekazi was found using television monitor as additional devices which he saved download information from internet, like informative texts and videos to universal serial bus. The downloaded information was displayed via television monitor so that learners can view during his lesson presentation. These participating teachers have demonstrated different initiatives to integrate technology in leading teaching in the context where they serve.

The initiative that these teachers made has resulted in technology positively impacting on their teaching. Again, all the participating teachers were found embracing technology as a mechanism that impacts teaching positively, to the extent that they agreed that their teaching changes tremendously. Despite the above adjustment, teachers in rural setting again experience the challenges in leading teaching and learning in the presence of technology from the context they work in. Numerous challenges were identified by the participating teachers. Among the challenges includes learner-ratio proportion towards devices, time factor, poor signal, teachers lacking computer skills. Firstly, these teachers identified the shortage of devices as a hindrance for their students to enjoy hands-on experience with the devices. Secondly, time was identified as a factor that deters teachers from paying individual attention to other student who are struggling to interact with the devices. Thirdly, poor signal supposed to support internet to connect during learning with devices was found as a challenge for teachers teaching in rural settings. The issue of poor signal most affected Miss Nogumedana as her CAT teaching subject uses internet more frequently during teaching and learning. Lastly, lack of technology skills was also mentioned as a challenge that prohibited teachers from teaching in the presence of technology. These teachers reported that strenuous situation resulted from challenges experience by teachers has made teaching and learning to be difficult in the context where they work. However, they continue teaching despite such experiences. These teachers demonstrated the qualities of teacher leadership theory which suggests that teachers should do whatever it takes to enhance teaching and learning practices so as to improve the achievement of learners (De Villers, 2011; York-Bar & Duke, 2004).

3.5.2 STRATEGIES DEvised BY TEACHERS TO RESPOND TO THE CHALLENGES

This study was about the experiences of teachers leading teaching and learning with technology in rural settings. These teachers have come across with different challenges in the school where they teach. This challenge does not hamper them to fulfil their teaching responsibilities. These teachers devised strategies in order to ensure that teaching in the presence of technology is alive or happening. They were found using different strategies which include teaching extra classes, during weekends and school holidays. The participating teachers compromise their personal time for their learners' learning and they appeared to admire their work. Such practice was observed from Miss Nogumedana who taught her learners during weekends, holidays and afternoons. The time allocated for CAT was not enough since this subject is practical. Therefore, practical lessons required more time because individual assistance is needed during teaching. Likewise, Miss Mdletsheni used to do morning classes as the strategy to overcome the challenge they experience when teaching in the presence of technology. Again, Miss Nogumedana, Miss Mdletsheni, Miss Mlungu and Mr Ngwekazi use data projector to overcome the challenge of devices in the school where they teach. Miss Mdletsheni has gone to an extent of bringing her tablets for internet use and to access more information for the benefit of her learners. Miss Mlungu brought her own educational disc for the benefit of learners learning.

I can conclude that teachers who were participating are aware and prepared to respond to the challenges they encountered when leading teaching and learning in the presence of technology in their context. These teachers were not demoralized by the context where they teach, instead they demonstrated their leadership skills. Their leadership skills were seen in their classrooms and Grant's (2008) confirms this in zone one. They led teaching and learning strategies to overcome challenges so that their learners can continue getting education.

5.3.3 THE ROLE PLAYED BY TEACHERS IN LEADING TEACHING AND LEARNING

Schools are situated in different contexts. Some schools are in rural while some are in urban contexts. The study took place in a rural context and is entrapped by numerous challenges. Positive impact was also noticed in schools using technology in teaching. However, the role played by teachers in leading teaching still remains important in the school. This study found important roles played by teachers in leading teaching and learning. For instance, Mr Ngwekazi was found identifying devices that are suitable for prepared lessons. Such occurrence was seen when he was using a television monitor to display the downloaded information text and videos when leading teaching. Miss Mlungu was found integrating technology in her teaching so that her learners can be used to technologies. She was preparing them for

future circumstances through equipping learners with computer skills so that they can stand with their feet to face the world.

It appeared that teachers integrated technology with teaching regardless of the context in which they serve. Miss Mdletsheni has gone to the extent of providing for her learners. She was found using her own educational disc for the benefit of her learners. This educational disc contains resourceful information used for teaching and learning. Apart from providing for her learners, she offers guide, gives instruction and monitors that devices are used for educational purpose.

5.4 RECOMMENDATIONS

Drawing from data generated, recommendations were made to and directed to the department of education; school management teams; and researchers.

5.4.1 RECOMMENDATION TO THE DEPARTMENT OF EDUCATION

Regarding the Education Department, this is what was found. Large classes in which teachers taught brought a challenge of learner ratio towards the technological resources found in school. I am of the view that government should build more classes or computer labs and to increase the norms and standards funding especially for rural schools so that they can afford to supplement technology resources. Secondly, I recommend that training should be provided to teachers in order for them to use technology devices in teaching practices. Thirdly, I recommend that every school should be equipped with technological resources so as teaching practice can be enhanced.

5.4.2 RECOMMENDATION TO SCHOOL MANAGEMENT TEAMS

The findings from data generated revealed that school management teams have made little effort to assist teachers and to make sure that technology is used during teaching and learning. Therefore, I recommend that school management teams should contact the information technology subject advisors as to equip teachers with necessary skills on how to use technology during teaching. Secondly, schools should find on its own an expert that is able to assist teachers with skills and support them in terms of technology integration into teaching.

5.4.3 RECOMMENDATIONS TO RESEARCHERS

This was a small-scale study based on the lived experiences of four teachers leading teaching with technology in two rural schools. The findings cannot represent the rest of rural school teachers lived experiences of using technology resources in teaching and learning. Therefore, the study also lacks generalisability as I explored the views of four participants in UMkhanyakude district. Therefore, more studies may be conducted using a larger sample.

5.5 CHAPTER SUMMARY

The study focused on the experiences of teachers teaching in a rural setting and was guided by the three research questions. The study revealed the challenges experienced by teachers teaching under this context with regards to technology integration. Among the challenges were learner ratio, teacher's incapability, time and poor internet access. Apart from challenges, survival strategies were adopted to overcome the challenges experienced by teachers. Again, the study revealed the role played by teachers leading teaching in the presence of technology. This is the last chapter whereby conclusions were drawn from findings, and recommendations were made to the Department of Education; School Management Teams as well as researchers.

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Data generation tools

SEMI-STRUCTURED INTERVIEW GUIDE

1. How do you integrate technology into your teaching?
 - What devices do you use?
 - How does the use of technology impact on you teaching?
 - Has the learners' performance improved?
 - 1. Tell me about the teaching and learning in the classroom in the presence of technology.
 - 2. What challenges have you encountered in terms of teaching devices?
 - 3. How do you respond to challenges you encounter?
 - About teaching?
 - About devices?
 - 4. What are your perceptions about using technology in your teaching?
 - 5. If these technological devices are not available, how do you teach in their absence?
 - 6. What is your role in integrating technology and teaching?
 - 7. How often do you use technology in your lesson and why?
 - 8. Do you have ability to use technology for teaching?
 - 9. What support do you require in this regard?

CLASSROOM OBSERVATION GUIDE

School name: _____

Grade: _____ Educator: _____

Subject: _____ Topic of lesson: _____

Classroom enrolment: _____ Date of lesson: _____

Time from: _____ To: _____ No. of learners present: _____

1. What technological resource was used in the classroom?

Comments-----

2. Is the resource(s) enough for all learners?

Comments-----

3. What is the role of the resource used?

Comments-----

4. How do teachers interact with technology?

Comments-----

5. How do learners interact with technology?

Comments-----

6. Is the resource or resources used for entire lesson?

Comments-----

Ethical clearance



11 February 2019

Mrs Sindisiwe Jabu Msweli (217078585)
 School of Education
 Edgewood Campus

Dear Mrs Msweli,

Protocol reference number: HSS/0305/018M

Project title: Exploring the experience of teachers leading teaching and learning in the era of advanced technology: A case study of eight teachers in two rural schools

Full Approval – Expedited Application

In response to your application received on 11 April 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and FULL APPROVAL for the protocol has been granted.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shamila Naidoo (Deputy Chair)

/ms

Cc Supervisor: SB Blöse
 Cc Academic Leader Research: Dr SB Khoza
 Cc School Administrator: Ms Sheryl Jeenarain

Humanities & Social Sciences Research Ethics Committee

Dr Rosemary Sibanda (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymann@ukzn.ac.za / mohunp@ukzn.ac.za

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Permission from the Department of basic education



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Enquiries: Phindile Duma

Tel: 033 392 1063

Ref.:2/4/8/1495

Mrs S Msweli

P.O Box 927
Mtubathutuba
3935

Dear Mrs Msweli

PERMISSION TO CONDUCT RESEARCH IN THE KZN DōE INSTITUTIONS

Your application to conduct research entitled: “**EXPLORING THE EXPERIENCES OF TEACHERS LEADING TEACHING AND LEARNING IN THE ERA OF ADVANCED TECHNOLOGY: A CASE STUDY OF EIGHT TEACHERS IN RURAL SCHOOLS**”, in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.
4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the Intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from 05 April 2018 to 09 July 2020.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Miss Phindile Duma at the contact numbers below.
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report/dissertation/thesis must be submitted to the research office of the Department. Please address it to The Office of the HOD, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to schools and institutions in KwaZulu-Natal Department of Education.

(SEE SCHOOLS LIST ATTACHED)

Dr. EV Nzama
Head of Department: Education
Date: 05 April 2018

KWAZULU-NATAL DEPARTMENT OF EDUCATION

Postal Address: Private Bag X9137 • Pietermaritzburg • 3200 • Republic of South Africa
Physical Address: 247 Burger Street • Anton Lembede Building • Pietermaritzburg • 3201
Tel.: +27 33 392 1063 • Fax.: +27 033 392 1203 • Email: Phindile.Duma@kzndoe.gov.za • Web: www.kzndoe.gov.za
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Letter from gatekeepers (School Principals)

P O Box 927

Mtubatuba

3935

20 January 2019

The Principal

ABC School

P O Box 3623

Mtubatuba

3935

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT YOUR SCHOOL

I am student and I am conducting research as a requirement of the University of KwaZulu-Natal towards a Degree of Masters in Education. The title of the research study is “Exploring the experience of teachers leading teaching and learning in the era of advanced technology: A case study of four teachers in two rural schools.”

I would like to use your school as one of the research sites, and this letter intends to request your permission. The focus of the study is on the experiences of teachers using technological tools in teaching and learning; therefore, I would like to request your teachers to participate in the study. Should permission be granted, the interviews with the teacher will be scheduled for dates and times that are convenient for them. Care will be taken that no disturbance is caused during such interviews. Please also note that the participation in this study is voluntary, and the participant has the right to withdraw from the study at any time without any negative consequence. In addition, you are assured that details of the school and the participant will be kept confidential, and your identity will never be disclosed to anyone.

For more information and questions about the study, you may contact the researcher or the research supervisor on the following details:

Name of researcher: Msweli Sindisiwe. Cell No. 0736038677; email: sindisiwemsweli@outlook.com

Supervisor: [Dr. SB Blose](#): Tel No.: (031) 260 1870; Email: Bloses@ukzn.ac.za

You may also contact the Research Office through: P. Mohun

HSSREC Research Office, Tel.: 031 260 4557 E-mail: mohunp@ukzn.ac.za

Thanking you in advance.

Yours in Education

Mrs. S J Msweli

Response letters from gatekeepers (school principals)



05 February 2019

PRIMARY SCHOOL

Tel.: (035) 550 0126

P.O. Box 154

Riverview 3930

Dear Sindisiwe

PERMISSION TO CONDUCT RESEARCH AT

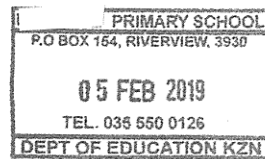
PRIMARY SCHOOL

Your letter research topic titled "Exploring the experience of teachers leading teaching and learning in the era of advanced technology: A case study of five teachers in rural schools." Request to conduct research in our school. Please be informed that you are granted a permission to conduct your research at the above mentioned school.

Yours in education

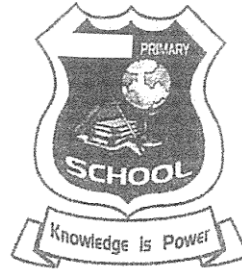
Ms


Principal



PRIMARY SCHOOL

POSTNET SUITE 181
P/ Bag X013
MTUBATUBA



Dear Sindisiwe


PERMISSION TO CONDUCT A RESEARCH

Please be inform that your request on conducting a research at Primary has been accepted.

Yours in education.

Yours sincerely
N.J.C Mhlanga

DEPT OF BASIC EDUCATION
THE PRINCIPAL
PRIMARY SCHOOL
POSTNET SUITE 181 P/BAG X013
MTUBATUBA, 3935

SIGNATURE: 
13 JULY 2019

Participants' consent of participation

P O Box 927

Mtubatuba

3935

03 February 2019

Dear participant

REQUEST FOR PARTICIPATION IN THE RESEARCH

I am student who is willing to conduct a research as a requirement at the University of KwaZulu-Natal towards a Degree of Masters in Education. The title of the research is “Exploring the experience of teachers leading teaching and learning in the era of advanced technology: A case study of four teachers in two rural schools”. The objectives of the study are to:

- Explore the experiences of teachers leading teaching and learning in the era of advanced technology in rural schools.
- Make known the strategies that teachers apply to respond to the challenges they experience.
- Explore the role of teachers in leading teaching and learning in the presence of technology.

The study will focus on the experiences of teachers using technology tools in teaching and learning. This letter intends to elucidate the purpose of the study and to request your participation in the study.

Please note that:

- Your confidentiality is guaranteed as your inputs will not be attributed to you in person, but reported only as a population member opinion.
- The interview may last for about 1 hour and may be split into two parts depending on your preference.
- Any information given by you cannot be used against you, and the collected data will be used for purposes of this research only.
- Data will be stored in secure storage and destroyed after 5 years.
- You have a choice to participate, not participate or stop participating in the research. You will not be penalized for taking such an action.
- Your involvement is purely for academic purposes only, and there are no financial benefits involved.

- If you are willing to be interviewed, please indicate (by ticking as applicable) whether or not you are willing to allow the interview to be recorded by the following equipment:

Instrument	Willing	Not willing
Audio equipment		
Photographic equipment		
Video equipment		

I can be contacted at: Email: sindisiwemsweli@outlook.com

Cell: 0736038677

My supervisor is Dr. SB Blose who is located at the School of Education, at the University of KwaZulu-Natal. He can be contacted at:

Email: Bloses@ukzn.ac.za

Phone: 031 260 1870

I hope this letter will find your positive consideration, thanking you in advance.

Yours Sincerely

Sindisiwe Msweli

PLEASE COMPLETE THE FOLLOWING SECTION FOR CONSENT OF PARTICIPATION:

I _____ (Full names of participant) hereby confirm that I understand the nature and purpose of the study titled: “Exploring the experience of teachers leading teaching and learning in the era of advanced technology: A case study of four teachers in two rural schools”. I agree to participate in the study. I am also fully aware that I have the right to withdraw from the study at any point should I wish to do so, without any negative or undesirable consequence. I am also aware that there are neither any foreseeable direct benefits nor direct risks associated with my

participation in this study. I therefore understand the contents of this letter fully and I do **give consent/ do not give consent** for the interviews to be digitally recorded.

Signature: _____

Date: _____



Turnitin report

Mrs S Msweli

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sathsgovender4@gmail.com

Dr Saths Govender

19 NOVEMBER 2019

TO WHOM IT MAY CONCERN

LANGUAGE CLEARANCE CERTIFICATE

This serves to inform that I have read the final version of the dissertation titled:

EXPLORING EXPERIENCES OF TEACHERS LEADING TEACHING AND LEARNING IN THE ERA OF ADVANCED TECHNOLOGY: A CASE STUDY OF TEACHERS IN TWO RURAL SCHOOLS, by SINDISIWE JABU MSWELL, student no.217078585.

To the best of my knowledge, all the proposed amendments have been effected and the work is free of spelling and grammatical errors. I am of the view that the quality of language used is satisfactory.

Yours faithfully

S. Govender

DR S. GOVENDER

B Paed. (Arts), B.A. (Hons), B Ed.
Cambridge Certificate for English Medium Teachers
MPA, D Admin.