ASSESSING THE UTILISATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN INCLUSIVE CLASSES IN THE OSHANA REGION OF NAMIBIA

A RESEARCH THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION (INCLUSIVE EDUCATION)

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ABSTRACT

The introduction of Information Communication and Technology (ICT) in the 21st century has transformed education processes in inclusive classes, including the role of teachers and learners of the 21st century. Subsequently, the academic achievement of learners in inclusive classes was enhanced/improved. Following this global development, Namibia has adopted the ICT Policy for Education (1999) with the objective to foster appropriate development, efficient delivery and quality utilisation of technology in order to ensure ICT integration for excellence and equity in the education system. The purpose of this research study was to assess the use of Information Communication Technologies in inclusive classes at two schools in the Oshana Region of Namibia. The study, furthermore, investigated ICT-related challenges faced by teachers in teaching learners in inclusive classes, and identified solutions which can be put in place to overcome the challenges. This research study adopted a qualitative methodology and employed semi-structured interviews and observations as the main data soliciting tools. The researcher, furthermore, employed a purposive sampling method, where respondents were selected based on their experiences in teaching children with special needs. The content analysis method was employed to capture meaning from the data.

Findings indicate that ICTs can be used as evaluative and assistive devices for learners in inclusive classes. The study further reveals that teachers failed to integrate ICTs successfully in their inclusive classes due to challenges, such as a lack of technical support, training of teachers on the utilisation of ICTs and pedagogical knowledge, as well as insufficient ICT gadgets and the inability of teachers to integrate ICTs. Lastly, the study advocates for the training teachers in employing ICTs, arranging regular workshops to keep teachers abreast of technological advancements, as well as providing technical support and adequate ICT gadgets to schools. A consistent supply of electricity in the schools and a supportive infrastructure, among others, are possible solutions to challenges that inhibit the successful integration of ICTs in inclusive classes.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ATD	-	Assistive Technology Device
CD- ROM	-	Compact Disc, read-only-memory
DVD	-	Disc Video Decoder
ICT	-	Information Communication and Technology
MOE	-	Ministry of Education
MKO	-	More Knowledgeable Other
SEN	-	Special Educational Needs
VLC	-	Visual Local Area Network Client
ZPD	-	Zone of Proximal Development

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DEDICATION

This thesis is dedicated to my husband, Lazarus Nafenya, and my two lovely sons, Abraham Pombili and Heinrich Pendapala Nafenya, for the patience, love, support and encouragement they offered me during the period of my study. Moreover, I would like to dedicate this thesis to my beloved father, Thomas Katushivamwe Bonifatius, meme, Frieda Nahambo and my aunty meme, Martha Fillipus-Amaambo, for granting me the opportunity to attend school and make the best of it.

I will also not forget the well wishes and endless blessings I received from my grandmother, kuku Apolonia Johannes.

DECLARATIONS

I, Secilia Magemano Bonifatius, hereby declare that this study is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution of higher education.

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Name of Student	signature	Date

CHAPTER ONE
INTRODUCTION

1.1.Background of the study

Rapid developments in Information and Communication Technologies (ICTs) have profoundly impacted on every aspect of human life and the field of modern education is no exception. The powerful ICT tools have supported and transformed education in many ways; from making it easier for teachers to create instructional materials to enabling new strategies for learners to learn and work together, (Prajapati and Singh, 2021). The Namibian government has hitherto acknowledged this significant role which ICTs can play as the country moves towards a knowledge-based society, which is stipulated in the Vision 2030 document (NDP 5). In the same vein, the Namibian ICT Policy for Education was published in 2005 in order to promote effective learning. This policy is concerned with the provision of clear objectives and basic competencies for both learners and teachers to achieve key ICT knowledge and skills (Namibia Ministry of Education, 2013). For learners with special educational needs (SEN) ICT is a valuable tool as it can increase their participation in education. By so doing, it can improve their quality of life, as stipulated in the United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006).

In 2012, the Education Sector Policy on Inclusive Education was adopted by the Ministry of Education (MOE, 2013). The policy comprises five strategies of which strategy five highlights the utilisation of Information Communication Technology (ICT) including, the internet, to promote teaching and learning. By utilising ICTs, teachers can use digital assessment strategies, for example, creating tailor-made tests that learners can take online to evaluate their knowledge base. Utilising ICTs into the classroom means learners can make use of eBooks. These allow students to limit the number of books they have to carry to school and also allow them to access a wide variety of books in seconds. Furthermore, utilising ICTs in education can help to improve teaching and learning in inclusive classes. By employing assistive technology devices and services such as visual aids, argumentative communication devices and specialised equipment for computer access, learners with SEN can benefit from education, (Jellinek & Abraham, 2012). Utilising ICTs, furthermore, provides significant support to learners, including those with SEN, to engage with learning. It helps to break some of the challenges leading to underachievement and educational exclusion (Jellinek and Abraham, 2012).

Although the Ministry of Education Arts and Culture has put in place an ICT policy aimed at enhancing the teaching-learning processes across the divide, the researcher experienced that despite the policy being in place, learners in inclusive classes were still struggling to attain set learning objectives. Reasons for the struggle could be multiple and failure to utilise ICT was one of them. Studies by Fu (2013) show that, if effectively utilised, ICT can promote a learner-centred and self-directed learning. It allows learners to easily acquire knowledge as it becomes more accessible, and the concepts in learning areas easy to understand, (Fu 2013). According to the author, ICTs can support teaching by facilitating access to course content by learners, at the same enabling them develop autonomy, capability, and creativity in the learning processes, (Fu, 2012). Furthermore, the ICT environment can foster learners' higher critical thinking skills and develop their understanding in (SEN) different areas of learning (Chai, Koh and Tsai 2010) cited in Fu (2012).

The author found that there was still noticeable under-performance and under-achievement of learners in Namibian secondary schools registered every year. This was especially visible in the Grade 10 and 12 results. Learners with special educational needs comprised the highest percentage of those who did not perform well enough to proceed to the next level of education. This indicates a problem which needs to be addressed. This could be attained by identifying the major causes of the under-performance of Grade 12 learners failing to obtain the required number of points to enter universities and vocational training centres and Grade 10 learners who are not competent enough to proceed to Grade 12 (Ipinge, 2010).

The researcher observed that, since the implementation of the ICT policy in teaching and learning in schools in Namibia, a number of studies have been conducted in this field. For example, Quest (2014) focused on principals' perceptions regarding the implementation of ICT in secondary schools in the Khomas education Region of Namibia. Afunde (2015) investigated the integration of ICT in the teaching of science subjects at the Namibian College of Open Learning and Kanandjebo (2016) focused on the effects of ICT-driven pedagogy on the performance of Grade 12 Geometry Ordinary Level learners in the Omusati educational region of Namibia. The researcher is thus of the opinion that there is a need to conduct an in-depth study on the utilisation of ICTs in inclusive classes in Namibia, with specific reference to the Oshana Region.

Statement of the problem

The under-performance and under-achievement of learners in Namibian secondary schools are evident every year, especially in the Grade 10 and 12 results. In 2016 and 2017 respectively, only 53.6% and 60% of the Grade 10 learners managed to proceed to Grade 11 (Ministry of Education, 2018). Among the multiple reasons why learners under-performed could be that learners' diverse needs are not met in their classes. Providing a class that can accommodate diverse learners is a challenge for all schools today (Lunsford, 2017). Al-Husseiny (2019) asserts that the attainment of competences in inclusive education is subject to the excellence of the teaching strategies employed in those classes. The teacher is one of the most important axes in the educational processes but, in most schools, teachers are not appropriately proficient in managing inclusive classes (Al-Husseiny, 2019). Some teachers find it difficult to disseminate information to learners with SEN in inclusive classes, (Al-Husseiny, 2019).

These learners are confronted with many barriers to learning in secondary schools as they work to acquire knowledge in a variety of subjects (Al-Husseiny 2019). However, most of these barriers are likely to be addressed through the utilisation of ICTs, (Al-Husseiny, 2019)

The different learning preferences of learners can be addressed when instruction includes a range of meaningful and appropriate methods, activities and strategies of assessment (Chitiyo Hughes, Chitiyo, Changara, Itimu-Phiri, Haihambo and Dzenga, 2019). The Namibian government promulgated the ICT Policy (2003) in order to meet the needs of all learners in inclusive classes and subsequently secure their success. However, the multimillion dollar question is whether teachers are utilizing ICTs to enhance the teaching of learners in the inclusive classes. This study therefore assessed the strategies in which ICTs can be utilised to enhance the teaching of all learners, including those with diverse needs in inclusive classes.

1.2.Objectives of the study

The following objectives underscored this study:

1. The exploration of the different uses of ICTs to enhance learning in inclusive classes.
2. The assessment of ICT-related challenges experienced by teachers teaching inclusive classes.
3. The identification of solutions to the ICT-related challenges faced by teachers in inclusive classes.

1.4 Significance of the study

1.4.1 Researchers

Researchers on the use of ICTs in inclusive classes will benefit from the study as it adds to the body of research on ICT use in schools. The research could be employed as reference material by researchers.

1.4.2 Policy makers

The study may guide policy makers regarding what critical issues to consider when formulating and reviewing existing policies on inclusive education, especially with regards to the utilisation of ICTs when teaching learners in inclusive classes.

Policy makers will also benefit from the research by gaining insight into the findings regarding the implementation of policies related to ICT and Inclusive Education.

1.4.3 Teachers

Teachers will benefit from the research by learning efficient strategies of teaching, motivating and engaging learners in inclusive classes utilising ICT.

1.5 Limitations of the study

The researcher experienced the shortage of time as a major limitation due to her tight work schedule as a full-time teacher. The time limitation affected the researcher's opportunity to conduct the study with a larger sample and to go into the depth that it deserves.

To circumvent the limited time factor, the researcher utilised school breaks and lunch times to conduct interviews with a smaller sample. A small sample size allowed the researcher to conduct an in-depth study. It enabled the researcher to limit the sample size at the point of saturation and avoid the risks of having repetitive data (Shetty 2018). The small sample size also required less time to probe for clarification and to make follow-ups when compared to a larger sample size.

1.6 Definition of terms

In this section the terms and concepts relevant to the study are defined in relation to how they are used in this study.

Learners with Special educational needs refers to learners who have learning problems or difficulties that make it difficult for them to learn when compared to most children of their age (Cline &Frederickson &, 2009).

Inclusive education means that all children, no matter who they are, can learn together in the same school. This entails reaching out to all learners and removing all barriers that could limit participation and achievement (Hornby, 2011).

Inclusive class refers to a general-education class in which learners with and without disabilities learn together (Dreyer, 2017). In inclusive classes, all diverse needs of learners (not only disabilities) are identified and barriers addressed to ensure the participation, performance and achievement of all learners.

Information and Communications Technology (ICT) comprises any communication device or application, encompassing radio, television, cellular phones, personal digital assistants, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning (Kaapanda, 2010). ICT refers to the technologies, including computers, telecommunications and audio-visual systems that enable the collection, processing, transportation and delivery of data, information and communications services between utilizers, (Kaapanda, 2010).

ICT integration is the process of determining where and how technology fits into the teaching and learning environment (Rosnain & Mohd, 2008, in Ghavifekr, Kunjappan, Ramasamy & Anthony, 2016).

Assistive devices refer to any device designed or adapted to assist people with physical or emotional disorders in order to perform actions, tasks and activities (McFarlane & Sakellariou, 2002).

1.7 Delimitation of the study

This study was limited to two secondary schools in the Oshana Region of Namibia. The population and sample of the study were limited to Oshana Region.

1.8 Structure of the study

The first chapter outlines the background of the study and presents the statement of the problem, research objectives and significance of the study. It also discusses the limitations and the delimitation of the study area, as well as presents the definition of terms employed in this study.

The second chapter describes the theoretical framework and a review of the literature related to the problem under study.

The third chapter gives a detailed description of the research design, population, as well as the sampling technique employed and the sample of respondents. It explains the research instruments employed, the pilot study and its results, the data collection procedures and data analysis, as well as the ethical considerations adhered to in this study.

The fourth chapter presents the research findings and the last chapter includes a discussion of the results, as well as recommendations and conclusions.

1.9 Summary

In this chapter the researcher provided the background to the study and the statement of the problem. The chapter also outlined the main objectives of the study and the significance of the research. Finally, the delimitations and limitations of the study were discussed.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter consists of the theoretical framework that underpins this study, as well as a review on different strategies in which ICTs can be utilised to enhance learning in inclusive classes. The chapter also reviews ICT-related challenges encountered by teachers when teaching learners in inclusive classes and, finally, the possible solutions which can be put in place to overcome the ICT-related challenges experienced by teachers teaching in inclusive classes.

2.2 Theoretical framework

The study is embedded within Vygotsky's social constructivist learning theory which has its origin in the field of psychology (Vygotsky, 1978). The social constructivist learning theory highlights the role that social and cultural interactions play in the learning process (Hibberd, 2005). Learning happens with the assistance of other people, thus contributing the social aspect of the theory. Vygotsky's theory (1978), furthermore, states that knowledge is co-constructed, and individuals learn from one another. This theory also shows that, when learners learn from each other, they can assist one another and co-construct knowledge.

Three aspects of Vygotsky's cognitive learning work intertwine to facilitate the teaching and learning process of learners in an inclusive class, (Hibberd, 2005). These aspects are the more knowledgeable others, zone of proximal development and scaffolding. Figure 1 below illustrates the mentioned aspects.

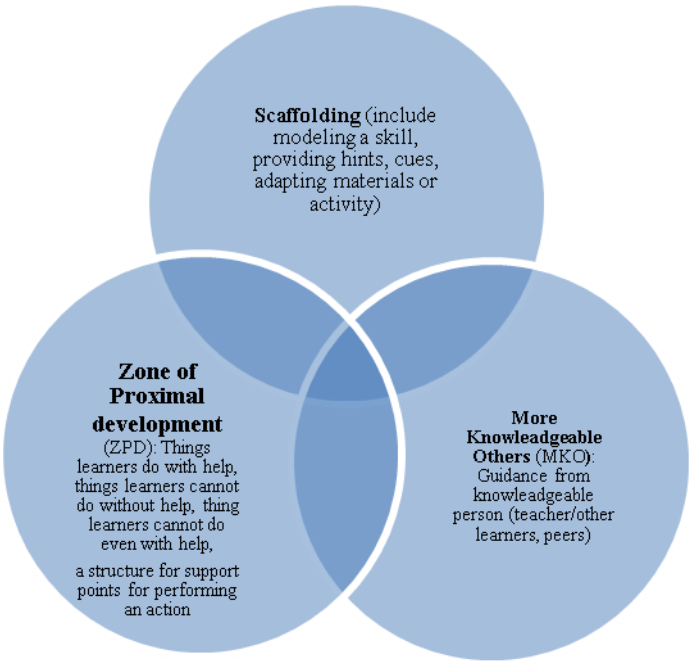

Figure 1: Adapted from McLeod (2019).

2.2.1 More knowledgeable other

The more knowledgeable other (MKO) refers to someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process or concept (Vygotsky, 1978). Vygotsky argues that much crucial learning by learners occurs via social interaction with an expert teacher or a teacher/learner who knows more than the individual learner who needs support to acquire the necessary competencies. This happens when teachers (or learners), who are experts in a certain area, present behaviours or, in some cases, give verbal instructions to the learners. The learners then seek to understand the presented behaviours or commands provided by the teachers in order to internalise the information. In this case, a teacher is considered the more knowledgeable other (Vygotsky, 1978).

Although the implication is that the MKO is a teacher or an older adult, this is not necessarily the case. Often a learner's peers may be the individuals with more knowledge or experience. With the advent of ICTs, learners in their learning processes can benefit from the utilisation of electronic performances support systems (Vygotsky, 1978). The MKO may utilise computers and internet resources to assist the learners with special educational needs to acquire and achieve a more concrete and tangible understanding of the concepts and the tasks to be learned (Vygotsky, 1978). Electronic tutors have also been employed in educational settings to facilitate and guide students through the learning process, (Ghavifekr, Kunjappan, Ramasamy and Anthony, 2016). The key to MKOs is that they must have (or be programmed with) more knowledge about the topic being learned than that of the learner.

2.2.2 Zone of proximal development

Another fundamental aspect of Vygotsky's theory is the Zone of Proximal Development. Vygotsky's concept of the zone of proximal development is based on the idea that cognitive development is defined both by what a learner can do independently and by what the learner can do when assisted by a more knowledgeable other/teacher (Vygotsky, 1978). This comprises a range of tasks that are too difficult for an individual to master alone, but can be mastered with the assistance or guidance of adults or more-skilled peers (Schepers and Van den Berg, 2007). Teachers who utilise information and communication technologies in their classes to support learners are more likely to achieve better results in learning, (Schepers and Van den Berg, 2007). Additionally, sophisticated Information and Communication Technology tools, for example, electronic calculators can capture the cognitive processes in which learners engage when solving problems (Schepers and Van den Berg, 2007). This affords teachers' reflection and coaching to aid deeper learning, especially when working with learners with special needs.

2.2.3 Scaffolding

Vygotsky called the support that students receive in order to learn "scaffolding." Scaffolding is the process of anchoring or building knew knowledge based on prior existing knowledge. With support or scaffolding, the learners can learn the concept or skill, and practise with their supportive mentor or more knowledgeable other until they are comfortable to continue on their own. This is the point at which the scaffolding is removed, and the learners has mastered the concept or skill.

Technology provides numerous opportunities that teachers can employ in- and outside the class to enhance learners' learning. Technology-based scaffolds can support individual students by communicating a range of processes and cognitive activities, and simultaneously, freeing the teacher to focus on dynamic, customized scaffolding (Schneider 2016). In technology-enhanced environments, tools and agents support some roles traditionally assumed by tutors or experts (Schneider 2016). It is important, however, to note that such scaffolds are integrated within a dynamic, complex environment often featuring a wide range of resources and artifacts (Schneider 2016).

With regards to the ZPD, success depends on what learners can achieve or perform with the assistance of a more knowledgeable person and, if these learners cannot achieve anything after receiving assistance, for example using braille machines to read or using calculators to solve maths problems, the third aspect, scaffolding comes into play to propel the level of assistance learners should be given, based on the level of their individual performance (Schneider, 2016). Scaffolding is withdrawn gradually as success is demonstrated by the learner.

2.3 Strategies in which ICT can be utilized to enhance learning for learners with special educational needs

This section will highlight research relating to the different strategies in which ICT tools can be utilised in the teaching and learning of learners with different needs in inclusive classes. There are different strategies in which ICT tools can be utilised in the teaching and learning of learners with special educational needs. Numerous studies; (Alharbi, 2016: Course, 2006; Haddad & Daxler, 2002 and Berger & Luckmann, 1996; Ernest, 2009; Means, 1994; Shotter, 1993;) were cited in Creswell (2012) which touch upon some of the strategies in which ICT tools can be utilised in teaching and learning have been conducted all over the world. Some of the strategies include the presentation of lessons to learners in inclusive classes, the utilisation of overhead projectors to present lessons through power point presentations with pictures and sounds inserted. Utilising these devices enables learners with visual impairments in inclusive classes to learn, since auditory learning is crucial for them, (Starcic 2010). Further, strategies in which ICT can be included are the utilisation of pictures and print to enable children with hearing impairments to read from the power point projection and the utilisation of hand lenses for reading texts that are printed in small letters (Starcic 2010).

ICT tools can be employed in schools when it comes to the presentation and demonstration of lessons. Networked computers and the internet are utilised in interactive and collaborative learning. ICT can furthermore, be utilised to teach, explore and communicate, as well as access and manage information, thus, assistive devices offer social support (Starcic, 2010).

Starcic (2010) conducted a qualitative study about the utilisation of ICT tools in inclusive schools. The study employed interviews to gather information from twenty teachers about the utilisation of ICT devices in inclusive schools. Starcic (2010) found that ICT tools in education could be utilised for the presentation of lessons for learners in inclusive classes. In addition, ICT tools such as an overhead projector could be utilised to present a lesson by means of a power-point presentation where pictures and sounds could be inserted. The study, furthermore, found that utilising these devices enabled visually and hearing impaired learners in inclusive classes to learn, since they could learn by listening to the sounds or from the pictures. Furthermore, Starcic (2010) posits that other ICT devices that can be utilised in the presentation of lessons include hand lenses. These are devices modified based on the degree of the visual disabilities of learners, and they can be utilised to read texts that are printed in small letters as they enlarge the print.

In line with the above, a qualitative study was carried out by Hanımoğlu1 (2018) to investigate the efficacy of the utilisation of ICT in American Secondary Schools. He identified ICT tools, such as printers, audios, video, cassettes, radio and TV broadcasts, as well as computers and the internet. These tools can be useful in schools when it comes to the presentation of, and demonstrations in lessons, (Hanımoğlu1, 2018). The author, furthermore, argues that networked computers and the internet are the most powerful ICT tools in interactive and collaborative learning.

In addition, Mwakyeja (2013) conducted a study in East Africa to investigate the ways in which Tanzanian learners perceived the utilisation of ICT in an inclusive class. It was found that ICT could be utilised to teach, explore and communicate, as well as access and manage information. Mwakyeja (2013) furthermore, notes that assistive devices offer social support, as learners can share programmes with one another to overcome barriers to learning posed by physical and sensory impairments. Another study was carried out by Alharbi (2016) to investigate the utilisation of ICT in education in South Africa. A quantitative research approach was followed.

Alharbi found that assistive devices were very useful when it came to reading literacy, which comprises both reading and writing. Alharbi, furthermore, posits that ICTs help learners to maximise their learning and concretise the content, as simulation enables learners to interact with the reality in the inclusive class, consequently, making learning more enriching and meaningful. Alharbi continues that ICT devices, such as computer programmes, are expected to assist significantly those learners with learning disabilities in making progress and strengthening their reading skills. The programmes, furthermore, play a vital role in supporting learners with learning difficulties. Alharbi's study also reports that computer programmes have been recognised to assist in achieving basic reading skills by means of their software called Write and Read Gold (Alharbi, 2016). The software programme provides a text-reading programme which enables learners to read on their own in class.

While several strategies have been highlighted in the utilisation of ICT elsewhere, and have proved to work effectively to enhance teaching and learning in an inclusive class elsewhere, the actual strategies in which ICT can be utilised in schools in the Oshana Region of Namibia, specifically, to enhance meaningful learning in a mainstreamed class have not yet been researched on.

2.4 ICT-related challenges faced by teachers in teaching learners with SEN in an inclusive class.

This section will focus on literature (Rastogi and Malhotra, 2013; Mikre, 2011; Ngololo, Howie & Plomp, 2012; Petty, 2012; Udoba, 2014; Salehi, 2012) relating to ICT-related challenges that teachers face when teaching learners including special educational needs in inclusive classes. A qualitative study was carried out by Mikre (2011) in the Caribbean to unveil the different shortcomings in the utilisation of ICT among learners in mainstreamed classes. He found that the inadequacy of skills and knowledge of ICT by teachers made it problematic for them to utilise ICT tools. It is imperative to note that the limited technical support and limited time are ICT-related challenges which impede the effective utilisation of ICTs in the teaching and learning process in schools. Mikre (2011), furthermore, reports that a lack of sufficient ICT resources in inclusive classes was another challenge, and it resulted in poor performance since the available ICTs did not address the needs of all learners.

Another survey was conducted by Petty (2012) in Slovanian secondary schools to investigate the level of ICT expertise among the teachers utilising ICT. Petty found that the level of expertise and training of teachers in ways to utilise ICT in teaching, learners' perceptions, acceptance of ICT integration and the adaptation of the curriculum, as well as the integration of technology in the inclusive class, were some of the major ICT-related challenges that teachers faced when teaching learners with SEN in inclusive classes.

Salehi (2012) also conducted a research study on Grade eight mainstreamed learners in Italy to investigate teachers' perceptions of those barriers and challenges that are preventing teachers from incorporating ICTs in teaching and learning in the class. The study employed a quantitative research methodology, and a questionnaire was administered as instrument to collect the data. The findings of the study indicated that, although teachers had a strong desire to utilise ICT in teaching and learning, they encountered a lack of support from school leadership which prevented them from integrating ICT into teaching and learning. It also emerged from Salehi's (2012) study that, without a supportive school leadership, incorporation of ICTs in teaching and learning was characterised by conflicts and contradictions which hampered the utilisation of information technology in the teaching and learning of learners with SEN. In addition, Rastogi and Malhotra (2013) conducted a quantitative study on the challenges faced by teachers in the incorporation of ICTs in education for the enhancement of teaching and learning. The study administered questionnaires as the mode of data collection. The findings of the study revealed that the majority of teachers lacked training skills and knowledge when it came to the utilisation of ICTs in teaching and learning. It, furthermore, emerged from the study that most teachers did not have the competencies to utilise ICT devices in the class. The study also found that a lack of skills and knowledge in ICT use could be some of the factors preventing teachers from incorporating ICTs when teaching learners with special educational needs. Rastogi and Malhotra (ibid) also shows that a lack of teacher training has a strong impact on learners with special educational needs because technology is often a critical component in the planning and implementation of an educational programme for these learners.

Quest (2014) conducted a qualitative study by employing an in-depth face-to-face interview to investigate principals' perceptions on implementing ICT in the teaching and learning environment in the Khomas education region of Namibia. Despite the fact the study was about principals' perceptions it still revealed that competency was one of the challenging factors when it came to the implementation of ICT in teaching and learning because school principals, who lacked knowledge and skills of computer technology, ended up with a high degree of doubt regarding whether to utilise ICT in teaching or not. The findings, furthermore, revealed that some school principals were familiar with ICT devices but they lacked practical skills in utilising these, which prevented them from incorporating these devices in their classes.

Abdallah (2008) also conducted a study on challenges to the successful incorporation of ICTs in teaching learners in inclusive schools in Ghanaian schools. The purpose of the study was to present perceived challenges to the integration of ICTs. A qualitative research design was employed, and semi-structured interviews were conducted. The findings from this study indicate that a lack of confidence in the utilisation of ICTs impedes the effective integration of technology in the teaching and learning of learners with special educational needs in schools. The study, furthermore, holds that teachers appreciate the utilisation of ICTs in teaching and learning but a lack of confidence and technical know-how influence their inspiration to utilise ICT in teaching learners in inclusive classes.

In addition to the above, Ngololo, Howie and Plomp (2012) conducted a quantitative study on the challenges faced in the implementation of the National ICT Policy for Education in Namibian Rural Science classes. They found that the majority of teachers did not have skills in ICT and, as such, did not utilise ICT when teaching science subjects. The study also indicated that only a few teachers were skilled in terms of ICT usage in the teaching of Science in Namibian schools. The findings furthermore, revealed that there was a lack of leadership, vision, collaboration, support, digital learning materials, expertise, ICT infrastructure, professional development and positive attitudes from stakeholders in the education system (Ngololo et al., 2012). Whilst the study does not focus on the use of ICT in inclusive classes, results obtained might be a reflection of lack of skills and competences in utilising ICTs among Namibian teachers across the board. In another quantitative study to investigate the benefits of, and barriers to, utilising ICTs in teaching and learning is cited in the Becta Review (2005). It held that limited technical support impeded the effective integration of ICT in teaching and learning of learners in inclusive classes.

It also emerged from this study that technical problems hindered the smooth delivery of lessons and the continuous flow of class activities. Such technical barriers comprised waiting for a website to open, failing to connect to the internet, printers not functioning well, as well as malfunctioning computers. A lack of technical support resulted in the poor technical maintenance of ICTs, thus creating a higher risk of technical breakdown during lessons; the technical faults also discouraged teachers from utilising ICT because of the fear that equipment might break down. Another qualitative study was conducted by Udoba (2014) in Chicago to identify the challenges faced by teachers when teaching learners while using ICTs. The study found that teachers were willing to make use of modern teaching materials, such as projectors, computers, television and audios, to teach learners in inclusive schools, and it was unfortunate that these materials were not always available. The study also showed that government did not provide enough funds to purchase teaching materials; therefore, the only way to support learners was to utilise local teaching materials that suited the needs of some learners only while discriminating against other learners. Udoba (2014) also reports that there was a lack of parental support regarding the successful implementation of ICT in inclusive classes. Udoba's findings also show that most parents expect to see their children perform well in ICT. However, parents fail to understand that learners with special needs may require more time to master the utilisation of ICTs. The findings in this regard show that teachers felt that the time spent to teach the learners in a class was not adequate (Udoba, 2014).

2.5 Solutions to overcome the ICT-related challenges faced by teachers in teaching learners with SEN in inclusive classes

This section offers a review of studies (Archar, Childs, Covadu, & De Young, 2012 as cited in Angula, Chirimbana and Ugwanga (2019); Balanskat & Vuorikari, 2000: Barnett, 2013; Bingimals 2009: Mingaine, 2013: Mndzebele, 2013; and Starcic, 2010) relating to the solutions which could be put in place to overcome ICT-related challenges. Some of the solutions identified were to give relevant training to the teachers and improve the collaboration of teachers and other circuit administrators regarding ICT integration in teaching and learning.

A quantitative study was conducted in Nigeria by Starcic (2010) to investigate solutions for the successful implementation of ICTs in schools. The study revealed the need for teachers' training in the efficient utilisation of ICT in teaching in order to meet the needs of learners in inclusive classes. All teachers, both in regular and special education programmes, need training in the ways that technology can be utilised. They also need technical skills to carry out plans of action, (Starcic, 2010). Mndzebele (2013) conducted a study in Zimbabwe that aimed to present an assessment of the state of ICT in the school system in a developing country by evaluating its current utilisation, as well as solutions to ICT-related challenges, in inclusive classes. The study was qualitative and quantitative in nature, with questionnaires and interviews as tools employed to collect data. Mndzebele's (2013) study shows that the school needs to be provided with adequate facilities and resources for effective implementation of ICT which largely depend on the teachers and also to provide in service training to teachers on how to utilise ICT effectively.

Another study by Mingaine (2013) in Ukraine looked at solutions to ICT-related challenges in schools. The study employed a quasi-experimental, quantitative research design, with a survey tool, to collect the data. The results show that the high cost associated with the purchasing and preservation of the ICT tools should be reduced through the utilisation of other alternative measures, such as "locally assembling education software as well as exploiting alternative technologies to avoid over-reliance on costly imported software and hardware. Investments in custom-made digital materials with highly relevant content for Ukrainian schools in rural and urban context are required" (Mingaine, 2013, p134). The results further suggest that the Education Ministry should be fully in charge of the implementation of ICT to ensure that there is internet connection in all schools. This will help schools that are not financially stable to have the privilege of internet connection.

Merrill, Read and Barnett (2013) conducted a qualitative study to investigate the challenges faced by schools in Ethiopia regarding the implementation of ICT in mainstream secondary schools. They recommend that schools should make available ICT resources, including hardware and software, which the teachers have to utilise in the integration processes. Merril et al. (2013), furthermore, advocate that teachers should take advantage of the resources offered at their schools and in their communities, and that they should also have access to ICT resources at home.

In another quantitative study conducted in California to determine the effectiveness of ICT as a teaching strategy in mainstream secondary schools, Bingimals (2009) found that a lack of access was not always about the absence of ICT equipment. It also stretched into the areas of poor organisation of resources, poor quality hardware, inappropriate software, as well as a lack of personal access for teachers.
Teachers must ensure that they have quality software installed and that they have the right educational software suited to their subject matter. Teachers should be provided with the relevant up-to-date information that they need.

Archar, Childs, Covadu and De Young (2012) as cited in Angula, Chirimbana and Ugwanga (2019) conducted a quantitative study to determine the role of ICT in teaching and learning among primary school teachers teaching in mainstreamed classes in New Zealand. They found that teachers needed technical support in the utilisation of ICT in mainstremed classes, which could be offered in schools either gratis or for a fee.

Balanskat, Blamire and Kefala (2006) carried out a qualitative study among teachers in the Seychelles. He reports that teachers were of the view that schools should provide training courses in using new ICT devices, modern technologies and new pedagogical approaches. Teachers should also prepare themselves for the integration of ICTs through pre-service training. The type of training should be hands-on training, where teachers are doing it themselves. Training should be an on-going process to meet the demands of technology, as technology is an ever-changing phenomenon.

Although several recommendations and solutions have been proposed and have proved to work in improving the utilisation of ICTs in the teaching of different mainstreamed learners, there is little that has been on the actual strategies that can be utilised to enhance meaningful teaching and learning through ICT in the Oshana Region of Namibia.

2.6 Summary

This chapter provided an overview of literature relevant to this study. Firstly, it looked at the theoretical framework employed in this study to understand the utilisation of ICTs in inclusive classes. Secondly, the chapter presented literature related to the ways in which ICT can be utilised to teach learners in inclusive classes. This was followed by a review of literature on ICT-related challenges faced by teachers when teaching learners with special education needs. The last part of the chapter presented literature relating to solutions to the challenges facing teachers who utilise ICT's in inclusive classes.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1. Introduction

This chapter presents the research methodology that was employed to conduct this research study, and includes the research design and target population. It also looks as the sampling technique and sample size. It, furthermore, describes the data collection instruments, pilot study, data collection procedures and the data analysis. The chapter concludes with a discussion of the validity and reliability of this study, as well as the ethical considerations adhered to.

3.2. Research design

This study adopted a qualitative research approach to a descriptive research design. According to Creswell (2013), qualitative methodology encompasses a study of objects in their natural setting, attempting to make sense of, or interpret, phenomena in terms of the meaning people bring to them. By means of this methodology, life experiences, perceptions, feelings, opinions and aspirations are disclosed by the respondents as they offer detailed accounts of why, what, who and how of their daily routines from their point of view (Punch & Oancea, 2014). The current study adopted an exploratory design. Exploratory research is defined as the investigation of a problem which is not clearly defined. Research is conducted to gain a better understanding of the existing problem, but will not provide conclusive results.

In such research, a researcher starts with a general idea and employs this methodology as a medium to identify issues which can be the focus for future research. An important aspect here is that the researcher should be willing to change his/her direction, subject to the revelation of new data or insights. Such research is usually carried out when the problem is at a preliminary stage. It is often referred to as grounded theory or interpretive research as it employed to answer questions like what, why and how. Kothari and Grag (2015) explain that the exploratory research design is employed in qualitative research as it presents itself with unique characteristics, and the participants are studied in their natural environment.

This design allowed the researcher to fully explore the utilization of ICT in inclusive classes in the Oshana Region, giving appropriate descriptions of the ways in which, and for what purpose, teachers are utilizing ICT in the schools. Furthermore, the different strategies that inhibit full utilization of ICT in inclusive classes were explored.

3.3. Population

In the current study, the population of this study comprised 16 secondary school teachers of learners with special educational needs in inclusive classes in the Oshana Region of Namibia.

Two inclusive secondary schools were identified to pilot inclusive education in 1995 (Josua,2013). These schools ultimately and became known as inclusive schools for special educational needs learners in the Oshana Region. The schools were Gabriel Taapopi Secondary School and Mweshipandeka Senior Secondary School.

3.4 Sample

Sampling is a systematic process of selecting legible participants from the research population who can take part in a research study (Morgan, 2016) cited in (Johnson and Shoulders, 2019). This study employed purposive sampling which is a non-probability sampling strategy, in which the researcher made use of her subjective opinion to choose respondents based on the research problem and significance of the issue being studied (Neuman, 2014). Purposive sampling was employed in this study because it drew information-rich cases and also made it easier for the researcher to create the much needed understanding of the subject under enquiry (Cohen, Manion, and Morrison, 2011).

First of all, schools were selected based on the fact that they were the only inclusive secondary schools pronounced as spaces for sampling the implementation of inclusive education by the Ministry of Education in 1995, and are thus still regarded as intentional inclusive secondary schools, teaching children with special educational needs in the Oshana Region. Hence, schools were sampled purposively.

Secondly, all the teachers for inclusive classes from the selected schools were also purposively selected to take part in the study as they were the ones directly involved in the teaching and learning process of inclusive learners at these two schools. All-inclusive secondary school teachers for Grades 11 and 12 participated. The total sample consisted of 16 participants as there were 16 inclusive secondary school teachers, 8 per school in this region. All 16 teachers automatically participated in the study. Of the 16, seven were males and nine females.

The researcher selected teachers to gather evidence-based information on condition that they understood the English language and that they were teaching in mainstream classes in secondary schools, as well as have knowledge of ICT. The school management (two Principals) assisted the researcher in selecting suitable participants (with information needed) to participate in the interviews.

3.5. Research instruments

Research instruments are defined as tools which are employed by a researcher to collect and gather the data for the study (Punch & Oancea, 2014). For this study, the researcher employed qualitative research instruments to collect data. The instruments were semi-structured interviews and observation checklists. These instruments are explained in detail in the following subsections.

3.5.1 Semi-structured interviews

An interview is a conversation between a researcher and an interviewee. There are many types of interviews in a research study. Semi-structured interviews were utilised as the main data gathering method in this research. By means of semi-structured interviews, the researcher aimed to explore the different ways in which ICT could be utilised to enhance learning for learners with special educational needs and to examine ICT-related challenges faced by teachers teaching learners with special educational needs in inclusive classes (see Appendix A).

Creswell (2013) affirms that semi-structured interviews generate rapport between the researcher and participants, and also allow the interviewer to follow-up responses and check initial information from the participants. Semi-structured interviews were suitable as they encourage a high response rate and leave room for the researcher to ask for elaboration of points from the participants (Neuman, 2014). The utilisation of a semi-structured interview guide had the advantage that the researcher could probe for more information and could observe and record the body language of the participants and incorporate these in the overall meaning of the data.

In the current study, the researcher made appointments with the participants, audio recorded each interview with the participants and later transcribed the recordings. The researcher utilised a reflective diary to record all her observations during the interview sessions. The duration of the interview ranged from 40 to 45 minutes per participant. In total, 16 semi-structured interviews were conducted.

3.5.2 Observation

Neuman (2014) argues that an observation is a qualitative data collection technique that involves the movement of the researcher to the schools under investigation. The researcher observes the behaviour of the participants in their natural settings. The researcher constructed an observation checklist to overcome some weaknesses, such as shyness or reluctance to freely talk to the researcher directly, inherent to semi-structured interviews. The observation method was employed to observe the ICT resources available, as well as the way in which they were utilised to support learners with special needs in inclusive classes.

Observation enabled the researcher to observe life as it happened naturally in order to add weight and substance to the research findings obtained by means of the semi-structured interviews. Teachers were observed while teaching their classes. At each school, the principal informed them in advance of the researcher's intended observation schedule.

3.6. Pilot study

Pilot studies assist in refining instruments in order to ensure that appropriate and relevant information will be collected. In addition, piloting enables the researcher to become familiar with the administration of the instruments, the respondents and the best way to analyse the information obtained (Punch & Oancea, 2014).
A pilot study was carried out at Andimba Toivo ya Toivo Secondary School where teachers were integrating ICTs in their inclusive classes. This school was not included in the actual study. The sample of the pilot study consisted of five teachers. The researcher explained the purpose of the pilot study to respondents before interviews and observations were carried out.

Verbal informed consent was obtained from respondents to audio record the pilot study interviews. After the interviews and observations, the participants were asked to comment or suggest ways in which the questions could be asked to yield the necessary information

3.7. Results of the pilot study

The results of the pilot study revealed that the respondents did not know the content of the ICT Policy or were not aware of such a policy. Hence, Question 6 in the interview guide (which read: “Would you say that there are conflicts/contradictions between the ICT Policy and the practices in schools”? If yes, to what extent do conflicts and contradictions between policy and practice affect the utilisation of ICT?”) was rephrased and explained to respondents.

In terms of conducting the interviews with the teachers during the pilot study, a few challenges were encountered. Securing interview appointments with teachers while they were conducting lessons was a major challenge. As a result, the researcher decided to utilise the school break, lunch and free periods on teachers’ timetables to conduct the interviews to avoid disruptions in the teaching and learning process. The researcher posed questions to the participants and recorded responses on the printed guide.

3.8. Ethical and Data collection procedures

Before the commencement of the collection of data, the researcher applied for, and received, ethical clearance from the University of Namibia UREC (University Research and Ethical Committee). The researcher then sought permission from the Executive Director in the Ministry of Education, Arts and Culture through the Oshana Regional Director of Education and the principals of Gabriel Taapopi Secondary school and Mweshipandeka Senior Secondary school in the Oshana Region.

The researcher provided a consent form to the participants on which they had to indicate their willingness to participate in the study. It was made clear to them that taking part in the study was voluntary and participants could withdraw at any stage of the interview. Equally for the class observation, teachers also signed a consent form (see Appendix B) with the same purpose as the interview guide. The researcher also asked permission from the teachers and the principals to audio-record the interviews in order to transcribe them later to ensure that all the responses were captured. The results from the observation schedule were recorded on the form designed by the researcher.
The researcher personally collected the data by making appointments with the two school principals two weeks in advance. When permission was granted, the principals informed the concerned teachers two days in advance that the researcher would be around for both observations and semi-structured interviews. The researcher utilised a store room at each of the participating schools as an interview room since the interviews took place during class time or when a teacher had a free period. Observations were carried out during their lessons as the purpose was to observe the utilisation of ICT during classes.

3.9 Data analysis

In this study, the content analysis method was employed to capture meaning from the data. Content analysis is a strategy to analyse qualitative research where a researcher is central to the analysis of the information gained (Punch & Oancea, 2014). The first stage of the analytical process was the gathering of the data through the interview transcripts and observations check lists. In a process known as open coding, the data was then re-read and examined several times to establish an overview of all the data gathered.

In the step that followed, data were organised according to themes, sub-themes and, lastly, categories (Miskel, 2014) (see Table 3.1 below). Participants' verbatim quotes were employed as low-inference descriptions to support the sub-themes and categories identified.

The responses from teachers relating to their experiences with integrating ICT into their inclusive classes were categorised into themes, sub-themes and categories created by the researcher and guided by the data obtained. The central concepts were concluded from the themes and sub-themes. In accordance with the research questions, the following three main themes were identified: a) The different strategies in which ICT can be utilised to enhance learning for learners with special educational needs, b) The ICT-related challenges faced by teachers and learners with special educational needs in inclusive classes, c) Strategies which can be put in place to overcome the ICT-related challenges faced by teachers in inclusive classes. Each of these three themes were further divided into sub-themes that emerged from the subsequent creation of categories and coding of the transcript data.

Table 3.1: Presentation of themes and sub-themes

THEMES	SUB-THEMES	Categories
1: The different strategies in which ICT can be utilised to enhance learning for learners with special educational needs	Improves learners' understanding	The recorded lessons can be listened to at learners' own pace and time. Videos enhance learners understanding.
	Improves communication difficulties	Facilitates communication. Utilised as didactical tool.
	Allows learners to acquire new skills	New skill development and teaching strategies booster.
	Acts as a motivational tool	Increased participation. Grabs attention.
	Can be utilised as an assessment tool	Instant feedback.
	ICT allows learning autonomy	Independence.
	ICT is utilised as a management tool	Enables individual teachers to develop education plans
2: The ICT-related challenges faced by teachers and learners with special educational needs in inclusive classes	Lack of sufficient training in ICT usage	Improper utilise of ICT devices. Continuous malfunctioning of the ICT devices.
	Teachers' lack of pedagogical knowledge	Inhibits teacher's self-confidence. Engendered incompetence.
	Teachers' lack of technical support	Lack of technical services. Poor internet connectivity
	Insufficient ICT gadgets in schools	Lack of gadgets. Inaccessibility of available devices
	Inability of teachers to integrate ICT	Obsoleteness of devices.
	Insufficient time	Inhibited the aptitude to complete the workloads.

	Poor implementation of ICT tools and devices	Stemming from a poor inclusive education policy.
3: Strategies which can be put in place to overcome the ICT-related challenges faced by teachers in inclusive classes	Need for teachers in-service training	Training. Workshops.
	Need for technical support	Need for experts. Need for subject-specific software programmes
	Availing more ICT gadgets in schools	Provision of projectors. Provision of enough computers.
	Provision of electricity in schools	Constant supply of electricity
	Provision of e-Books in schools	Provision of e-books
	Improving school infrastructure that supports the utilisation of ICT	Infrastructure development

3.10 Validity and reliability

Validity is the degree to which the qualitative data that were collected accurately reflect the social phenomenon to which they refer (Hennink, Hutter, & Bailey, 2015). A common term employed in qualitative research for validity is trustworthiness. To ensure trustworthiness, triangulation was used for data collection and data analysis. This is "a validity procedure where researchers search for convergence among multiple and different sources of information to form themes or categories in a study" (Creswell & Miller, 2000, p. 126). Specifically, the observation checklist and the interview guide were used to ensure trustworthiness on the data collected. The two different methods and perspectives helped to produce a more comprehensive set of findings. The researcher distributed the two instruments to three experts (main supervisor, co-supervisor and an ICT expert) in the field of research, ICT and human inclusive education. This assisted the researcher in ensuring that the instruments had appropriate content and followed the right procedures. Comments made were utilised to improve the instrument.

3.11 Ethical considerations

This study was guided by fundamental ethical considerations that relate to responsible research in the human sciences. According to Kimmel and Kitchen (2014), research ethics comprise principles and standards that, along with underlying values, guide the researcher to appropriate conduct relevant to the research decisions. Neuman (2014) identifies four guiding principles that define parameters in the relationship between the researcher and the participants. These include ensuring that participants have given informed consent, no harm comes to participants, confidentiality and anonymity, as well as ensuring that permission has been obtained.

Ensuring participants have given informed consent

Neuman (2014) posits that the principle of informed consent must be applied in a study to ensure that participants are knowledgeable about the research before data gathering. This enables them to make an autonomous and intended decision either to participate or not in a research study. To ensure this, secondary school teachers at Gabriel Taapopi and Mweshipandeka Secondary Schools in the Oshana Region were informed about the study and its intentions. After they have accepted the request to participate in the study, the data collection commenced.

Ensuring confidentiality and anonymity

It is the right of the respondents to have their identity protected. As such, during the interviews, respondents' names were not recorded in an audio or written on paper. Furthermore, the participants were guaranteed that the findings from this study would be confidentially preserved and employed only for the purpose of academic study (Lyon, Mšllering and Saunders, 2015).

3.12 Summary

This chapter presented the research methodology followed in this study. It highlighted the research design, the target population and the sampling approach. The research instruments, pilot study, data collection procedure, data analysis, validity and reliability and ethical considerations followed were also discussed. The next chapter will focus on the findings of the study.

CHAPTER FOUR

PRESENTATION OF DATA

4.1 Introduction

In this chapter the researcher presents the research results of the study. Data were collected by means of two methods, namely interviews and observations. The data collected in the interviews are presented first followed by data collected by means of observations. The results are presented according to themes, sub-themes and categories (see Table 3.1). The themes are centred around the following issues: different strategies in which ICT can be utilised to enhance learning for learners in inclusive classes, the examination of ICT-related challenges faced by teachers when teaching learners with special educational needs in inclusive classes and the identification of strategies which can be put in place to overcome the ICT-related challenges faced by teachers in inclusive classes.

4.2 Strategies in which ICT can be utilized to enhance learning for learners with SEN

Teachers were asked to share their views on strategies in which ICT can be utilised to enhance learning in inclusive classes. In this section, the researcher presents the research results according to the sub-themes and categories, in each case providing narrative examples. The following sub-themes were created:

ICT improves learners' understanding and communication difficulties, allows learners to acquire new skills, acts as a motivational tool, 'allows learning autonomy and it can be utilised as an assessment and management tool.

Among all the themes, the one that indicates that ICT can be utilised to improve learners' understanding was ranked the highest at 37.5%, followed by the one indicating that ICT can be utilised as a management tool, which rated 18.6%. The theme indicating that ICT can be utilised to improve communication, allowing learners to acquire new skills, was ranked third at 12.5%. Finally, the theme indicating that ICT can be utilised as an assessment tool, securing the learning autonomy of learners and acting as a motivational tool, was ranked the lowest at 6.25% (the results are presented in Table 4.1).

Table 4.1: Sub-themes on strategies in which ICT can be utilised to enhance learning for learners with special educational needs.

Sub-theme	**Number of teachers**	**Percentage (%)**
It improves learners' understanding	6	37.5
It improves communication difficulties	3	18.75
It allows learners to acquire new skills	2	12.5
It acts as a motivational tool	2	12.5
It can be utilised as an assessment tool	1	6.25
It allows learning autonomy	1	6.25
It can be utilised as a management tool	1	6.25
Total	16	100

4.2.1: ICT improves learners' understanding

The categories that emerged from this sub-theme were: the recorded lessons can be listened to at learners own pace and time. This category was ranked the highest at 75%, followed by the one indicating that videos enhanced learners' understanding, which was ranked the lowest at 25% (see Table 4.2).

Table 4.2: Sub-theme One categories

Category	No of teachers	Percentage
The recorded lessons can be listened to at learners' own pace and time.	12	75
Videos enhance learners' understanding	4	25
Total	16	100

The recorded lessons can be listened to at learners' own pace

The majority of teachers said that recorded lessons allowed the learners with special needs to listen at their own pace, since some of them were slow and could not cope with the teachers' pace. Some of the teachers made the following remarks:

T01: "*If teachers introduced a new topic with difficult terminologies, it will be a bonus to learners to be able to play back the taught topic at their own pace to understand it better".*

The same view was supported by T05 who said, "*When they are listening to their teacher's lesson more than once, learners retain the information that was taught to them at an earlier time"*

Videos enhance learners' understanding

Most of the teachers teaching students with special educational needs in inclusive classes were of the opinion that the recorded videos appealed to both the senses of sight and hearing, and could be watched repeatedly, and this enhanced learners' understanding. Some of the teachers said that learners learned better by means of their sense of sight. In some cases, it was quite complicated to explain abstract concepts. The recorded videos enhanced learners' understanding since they were able to listen and see at the same time. Some of the respondents motivated their views as follows:

T09: *"I personally think that ICT is a game changer because some of the learners cannot grasp all the concepts the first time you teach them but with recorded videos, they can just watch them as many times as they want, using both their sense of sight and sense of hearing".*

The point was also supported by T08 who pointed out*; "Using videos is very important as learners can easily follow along with the lesson with greater independence"*

4.2.2 ICT improves communication for learners with difficulties

Another strategy in which ICT can be utilised to enhance learning for learners with special educational needs in inclusive classes is that of improving communication difficulties. The categories that developed from this sub-theme were: ICT facilitates communication, which was ranked the highest at 66.7%, and ICT can be utilised as didactical tool, which was indicated by 33.3% of the respondents (the results are presented in Table 4.3).

Table 1.3: Sub-theme Two categories

Categories	Number of teachers	Percentage (%)
ICT facilitates communication	14	87.5
ICT is utilised as didactical tool	2	12.5
Total	16	100

ICT facilitates communication

Most of the teachers (87.5%) were of the view that ICT tools facilitate communication. The following extracts represent their opinions:

T04: *"The utilisation of visual displays using a projector helps me to communicate easily with hearing impairment learners. If I explain using sign language and give them an exercise, they perform poorly but if I complement sign language with visual displays their performance will be at the same level with their peers without special educational needs".*

T05: *"Using projectors improves learners' understanding and information retention*."

Utilised as didactical tools

Of the 16 respondents, the 2 (12.5%) who were interviewed on this category noted that teaching learners with special needs by utilising ICT devices, was easier. Learners with special educational needs (SEN) learn best when they are communicating or being communicated to through the utilisation of ICTs. One of the teachers stated:

T12**:** *"ICT is now part of our teaching process and our work has become very easy, thanks to this technological advancement."*

Related to this view, T05 said, "We find it easier when giving instruction to learners with special educational needs as they can use assistive devices to tackle problems"

4.2.3 ICT's allow learners to acquire new skills

The categories identified under this sub-theme were: ICT enhances new skills development and serves as a teaching strategy booster. The sub-themes ICT enhances "New skills development and serves as teaching strategies booster," each received a score of 50% (see Table 4.4).

Table 4.4: Sub-theme Three categories

Category	Number of teachers	Percentage (%)
ICT enhances new skills development	8	50
Teaching strategies booster	8	50
Total	16	100

ICT enhances new skills development

Half the respondents interviewed indicated that, specialised ICT tools like Braille machines and projectors in place for learners with barriers to learning, made the teaching and learning environment conducive for both teachers and learners. Utilising different types of ICT tools allows teachers to develop new skills and, at the same time, minimise learners' difficulties.

One teacher said:

T07: *"ICT helps me in matching my teaching strategies with learning needs for learners with special needs".*

Teaching strategies booster

Half of the respondents pointed out that utilising ICT tools, such as the Braille machine and projector, to teach learners with barriers to learning made teaching and learning easier.

One teacher said:

T08: *"A Microsoft PowerPoint presentation can help me to teach a topic in a very innovative and creative way that will lead into discussion and exchanging of ideas and thoughts." This* same view was shared by T10 who said, *"PowerPoint presentations allow teachers to adjust information depending on learners' understanding of the concept being taught. Personally, I can even add notes during a PowerPoint presentation to further learners' grasp of the concept being taught"*

4.2.4 ICT acts as a motivational tool

The categories that emerged were: ICT increases participation and grabs attention. The categories received the same ranking of 50% each (the results are presented in Table 4.5).

Table 4.5: Sub-theme Four categories

Categories	Number of teachers	Percentage (%)
ICT increases participation	8	50
ICT grabs attention	8	50
Total	16	100

ICT increases participation

Eight of the teachers interviewed were of the opinion that the use of projectors and other ICT-related tools drove learners to participate actively in class activities. Their opinions were reflected in the following remarks:

T03: *"I think if I stop using a projector or ICT-related tools my learners will become very passive. Currently, their participation is just amazing*".
T05: *"I enjoy teaching when I am using a projector because it awakens my learners and they become lively".*

ICT grabs attention

Another 50% of the teachers affirmed that utilising tools, like PowerPoint, helped learners to pay more attention. The following excerpt illustrates one of the teachers' views:
T01: *"All my learners enjoy my lessons when I am using PowerPoint; their concentration is higher than when I just explain concepts without ICT tools".*

4.2.5 Sub-theme Five: ICT can be utilised as an assessment tool

The category identified under this sub-theme was: gives instant feedback. The response rate was 100 % (the results are presented in Table 4.6).

Table 4.6: Sub-theme Five category

Category	Number of teachers	Percentage (%)
Gives instant feedback	16	100
Total	16	100

ICT gives instant feedback

All the teachers interviewed indicated that ICT could be utilised as an assessment tool that could provide prompt feedback. This would improve learners' progress and monitor their performance. It would also develop learners' confidence and change their attitudes towards the subject being learnt. The following remarks reflect teachers' opinions:

T05: *"Through ICT, teachers can assess learners' learning as well as their performance and report on assessment tasks instantly. ICT provides prompt feedback and learners don't have to wait longer to get feedback".*

4.2.6 ICT allows learning autonomy

The category identified under this sub-theme was: independence. This category received a response rate of 100 % (the results are presented in Table 4.7).

Table 4.7: Sub- theme Six category

Category	Number of teachers	Percentage (%)
Independency	16	100
Total	16	100

Independence

All the teachers interviewed stressed that the provision of ICTs in inclusive classes had a great impact on the academic performance of learners with special needs. Utilising ICTs allowed independence and efficiency for learners. The researcher noted that some ICT devices could enable learners to overcome their difficulties. Learners with visual impairments could read independently by utilising the Braille reader. Some of the teachers interviewed said:

T05: *"In my class one cannot tell whether a learner is [visually impaired] because they will all be working and participating independently. I am impressed with how technology is bridging the gap between learners with diverse needs".*
T14: *"Different educational websites like Investopedia, Ask and Extreme help learners to find out what and how other people internationally are viewing different educational scenarios. Educational websites also assist them in finding answers to challenging questions. Learners are also able to get a wide range of revision past examination question papers and answers".*

4.2.7 Sub-theme Seven: ICT is utilised as a management tool

The category that emerged from this sub-theme was: enables individual teachers to develop education plans. This category received a response rate of 100 % (see Table 4.8).

Table 4.8: Sub-theme Seven category

Category	Number of teachers	Percentage (%)
Enables individual teachers to develop education plans	16	100
Total	16	100

Enables individual teachers to develop education plans

All the teachers interviewed maintained that the integration of ICT devices in teaching and learning enabled them to develop individual, educational plans designed to address the difficulties of learners in inclusive classes. One of the teachers interviewed indicated that:

T04: *"ICT is a crucial management tool, especially when utilised for learners with diverse needs. It enables teachers to develop specialised and individual-centred instructions within inclusive classes".*

From the above results, it is evident that ICTs can be utilised to enhance learning for learners with special educational needs in inclusive classes. The researcher established from the interviews that integration of ICTs into inclusive classes improved learners' understanding, alleviated communication difficulties, allowed learners to acquire new skills, acted as motivational tools, could be utilised as assessment tools and allowed learning autonomy, as well as being utilised as management tools.

4.3 Data collected by means of observations on the strategies in which ICT can be utilized to enhance the learning of learners with SEN in inclusive classes

The researcher supplemented and enriched the interview data with data obtained by means of observations. The observations focused on ways in which ICT could be utilised to enhance the learning of learners with special educational needs.

The researcher wanted to establish whether teachers utilised audio recorders, Braille machines, electronic books, eye glasses for learners to see better, large print books, screen readers, grammar checkers, word prediction and voice recognition software and scientific calculators when teaching listening, reading, writing and mathematics skills to enhance the learning of learners with special education needs in inclusive classes. The researcher observed 16 classes to identify the ways in which the ICTs listed above were utilised (the results are presented in Tables 4.9.1 to 4.9.9).

Table 4.9.1: Audio recorders for listening skills

	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Yes	14	87.5	87.5	87.5
No	2	12.5	12.5	12.5
Total	16	100	100	100

Of the 16 teachers observed, 87.5 % utilised audio recorders to record lessons. This allowed the learners with special needs to listen at their own pace since some of them were slow and could not cope with the teachers' pace. Twelve percent (12.5 %) of the total number of teachers did not utilise audio recorders.

Table 4.9.2: Electronic books for reading skills

	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Yes	0	0	0	0
No	16	100	100	100
Total	16	100	100	100

The researcher, furthermore, observed that none of the teachers were teaching reading while utilising electronic books.

Table 4.9.3: The use of Braille machines for reading skills

	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Yes	14	87.5	87.5	87.5
No	2	12.5	12.5	12.5
Total	16	100	100	100

The observation revealed that 14 teachers (87.5%) utilised Braille machines for learners with visual impairments. The learners with visual impairments were able to read and share ideas with peers as the ICT tools acted as reading aid tools for these learners. Two of the teachers observed (12.5%) did not make use of Braille material to assist learners to learn to read.

Table 4.9.4: Eye glasses for reading

	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Yes	14	87.5	87.5	87.5
No	2	12.5	12.5	12.5
Total	16	100	100	100

Fourteen of the teachers (87.5%) utilised eye glasses for learners with visual impairments; however, 12.5% failed to provide magnifying ICT devices to allow learners to access all the printed information.

Table 4.9.5: Large print books for reading

	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Yes	14	87.5	87.5	87.5
No	2	12.5	12.5	12.5
Total	16	100	100	100

The researcher observed that 14 teachers (87.5%) utilised large print books for learners with visual impairments. On the other hand, 2 teachers did not utilise large print books when they taught learners with visual impairments.

Table 4.9.6: Screen readers for reading

	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Yes	14	87.5	87.5	87.5
No	2	12.5	12.5	12.5
Total	16	100	100	100

Fourteen teachers (87.5%) utilised screen readers for the teaching and learning of learners with visual impairments. ICTs allowed them to scan printed material into a computer or handheld unit.

Data further revealed that two teachers (12.5%) did not utilise any ICT for the teaching and learning of learners with special educational needs in inclusive classes.

Table 4.9.7: The utilisation of grammar checkers for writing skills

	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative percentage (%)
Yes	6	37.5	37.5	37.5
No	10	62.5	62.5	62.5
Total	16	100	100	100

In terms of teaching learners to write correctly, the researcher observed that, 6 teachers (37.5%) utilised grammar checkers, word prediction and voice recognition software to assist learners with special needs to learn to write. These ICT software applications were utilised to check grammar and to write words correctly. However, 10 teachers (62.5 %) observed did not utilise these ICT tools.

Table 4.9.8: Word prediction and voice recognition software for writing

	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Yes	14	87.5	87.5	87.5
No	2	12.5	12.5	12.5
Total	16	100	100	100

The researcher observed that 14 teachers (87.5%) utilised word prediction and voice recognition software for writing**.** The assistive technology tools were utilised to help learners who struggled with writing. The researcher observed that 2 teachers (12.5%) did not have these teaching and learning aids.

Table 4.9.9: Scientific calculators for Mathematical calculations

	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative percentage (%)
Yes	16	100	100	100
No	0	0	0	0
Total	16	100	100	100

It was, furthermore, observed that the only available ICT tools for Maths lessons at the two schools were scientific calculators. These were utilised by both teachers (100%) and learners to solve complex mathematical calculations.

4.4 ICT-related challenges as experienced by teachers when teaching learners with SEN in inclusive classes

Teachers were asked to share their views on the ICT-related challenges they faced when teaching learners with SEN in inclusive classes. In this section, the researcher presents the research results according to the sub-themes and categories, in each case providing narrative examples. The following sub-themes emerged: lack of sufficient training in the utilisation of ICT, teachers' lack of pedagogical knowledge and technical support, insufficient ICT gadgets in schools, teachers' inability to integrate ICT during teaching, insufficient time and poor implementation of ICT tools and devices. The highest rated challenge faced by teachers was the lack of sufficient training in the utilisation of ICT with 5 teachers (31.25 %), followed by teachers' lack of pedagogical knowledge with 3 teachers (18.6 %). Teachers' lack of technical support, insufficient ICT gadgets in schools and teachers' ability to integrate ICT during teaching rated third, with 2 teachers (12.5 %) each. Insufficient time and poor implementation of ICT tools and devices were ranked the lowest, with 1 teacher (6.25 %) each (the results are presented in Table 4.10).

Table 4.10: Sub-themes on ICT-related challenges faced by teachers when teaching learners with SEN in inclusive classes

Sub-themes	Number of teachers	Percentage (%)
Lack of sufficient training in ICT usage	5	31.25
Teachers' lack of pedagogical knowledge	3	18.6
Teachers' lack of technical support	2	12.5
Insufficient ICT gadgets in schools	2	12.5
Teachers' inability to integrate ICT during teaching	2	12.5
Insufficient time	1	6.25

Poor implementation of ICT tools and devices	1	6.25
Total	16	100

4.4.1 Sub-theme One: Lack of sufficient training in ICT usage

Results show that most of the teachers who were utilising ICT devices and software in teaching learners with learning difficulties lacked training. The categories that emerged from this sub-theme were: the improper utilisation of ICT devices, which received a response of 10 teachers (62.5%) while continuous malfunctioning of the ICT devices was responded by 6 teachers (37.5%) (see Table 4. 11).

Table 4.11: Sub-theme One categories

Categories	Number of teachers	Percentage (%)
Improper utilisation of ICT devices	10	62.5
Continuous malfunctioning of the ICT devices	6	37.5
Total	16	100

Improper utilisation of ICT devices

Ten of the teachers who responded to this question stated that some teachers did not know how to utilise computers and other ICT devices, and that it was a big challenge. One of the teachers said:

T02: "*I personally struggle with using computers since I never received proper training in that field and this affects my performance".*

Continuous malfunctioning of computers

A large number of teachers stressed that they did not know how to operate ICT devices and this led to the malfunctioning of computers. The teachers said:

T06: *"Sometimes you switch on the computers and you find some things which are uninstalled and some deleted".* T09 also complained about malfunctioning computers. *"It is discouraging as sometimes we find the computers not properly to meet the needs of learners with special educational needs. A might have to spend time seeking assistance to get the computer fixed, at the expense of the real teaching," she said.*

4.4.2 Sub-theme Two: Teachers' lack of pedagogical knowledge

This study reveals that the lack of pedagogical knowledge in the integration of ICT in schools inhibited teachers' self-confidence when utilising ICT devices and software. The categories identified under this sub-theme were: inhibited teachers' self-confidence received 12 responses (75%) and was ranked the highest. This was followed by the category, engendered incompetence, with 4 respondents (25%) (the results are presented in Table 4.12).

Table 4.12: Sub-theme Two categories

Categories	Number of teachers	Percentage (%)
Inhibited teachers' self-confidence	12	75
Engendered incompetence	4	25
Total	16	100

Inhibited teachers' self-confidence

It emerged from the study that the majority of the teachers who taught in schools did not have the pedagogical knowledge and competencies to utilise ICT. This led to a lack of self-confidence when utilising technological devices in teaching learners, especially those with special educational needs in schools. One teacher revealed that

T12: *"ICT is good for both the teachers and learners but unfortunately, most of us do not really know how to utilise the ICT tools or incorporate them into our lessons. Additionally, lack of self-confidence makes us incompetent to apply ICT devices during lessons".*

Engendered incompetence

Four of the 16 teachers who were interviewed indicated that they were not competent to integrate ICT devices in their teaching. One teacher said:

T13: *"It is difficult for us to integrate ICT devices and software due to the fact that we do not possess the pedagogical knowledge to utilise ICTs as teaching aids".* The point is elaborated by T15's comment. *"Some of us are not knowledgeable on how to use ICT gadgets, we have not been trained to use them," he said.*

4.4.3 Sub-theme Three: Teachers' lack of technical support

It emerged from this study that the absence of technical support in relation to the utilisation of ICTs was a challenge. This hindered the use of ICT in teaching learners with special educational needs in inclusive classes.

The categories identified under this sub-theme were lack of technical services (62.5%) followed by poor internet connectivity (37.5 %) (the results are presented in Table 4.13).

Table 4.13: Sub-theme Three categories

Categories	Number of teachers	Percentage (%)
Lack of technical services	10	62.5
Poor Internet connectivity	6	37.5
Total	16	100

Lack of technical services

Ten interviewees indicated that they failed to make use of ICT in class due to a lack of technical services.

Some of the teachers said:

T04: *"If technical faults arise, the technicians will not be able to fix them in time and sometimes if the faults occur, it takes about a month before they are fixed. This means that teachers will not be able to get access to ICT tools to aid their teaching. As a result, this disrupts some lessons on a daily basis".*

T05: *"It is difficult to utilise ICT devices in teaching and learning since there is no full-time technician at school who can fix problems".*

Poor internet connectivity

Six of the teachers interviewed indicated that they failed to utilise ICT software due to the habitual lack of internet connectivity. One teacher made the following remark:

T06: *"Poor internet connectivity makes me to deliver poor lessons because habitually, we experience faulty internet connection. This result in failure to conduct effective lessons, especially in Natural Science subjects such as Biology, Physical Science and Life Science which require videos and pictures downloaded from Google platforms to aid explanations".*

4.4.4 Insufficient ICT gadgets

Of the 16 teachers in this study, 10 were interviewed and indicated that the lack of gadgets and the inaccessibility of ICT devices were the main stumbling blocks to the effective teaching and learning of learners in inclusive schools. The categories that emerged from this sub-theme were lack of ICT devices (81.25 %) while inaccessibility rated lowest at 18.75% (see Table 4.14).

Table 4.14: Sub-theme Four categories

Categories	Number teachers	Percentage (%)
Lack of gadgets	13	81.25
Inaccessibility of available devices	3	18.75
Total	16	100

Lack of gadgets

The majority of teachers interviewed complained about the shortage of computers for learners with special needs. Teachers also pointed out that some of the ICT resources were not in good working condition, something that emanated from the unavailability of hardware to repair them. One teacher revealed that

T02: *"Our classes are not well equipped with ICT gadgets. Some gadgets are not functioning and are in need of repair. The numbers of computers which are available are not enough to accommodate all learners to conduct search for information about their subject areas".*

Inaccessibility of the ICT devices

Three of the teachers indicated that inaccessibility of ICT devices discouraged teachers of learners with special needs from delivering the subject contents fully. One of the teachers who were interviewed said that

T05: *"There are usually no specialised personnel to take care of the ICT devices in the schools, so the devices are locked up in storerooms such that you cannot easily access them any time you need to utilise them".*

T07 also pointed out "*The school does not have a person designated specifically to monitor and account for the issuing of the ITC tools from the storeroom. If I want to use Braille machines for example, but no one is ready to issue them out, it disturbs me from teaching learners the concept planned."*

4.4.5 Sub-theme Five: Inability of the teachers to integrate ICT in teaching

The category that emerged from this sub-theme was the obsoleteness of devices. This category received a response rate of 100 % (the results are presented in Table 4.15).

Table 4.15: Sub-theme Five category

Category	Number of teachers	Percentage (%)
Obsoleteness of devices	16	100
Total	16	100

Obsoleteness of devices

The study revealed that all teachers interviewed were finding it difficult to integrate ICT in the teaching and learning of learners with special educational needs in inclusive classes. One of the respondents said that

T05: *"Some of the ICT devices are out-dated. We need new ICT devices which are working properly and as others are no longer working. This has negative ramification on teachers in schools. We have so many dead computers in the school and some of the projectors do not work well anymore".*

4.4.6 Sub-theme Six: Insufficient time

Results from this sub-theme show that teachers failed to create enough time to utilise ICT devices and tools in teaching learners with special educational needs in inclusive classes. One category emerged from this sub-theme, namely that it inhibited the ability to complete the workloads. This category received a rating of 100% (see Table 4.16).

Table 4.16: Sub-theme Six category

Category	Number of teachers	Percentage (%)
Lack of sufficient time to complete the workloads	16	100
Total	16	100

Lack of sufficient time to complete the workloads

All 16 teachers interviewed were of the view that a shortage of time hindered them in utilising ICT devices during lessons. Teachers, furthermore, indicated that their workloads limited them from using ICT devices. The following extracts represent the teachers' opinions:

T02: *"Although some few teachers possess the technical know-how regarding the utilisation of ICT tools in teaching and learning, they are unable to utilise it because their work schedules are too busy to the extent that they are not able to make use of ICT tools to deliver their lessons".*

T03: *"Lack of sufficient time to scrutinise the ICT tools and make use of them in teaching learners at school emanated from a lot of work which needs to be done concurrently and this inhibits the aptitude to complete the workloads as stipulated in the work plan".*

4.4.7 Sub-theme Seven: Poor implementation of ICT tools and devices

One category was identified under this sub-theme, namely that poor implementation stemmed from a poor inclusive education policy. This category received a 100 % response rate from teachers interviewed (the results are presented Table 4.17).

Table 4.17: Sub-theme Seven category

Category	Number of teachers	Percentage (%)
a poor inclusive education policy	16	100
Total	16	100

All the teachers who were interviewed indicated that the poor implementation of the inclusive education policy contributed to the poor utilisation of ICT tools. One teacher interviewed said that

T02: *"Poor implementation of ICT tools and devices stemmed from a poor inclusive education policy on integrating learners with different learning abilities into mainstream classes. It becomes problematic for a teacher to attend to all learners and remedy their problems. When the fast learners understand what is taught, the teacher moves to another concept and the slow learners are left behind, not understanding what they are taught".*

Findings from this section revealed that the major ICT-related challenges faced by teachers in the integration of ICT in teaching learners in inclusive classes were the obsoleteness of devices, poor implementation of the inclusive education policy and the lack of sufficient time to complete the workload.

4.5 Results collected by means of observations regarding ICT-related challenges faced by teachers when teaching learners with SEN in inclusive classes

In order to enhance the information obtained by means of the interviews, the researcher made observations in the class environment. The observations focused on the class management and teaching aids utilised by teachers in inclusive classes. Observations also focused on the teachers' competence when utilising ICT resources in inclusive classes. All 16 teachers from the two schools were observed and results were recorded, and are presented in the Table below.

Table 4.18: Observation results regarding the ICT-related challenges faced by teachers when teaching learners with SEN in inclusive classes.

Challenges	Yes	%	No	%
Teachers are not able to integrate ICTs in addressing learners' difficulties in inclusive classes.	10	62.5	6	37.5
Teachers do not have pedagogical knowledge to utilise ICTs in teaching learners in inclusive classes.	12	75	4	25
Teachers do not have confidence in using ICTs in teaching learners, especially those with special needs.	12	75	4	25
Teachers do not utilise ICTs because they have little access to the ICT resources.	10	75	6	25

Of the 16 teachers observed, 62.5% were not able to integrate ICTs when teaching learners with special education needs, while only 37.5% did utilise ICTs. Seventy-five percent of the teachers did not address learners' needs by utilising ICT due to a lack of pedagogical knowledge regarding ICT tools that could assist learners in inclusive classes. It was further observed that 75% of the teachers observed were not confident enough in utilising ICT devices to aid their teaching, especially when teaching learners with special educational needs.

4.6 Theme Three: Strategies to overcome ICT-related challenges faced by teachers teaching learners with SEN in inclusive classes

In this section, the results are presented according to the sub-themes and categories. The sub-themes that emerged from this theme were as follows: need for in-service teacher training, need for technical support, availing more ICT gadgets to schools, provision of electricity and e-books in schools and improving school infrastructures that support ICT usage. The highest rated strategy to overcome ICT-related challenges was the need for in-service training for teachers (37.5 %). Some teachers (31.25%) emphasised the need for technical support. This was followed by the sub-theme of availing more ICT gadgets to schools, which represents 12.5 % of the responses.
The provision of electricity and e-books to schools and improving infrastructures that support ICT usage at schools ranked the lowest at 6.25 % of the responses each (the results are presented in Table 4.19).

Table 4.19: Sub-themes of the strategies which can be put in place to overcome the ICT-related challenges faced by teachers in inclusive classes

Sub-themes	Number	Percentage (%)
Need for in-service training for teachers in ICT usage	6	37.5
Need for technical support to teachers of inclusive classes by school management	5	31.25
Availing more ICT gadgets to schools	2	12.5
Provision of electricity to schools	1	6.25
Provision of computer-based books to schools	1	6.25
Improving schools' infrastructure that support ICT usage	1	6.25
Total	16	100

4.6.1 Need for in-service training for teachers

The following categories emerged from this sub-theme: the need for training and workshops. The need for training and workshops received a response rate of 50% each (see Table 4.20).

Table 4.20: Sub-theme One categories

Categories	Number of teachers	Percentage (%)
Pre-service training	8	50
In-service training	8	50
Total	16	100

Pre-service training

Of the 16 teachers interviewed regarding practical training in the usage of ICT devices, 8 (50%) indicated that they needed the requisite skills in order for them to be able to utilise computers. The following extract is the opinion of one of the teachers:

T03: *"The training of teachers in ICT use and integration will provide teachers with competencies on how ICT tools and devices can be used. This provides an enabling environment where teachers have confidence to deliver lessons in front of learners".*

The view is supported by T08 who also pointed out that, *"If teachers get practical training in the usage of ICT devices, they become prepared for the integration of ICTs into their teaching after training."*

In-service training

Six of the 16 teachers felt that on-going, in-service training regarding the use of ICTs in inclusive classes should be conducted. One teacher interviewed said that

T05: *"I personally think that seminars and workshops will give us a platform to interact with experts on to how utilise of ICT tools in teaching inclusive classes".*

4.6.2 Sub-theme Two: Need for technical support

The categories that emerged from this sub-theme were the need for experts and subject software. The need for experts was rated the highest at 87.5 % while the need for subject software was rated the lowest at 12.5 % (see Table 4.21).

Table 4.21: Sub-themes Two categories

Categories	Numbers of teachers	Percentage (%)
Need for experts in ICT	14	87.5
Need subject specific software	2	12.5
Total	16	100

Need for ICT experts

The teachers interviewed were of the opinion that the employment of many ICT technicians was the answer to overcome the frequent occurrence of technical faults when teachers were conducting ICT-aided lessons. The teachers said the following:

T08: "*The Ministry of Education Art and Culture should employ two full time ICT technicians at each school in Oshana Region so as to reduce the time taken before the technical fault is resolved".*

TO9: *"The sustainability of Sector Policy on Inclusive Education and its integration in schools can only be achieved if the technicians are well vested in ICT technical maintenance".*

Subject specific software

Two of the 16 teachers interviewed indicated that subject software that provided instructions could assist both learners and teachers in the implementation of the Sector Policy on Inclusive Education, as no learner would feel left out. One teacher said the following:

T07: *"The solution to enhance the integration of ICT tools and devices in the teaching and learning process is to provide teachers with specific subject software and upload them onto the computers at schools so as to equip teachers and learners with ICT".*

4.6.3 Sub-theme Three: Availing more ICT gadgets to schools

The following categories emanated from this sub-theme: provision of projectors and enough computers. Both categories were rated at 50% each by the teachers interviewed (the results are presented in Table 4.22).

Table 4.22: Sub-theme Three categories

Categories	Number of teachers	Percentage (%)
Provision of projectors	8	50
Provision of enough computers	8	50
Total	16	100

Provision of projectors

Eight of the 16 teachers regarded projectors as important tools in teaching and learning; therefore, the shortage that they were currently experiencing made their work very difficult. The teachers, furthermore, explained that utilising projectors saved time usually taken up by having to write lessons on the chalk boards. The remarks below reflect the teachers' opinions:

T02: *"The projectors will help us to make the teaching and learning process more interesting, lively and colourful by showing videos and pictures through projectors. We also save the time we spend writing on the boards".*

Provision of enough computers

The remaining 8 teachers said that there was a need for the Ministry of Education, Arts and Culture to provide sufficient numbers of computers in order to reduce the overcrowding of learners per computer. The teacher's views are expressed in the following excerpt:

T06: *"The provision of computers by the government can assist the teachers to integrate ICT tools resulting in all learners having access to devices without sharing computers with other learners".*

4.6.4 Sub-theme Four: Provision of electricity in schools

One category was identified under this sub-theme, namely the uninterrupted supply of electricity (see Table 4.23).

Table 4.23: Sub-theme Four category

Category	Number of teachers	Percentage (%)
Constant supply of electricity	16	100
Total	16	100

Constant supply of electricity

Sixteen teachers interviewed in this study indicated that the government should not only supply electricity occasionally but continually for as long as schools were open. The teachers had the following to say:

T012: *"Constant supply of electricity is the remedy to achieve a sustainable Sector Policy on Inclusive Education (2013). Failure to take into consideration the issue of electricity cuts in schools will be a stumbling block for teachers and learners to achieve the integration of Sector policy on Inclusive Education and utilise of ICTs".*

4.6.5 Sub-theme Five: Provision of e-books to schools

Ensuring the constant availability of e-books was a category under this sub-theme. The category was rated 100 % (see Table 4.24).

Table 4.24: Sub-theme Five category

Category	Number of teachers	Percentage (%)
Provision of e-Books	16	100
Total	16	100

Provision of e-books

All sixteen teachers interviewed in this study were of the view that the Ministry of Education, Arts and Culture should ensure that e-textbooks were availed in order to integrate ICT tools in teaching learners with special educational needs in an inclusive class. Teacher T11 said the following:

T11: *"The provision of e-textbooks allows teachers and learners to have free access to information regarding their diverse subjects and this improves the academic performance of learners with special educational needs in an inclusive class".*

4.6.6 Sub-theme Six: Improving infrastructure that supports ICT usage

The following category was identified: infrastructure development. This category received a response rate of 100 % (see Table 4.25).

Table 4.25: Sub-theme Six category

Category	Number of teachers	Percentage (%)
Infrastructure development	16	100
Total	16	100

Infrastructure development

Sixteen teachers indicated that classes needed to be renovated to accommodate ICTs. The teachers' opinions are reflected in the following remark:

T15: *"Although ICT resources are insufficient, there is a need to renovate the classes for easy setting up of projectors as well as mounting white boards to ensure quality visual displays".*

4.7 Summary

This chapter presented the results of the study collected by means of interviews and observations. The results from the interviews were presented first, followed by data collected during observation. The results were presented according to the themes and sub-themes and categories identified.

The researcher responded to the three objectives which were, firstly, seeking to establish ways in which ICT can be utilised to enhance the learning of learners in inclusive classes. This was followed by the second objective which focused on examining ICT-related challenges faced by teachers teaching learners in inclusive classes and, finally, the third objective which sought to identify solutions which can be initiated to overcome the ICT-related challenges faced by teachers in inclusive classes.

The next chapter will give a summary of the research, draw conclusion from the findings and offer recommendations that can lead to the successful utilisation of ICT to enhance learning for learners in inclusive classes.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study focused on the utilisation of information and communication technologies (ICTs) in inclusive classes. In the previous chapter the results of the study were presented. The aim of this chapter is to discuss and interpret the findings of the study. The findings are discussed based on themes, sub-themes and categories that emerged from each research objective. The themes identified were ways in which ICT can be utilised to enhance learning for learners with special educational needs in inclusive classes, ICT-related challenges faced by teachers when teaching learners with special educational needs in inclusive classes and strategies which can be put in place to overcome the ICT-related challenges faced by teachers in inclusive classes.

5.2 Discussion of different strategies in which ICT can be utilized to enhance learning for learners with special educational needs in inclusive classes

The discussion focuses on six sub-themes as reported by teachers. They were ICT improves learners' understanding, ICT improves communication, ICT allows learners to acquire new skills, ICT acts as a motivational tool, ICT can be utilised as an assessment tool, ICT allows learning autonomy and ICT can be utilised as a management tool. Each sub-theme is discussed in brief below.

5.2.1 Discussion of the strategy in which ICT improves learners' understanding.

The following categories were discussed under this sub-theme: recorded lessons can be listened to at learners' own pace and time and videos enhance learners' understanding.

5.2.1.1 Recorded lessons can be listened to at learners' own pace

Findings from the interviews revealed that recorded lessons were useful and advantageous as these allowed learners with special needs to revisit the lessons at their own time; hence, they progressed in learning at their own pace. One of the teachers (T01) said that "*If teachers introduced a new topic with difficult terminologies, it will be a bonus to learners to be able to play back the taught topic at their own pace to understand it better*."

This finding is supported by Kanner (2009) who argues that a tape recorder helps to individualise the instruction to the learning needs of learners with special educational needs and, thus, implies that assistive technology is ideal for learners who have trouble keeping up with lessons. It can be concluded that the use of audio recorders is essential when teaching learners with special educational needs in inclusive classes. The learners, especially those with special educational needs (SEN) and cannot cope with the pace of the lessons can benefit from the recorded learning material as their mastery of concepts is enhanced.

5.2.1.2 Videos enhance learners' understanding

The researcher established that, teachers who were teaching learners with special educational needs believed that recorded videos appealed to both the senses of sight and hearing. The videos could be watched again and again, which enhanced learners' understanding. T09 said that *"I personally think that ICT is a game changer because some of the learners cannot grasp all the concepts the first time you teach them but with recorded videos, they can just watch them as many times as they want using both their sense of sight and sense of hearing"*.

This result is in line with Rossiter, Nortcliffe, Griffin and Middleton (2009) who posit that utilising captions and subtitles with videos has proven to be effective in helping learners to access and process information, especially when considering diverse learner populations, including non-native English speakers and those with special needs. They, furthermore, claim that one of the most effective ways to allow information to make that important jump from the limited short-term memory to the more powerful long-term memory is to pair text with images (Rossiter, Nortcliffe, Griffin & Middleton, 2009).

Findings from this study also reveal that the convenience and versatility of videos make them an asset to learners and teachers alike. While it can be quite complicated for teachers to explain concepts abstractly, once there are recorded videos, it enhances learners' understanding since they offer the flexibility to pause, rewind or skip to have class discussions or review particular areas (Rossiter, Nortcliffe, Griffin & Middleton, 2009). Videos also create a more engaging, sensory experience than when only print materials are utilised. Learners can both see and listen to the concept being taught (Rossiter, Nortcliffe, Griffin & Middleton, 2009).

5.2.2 Discussion of the way in which ICT improves communication difficultie

The categories discussed under this sub-theme were ICT facilitates communication and it can be utilised as a didactical tool.

5.2.2.1 ICT facilitates communication

From the findings, the researcher established that ICT can be utilised to facilitate communication. The finding is supported by one a quote from one of the teachers who said "*The use of visual displays using a projector helps me to communicate easily with the hearing-impaired learners. If I explain using sign language and give them an exercise they perform poorly but if I complement sign language with visual displays their performance will be at the same level with their peers without special educational needs."*

The above finding is supported by Josjö (2012) who points out that assistive ICT tools help learners with communication difficulties to exhibit their abilities in an appropriate way. In fact, utilising ICT in schools to support inclusion can enable learners to communicate, participate in lessons and learn more effectively (Josjö, 2012). This clearly shows that ICTs mediate communication with learners who have communication difficulties in inclusive classes. It furthermore unlocks the hidden potential for those with communication difficulties.

5.2.2.2 ICTs are utilized as didactic tools

Findings from the study showed that teachers find it easier teaching learners with special needs when using ICT devices. One teacher said that *"ICT is now part of our teaching process and our work has become very easy, thanks to this technological advancement".*

These findings are supported by Skutil and Manenova (2013) who posit that didactic tools, such as visual aids and organisational forms of teaching, contribute to the overall effectiveness of the teaching process. The authors, furthermore, claim that ICT can be utilised to promote learner-centred models of learning. It implies that, it is imperative for teachers to integrate ICT when teaching learners with diverse needs. When ICT resources are utilised, learners perceive, observe, imagine and also develop aesthetic senses during learning. It also implies that, without ICT tools, the teaching of learners with special needs is less effective since these learners learn best when they are communicating or being communicated with by means of ICTs.

5.2.3 Discussion of the way ICTs allow learners to acquire new skills

The following categories will be discussed under this sub-theme, namely ICTs can lead to new skills development and the boosting of teaching strategies.

5.2.3.1 Category: New skills development

The research concluded that, having specialised ICT tools like the Braille machines and projectors in place for learners with partial impairments makes the teaching and learning environment conducive for both teachers and learners. These results are supported by Martínez (2011) who notes that ICT can be utilised as a tutor. He claims that the use of individualised, computer-based software and different ICT tools helps learners to understand the subject content and enhance their performance, (Martínez 2011). These findings, furthermore, correspond with Hennessy, Onguko, Harrison, Ang'ondi, Namalefe, Naseem and Wamakote (2010) who posit that ICT helps teachers to duplicate excellence in inclusive classes, as well as develop teaching strategies to address the diverse needs of learners in inclusive classes.

The findings above imply that ICTs serve as a private tutoring tool for learners with and without special educational needs in inclusive classes. Ultimately, ICTs improve learners' academic performance. With the help of ICTs, teachers are able to meet the diverse needs of learners in inclusive classes as a variety of ICT tools allow teachers to develop new skills while at the same time minimise barriers to learning.

5.2.3.2 ICTs as a teaching strategy booster

Eight of the teachers interviewed pointed out that utilising ICT tools in the class helped teachers to attend to the diversity of learners. The teachers indicated that the effective utilisation of ICTs played an important role in promoting new instructional methods for teaching and learning.

One teacher (T07) said that *"A Microsoft PowerPoint presentation can help me to teach a topic in a very innovative and creative way that will lead into discussion and exchanging of ideas and thoughts."* These findings are supported by Ezekoka (2015) who asserts that ICTs can engage learners in collaborative learning, as well as enhance their social interaction.

The finding above implies that the adoption and utilisation of ICTs in inclusive classes have a positive impact on teaching and learning. Teachers can incorporate sophisticated visual and auditory media into lesson presentations. By carefully mixing sophisticated visuals and auditory media, lesson presentations can appeal to diverse learners, which makes learning more stimulating. It means that ICT resources should be integrated into teaching as a strategy to minimise learning difficulties. It, furthermore, implies that ICTs can promote a learner-centred approach which, in turn, leads to effective teaching and learning.

5.2.4 Discussion of the way ICT can act as a motivational tool

The categories discussed under this sub-theme were increased participation and attention grabbing.

5.2.4.1 Category: ICTs increase participation

Participation is one of the key pillars of inclusive education. Eight of the sixteen teachers indicated that the utilisation of projectors and other ICT-related tools drive learners to participate actively during class activities. Their opinions are reflected in the following remarks: *"I think if I stop using a projector or ICT-related tools my learners will become very passive. Currently, their participation is just amazing* (T03)." Another teacher (T05) said that *"I enjoy teaching when I am using a projector because it awakens my learners and they become lively*".

These findings are supported by Martínez (2011) who claims that ICTs help teachers to overcome the obstacles of time and space, supplementing vital human functioning and supporting the development of crucial skills. ICTs contribute to the increased effectiveness of educational processes by enabling people with special needs to participate actively in teaching-learning processes. It can be deduced from this position that learners participate more when teachers integrate ICTs in their teaching. The learners' obstacles to learning are minimised and their learning is enhanced.

5.2.4.2 Category: ICT grabs attention

Some of the teachers also indicated that using ICT tools helped learners to pay more attention. Findings showed that, with the advent oft ICT teachers not need to be on their toes constantly in order to get learners to pay attention to the material being taught. These findings are in line with Bester and Brand (2013) who report that the utilisation technology in teaching captures learners' attention. Bester and Brand (2013) argue that technology has the potential not only to maintain attention but also to motivate learners to pay attention. It implies that teachers should integrate ICTs in inclusive classes to attract learners' attention. When learners are motivated to a task, commitment, enjoyment, learning and self-efficacy increase (Bester & Brand, 2013).

5.2.5 Discussion of the way in which ICT can be utilised as an assessment tool

The category discussed under this sub-theme was that ICTs gives instant feedback.

5.2.5.1 Category: ICT gives instant feedback

The findings of the research were that; ICTs could be utilised as assessment tools which could provide prompt feedback. The following remark reflects teachers' opinions: *"Through ICT, teachers can assess learners' learning as well as their performance and report on assessment tasks instantly. ICT provides prompt feedback and learners don't have to wait longer to get feedback"* (T05). (T07) supported the view and said, *"Using ICT tools automatically gives the learners timely and relevant feedback. Just when the assessment has been concluded and is still fresh in the learners' minds, feedback is send."*

These findings are supported by Wong and Yang (2017) who maintain that certain ICT applications enable instant, system-facilitated feedback. The same view is shared by Black and Wiliam (1999) cited in the Oxford University Press (2014) which states that, ICT tools such as Google Forms enables teachers to deliver timely and immediate feedback on learners' assessments. For example, learners can receive tailored feedback messages on incorrect answers to online quiz questions. The finding implies that teachers should integrate ICT applications that provide instant feedback to learners. If these ICT applications are combined with immediate teacher feedback and peer feedback, they provide learners with cognitive support by scaffolding their critical thinking and self-reflection.

5.2.6 Discussion of the way ICT enables learning autonomy

The category discussed under this sub-theme was that ICTs give independence to learners.

5.2.6.1 Category: ICTs give independence to learners

Findings from the study established that ICTs allowed learners to acquire independence and efficiency, as most ICT devices enabled them to overcome their difficulties. One of the teachers (T05) said that *"In my class one cannot tell whether a learner is visually impaired because they will all be working and participating independently. I am impressed with how technology is bridging the gap between learners with diverse needs." (*T09) *also added,*

These findings correlate with Lindström et al., (2012) who advocate that ICTs can be utilised as educational tools to provide learners in inclusive classes with the opportunity to participate independently in educational activities, in the same way as their peers do. In the same vain Joshi and Poudel (2019:70) state that, "learner autonomy and learner independence can be sought in the classroom through the integration of ICTs in classroom intervention and in students' self-study." This finding indicates that it is important for schools to provide a conducive ICT supported environment to improve the teaching and learning of all learners in inclusive classes. For example, the visually impaired learners can read smoothly and independently by means of ICT devices, such as screen readers and Braille machines.

5.2.7 Discussion of the way ICTs are utilized as a management tool

The category that emerged from this sub-theme was that ICT enabled individual teachers to develop education plans.

5.2.7.1 Category: ICTs enables individual teachers to develop education plans

From the findings the researcher established that the integration of ICT devices in teaching and learning enabled teachers to develop individual education plans designed to address the difficulties of learners in the inclusive classes. One of the teachers justified this statement by saying that *"ICT is a crucial management tool especially when utilised for learners with diverse needs. It enables teachers to develop specialised and individual centred instructions within inclusive classes"* (T04).

These findings are in line with Ridwan (2015) who asserts that ICTs provide a way to create and maintain electronic records and databases. He, furthermore, claims that these are easy to update, amend and transfer into many different formats to suit individual learners. Mwakyeja (2013) also believes that ICT tools can be used to manage records of information about learners. It can thus be deduced that ICT devices are indispensable in inclusive classes. There is a need for records management to enable teachers to track the progress of their learners. The records, together with individualised learners' instructions, are easy to create, manage and amend when utilising ICT tools.

5.3 Discussion of results regarding strategies in which ICT can be utilized to enhance the learning of learners with special educational needs

In this section the researcher discusses the results collected during observations of ways in which ICT can be utilised to enhance the learning of learners with special educational needs. The researcher observed 16 classes at two schools to identify strategies in which ICTs can be utilised to enhance learning.

The researcher wanted to establish whether different ICT devices were utilised in inclusive classes. These devices include audio recorders for listening skills, electronic books for reading, Braille machines for reading and writing, eye glasses for reading, large print books for reading, screen readers for reading, grammar checkers for writing skills, word prediction and voice recognition software for writing and calculators for mathematical calculations.

5.3.1 Audio recorders for listening skills

Findings from the observations at the two schools showed that teachers utilised audio recorders to record lessons. This allowed the learners with special educational needs to listen at their own pace since some of them were slow and they could not cope with the teachers' pace. The utilisation of voice recorders for learners with diverse needs is supported by Sediyani (2017) who advocate that learners can record what they are working on during class and go back to it at a later date with fellow learners. This is very beneficial to the learners in inclusive classes who may have a hard time understanding the first time around. Furthermore, audio-visual media can stimulate the minds and feelings of learners with diverse educational needs.

This finding implies that teachers should integrate audio recorders in teaching learners in inclusive classes. Teachers can leave learners to generate their own audio recordings to enhance and personalise learning in a self-directed way that suits their individual learning styles. Audio recorders can also be listened to by learners to improve knowledge of a topic. For instance, recordings can just be like references. If the learners are not sure of what they have learnt, they can listen and re-listen to the recordings many times. This will give insight into what they have actually learnt.

5.3.2 Using Electronic books for reading

Findings revealed that, none of the teachers observed at the two schools teaching reading skills had electronic books, although these reading devices offer many interactive features, like annotations, pen tools, page zoom and search options, as well as read-aloud. Besides, the learners can also change the font size and style and adjust the brightness of the device as per what suits their eyes. Despite the fact that none of the teachers at the two schools utilised e-books, the importance of e-books is supported by Harman (2018) who states that e-books are all-in-one devices and provide wholesome learning experiences to learners.

This indicates that e-books allow learners to refer to their notes and course materials at any time they want, without having to carry multiple books. Learners have everything in one place. Teachers should integrate e-books into classes to make learning a fun and engaging experience which benefits learners in inclusive classes.

5.3.3 Arranging for Learners to use Braille for reading

The researcher established that all the fourteen of the teachers observed at the two schools utilised Braille for leaners with visual impairments. The visually impaired learners were able to read and share ideas with other peers as the ICT tools acted as reading aid tools for these learners. These findings are supported by Brauner (2019) who maintains that, using Braille with learners in inclusive classes helps them to have less “pull out” time, and they participate more in class with their peers. The finding means that learners with visual disabilities in inclusive classes can become motivated when they have access to Braille machines. ICT for inclusive classes should, therefore, avail Braille letters, phonics, word games and early reader books available for these devices. They should also avail elementary reading and writing apps, some of which incorporate music and interesting sounds, which further intrigue learners with visual impairments. The utilisation of these educational apps enables learners in inclusive classes to work independently, at the same time making learning fun, which helps to improve the performance and achievement of the learners in inclusive classes.

5.3.4 Eye glasses for reading

Findings from the observations established that, learners in fourteen of the 16 classes observed at the two schools in the inclusive classes had eye glasses. The utilisation of eye glasses is supported by Murphy (2016) who argues that failure to provide eye glasses to learners in inclusive classes means the learners may fail to cope with reading. The learners may suffer from headaches or eye strain, blurred vision or double vision, crossed eyes or eyes that appear to move independently of each other.

These learners come to dislike or avoid reading and close work. They demonstrate a short attention span during visual tasks, turning or tilting the head to utilise one eye only or closing or covering one eye, placing the head very close to the book or desk when reading or writing. There is excessive blinking or rubbing of the eyes, posing places while reading or using a finger as a guide. They also have a slow reading speed or poor reading comprehension and many more.

This means that vision and learning are intimately related. Most of what a child learns in school is information that is presented visually. It is, therefore, important for teachers to ensure that learners have access to ICT resources, such as eye glasses, as these are essential for learners with visual impairments. With the correct, prescribed reading glasses, the learners will be able to cope with reading just like their counterparts.

5.3.5 Using large print books for reading

The researcher established that, 12 of the 16 teachers observed utilised large print books for learners with visual impairments. The observations revealed that learners who read large print books developed stronger reading skills, felt more comfortable reading and adopted new, positive reading mind sets. These findings are supported by Friedman (2019) whose study revealed that learners, who utilised large print books, improved self-efficacy around reading and changed their reading habits. Friedman (2019), furthermore, argues that large print books renew students' confidence around reading and improved their reading habits.

These findings indicate that, by using large print books in inclusive classes, learners improve their reading skills; they also improve their attitudes to reading. This is significant as learners' transition from learning to read to reading to learn.

5.3.6 Screen readers for reading

Findings revealed that fourteen of the 16 teachers who were observed utilised screen readers for learners with visual impairments. Learners were assisted to recognise real words and not simply sound out 'nonsense' words by using phonics skills. The technology allowed them to scan printed material into a computer or handheld unit. It enabled the child to type-print text to the computer, while the speech synthesiser read the text back aloud for the child to hear and see the text alongside.

The utilisation of the ICT as was observed is supported by Adebisi, Liman and Longpoe (2015) who assert that the ICT is useful for learners with reading difficulties when reading printed words, and also those learners who understand better what they hear than what they can see. The finding indicates that teachers should utilise these ICT resources consistently as it can level the playing field for learners with visual impairments. It opens educational doors for learners by providing alternative solutions to their reading difficulties. It also means that the learners will feel better about themselves as they perform reading tasks utilising the assistive technology.

5.3.7 Grammar checker for writing skills

Findings of the study revealed that teachers at the two schools utilised grammar checkers, as well as word prediction and voice recognition software, to assist learners with special needs to learn how to write. These were utilised to check grammar and to write words correctly. The utilisation of the ICT software applications for word processing, editing, spell checking, as well as grammatical tools, is supported by Istenic Starcic and Bagon (2014). They postulate that the software facilitates the inclusion of learners with special needs in regular classes. The ICT tools allow learners to keep up with much of the work, and they often feel better about themselves as active learners. However, the majority of the classes observed at the two schools did not have these ICT tools.

The implication of the findings is that most learners, who struggle with writing, spelling, grammar, punctuation, word usage and sentence structure, may continue to lag behind in writing. If teachers could integrate the ICTs, all learners would benefit immensely from the software programmes included in the word processing systems. Failing to integrate the ICT tools means learners with special educational needs are prevented from participating fully in the inclusive classes.

5.3.8 Word prediction and voice recognition software for writing

The researcher revealed that fourteen of the teachers observed at the two schools utilised word prediction and voice recognition software for writing. These observations are supported by Adebisi1, Liman and Longpoe (2015) when they affirm that providing these ICT resources help learners with special educational needs to be independent when completing educational tasks and thus participate on an equal basis with their developing peers in the regular educational environments.

The above finding indicates that assistive technology provides many benefits to learners with special educational needs. Since the learners often find the writing process frustrating, with assistive technology, they can cope with these challenges. It, furthermore, implies that teachers and assistive technology can, therefore, jointly enable those learners with special educational needs to achieve their goals in education.

5.3.9 Scientific calculators for mathematical calculations

Findings indicated that, at both school teachers and learners utilised scientific calculators to solve complex mathematical calculations. The utilisation of scientific calculators for complex mathematical calculations is supported by Raskind and Stanberry (2016) who assert that Assistive Technology (AT) tools for Maths help learners who struggle with computing, organising, aligning and copying Maths problems down on paper.

This implies that the utilisation of scientific calculators is essential when teaching learners with special needs in inclusive classes. With the visual and/or audio support from some scientific calculators, learners with special education needs can calculate basic Maths problems.

The researcher's observations revealed that not all the ICT tools suggested in this section were utilised by the teachers in inclusive classes. For example, no teacher was observed utilising electronic books in the inclusive classes. The teachers utilised other devices mentioned above to assist the learners.

5.4 Discussion of results regarding ICT-related challenges faced by teachers when teaching learners with SEN in inclusive classes

Teachers were also asked to share their views on the ICT-related challenges they faced when teaching learners with SEN in inclusive classes. The discussion focuses on seven sub-themes as stated by teachers. They were lack of sufficient training in ICT usage, teachers' lack of pedagogical knowledge, teachers' lack of technical support, insufficient ICT gadgets in schools, teachers' inability to integrate ICT during teaching, insufficient time and poor implementation of ICT tools and devices. Each sub-theme is discussed in brief below.

In this section the researcher presents the research results according to the sub-themes and categories, at the same time integrating results from interviews and those from observations.

5.4.1 Discussion of the lack of sufficient training in ICT usage

The categories that emerged from this sub-theme were improper utilisation of ICT devices and the continuous malfunctioning of the ICT devices.

5.4.1.1 Category: Improper utilisation of ICT devices

The research established that teachers did not know how to utilise computers and other ICT devices and that it was a big challenge. One teacher (T02) said that *"I personally struggle with using computers since I never received proper training in that field and this affects my performance".*

This result is supported by Habibu, Al-Mamun and Clement (2012) who advocate that teachers need training courses in dealing with new devices, modern technologies and new pedagogical approaches. This implies that a lack of technical know-how in utilising ICTs is a great challenge to many teachers. The lack of expertise can discourage teachers to implement ICTs; hence, learners with special needs may be left behind in the inclusive classes. Teachers should have hands-on training that will enable them to utilise ICTs themselves. The training should be an on-going process to meet the demands of technology, since technology is an ever-changing phenomenon.

5.4.1.2 Category: Continuous malfunctioning of computers

Some teachers, furthermore, revealed that teachers did not know how to operate ICT devices. This leads to the malfunctioning of the computers. One teacher (T06) said that *"Sometimes you switch on the computers and you find some things which are uninstalled and some deleted".* The findings are in line with Habibu, Al-Mamun and Clement (2012) who argue that ICT technical problems hinder the smooth delivery of lessons. They, furthermore, assert that technical barriers, such as malfunctioning computers, hinder the continuous flow of class activities.

It can be concluded that teachers are willing to integrate ICT resources, such as projectors, computers and audio, to teach learners in inclusive schools but, due to a lack of technical support, ICT devices are not always working effectively. There is, therefore, a need for schools to provide technical support so that the available ICT resources are always properly functioning.

5.4.2 Discussion of teachers' lack of pedagogical knowledge

The categories discussed under this sub-theme were inhibited teachers' self-confidence and engendered incompetence.

5.4.2.1 Category: Inhibited teachers' self-confidence

The majority of teachers revealed that they were not confident to utilise ICTs. Most of them suffered from inhibited confidence. One teacher (T12) said that "*Some of us feel like we are not confident enough to integrate ICT during teaching because we do not possess enough competencies. We fear that our lack of confidence in using ICTs when teaching might lead students to lose confidence as well"*. The above results are substantiated by Peterson (2011) who are of the view that the majority of teachers in schools lack self-confidence and the necessary competencies to utilise ICT devices as educational tools.

The results could imply that a number of the teachers interviewed might not have been exposed to technologies like computers and the internet. This could have contributed to their inhibiting lack of self-confidence. The learners who are more knowledgeable could intimidate teachers, especially those with little technological experience. When teachers feel they do not have the necessary competencies when utilising technology, they may feel less in control of the class. They will also utilise technology less frequently, and stick to traditional teaching methods, unwilling to face the challenges of instructing the digital learners in a digital environment. This could then impede the effective integration of technology in teaching learners with special educational needs.

5.4.2.2 Category: Engendered incompetence

Findings revealed that one quarter of the teachers interviewed believed that some learners were more sophisticated in their utilisation of technology than teachers. One teacher (T13) said that

"ICT is good for both the teachers and learners but unfortunately, most of us do not really know how to utilise the ICT tools or incorporate them into our lessons. Additionally, lack of self-confidence makes us incompetent to apply ICT devices during delivering lessons."

These findings concur with Peterson (2011) who argue that teachers' lack of confidence in the utilisation of ICT impedes the effective integration of technology in the teaching and learning of learners with special educational needs in schools. Abdallah also notes that a lack of self-confidence and skills deficiencies may often be important factors inhibiting the effectiveness of ICT utilisation in education.

This implies that teachers may be willing to integrate ICTs into their teaching, but their engendered incompetence inhibits their self-confidence in utilising ICT devices and software. As such, there is a need to capacitate teachers regarding the use of ICT in teaching learners with special education needs in inclusive classes. This can be done through workshops and in-service training.

5.4.3 Discussion of teachers' lack of technical support

The categories discussed under this sub-theme were the lack of technical services and poor internet connectivity.

5.4.3.1 Category: Lack of technical services

The researcher found that more than half of the teachers failed to make use of ICT in the classes due to the lack of technical services. One teacher (T04) said that *"If technical faults arise the technicians will not be able to fix them on time and sometimes if the faults occur, it takes about a month before they are fixed*". This finding is supported by Amuko, Miheso and Ndeuthi (2015) who say that limited technical support impedes the effective integration of ICT in the teaching and learning of learners with SEN.

The deduction that could be made is that, due to a lack of technical services, lessons and the smooth flow of class activities are disrupted. Since a lack of technical support could result in the poor technical maintenance of ICT tools, there are high risks regarding technical breakdowns during lessons. These faults could discourage teachers from utilising ICT resources because of the fear that the equipment might break down amidst lessons.

5.4.3.2 Category: Poor internet connectivity

Findings revealed that more than one third of the teachers interviewed failed to utilise ICT software due to a habitual lack of internet availability. One teacher (T06) said that "*Poor internet connectivity makes me to deliver poor lessons because habitually, we experience faulty internet connection"*. This finding is in line with Johnson, Jacovina, Russell and Soto (2016) who assert that, if schools do not possess adequate fast internet connection, the implementation of educational technology is not feasible. Mingain's (2013) studies also recommended that, for successful implementation of ICTs in schools, there is need to ensure that there is internet connection in all schools. This enables teachers to effectively utilise ICTs is teaching inclusive classes.

This indicates that, without consistent internet connectivity, effective integration of ICTs remains a dream. There is a need for collaborative efforts from the Ministry of Education, Arts and Culture and school management boards to ensure that internet service provision in schools is consistent. Internet service providers with the best internet services should be contracted so that the integration of ICTs in education becomes a reality.

5.4.4 Discussion of inadequate numbers of ICT gadgets

The categories that emerged from this sub-theme were the lack of gadgets and inaccessibility to ICT devices.

5.4.4.1 Category: Lack of gadgets

Findings from the research established that inaccessibility of ICT devices was the main stumbling block in the effective teaching and learning of learners in inclusive schools. One teacher (T02) said that *"Our classes are not well equipped with ICT gadgets. Some gadgets are in dire need of repair. The numbers of computers which are available are not enough to accommodate all learners to conduct search for information about their subject areas"*.

These findings are supported by Raman and Yamat (2014) who note that a lack of sufficient ICT resources in inclusive classes is another challenge to the integration of ICT in teaching. The few available ICT resources do not suffice for the demand of all learners.

This indicates that, without adequate resources, the integration of ICT in inclusive classes is difficult. There is a need for schools to be adequately resourced so that teachers' efforts are fully supported. Hardware should be readily available so that devices are repaired when they develop technical faults.

5.4.4.2 Category: Inaccessibility of ICT devices

Findings from the study concluded that a small of teachers believed that the inaccessibility of ICT devices impeded the integration of ICT in inclusive classes. One teacher (T05) said that" There *are usually no specialised personnel to take care of the ICT devices in the school, so the devices are locked up in storerooms such that you cannot easily access them any time you need to utilise them"*. It was pointed out that computers had to be booked in advance and the teachers would forget to do so, or they could not book them for several periods in a row when they wanted to work on several projects with the learners. These findings are in line with Johnson, Jacovina, Russell and Soto (2016) who argue that the inaccessibility of ICT devices in schools discourages the teachers from incorporating ICT devices in the teaching and learning of learners with special educational needs.

This implies that the implementation of ICTs will remain a vision since teachers and learners are finding it problematic to access the ICT tools. The inaccessibility of ICTs barricades the integration of ICT in teaching learners with special educational needs. In order to develop teachers' ICT-related skills, they should have regular access to functioning and relevant ICT equipment.

5.4.5 Discussion of the inability of teachers to integrate ICT

The category that emerged from this sub-theme was the obsoleteness of devices. It appeared from the study that some ICT gadgets were unable to perform efficiently those tasks for which they were designed.

5.4.5.1 Category: Obsoleteness of devices

Findings from the study indicated teachers found it difficult to integrate ICT in the teaching and learning of learners with special educational needs. Some difficulties emanated from the fact that some of the ICT devices are out-dated and needed replacement or repair. These findings concur with Johnson, Jacovina, Russell and Soto (2016) who assert that updated technology makes it easier for utilisers to store and locate information, as well as streamline their workflow. Outdated ICT gadgets may consume productive time through repairs, updates, maintenance and security fixes.

The message could be that school systems need to keep pace with the latest technologies and the new possibilities they present. Schools with diverse learners should, therefore, have stocks of up-to-date and properly working ICT devices for teachers to perform their tasks efficiently.

5.4.6 Discussion of insufficient time

The category that emerged from this sub-theme was that ICT inhibits the completion of workloads.

5.4.6.1 Category: Lack of sufficient time to complete the workloads

The researcher found that teachers interviewed complained about not having enough time to utilise ICT devices in teaching learners in inclusive classes. One of the challenges established by this research was a shortage of time, which kept teachers from utilising ICT devices during lessons. Whilst some few teachers possessed the technical know-how regarding the use of ICT tools in teaching and learning, they were unable to utilise the tools because of their tight work schedules. These findings concur with findings by Raman and Yamat (2014) who posit that insufficient time is an obstacle that limits teachers' utilisation of ICT tools when teaching learners with special educational needs. Teachers struggle to utilise ICT tools and devices owing to tight work schedules. Introducing and using ICTs to support teaching and learning is time-consuming, as teachers attempt to shift pedagogical practices and strategies. It thus, implies that schools should be adequately staffed so that teachers' schedules become more flexible. Teachers will continue with their traditional pedagogies which are less time consuming, but to the disadvantage of the diversity of learners if more time is not availed for the integration of ICT.

5.4.7 Discussion of the poor implementation of ICT tools and devices

The category that emerged from this sub-theme was poor implementation of the Inclusive Education policy

5.4.7.1 Category: Poor implementation of the Inclusive Education Policy

The researcher found that all the teachers believed that poor implementation of the Sector Policy on Inclusive Education was a barrier to the utilisation of ICTs in teaching learners with diverse needs. One teacher (T02) had this to say: "*Poor implementation of ICT tools and devices stemmed from a poor inclusive education policy which focuses on integrating learners with different learning abilities"*.

This finding is supported by Ghavifekr and Rosdy (2015) who argue that preparations for technology-based teaching and learning begin with proper policy implementation. It can be concluded that the very first stage of ICT integration starts with the successful implementation of the Sector Policy on Inclusive Education.

This implies there is need for the Ministry of Education, Arts and Culture to enforce the implementation of the Sector Policy on Inclusive Education. Government should put in place plans for enhancing teachers' capacity for inclusive education. This can be done through provision of ICT teaching resources in schools and offering training courses in ICT integration in inclusive classes.

5.5 Discussion of results regarding ICT-related challenges faced by teachers when teaching learners with SEN in inclusive classes

In this section the researcher discusses the findings regarding ICT-related challenges faced by teachers when teaching learners with special educational needs. These results were obtained by means of class observations.

The following four major challenges were observed: teachers were not able to integrate ICTs in addressing learners' difficulties in inclusive classes; teachers did not have the necessary pedagogical knowledge to utilise ICTs in teaching learners in inclusive classes; teachers did not have confidence in utilising ICTs in teaching learners, especially those with special needs; teachers did not utilise ICTs because they had little access to ICT resources.

5.5.1 Teachers are not able to integrate ICTs in addressing learners' difficulties in inclusive classes

The class observations at the two schools showed that 10 of the teachers observed were not able to integrate ICTs when teaching learners with special education needs in inclusive classes. This stemmed from the fact that the teachers lacked competence in utilising the ICT resources for teaching. Johnson, Jacovina, Russell and Soto (2016) suggest that schools should provide training courses to teachers dealing with new devices, modern technologies and new pedagogical approaches.

The implication is that teachers should be coached in the ways to utilise ICT devices through hands-on, in-service training. In-service training for teachers should be on-going to meet the new demands of technology, since technology is an ever-changing phenomenon.

5.5.2 Teachers did not have pedagogical knowledge to utilise ICTs in teaching in inclusive classes

From the findings of the study, the majority of teachers who taught in inclusive schools did not have the necessary pedagogical knowledge and competencies to utilise ICT. As a result, teachers lacked self-confidence to utilise technological devices in teaching learners with diverse educational needs. These findings are confirmed by Ghavifekr and Rosdy (2015) who revealed that teachers teaching learners in mainstreamed classes lack adequate skills and knowledge to make use of ICT. This is supported by Mikre (2011) who points out that lack of skills and knowledge of ICT was a challenge for teachers to be able to utilise ICT tools. Teachers should, therefore, be trained and attend regular workshops to acquire competencies to utilise and integrate ICTs when teaching in inclusive classes.

5.5.3 Teachers did not have confidence to utilise ICTs in teaching learners in inclusive classes

From the findings of the study, twelve of the teachers observed at the two schools were not confident enough to utilise ICT devices to aid their teaching, especially when teaching learners with special educational needs. This challenge was confirmed by Raman and Yamat (2014). They posit that a lack of confidence in the use of ICT impedes the effective integration of technology in the teaching and learning of learners with special educational needs in schools. They, furthermore, reveal that teachers had the desire to utilise ICT in teaching and learning but a lack of confidence hinders them. This implies that there exists a need for teachers to be trained in utilising ICTs. When they acquire competencies, they will gradually gain enough confidence to utilise ICTs in the inclusive classes. This will ultimately benefit learners in inclusive classes.

5.5.4 Teachers do not utilise ICTs because of minimal access to ICT resources

From the observations, established that 10 teachers at the two schools did not utilise ICTs because they had minimal access to ICT resources. The schools did not have sufficient ICT tools to allow all teachers access, whenever they needed it. The same challenge was identified by Raman and Yamat (2014) who found that a lack of access to ICT equipment affected efforts by teachers to integrate ICTs in inclusive classes.

5.6 Discussion of results regarding the strategies to overcome ICT-related challenges faced by teachers teaching learners with SEN in inclusive classes

In this section, the researcher discusses the findings regarding strategies to overcome ICT-related challenges. The findings are discussed according to the sub-themes and categories.

The sub-themes that had emerged from this theme were the need for in-service teacher training, need for technical support, availing more ICT gadgets in schools, the provision of electricity to schools, provision of e-books to schools and improving schools' infrastructure that supports the utilisation of ICTs.

5.6.1 Discussion of the need for teacher pre-service training

The categories that emerged from this sub-theme were training and workshops.

5.6.1.1 Category: Pre-service training

Findings indicated that the training of teachers regarding the utilisation of ICT would be conducive in providing them with pedagogical skills. One teacher (T03) said that *"The pre-service training of teachers in ICT use and integration will provide teachers with competencies on how ICT tools and devices can be utilised. This provides an enabling environment where teachers have confidence to deliver lessons in front of learners"*.

This finding is in line with Rastogi and Malhotra (2013) who reports that most teachers lacked skills and knowledge when it came to the utilisation of ICTs in teaching. By acquiring skills and knowledge, teachers who teach learners with special educational needs, will have robust capabilities in applying ICT software and devices to improve the academic performance of learners. The same idea is supported by Balanskat, Blamire and Kefala (2006) who advocates the provision of ICT training courses for teachers in order to capacitate them for the integration of ICTs in inclusive classes.

This implies that training teachers in utilising ICTs at universities and colleges will act as a blueprint for attaining sustainable ICT utilisation in Namibia and, in particular in the Oshana region. Teachers must be trained in the integration of ICT through workshops. In addition, teachers who are still at university should be trained in the ways in which ICT can be utilised in teaching learners with special needs in inclusive classes.

5.6.1.2 Category: In-service training

The study established that six of the teachers interviewed believed that there was a need for teachers to attend workshops on a regular basis. These workshops can enhance teachers' skills in using ICTs when teaching learners in inclusive classes. One teacher (T05) said that *"I personally think that seminars and workshops will give us a platform to interact with experts on how to utilise of ICT tools in teaching inclusive classes"*.
These findings concur with Archar, Childs, Covadu and De Young (2012) in Angula, Chirimbana, and Ugwanga (2019) who believe that teachers need relevant training in ICTs to improve their utilisation in teaching and learning. Rastogi and Malhotra (2013) concurs and reveals that the absence of technological training and workshops regarding ICT-assisted teaching and learning in teacher education programmes is the main obstruction to the effective utilisation of ICT devices and software in teaching inclusive classes. Mndzebele (2013) also supports the idea that effective implementation of ICT largely depends on provision of in service training to teachers on how to utilise ICT effectively.

Therefore, there is need to conduct workshops and/or seminars on a regular basis for teachers in inclusive schools with a focus on equipping them with ICT skills.
This will help practising teachers to keep abreast with ICT developments. It will also enable them to integrate these into their teaching of learners in inclusive classes.

5.6.2 Discussion of the need for technical support

The categories discussed under this sub-theme were the need for experts and subject software.

5.6.2.1 Category: Need for ICT-related experts

Findings from the study indicated the majority of the teachers needed experts in ICTs in their schools. It was established that ICT integration in schools can only be achieved if the technicians are well vested in ICT technical maintenance. These findings concur with Petty (2012) who argues that the level of expertise and training of teachers in the utilisation of ICT in teaching learners in inclusive schools and technology integration in the inclusive classes are some of the major ICT-related challenges which teachers face. This implies that the improvement of ICT integration and usage in schools can only be achieved when the Ministry of Education, Arts and Culture in the Oshana Region employ a number of ICT technicians to resolve the technical problems, troubleshoot and the fix the internet software problems at schools.

5.6.2.2 Category: Subject-specific software programmes

Two of the teachers indicated that software that gives instructions can assist both learners and teachers. One of the teachers (T07) said that "*The solution to enhance the integration of ICT tools and devices in the teaching and learning process is to provide teachers with specific subject software and upload them onto the computers at schools so as to equip teachers and learners with ICT"*.

This finding correlates with Petty (2012) who noted that ICT can be utilised as a tutor and the utilisation of individualised computer-based software and different ICT tools help learners to understand the subject content and enhance their performance. Merrill, Read and Barnett (2013) concur with Petty (2012) in their study. The authors recommended that schools should make available ICT resources, including hardware and software, which the teachers have to utilise in the integration of ICTs in inclusive classes. This implies that teachers need to work with software developers to ensure that the needs of the SEN learners are considered. Without these interventions, learners with educational needs in inclusive classes will face difficulties.

5.6.3 Discussion regarding availing more ICT gadgets in schools

The following categories were discussed under this sub-theme: the provision of projectors and enough computers.

5.6.3.1 Category: Providing projectors

Findings from the 16 teachers interviewed showed that 50% agreed that projectors would assist them. One teacher (T02) said that *"Projectors will help us to make the teaching and learning process more interesting, lively and colourful by showing videos and pictures through projectors. We also save the time we spend writing on the boards"*.

These findings are consistent with findings from Whitaker (2018) who asserts that projectors enable teachers to create bulleted PowerPoint presentations or other highly organised notes for the class. With the utilisation of projectors in the class, learners can take better notes since they can discern what information the teacher displays is most useful to them. Starcic (2010) also believes that overhead projectors can enable visually and hearing impaired learners to learn as they can listen to sounds and learn from pictures.

This implies that there is a need for teachers who teach in inclusive classes to utilise projectors. Learners with special needs, for instance the visually impaired learners can make use of sounds to enhance understanding of concepts taught, whilst the hearing impaired can make use of pictures. Furthermore, when utilising these ICT devices, learners can ask the teacher to repeat a slide if they have missed information or even ask the teacher to email the presentations for further review. This will enhance learners' understanding of the concepts taught.

5.6.3.2 Category: Provision of enough computers

Findings indicated that teachers had to wait for other teachers to finish their lessons in order to be able to utilise the same ICT tools. One of the teachers (T02) said that "*The provision of computers by the government can assist the teachers to integrate ICT tools resulting in all learners having access to devices without sharing computers with other learners".*

These findings are in line with Starcic (2010) who argues that the efficacy of integrating ICT in schools can be enhanced by providing and ensuring that there are adequate ICT resources in relation to learners with special educational needs. The scarcity of resources should be resolved to enable an effective implementation and integration of the ICT usage in teaching learners in inclusive classes. Schools should provide ample ICT tools that teachers can integrate effectively into the education system for the benefit of learners in inclusive classes.

5.6.4 Discussion of the provision of electricity in schools

The following category was discussed under this sub-theme: constant supply of electricity.

5.6.4.1 Category: Constant supply of electricity

The research found that 16 teachers interviewed in this study believed that the government should not only supply electricity occasionally but continually for as long as schools were open to avoid power failures during lessons. One teacher (T012) indicated that *"Constant supply of electricity is the remedy to achieve a sustainable Sector Policy on Inclusive Education. Failure to take into consideration the issue of electricity cuts in schools will be a stumbling block for teachers and learners to achieve the integration of Sector Policy on Inclusive Education and use of ICTs."*

These views are supported by a report from the World Bank and United Nations Educational, Scientific and Cultural Organization (UNESCO, 2015) which stress that the provision of electricity in both primary and secondary schools allows access to information and communication technologies (ICTs). The unavailability of electricity and the sudden electrical power cuts disrupt lessons, especially when the teachers and learners are making use of internet websites to search for information. Without electricity or an alternative, but reliable source of power, it will be difficult for teachers to access information on the subjects and topics they will be teaching. It is, therefore, imperative that sustainable ICT integration and utilisation in schools are accompanied by solutions to diminish the recurrent occurrence of electricity power cuts.

5.6.5 Discussion of the provision of e-books in schools

The category discussed under this sub-theme is the provision of e-books.

5.6.5.1 Category: Provision of e-books

The research established that, all the 16 teachers shared the view that the Ministry of Education, Arts and Culture should ensure that e-textbooks are availed in order to integrate ICT tools in teaching learners with special educational needs in an inclusive class. One teacher interviewed (T11) had this to say, "*The provision of e-textbooks allows teachers and learners to have free access to information regarding their diverse subjects and this improves the academic performance of learners with special educational needs in an inclusive class."*

The findings are supported by Harman (2018) who asserts that e-books ensure that learners are pro-actively interacting with the learning material by way of videos, animations, augmented reality, changing displays, taking notes, among others. The deduction that could be made is that, for a successful integration of ICTs in inclusive education, schools should provide e-books to allow learners with diverse needs to pro-actively interact with the learning material and, at the end of the day, it will enhance learning.

5.6.6 Discussion on improving schools' infrastructure that supports ICT usage

The category that emerged under this sub-theme was infrastructure development.

5.6.6.1 Category: Infrastructure development

Findings of the 16 teachers in the study indicated that there was a need for infrastructural development for the successful integration of ICT in teaching in inclusive classes. One teacher (T15) said that "Al*though ICT resources are insufficient, there is need to renovate the classes for easy setting of projectors as well as mounting white boards to ensure quality visual displays.*" This finding is in line with Ogbomo (2011) who says that, before any ICT-based programme is launched, policymakers and planners must carefully consider that there are appropriate rooms or buildings available to house the technology. The same idea is supported by Mndzebele's (2013). He believes that, providing adequate facilities and resources in paramount for effective integration and utilisation by teachers.

This implies that schools should renovate the infrastructure they intend to utilise as ICT resource centres. For example, old school buildings need extensive retrofitting, proper electrical wiring, heating/cooling and ventilation, as well as safety and security. The discussion from this section established that there are possible solutions to ICT-related challenges faced by teachers. The major solutions include infrastructure development, provision of e-books and constant supply of electricity.

The major objective of the study was to establish ways in which ICTs can be utilised to enhance the teaching of learners in inclusive classes in Namibia, with specific reference to the Oshana Region of Namibia.

Summary of findings

The major objective of the study was to assess the utilisation of information and communication technologies in inclusive classes in the Oshana Region of Namibia. The study found out that ICT improves learners' understanding and class communication. It, furthermore, allows learners to acquire new skills and motivates them to learn. It has also been concluded that teachers could integrate ICTs as tools for management of their records and for assessment of their learners' progress and performance. Lastly, ICTs can be utilised in the inclusive classes to grant learners autonomy over their own learning.

The second objective of the study was to identify ICT-related challenges faced by teachers when teaching learners with diverse educational needs in inclusive classes. The lack of sufficient training in utilising the ICT gadgets, lack of pedagogical knowledge and technical support, insufficient ICT gadgets for utilisation and the inability of the teachers to integrate ICT due to factors, such as engendered lack of confidence, were identified as some of the challenges. The study, furthermore established that the lack of adequate time to set up the ICT devices and utilise them during lessons is another barrier to the successful integration of ICTs in teaching leaners in inclusive classes. Lastly, teachers are inhibited by various factors to implement ICT tools and devices properly during lessons in the inclusive classes. These factors range from the lack of knowledge of the intersection between ICTs and the Sector Policy on Inclusive Education, poor ICT infrastructure and unreliable power sources to support the utilisation of ICT in classes, among others.

The third and last objective of the study was to explore possible solutions to overcome the ICT-related challenges faced by teachers in inclusive classes. The study found that possible interventions are that teachers should receive pre-service training in utilising ICTs for teaching learners in inclusive classes. They should also attend in-service training workshops on a regular basis to keep abreast with technological advancement relevant to teaching and learning in inclusive classes.

The provision of technical support and adequate ICT gadgets in the schools is imperative for the successful integration of ICTs in teaching diverse learners. There should be a consistent supply of electricity or alternative power sources in the schools since ICT resources require electricity to be operative. It is also imperative that schools have e-books for both teachers and learners to access up to date information easily. Lastly, the research concluded that the need for up-to-date ICT supportive infrastructure is indispensable if the integration of ICTs in teaching learners in inclusive class should be achieved.

5.7 Conclusions

The major objective of the study was to assess the utilisation of ICTs to enhance the teaching of learners in inclusive classes in Namibia, with specific reference to the Oshana Region. Based on the qualitative analysis of the data, this study concluded that ICT tools are indispensable teaching aids when teaching learners in inclusive classes. The study demonstrated that, the utilisation of ICT tools in inclusive classes is premised in Vygotsky's Zone of Proximal Development (ZPD) which explains that learners can learn independently and through assistance by the More Knowledgeable Other, who can be the teacher. The study also concluded that teachers may face a myriad of ICT-related challenges, but there are possible solutions to address them and better the teaching and learning of learners in inclusive classes, especially those with special educational needs.

5.8. Recommendations

Based on the study findings and conclusions, the following recommendations are made:

- Teachers should receive pre-service training on ICT use and how to integrate ICT tools during lessons in inclusive classes.
- Teachers for inclusive classes should be provided with sufficient and efficient ICT gadgets, so that they utilise them to enhance teaching of learners with special educational needs (SEN).

- Teachers should undergo Continuous Professional Development on the use of ICTs in order to cope with the continuous advances in Information and Communication Technologies. This can be done by conducting regular workshops, seminars and conferences with the objectives of updating the teachers' existing knowledge and competences on ICT use in education and in inclusive classes, specifically.

Recommendations for future research

The researcher recommends further research that focusses on the perceptions of learners with special educational needs with regard to the contribution of ICTs to their learning.

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APPENDICES

Appendix a: ethical clearance certificate from UNAM

UNAM
UNIVERSITY OF NAMIBIA

ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: FOE /310/2017 **Date: 10 October, 2017**

This Ethical Clearance Certificate is issued by the University of Namibia Research Ethics Committee (UREC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the Faculty/Centre/Campus Research & Publications Committee sitting with the Postgraduate Studies Committee.

Title of Project: Assessing The Use Of Information And Communication Technologies In Inclusive Classrooms In The OshanaRegion Of Namibia

Researcher: Secilia M Bonifatius

Student Number: 200915029

Faculty: Faculty of Education

Supervisor(s): Prof. A. D. Möwes (Main) (Co) : Dr. C. K Haihambo

Take note of the following:

(a) Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the UREC. An application to make amendments may be necessary.

(b) Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the UREC.

(c) The Principal Researcher must report issues of ethical compliance to the UREC (through the Chairperson of the Faculty/Centre/Campus Research & Publications Committee) at the end of the Project or as may be requested by UREC.

(d) The UREC retains the right to:

(i) Withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,

(ii) Request for an ethical compliance report at any point during the course of the research.

UREC wishes you the best in your research.

Prof. P. Odonkor: UREC Chairperson

Ms. P. Claassen: UREC Secretary

Appendix B: a letter to request permission to conduct a research

P O Box 15428
Oluno
Ondangwa
10 September 2017

The Permanent Secretary
Ministry of Education
Windhoek
Private Bag 13391
Windhoek
Namibia
Dear Sir/Madam

RE: REQUEST TO CONDUCT A RESEARCH STUDY IN TWO SCHOOLS IN THE
OSHANA EDUCATION REGION.

I am Secilia Megameno Bonifatius, a grade 9 – 12 Oshindonga teacher at Andimba Toivo yaToivo Secondary School in the Oshana Education Region. At present, I am in my final year of my Master of Education (Inclusive Education) program at the University of Namibia. As a requirement for the fulfilment of the degree, I am required to complete a research paper. It is for this reason that I am hereby requesting a permission to conduct a pilot study at Andimba Toivo ya Toivo, Oshana regionas well as research at Gabriel Taapopi SSS in SSS and Mweshipandeka SS in the Oshana region.

My study seeks to examine how ICTs can be utilised to enhance the teaching and learning of learners with diverse needs in an inclusive class. The researcher will select eight teachers will be interviewed in a pilot study and 16 teachers from the two schools will be interviewed for the actual research.

My research topic is: “ASSESSING THE UTILISATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN INCLUSIVE CLASSES IN THE OSHANA REGIONOF NAMIBIA”. The findings and recommendations will be shared with the schools involved as well as the Ministry of education.

All research ethics will be observed and the research shall not interfere with the teaching and learning activities at the schools.

I will be delighted if I am granted the permission.

Yours Sincerely,

Sbonifatius
Secilia M Bonifatius
Cell 0812326546
(Student: 200915029)

Appendix C: permission letter from the ministry of Education, Arts and Culture

REPUBLIC OF NAMIBIA

OSHANA REGIONAL COUNCIL

DIRECTORATE OF EDUCATION, ARTS AND CULTURE

ASPIRING TO EXCELLENCE IN EDUCATION FOR ALL

Tel: 065 - 229800/23
Fax: 065 - 229834

Private Bag 5518
Oshakati

Enquiries: Hileni M Amukana
Ref. 12/2/1

Ms. Secilia Megameno Bonifatius
P.O. Box 15428
Ondangwa

SUBJECT: REQUEST FOR THE PERMISSION TO CONDUCT RESEARCH STUDY

Your letter dated 21 September 2017 on the above caption bears reference.

Kindly be informed that permission is hereby granted to conduct research study at Gabriel Taapopi and Mweshipandeka Secondary School in Ompudja Circuit, Oshana Region.

This permission is subject to the following strict conditions; (i) There should be minimal or no interruption on normal working schedule (ii) Ethical issues of confidentiality and anonymity should be and respected and retained throughout this activity i.e. Voluntary participation, and consent from participant and (iii) the permission is valid for entire academic year 2017.

Both Parties should understand that this permission could be revoked without explanation at any time.

Furthermore, we humbly request you to share with us your research findings with the Directorate of Education, Arts and Culture Oshana Region. You may contact Mr. GS Ndafenongo, the Deputy Director; Programs and Quality Assurance (PQA) for the provision of summary of your research findings.

We wish you the best in conducting your study.

Yours sincerely,

22/09/2017

HILENI M. AMUKANA
REGIONAL DIRECTOR

OSHANA REGIONAL COUNCIL
DIRECTORATE OF EDUCATION, ARTS & CULTURE
OFFICE OF THE DIRECTOR
22 SEP 2017
Private Bag 5518
OSHAKATI
REPUBLIC OF NAMIBIA

Cc: Mr. Hafni Kapolo, Ompudja Circuit
The Principals, GT SSS and Mweshipandeka SSS

Appendix D: request for permission to conduct a pilot study

P O Box 15428
Oluno
Ondangwa
23 September 2017

The Principal
Andimba Toivo ya Toivo Secondary School
Private Bag 2002
Ondangwa

Dear Sir/Madam

RE: REQUEST FOR TO PILOT RESEARCH INSTRUMENTS AT ANDIMBA TYT SSS.

I am Secilia Megameno Bonifatius, a grade 9 – 12 Oshindonga teacher at Andimba Toivo yaToivo Secondary School in the Oshana education Region. At present, I am in my final year of my Master of Education (Inclusive Education) program at the University of Namibia. As a requirement for the fulfilment of the degree, I am required to complete a research paper. It is for this reason that I am hereby requesting a permission to conduct a pilot study at Andimba Toivo ya Toivo, Oshana region.

My study seeks to examine how ICTs can be utilised to enhance the teaching and learning of learners with diverse needs in an inclusive class. The researcher will select eight teachers will be interviewed in a pilot study.

My research topic is: "ASSESSING THE UTILISATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN INCLUSIVE CLASSES IN THE OSHANA REGION OF NAMIBIA". The findings and recommendations will be shared with the schools involved as well as the Ministry of education.

All research ethics will be observed and the pilot research shall not interfere with the teaching and learning activities at the schools.

I will be delighted if I am granted the permission.

Yours Sincerely,

Sbonifatius
Secilia M Bonifatius
(Student: 200915029)
Cell 0812326546

Appendix E: permission letter to conduct a pilot study

The Principal
Andimba Toivo ya Toivo Secondary School
Private Bag 200
Ondangwa

P O Box 15428
Oluno
Ondangwa
22 September 2017

Dear Ms. Bonifatius

RE: RESPONSE TO DO A PILOT STUDY AT ANDIMBA TYT SSS

In response to your request regarding your study to carry out a pilot study at our school regarding the issue to examine how ICTs can be used to enhance the teaching and learning of learners with diverse needs in an inclusive classroom. I am hereby granting you a permission to do your pilot study mostly after school so that your activity does not disturb the usual school work because the study involves teachers that are usually teaching in the morning hours.

Yours Sincerely,

Mr. W. Shapeka
School principal

Appendix F: letter to the school principal A

SECILIA MEGAMENO BONIFATIUS
P O BOX 15428 Oluno, Ondangwa
E-mail: seccmegy@gmail.com
Cell: 0812326546

Date: 02 October 2017

Dear Sir/Madam

RE: REQUESTING A PERMISION TO CONDUCT A STUDY AT GABRIEL TAAPOPI SSS

I am Secilia Megameno Bonifatius, a grade 9 – 12 Oshindonga teacher at Andimba Toivo ya Toivo Secondary School in the Oshana education Region. At present, I am in my final year of my Master of Education (Inclusive Education) program at the University of Namibia. As a requirement for the fulfilment of the degree, I am required to complete a research paper. It is for this reason that I am hereby requesting a permission to conduct a research study in your school namely Gabriel Taapopi SS in the Oshana Region.

My study seeks to examine how ICTs can be utilised to enhance the teaching and learning of learners with diverse needs in an inclusive class. The researcher will select eight teachers from GT SSS which have inclusive classes and are making utilise of ICT. Observation will also be conducted on the physical environment to find out the availability of ICT resources in the class, how ICT tools are utilised by teachers and learners in different subjects and also to observe learners and teachers' abilities in using assistive ICT tools.

My research topic is: "ASSESSING THE UTILISATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN INCLUSIVE CLASSES IN THE OSHANA REGIONOF NAMIBIA". The findings and recommendations will be shared with your school as well as the Ministry of education.

All research ethics will be observed and the research shall not interfere with the teaching and learning activities at the school.

I will be delighted if I am granted the permission.

Yours Sincerely,

smbonifatius

Secilia M Bonifatius

(Student No: 200915029)

Cell 0812326546

Appendix G: permission to conduct a research at school A

GABRIEL TAAPOPI SECONDARY SCHOOL

Tel No: (065) 230345(w)
Fax No: (065) 230394
Inquiries: Mr. S.N.N. Eelu

Private Bag 5532
OSHAKATI
20 October 2017

Ms Secilia M. Bonifatius
Student No. 200915029
University of Namibia

Re: Permission to Conduct Research on Assessing the use of ICT in an inclusive classroom in the Oshana Region in Namibia

Dear Ms Bonifatius

I am glad to inform you that permission has been granted to conduct a research on **'Assessing the use of ICT in an inclusive classroom in the Oshana Region** in **Namibia".** The school Management is glad to authorize you to conduct your research at Gabriel Taapopi SS.

We trust that your study will add to value to the existing knowledge, which in return will facilitate better implementation of ICT in education and quality education. thereof. We also look forward to your positive advocacy to ICT in inclusive education that is currently a challenge in many schools countrywide.

We wish you success in your studies.

Yours truly,

.....
Sakaria NN Eelu
Principal

Appendix H: letter to the school principal

SECILIA MEGAMENO BONIFATIUS
P O BOX 15428 Oluno, Ondangwa
E-mail: seccmegy@gmail.com
Cell: 0812326546
Date: 25 September 2017

Dear Sir/Madam

RE: REQUESTING A PERMISION TO CONDUCT A STUDY AT MWESHIPANDEKA SSS

I am Secilia Megameno Bonifatius, a grade 9 – 12 Oshindonga teacher at Andimba Toivo ya Toivo Secondary School in the Oshana Education Region. At present, I am in my final year of my Master of Education (Inclusive Education) program at the University of Namibia. As a requirement for the fulfilment of the degree, I am required to complete a research paper. It is for this reason that I am hereby requesting a permission to conduct a research study in your school namely Gabriel Taapopi SS in the Oshana Region.

My study seeks to examine how ICTs can be utilised to enhance the teaching and learning of learners with diverse needs in an inclusive class. The researcher will select eight teachers from GT SSS which have inclusive classes and are making utilise of ICT. Observation will also be conducted on the physical environment to find out the availability of ICT resources in the class, how ICT tools are utilised by teachers and learners in different subjects and also to observe learners and teachers' abilities in using assistive ICT tools.

My research topic is: "ASSESSING THE UTILISATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN INCLUSIVE CLASSES IN THE OSHANA REGION OF NAMIBIA". The findings and recommendations will be shared with your school as well as the Ministry of education.

All research ethics will be observed and the research shall not interfere with the teaching and learning activities at the school.

I will be delighted if i am granted the permission.

Yours Sincerely,

smbonifatius

Secilia M Bonifatius

(Student: 200915029)

Cell 0812326546

APPENDIX I: PERMISSION TO CONDUCT A RESEARCH AT SCHOOL B

MINISTRY OF EDUCATION
OSHANA REGION

Tel. No: (065) 230050
Fax No. (065) 230274
Email. mweshipandekasss@gmail.com

Enq. Mr. JK Nangobe
0812626000

Private Bag 5529
Oshakati
Namibia

26-09-2017

MWESHIPANDEKA HIGH SCHOOL

ATT: MS. SECILIA M. BONIFATIUS

Re: Permission to carry out a study in Mweshipandeka SS granted.

This letter replies to your letter dated 23 September 2017. My office is pleased to inform you that permission is granted to your to conduct the study in the above mentioned school. Please bear with the teachers because some might be busy with examination activity.

Finally, kindly you may start with your study as soon as you are ready.

Thanking you for your interest in our school.

Yours faithfully

JK Nangobe
Principal

MINISTRY OF EDUCATION
Oshana Region
Otapuandja Circuit
Office of the Principal
2017 -09- 26
Mweshipandeka High School
P/Bag 5529, Oshakati
Tel: 065-230050 Fax: 065-230274

Appendix J: teachers' interview guide

Introduction

My name is Secilia M Bonifatius, a student doing a Master in Education Degree, specializing in Inclusive Education at the University of Namibia. I am doing a research on the utilisation of Information and Communication Technologies in Inclusive Classes in the Oshana Region of Namibia**.** The aim of this study is to seek your views, understanding and perceptions on the utilisation of Information and Communication Technologies for learners with special educational needs in inclusive classes. The research will be carried out in line with UNAM postgraduate studies guidelines, and all data collected will be treated with confidentiality and for the purpose of this study only. The interview will take approximately 45 minutes to one hour. You are encouraged to answer all questions as honest as possible.

Interview questions

1. How long have you been teaching?

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2. What is your current role in the school?

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3. Can you mention the ICT resources available in your class?

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4. How do you make utilise of ICT in the class to support teaching and learning?

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5. Where do you get your ideas from, when designing ICT based activities for learners with special educational needs?

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6. Would you say that there are conflicts/ contradictions between the ICT Policy and the practices in schools? If yes, to what extend do conflicts and contradictions between policy and practice affect the utilisation of ICT?

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7. What challenges are you experiencing with regard to the ICT provision within the school?

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8. Do you experience any challenges with regard to the ICT support within the school?

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9. What are the ICT-related challenges you are facing as a teacher in teaching learners in your classes?

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10. What would help you to make better utilise of ICT to support the teaching and learning?

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…….

Thank you very much for your time.

APPENDIX K: CLASS OBSERVATION SCHEDULE

Introduction

My name is Secilia M Bonifatius, a student doing Master in Education Degree (Inclusive Education) at the University of Namibia. I am doing research on the utilisation of Information and Communication Technologies in Inclusive Classes in the Oshana Region of Namibia**.** The aim of this study is to observe the ICT tools available and how they are being utilised to enhance teaching and learning in an inclusive class. The research will be carried out in line with UNAM guidelines, and all data collected will be treated confidentially and for the purpose of this study only. The observation will take approximately 45 minutes that is one lesson observation for every teacher involved in the study.

Date	
Time	
Observer	
Grade	
School code	

Availability of ICT Resources in the Class:

1.1 Are there ICT tools in the class?	
1.2 Which types of ICT tools are available?	

How ICT Tools were utilised by the teacher and learners in different subject areas:

CATEGORY/AREA OF LEARNING	ICT APPLICATIONS	COMMENTS
Reading	Electronic books, Talking electronic devices (Speech Software)	
Writing	Word processors, Word card/book/wall, Spelling/Grammar checker.	
Math	Enlarged Worksheets, Scientific Calculators	
Vision	Eye glasses, Magnifier, Screen Magnification, Screen Reader, Braille, Large Print Books, CCTV, Audio Lesson Tapes.	
Hearing	Hearing Aids, Pen and paper,	
Computer Access	Word prediction, Alternative Keyboards, Pointing Option, Voice recognition Software	

Learners and teachers' ability to utilise assistive ICT tools:

3.1 Was the teacher able to address learners' needs using ICT?	
3.2 Were learners able to utilise ICT to carry out given tasks?	

End of observations schedule.