AN INVESTIGATION OF THE INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) INTEGRATION STRATEGIES USED BY JUNIOR PRIMARY TEACHERS IN TEACHING PHONEMES IN THE OSHANA REGION

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ABSTRACT

The Namibian government has invested considerable resources in Information and Communication Technology (ICT) development to enhance teaching and learning. Technology is the science or knowledge put into practical use to solve problems or invent useful tools for classroom purposes. The study investigated ICT strategies used by teachers in teaching Phonemes in English and has adopted a qualitative research method or approach. The study comprised of 15 English teachers for junior primary schools in the Oshana Region. Few schools from Oshana region were purposefully selected and took part in the study. A purposeful sampling technique was used to select the teachers for teaching English and that allowed each of the participants to have equal opportunities to participate in the study. The qualitative data was collected by means of in-depth face-to-face interviews and questionnaires. The data was analyzed by means of transcribing the data and developing themes. Some major findings showed that teachers working conditions pertaining to ICT use in the teaching and learning need improvement, ICT use is low in some schools due to a lack of professional development courses, support and ICT related resources and more ICT resources need to be deployed to schools to help mitigate this problem. Further, the study suggested better ways to improve the ICT integration strategies for teaching English phonemes such as conducting teacher's training or workshop on the use of digital tools in education sector for the benefit of all teachers.

Keywords: ICT, Strategies, Integration, Phonemes, Teaching and Learning.

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I thank you!

DECLARATION

I, Renathe Ambambi Iiyambo, hereby declare that this study is my own work and 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.

Renathe Ambambi Iiyambo. …….. October 2022

Name of Student Signature Date

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LIST OF ABBREVIATIONS/ACRONYMS

ICT - Information Communication and Technology

PC - Personal Computer

MOEAC - Ministry of Education, Arts and Culture

MOE - Ministry of Education

TPCK - Technological Pedagogical and Content Knowledge

HOD - Head of Department

BETD - Basic Education Teacher Diploma

NIED-Namibia Institute for Education Development

NDP – National Development Plan

PDA - Personal Digital Assistant

UNESCO - United Nations, Educational, Science & Cultural Organization

QTS - Qualified Teacher Status

GRN - Government of the Republic of Namibia

CLS - Community Library Services

ELS - Education Library Services

MLS - Ministerial Library Services

NLN - National Library of Namibia

NAN - National Archives of Namibia

VSAP - Very Small Aperture Protocol

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter covers some background aspects related to the use of ICT by junior primary teachers in order to integrate ICT in the teaching of Phonemes in English, introduction, problem statement, importance-, questions- and limitations of the study.

1.2 Background of the study

Information Communication and Technology (ICT) solely covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form (Warschauer, Zheng, Niiya, Cotton & Farkas, 2014). According to Phajane (2014), a phoneme is defined as the smallest unit of speech distinguishing one word (or word element) from one another, such as the elements p in tap or any of the perception distinct unit of sound in a specified language that distinguish one word from another, for example p, b, d and t in the English words pad, bad, and bat. English – consist of approximately 41 phonemes. Phajane (2014) further indicates that the theoretical teaching of phonemes without computer aided simulations and modelling makes the understanding of phonemes difficult at the junior primary level. ICT devices such as computers and software can help make the teaching of phonemes effective and done efficiently. ICT comprises of computers, digital television, email, modems and internet and it mostly deals with how these different resources can combine and work with each other in order to make teaching effective and fun for learners. ICT resources can be divided into three categories namely information technology, telecommunication technologies and networking technologies. In this study, ICT in education is taken to mean the use of digital ICT resources to certain aspects of

teaching and learning of English specifically phonemes. The place of English in the Namibian education system is crucial since it is a medium of instruction to students in the Namibian primary schools. Apart from Oshiwambo, Afrikaans and Otjiherero, all other subjects are taught in English. This therefore means that for students to do well in school they should have a good grasp of the language of instruction, which is English. Knowledge in ICT is a prerequisite within this modern society where every sphere of our lives is controlled by technology (Jackson, Von, Witt, Zhao & Fitzgerald, 2011).

For Namibia the goal of ICT in education and teachers' professional development is nothing short of transformative vaulting this desert nation into a desert tiger by helping teachers and students attain the 21st century skills of creativity and problem solving (Burns, 2015). Burns stated that Namibia is just embarking upon this path of using ICT for teacher professional development and conclusions about its successes are premature. Nonetheless, Namibia offers useful lessons for African nations wishing to follow a similar path (MOEAC, 2014). In addition to that, the National Institute for Educational development (NIED) has arranged for World teach volunteers to improve skills training (and ideally computer integration assistance) at certain primary schools that possess computers.

ICT must be integrated in the English curriculum and in the methods used to teach. In order to produce students who are ICT literate and who can function and fit well in this twenty first century where technology dominate every sphere of life. Afreen (2014) is of the opinion that using ICT resources, especially computers, the internet and other related technologies in the classroom better prepares the learners for the work place in advance where this equipment is to be used. Students who are able to use ICT effectively have a better chance of being absorbed in the current globalizing environment. It is because of this need to have an ICT literate population that the

Government of the Republic of Namibia (GRN) continues to invest in teaching and learning resources in these areas especially in primary schools (MOESC, 2012). Several scholars argued that using ICT in teaching gives the learners a chance to learn how to function better in this digital era. Hartoyo (2012) argued that the use of old methods of teaching does not prepare the learners for their next academic level where the knowledge of technology is required. Hartoyo further argued that for institutions to claim to be preparing their learners for life in the present century, they must use new technologies in their teaching. The arguments presented above are in line with Arnell (2012), who alluded that when primary students are taught ICT skills in primary schools they are in a better position to face new developments with better understanding. There are several roles, which ICT can play, in the educational process. Against this background, concerted effort is being put in place to embrace the use of ICT in education in several regions in Namibia to reap the benefits of ICT integration. Education is normally provided according to collectively established frames of reference and thus posing a little opportunity for junior students' teachers to customize their curriculum in exploiting modern ICT requirements (Althoff & Leskovec, 2015). Teachers are thus unprepared for any changes that may be brought about by technology at schools.

The Namibian Ministry of Education, Culture, Sports, Science and Technology survey revealed that more than 33% of teachers were unable to use a computer and less than 25% were able to provide computer instructions (MOESC, 2012). The situation in Namibia is in stark contrast as they are pushing towards equipping the learners with the adequate required skills to fit in the technological era thereby promoting lifelong learning by success in ICT adoption in education. Digital technologies are seen as a way to developing a nation that gives its citizens the best and costs less but giving the required results (Hartoyo, 2012). Nearly all the primary schools in Namibia have computers but very few have the required ICT connectivity. Well-wishers; private

sectors and the government (MOESC, 2012) aided those schools that have ICT connectivity. It has been difficult to develop ICT infrastructure in primary schools the major obstacle being lack of internet connection. To improve on the sharing of learning materials, there is need to improve on the networks. Other alternative networks like the wireless systems cannot be used in schools because of the high cost of installation. Few learning institutions can access high-speed data and communication systems; moreover, schools in the rural areas cannot access wireless technology such as Very Small Aperture Protocol (VSAT) to access internet. The national ICT strategy for education and training policy paper of 2014 recognizes that Namibia lags far behind in ICT integration in learning especially in primary schools.

It further recognizes that in developed countries, integration of ICT in education has been compulsory since the 1980s and this has not been the case in developing countries like Namibia where integration of ICT in education is still in the formative stages. The Government of Namibia has indicated in various documents the important role that ICT plays in junior primary education. Namibia had put in place a National ICT Policy in 2008, a policy whose major objective was to ensure the availability of ICT services are reliable and ICT Policy for Education in 2006 (Ministry of Education (MOE, 2012). The government, in the policy, also advocated for the introduction and use of ICT in primary schools in order to improve the quality of teaching and learning. ICT has the capacity to enhance junior learners' achievement in mastering phonemes (Ghavifekr & Sufean, 2011). In addition, the use of ICT will motivate the learners and help them develop a favourable attitude towards learning. Thus, the study main purpose was to find out the strategies that can be implemented by junior primary teachers to integrate ICT in the teaching and learning, assess the challenges experienced in integrating ICT in the teaching as well as the responses to surpress these

challenges with regards to the integration of teaching phonemes in English in Namibia, specifically the Oshana Region.

1.3 Statement of the problem

As a teacher for English the researcher observed that teachers for junior primary have various ICT equipment, learning tools and management systems but lack the relevant strategies and modern methodologies on how to use and integrate them into their lessons. This occurs especially when teaching the concept of phonemes in English which seems to confuse both teachers and learners at the junior primary school level. The Ministry of Education Arts and Culture tried to equip the teachers with the necessary ICT skills that they can use in the integration of ICT in various lessons through the Tech/NA! ICT Implementation plan (Ministry of Education (MOE, 2012) and the ICT policy in Education (MOE, 2010). However, learners still struggle with phonemes and eventually perform poorly in English. Shifonono (2013) focused on ICT integration challenges in Biology. To the researchers' knowledge, there was no study found that has specifically focused on the strategies that can be used by teachers in the teaching of phonemes in English. Therefore, the purpose of this study was to investigate the strategies on how teachers integrate ICT in the teaching of phonemes in English as a second language in the Oshana region.

1.4 Questions of the study

The following research questions guided the study.

1. What strategies can be employed by junior primary teachers to integrate ICT in the teaching and learning of phonemes in English at the junior primary level in Oshana Region?
2. What challenges do Oshana junior primary teachers experience in integrating ICT in the teaching of phonemes in English?

3. What can junior primary teachers do to improve the integration of ICT in the teaching of phonemes in English in Oshana Region?

1.5 Significance of the study

This study identified the strategies for integrating ICT into classroom instruction when teaching phonemes in English. It also improved and further informed the way junior primary teachers can be assisted in the selection, design and use of ICT tools for the teaching and learning of phonemes in English. The findings could also be used to increase junior primary learners understanding of phonemes and this would ultimately improve their performance in English language writing and speaking proficiency. The study aimed at investigating the ICT integration strategies in the teaching of phonemes, and how it could benefit teachers and inform them more about the skills and competencies that junior primary school English teachers should have in the use and integration of ICT into their pedagogical practices in the teaching of English phonemes. The study can add value to the limited research of ICTs use and integration in Namibia, and provide a more holistic understanding of ICT integration for policy makers specifically in the teaching of English phonemes in the Namibian setting.

1.6 Limitation

Limitations of the study are predicaments or shortfalls, which might have influenced the study negatively (Cohen & Morrison, 2012). This study encountered a potential limitation of a low return rate of questionnaires due to the possibility of a misinterpretation of the meaning of the questions.

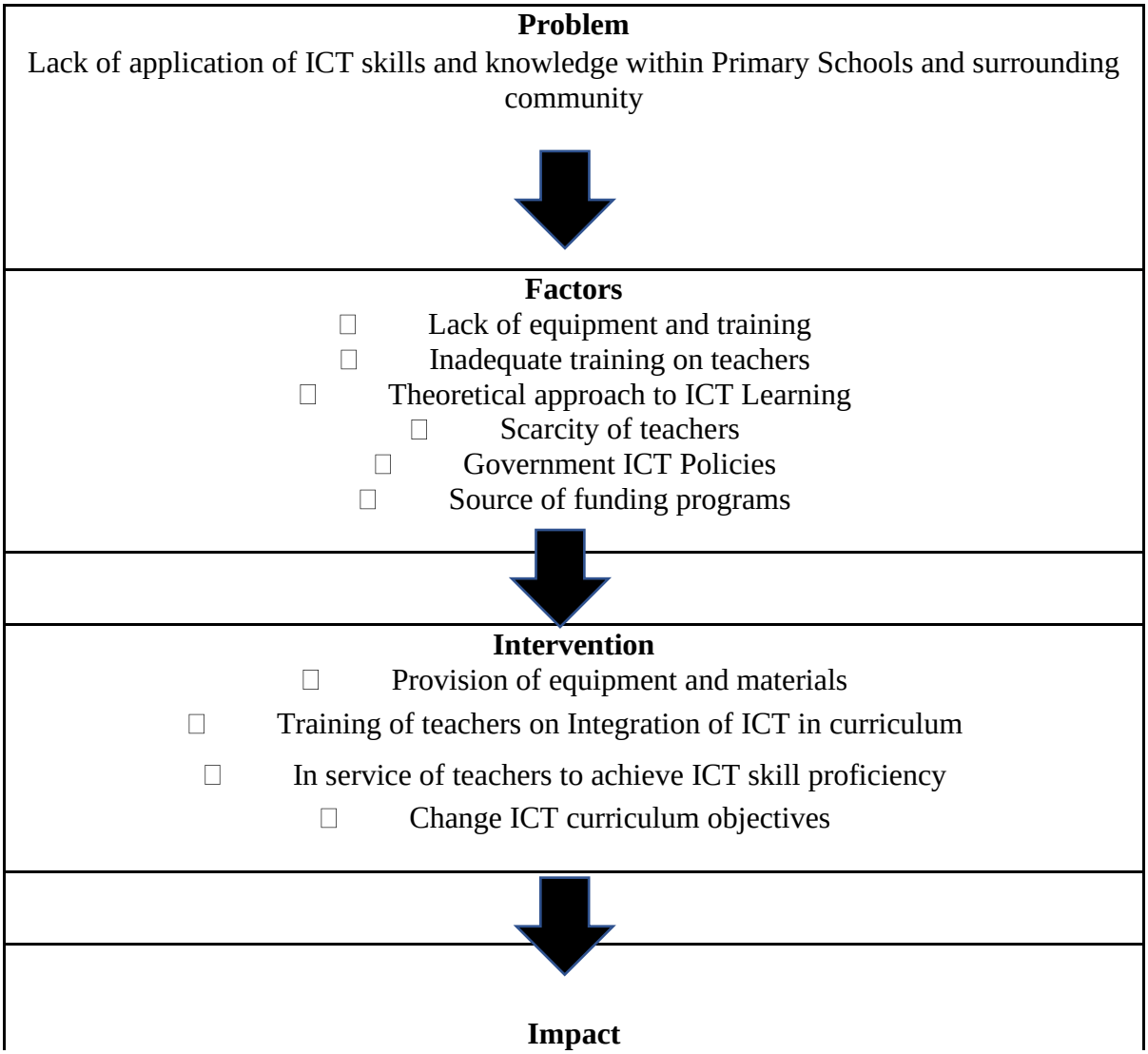
1.7 Delimitation of the study

The study was only limited to the junior primary teachers teaching English phonemes in the Oshana region. Thus, the results were not generalisable to the rest of Namibian junior secondary schools.

1.8 Conceptual Framework

A conceptual framework is used in a research paper to explain the key concepts or variables and relationships between them that need to be studied. Simply put, conceptual framework is the way ideas are organised to achieve a research project's purpose and explanation is the most common employed Eric (2012). The researcher developed own conceptual framework to predict the relationship between the variables as presented in figure 1.1.

Figure 1.1: Conceptual framework Adopted from (Chirimbana, 2022)



- Improved learners performance
- Improved teachers methods on Integration of ICT
- Improved acquisition of practical ICT skills
- Increased

1.9 Definition of Terms

Phonemes – In linguistics, the smallest units of speech distinguishing one word (or word element) from one another, as the element p in " tap'' (Phajane, 2014).

Information Communication and Technology - Refers to technologies that provide access to information through telecommunications (Deaukee, 2010).

Rime- The vowel and any subsequent consonants (Bizzocchi, 2017). E. g. (ae) in sat and flat.

Strategies- A plan of action designed to achieve a long term or overall aim (Mingaine, 2013).

Integration- The action or process of combining two or more things effectively (Bizzocchi, 2017).

1.10 Summary

This chapter addressed the background of the study followed by the statement of the problem. Furthermore, it presented the significance, research questions, limitations and delimitation of the study, and a diagramatic conceptual framework of the researcher's own perspective on ICT related ideas or concepts of integration in teaching.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter consists of a theoretical framework and a review of literature on the strategies, challenges and methods that junior primary teachers can use to improve the integration of ICT in the teaching of phonemes in English including practical interventions.

2.2 Theoretical Framework

Technological Pedagogical and Content Knowledge (TPCK) model developed by Mishra was used as the theoretical framework for this study (Mishra & Jaisankar, 2006). A theoretical framework provides four dimensions of insight for qualitative research that include; 1) provide focus and organization to the study, 2) expose and obstruct meaning, 3) connect the study to existing scholarship and terms, and 4) identify strengths and weaknesses (Bendassolli, 2014). TPCK had been introduced as a framework for the knowledge base teachers need to effectively teach with technology and therefore, it had been used to guide the study. The reason for selecting this theoretical framework is that it focused on technology, pedagogy and content on the integration of ICTs in teaching and learning in classroom settings (Archibald, 2012). ICT includes computers, the internet, and electronic delivery system such as radios, televisions, projectors among others and is widely used in today's education field.

Kent & Facer (2014) indicated that a school is an important environment in which students participate in a wide range of computer activities, while the home serves as a complementary site for regular engagement in a narrower set of computer activities. Increasingly, ICT is considered a powerful tool for educational change and reform. ICT tends to expand access to education.

Through ICT, learning can occur any time and anywhere. Based on ICT, learning and teaching no longer depend exclusively on printed materials.

Multiple resources are abundant on the Internet, and knowledge can be acquired through video clips, audio sounds, visual presentation and so on. Current research has indicated that ICT assists in transforming a teaching environment into a learner-centred one (Dang, 2011). Voogt (2008) stated that the integration of technology in education practice is a complex innovation for teachers. Voogt further stated that teachers have difficulty in integrating technology in their instructional processes. Therefore, even when the ICT application have proven to be effective in isolation, this does not always imply that the same effects are also realised in natural educational settings.

In Namibia, the Community Library Services (CLS), Education Library Services (ELS), Ministerial Library Services (MLS), National Library of Namibia (NLN), National Archives of Namibia (NAN) through the government were mandated to supervise training in records management in all Government officers, Ministries and Agencies as well as parastatals MOEAC, (2015). The Namibian government's Vision 2030 document stipulates that ICT must be the most important sector in the economic development of the country by 2030. Core to achievement of this is a demand driven to transform Namibia into a knowledge based economy. The policy further support Vision 2030 and National Development plans. Vision 2030 and National Development Plan (NDP) 5 sees Namibia as developing from a literate society to a knowledge-based society, a society where knowledge is constantly being acquired and renewed, and used for innovation to improve the quality of life (NIED, 2015).

Further, Serhan (2009) concluded that ICT foster autonomy by allowing educators to create their materials, thus providing more control over course content than is possible in a traditional

classroom setting. Therefore, the whole learning process enriches students learning skills and broadens their knowledge beyond what they already know. By using ICT, students' creativity can be optimized. According to Voogt (2008) to integrate technology in educational practice, empowering teachers to appropriately use technology is of paramount importance, because knowledge of specific hardware and software is needed to enable teachers to understand the options from which they may select, and operate them efficiently for specific domain in the curriculum. As it was indicated by Voogt (2008) that integrating ICT in Education it empowers teachers, the researcher strongly agree with Voogt due to the fact that ICT enhance could transform teaching and learning processes from being highly teacher – dominated to student- centerd, and that this transformation wuold result in increased learning gains for students,creting and allowing opportunities for learners. Seidenberg (2013) concluded that ICT should be infused into the entire curriculum so that pre-service teachers have the opportunity to understand the educational reasons for using ICT and experience how ICT can support teaching and learning across different subject domains.

In recent years, several studies and reports have highlighted the opportunities and the potential benefits of ICT for improving the quality of education. ICT is viewed as a "major tool for building knowledge societies'' (UNESCO, 2018), and particularly as a mechanism at the school education systems and processes, thus leading to quality education for all. Additionally, in Europe, appropriate use of ICT in school education is considered a key factor in improving quality at this educational level. The European Commission is promoting the use of ICT in learning processes through its eLearning Action Plan, one of the aims of which is " to improve the quality of learning by facilitating access to resources and services as well as remote exchange and collaboration" (Commission of the European Communities, 2001).

ICT develops students' new understanding in their areas of learning (Chai, Koh & Tsai, 2010). ICT provides more creative solutions to different types of learning inquiries. For example, in a reading class, e-books are commonly used in reading aloud activities. Learners can access all types of texts from beginning to advanced levels with ease through computers, laptops, Personal Digital Assistants (PDAs), or iPads. Therefore, ICT involves purpose-designed applications that provide innovative ways to meet a variety of learning needs.

2.3 Strategies for ICT integration in teaching

Research clearly demonstrated the powerful relationship between phonemic awareness and reading achievement. Many phonemes, however, are difficult to hear because they are pronounced or blended together in rapid, everyday speech. Thus, in order to help students learn how to read, it is important to employ teaching technology that enables students to hear individual phonemes in order to develop phonemic awareness (Arnell, 2012). The rime is the vowel and any subsequent consonants (Bizzocchi, 2017). Onset and rime is an important component of phonological awareness and teaching onset and rime is an important phonological strategy. The ability to recognize rhyme requires an underlying awareness that rhyming words end with the same sound.

Research indicated that phonological awareness is closely linked to reading success. Readers can become more competent word decoders and improve their reading accuracy (Wong & Li, 2019). Students who have poor phonemic awareness can find it difficult to segment words into onset and rime, have poor language skills and poor rapid automatic naming of letters and words (Phajane, 2014). Pelgrum (2009) stated that the inability of students to process the phonological features of language is the most common cause of reading difficulty. This may also impact other areas of

learning and how they learn eg. poor self-efficacy. A poor or immature phonological/phonemic awareness would impact a student's ability to identify initial, medial and final sounds, onsets and rimes, syllables and word families etc., (Hodgson, 2014).

Hodgson also stated that it is now well established that children who have developed phonological awareness gain written word recognition skills better than children who lack phonological awareness. Onset is the letter cluster that precedes the vowel in a monosyllabic word. The rime is the vowel and any subsequent consonants (Graaf, 2009). When words that rhyme are matched to their written equivalents, similarities in letter patterns can be observed. Understanding rhyme helps a student appreciate that certain words share specific clusters of letters with a sound unit larger than a single phoneme (Wyse & Goswami, 2008). Learning to read and write involves giving attention to the onset and rime sound units and linking them to spelling patterns (Cox, 2019). Wyse & Goswami (2008) stated that understanding rhyme also facilitates the use of analogy for word identification purposes. In using analogy the reader thinks about and manipulates what they already know about words. Competent word solvers have a large repertoire of strategies to draw from and use flexibly (Followes & Oakley, 2013). At the same time differences can be noted and it may provide a good opportunity for a teacher to introduce spelling rules. Multi-sensory mapping encourages multimedia information technology intergrated multi-sensory instruction on students learning motivation and outcomes as well as provide reference for teachers applying information technology integrated instruction and the promotion of relevant education units (Vu, McIntyre & Cepero, 2014).

A study done in the Caribbean by (Archar, Childs, Covadu & De Young, 2012) recommended that the strategies to assist in the learning of using analogy to decode unknown words should

include the emersion of rhyme in the early years. On the other hand, Wyse & Goswami (2008) found evidence that rhyme awareness appears to make a direct contribution to reading. Rhyme awareness contributes in two ways: firstly, by contributing to the child's phonological awareness and secondly, by facilitating children's spontaneous use of orthographic analogies during reading development. Research suggests that students in the early years of schooling who receive explicit instruction avoid developing long-term problems in learning to read. Successful learning occurs when it is explicit and student centred (Followes & Oakley, 2013). Explicit teaching has been highlighted as an effective approach to literacy pedagogy that directly influences literacy learning. Providing opportunities for students to receive explicit instruction in the area of onset and rime may help students to become better readers. The focus is on helping learners improve word decoding by teaching strategies such as segmenting and blending sounds so that they have an implicit awareness of sound patterns and can recognise, internalise and produce rhyming words. Once learners can segment and blend sounds, it is hoped that they can transfer this knowledge by applying other onset sounds to rhyme, manipulate sounds within words and make analogies. Exposing learners to onset and rime words in context would also assist students in developing a better understanding of the word and sentence meaning (Phajane, 2014). A study by Voogt (2008) on the primary school learners in Australian schools found out that oral language, active listening and aural activities are key components in the teaching process, so students have the opportunity to practice matching oral strategies before learning to use reading strategies.

Several strategies can be used to teach to improve the understanding of phonemes for the English Language, for example, Rhyme Generation strategy, Multi Sensory mapping Strategy, Picture card snap, Sound sorts, Treasure Chest etc., (Ahmad, Ludin, Ekhsan, Rosmani & Ismail, 2012). Rhyme

Generation is an instructional strategy that develops explicit phonemic awareness skills. During this activity, students are engaged in isolating, blending, and manipulating sounds on several levels (Archar, Childs, Covadu & De Young, 2012). Playing with language enables students to practice making words through rhyme generation. This can be enhanced through the use of ICT by allowing the learners to listen on the computer connected to speakers how words are pronounced and then they can follow suit. Rhyme generation can be a very effective method of learning phonemes through ICT not only because it necessitates learning, but it also makes learning more exciting and enriching as learners are exposed to rich learning environments through the sing and dance way (Odera, 2011).

The integration of ICT in teaching and learning has increasingly been used in various schools to improve the learners understanding of phonemes globally. These strategies, which are being used in various countries, depends on what developmental stage level that particular country is on the international scale (Ahmad et al., 2012). Those countries, which are highly developed, are making use of advanced electronic media and gadgets, which are given to the learners, while those countries that are still developing especially in the African continent and the Latin American communities are utilizing those gadgets, which they can also afford to purchase. These gadgets range from television, laptops, projectors, downloaded applications, YouTube videos among others and they depend on whether the particular teacher is able to make use of or operate such gadgets (Ariandika & Kartikawati, 2018). Ahmad et al., (2012) argued that the use of ICT gadgets in the teaching of English phonemes makes the teaching of English not only interesting but also understandable. From the point of Ahmad et al., (2012) that gadgets makes the teaching not only interesting but also understandable, the reseacher however strongly agree and support this view, as the researcher also understand and could acknowledge that ICT enhance communication, speed

up work and boost collaborations in a school setting. The researcher however strongly recommends that ICT can enhance performances and speed up teaching and learning. On this note, Arindika & Kartikawati (2017) stated that the synthetic phonics approaches emphasise the need for the child to be able to read the specific sound of every letter in a word. The sounds of letters are combined and the learners will be able to read out a word. This proves that with synthetic phonics, the learners are taught to segment sounds represented by each letter of a word and then blend the sounds. That means that the use of ICT can be used to make learners understand English phonemes better at the junior primary level.

Young children often struggle with snap. Snap is a simple card game with few rules (Di Carlo, 2013). This method requires a second deck of cards for playing when you go above six players. Some people choose to play Snap with decks from other card games, such as Old Maid, as long as the backs of the cards are all the same. Picture Card Snap provides emergent and early readers with scaffolder practice in identifying and categorizing sounds. Young children often struggle with phonemic awareness activities since we are asking them to treat speech sounds as objects to be manipulated (Archibald, 2012). However, research indicated that with specific training in identifying and manipulating sounds, young readers make significant progress in reading and sound spelling at a much earlier age (Ariati, Padmadewi & Suarnajaya, 2010).

The use of YouTube videos, PCs and cellphones has gained significant popularity in the teaching of English phonemes in schools. Videos, PCs and cellphones can be of great benefit in teaching phonemes to the learners in schools as these would allow the learners to undertake sound and picture matches, movement and sound play, hand on letters, sing songs that are aligned to a specific sound (Akram & Malik, 2010). This helps the learners to develop their phonetic understanding

and allow them to be able to develop their reading of English comprehension especially if these are applied at lower grades. With continued practice, learners would be able to decode skills and become automatics that they concentrate on and increase their understanding through concentration with what they are doing (MOEAC, 2015). Phonics raises learners' phonetic awareness and with videos and cellphones, these tools can be very effective learning tools in the teaching of English.

Arnell (2012) stated that Children learn to read by identifying the smallest units of the sound within a word (phonemes) and blending these to read a target word (McArthur, Castles, Kohnen, Jones, Anandakumar & Bales, 2015). This concurs with Wahyun, Fauziati & Hikmah (2016) who indicated that the synthetic approach begins with learning letter-sound relationships and blending them to create words can best be taught to lower primary learners by videos or mobile phones to make learning more meaningful to the learners. This intern has the benefit of enhancing learners' comprehension skills when they grow up (Ariati, Padmadewi & Suarnajaya, 2010).

Software programs can be used as effective ICT tools in the teaching of English phonemes to lower primary school learners. These programs or software's are effective in making learners master and improve their phonetic understanding at lower grade levels Walker, Betts, & Sainsbury (2013). These software programs vary from place to place and from school to school. Some schools prefer using Saxon phonics home study kits; the sing spell, read and write software, K5 beginning homeschool kit, happy phonics, hooked on phonics and the phonics pathways 10th edition (Coppola, 2006). According to Ariandika & Kartikawati (2018) learners can learn phonic sounds of words through matching them to a pictorial representation and this can be done in the classroom by software programs. In addition, Olugbeko (2016) believes that the learners might not know how

to spell the word cow, but she knows a cow when she sees one. Seeing a picture simulation of something that they know, allows them to pronounce the sounds more fluently. This resonated with Olugbeko (2016) that some learners are better at linking sound to pictures. Therefore, in this version, the letters are shown at the same time as the letter sounds are heard, allowing children to make the connection between the sound and the letter. A teacher can teach learners how to read by placing a picture next to the word that learners must read. Olugbeko (2016) further stated that software programs could be used to teach learners keywords used to remember the sounds and keywords of the alphabet. Participants in the study indicated that they make use of software's as ICT tools in the teaching of English phonemes to the lower primary children in their schools.

Projectors, whiteboards and jolly phonics are effective tools for lower primary learners to learn English phonemes. Jolly Phonics is a fun and child centered teaching approach for teaching literacy through synthetic phonics for each of the 42 letter sounds, the multi-sensory method is very motivating for children and teachers who can see the learners achieve their best in learning (Aliaga & Gunderson, 2017). The letter sounds are splinted into seven groups. The jolly phonics can be taught to the learners through five skills and these are learning the letter sounds, learning the letter formation, blending, identifying letters in words (segmenting) and learning tricky words. These jolly phonics methods are effective in making learners develop their various phonetics understanding skills in multi-dimensions (Graaf, Bosman, Hasselman & Verhoeven, (2009). The participants in the study indicated that they make use of the whiteboards, projectors and jolly phonics to teach learners to understand and comprehend their phonetic understanding.

Wahyun, Fauziati, & Hikmah (2016) observed the use of jolly phonics is an instrumental approach in making learners master phonic sounds. The authors stated that a teacher could invite learners to

sing a specific song that has a specific letter that the teacher wants learners to master through watching a video with phonetic activities. Combining the rhythm and action of songs or chants with clapping and dancing helps children to connect sounds and letters in an easily memorable and active way especially when it is done with jolly phonics (Henbest & Apel, 2017). Learners would be able to master the phonic sounds better. Application videos are also effectively used as an ICT teaching tool for English phonemes at lower primary levels. These applications videos can be used in the form of simulations where learners can imitate the way the videos are presenting a particular phonetic aspect and this could be in the form of a song, which learners would imitate to sing and dance as the application plays (Abera, 2012). These applications are computer based or mobile based depending on what is readily available to the teacher. They make the learning of phonemes more effective and more enriching by creating animations that can capture the whole attention of the learners making learning more interesting (Henbest & Apel, 2017). Participants in the study indicated that they make use of the downloaded application to teach English phonemes to make their teaching more beneficial to the learners.

Ariandika & Kartikawati (2018) stated that the use of application videos in teaching phonemes leads to significant benefits for pupils in pre-school until the end of primary school and that it had a positive and significant effect on disabled readers' reading skills. Therefore, this ICT tool creates quite a conducive for learners and all the readers with different abilities. According to Eshiet (2015) application videos used in the United Kingdom help the learners meeting the expected standard has increased from 58% to 74% in 2014 (Bizzocchi, 2017). This indicated that the number of learners who are mastering reading has improved, thus application videos in teaching phonemes is a useful method of teaching learners to master reading through doing the physical activities and watching what they are seeing and imitating.

2.4 Challenges for ICT integration in teaching

The use of ICT in the teaching of English phonemes at junior primary phase faces several challenges especially in the implementation processes (Ariandika & Kartikawati, 2018). These challenges vary from school to school, circuit to circuit and from individual to individual. The challenges are possible impediments that inhibit the successful implementation of the teaching of English phonemes using ICT in schools. These challenges range from institutional to personal and they are all responsible for the failure in the implementation plan for ICT integration in the teaching of English phonemes. Burns (2009) indicated that several challenges inhibit the teachers in schools from utilizing the ICT in their teaching of various subjects in schools. These challenges range from personal, institutional to pedagogical. Based on these findings, it can be stated that the biggest challenge to ICT integration is the lack of skills.

It emerged from this study that the absence of technical support in relation to the appropriation and implementation of ICT devices is a challenge, which hinders the use of ICT in the teaching of English phonemes. A closer examination of findings unearthed that the failure of teachers to make use of ICT in a classroom environment emanated from the scarcity of technical services such as internet break down due to poor technical maintenance (Ariandika & Kartikawati, 2018). Because of this, teachers find it problematic to research for information, which is required in that subject. To exacerbate the already predicament, ICT technical services maintenance is not done systematic which later culminates in tremendous risk in network breakdown (Akram & Malik, 2010). Taking a people centered approach on its axis, technical service maintenance act as a barrier for the teachers to make use of ICT devices and software in teaching English phonemes to the learners having fear of uncertainty that the technological system can slow down and breakdown in the process thereby disrupting the lesson being conducted (Bingilams, 2009).

Bingilams further stated that to concretize the aforementioned challenge, it is imperative to elucidate that ICT technical faults act as an obstruction, which inhibits the use of ICT tools and devices in efficacy delivery of lessons on English at junior primary levels. The researcher strongly agreed that, it is problematic for the teachers at junior primary school to implement and make use of ICT devices to enhance the teaching and learning of learners with special educational needs due to lack of technical support for the staff. Farkas (2013) indicated that in most schools, the school technicians are not able to fix the problem in time and this makes teachers not to be able to get access in making use of ICT tools to teach learners and this also disrupt some lessons on daily basis. Abera (2012) confirmed that it becomes problematic for the teachers to make use of ICT in looking for the information, which they need in the teaching of English phonemes.

For the integration of ICT in teaching and learning, there is a need for the institutions to avail the most needed ICT gadgets. The institutions need to support the teachers by providing all they need so that the teachers' work can be made easier (MOESC, (2011). Some of the teachers who were interviewed in this study indicated that the main obstacle to the effective teaching and learning of English phonemes using ICT is the inaccessibility of ICT devices. It emerged from unstructured interviews that most of the teachers were complaining about how problematic it is for the lower primary English learners in sharing a computer when they are conducting researches in the learning of phonemes. It is of paramount importance to take note that some of the ICT resources are not in working condition and this emanated from the unavailability of hardware and software among the classes of learners learning English phonemes. The inaccessibility of ICT devices in the teaching and learning of English phonemes discourages lower primary school learners from providing them with information and teaching materials. Because of this, teachers and learners find it difficult to access information on the internet since the ICT tools are not in good working condition.

Cox (2015) argued that the inaccessibility of ICT in schools discourages the teachers from integrating ICT devices in teaching and learning of English phonemes in schools, especially in developing countries. For one to teach any academic subject, he or she must have the relevant content knowledge (McArthur, Castles, Kohnen, Jones, Anandakumar & Banales, 2015). The findings of the study unearthed that the absence of technical expertise pertaining to the integration of ICT in the teaching of English phonemes inhibits teacher's self-confidence in the use of ICT devices and software. Most of the teachers do not possess technical knowledge in the use of ICT in the teaching of phonemes and this exacerbated the straining of teachers from the use of technological devices in teaching English phonemes to lower primary school learners in schools (Zimmerman & Smit, 2014).

Ariati, Padmadewi & Suarnajaya (2010) also reinforced this view that, the majority of teachers in schools lack self-confidence and competence to use ICT devices as an educational tool in the teaching of English phonemes. Because of this, it becomes problematic for the teachers to utilize ICT devices in front of learners in the fear that some of the learners possess more knowledge and confidence pertaining to ICT compared to their teachers. In the same vein teachers also have a fear of uncertainty that learners can laugh at them when they fail to apply and use the ICT devices and software in relation to the subject matter which they discussing. Therefore, this culminates in the poor academic performance of learners in the learning of phonemes and under the national examination.

For a teacher to make use of ICT innovations in the teaching of English phonemes he needs to know using such inventions (Ariandika & Kartikawati, 2018). If the teacher is not having sufficient knowledge in using the ICT tool, success in the integration of ICT will remain a dream (Chapman,

Greaney, Arrow & Tunmer, 2018). The knowledge to use ICT develops as one is being trained on how to use ICT tools. This training is vital as one becomes more and more exposed to the ICT tools. This knowledge can be developed through in-service training of the teachers in using these inventions. The findings of the study unearthed that the absence of pedagogical expertise pertaining to the integration of ICT in schools inhibits teacher's self-confidence in the use of ICT devices and software (Nyambane & Nzuki, 2010).

Walker, Bartlet, Betts, Sainsbury & Mehta (2013) indicated that teachers are not confident and competent in delivering a lesson using ICT devices especially in the teaching of phonemes and this, affects the flow of information from the teacher to the learners. According to Akram & Malik (2010) the majority of teachers in schools lacks self-confidence and competent to use ICT devices as an educational tool in the teaching of English phonemes. Because of this, it becomes problematic for the teachers to utilize ICT devices in front of learners in the fear that some of the learners possess more knowledge and confidence pertaining to ICT compared to their teachers. Junias (2009) also indicated that fear of uncertainty that learners can laugh at them when they fail to apply and use the ICT devices and software in relation to the subject matter which they discussing. This, therefore, results in poor performance by learners in the learning of English phonemes in lower graders.

Curriculum implementation is an important aspect that enhances the success of teaching and learning in schools (Akram & Malik, 2010). If teachers do not know how to implement their ICT policies in their teaching, success in teaching will not take place in schools. The poor integration of ICT tools and devices in schools stems from poor ICT policy understanding. Basing on this, it is problematic for a teacher to attend and supervise all learners' problems and sometimes when the

higher rank learners understood what is being taught, a teacher moved to another subject topic and the slower learners are left in darkness pertaining to what was taught (Junias, 2009).

Nutall (2010) stressed that poor implementation of ICT tools and devices stemmed from the class organization and from classes that focus on integrating learners with different ranking in terms of capturing what had been taught in class. These findings further harmonize with the findings of Hodgson, Heather, Conridge, Gibbons & Robinson (2018) who also disclosed that there is a contradiction between policy implementation in relation to the use of ICT to enhance teaching and learning process. In complement, the researcher observed that learners at school came from different backgrounds and owing to this problem. What is so depressing is that learners learning English phonemes using ICT inventions in the same classroom environment are that learners' level of understanding is not considered in the teaching process where the learners are given the same examination yet; they are supposed to be given their examination paper.

Hines (2009) confirmed that one of the greatest challenges in the use of ICT in schools is compromised support from the circuit management members who do not seem to cooperate well with the teachers and school management in the provision of ICT gadgets. This deters the success in the implementation of ICT in schools and has the overall effect of making the schools remain tagged in the past while the world of technology keeps moving forward. Thus, the Ministry of Education & Culture (2010) indicated that one of the greatest challenges in the use of ICT in schools is compromised support from the circuit management members who do not seem to cooperate well with the teachers and school management in ICT usage and provision of gadgets for ICT.

2.5 Strategies for improving ICT integration in teaching

Several strategies have proven to be effective in mitigating the teachers' utilization of ICT in the teaching of phonemes at the lower primary school level (Westhuizen, 2014). These various strategies are necessary to make the teachers improve their utilization of ICT in the teaching of phonemes (Chemwei, Leboo & Koech, 2014). Without these strategies, it would be difficult to make learners improve their understanding of phonemes and this would negatively affect their performances in the English language and other subjects, which rely on English as a medium of instruction. The participants in the study indicated many strategies that could be effective in improving teacher's utilization of ICT in the teaching of phonemes and these strategies differ from school to school depending on their various challenges in their respective schools.

Ministry of Education (2012) pointed out that Ministries and schools need to support teachers in their longing to use ICT in the teaching of phonemes at lower primary grades. This would help to improve the performances of the learners in English language comprehension, composition writing and improve their performances in other subjects, which are taught in English. Rewards and incentives are effective in boosting teachers to undergo ICT training initiatives (Castro & Aleman, 2009). Where there are rewards and people comprehend that once they have undergone some training they would be rewarded for their efforts. In line with ICT, the Ministry can reward teachers who volunteer to undergo ICT training (Zimba & Beau, 2005). This will inspire these teachers not to avoid technology but rather to be partakers of this technological innovation initiative, which is the cause for upwards technological mobility.

Montes, Reyes, Rodriguez & Formoso (2011) recommended that providing teachers with encouragements after attending ICT training initiatives would motivate these teachers to undergo

ICT training thereby improving their utilization of ICT in teaching and learning. This would help to make more teachers like attending the training more. Backing from the circuit and the Ministry is needed so that ICT usage can be a success in schools. The circuit is the one that links the schools to the education region (Chemwei, Leboo & Koech, 2014). If this support is weak, this means that the knowledge propagation process or chain will also be weak and this has an impact on the teaching and learning processes through ICT. This affects the effectiveness of the schools and this makes all the ministerial plans to be nothing but in vain since the circuit is the one to link the Ministry to the schools (Mingaine, 2013). If there is an active link and support between the schools and the circuit and the Ministry, the schools would be in a good position to communicate their problems to the circuit, which would also communicate with the Ministry on what might be needed by the schools. The Ministry of Education Arts and Culture has provided schools with computers and schools have ICT teachers to help with assisting learners and teachers at school Ministry of Education (2015). The in-service program is also in place to enhance teaching and learning but some teachers feel that these programs do not benefit everyone. A breakdown in this communication channel affects how schools would be helped, this has an overall effect on teachers not being able to use ICT initiatives, and the ultimately disadvantaged person is the learner.

Wong & Li (2012) supports that the efficacy implementation of ICT policy integration and use in teaching learners with special educational needs in schools could be productive if the teachers are equipped with technical support. Most of the ICT gadgets are electrical powered and cannot be used if there is no reliable source of power. If the school cannot provide hydro powered electricity, modern schools are making use of solar powers to operate the television, computers, radios and DVDs (Akram & Malik, 2010). The unavailability of electricity during lessons and the sudden electrical power cuts disrupts lessons especially when the teachers and learners are making use of

the internet to research information. The participants in the study indicated that the provision of electrical power would subsequently improve the implementation of ICT in the teaching of English phonemes in Oshana Regional primary schools.

Abera (2012) stated that the effective implementation of ICT policy integration and utilization in teaching English phonemes at junior primary level could be fruitful if the government acts to prevent electricity power cuts. The Ministry of Education, Arts and Culture must offer several computer-based textbooks in order to facilitate the integration of ICT tools in teaching English phonemes at lower primary levels in schools (Mingaine, 2013). Computerized teaching resources allow teachers to enhance the teaching and learning of English phonemes through the accessing of teaching resources. From the researcher's standpoint, it is pertinent to unveil that the provision-computerized textbook would offer a fertile ground for the sustainable integration and use of ICT tools and devices in the teaching of English phonemes at lower primary levels in schools. Hodgson et al., (2018) recommended that teachers need to be supported by their respective schools by providing them with computerized books that can be used to teach English phonemes. Monitoring and evaluation is the process of assessing whether an innovation put in a plan run according to the plan it was set for (Merrill, Read & Barnett, 2013). This process seeks to adjust the implementation processes for the improvement of the initiative. If this initiative is not in project implementation projects, it normally flops and fails to meet the desired objectives. The participants in the study indicated that they need more monitoring and evaluation of the implementation of ICT innovations in schools especially in the use of ICT in teaching English phonemes so that ICT implementation can be improved in schools. Jericho (2015); Ariandika & Kartikawati (2018); Archibald (2012) recommended monitoring and evaluation of ICT implementation in schools to be a consistent process that needs to be done regularly by all the ICT stakeholders in schools. Zimba & Beau

(2009) cited that monitoring and evaluation is a necessity for the success of any program or project and lack of it would make it flop.

Chang'ach, Kipsoi & Sang (2012) found that picture Snap Card provides emergent and early readers with specific, repeated practice in matching initial, medial or final sounds to pictures. An integral component of the instructional strategy is the levels of scaffolding that are provided to the young readers as they attempt (Deaukee, 2010). While so many ICT strategies have proved to be effective in the teaching of English phonemes, we remain unaware of the actual strategies that can be implemented in the teaching of English Phonemes in Oshana Region Junior primary schools. Different school in Oshana use different methods that suit them and their learners and each one claims theirs to be the best.Teachers are not trained on how to integrate ICT in the teaching of phonemes and it hampers learners performance in English (Hodgson et al., 2018). Brody (2010) stated that the issue of lack of confidence was the area that attracted the most responses from the subjects in his survey of practitioners. Brody (2010) considered this as a major barrier to the integration of ICT by the teachers in the teaching of physical science. This is seen as a barrier because if teachers do not have the confidence to integrate ICT in their lessons then the idea of integrating ICT will be an unachieved dream. Brantley & Ertmer (2013) contend that teachers "fear of failure" caused the lack of confidence makes them fail to integrate ICT in their teaching. Fear is a result of a lack of confidence to do things because one is afraid that others might notice the mistakes and laugh at him/her. Teachers who have fear of using technological innovations will not even attempt to utilize technology in their teaching because they do not want to be laughed at if they fail to use such technological inventions (Voogt, 2008).

The use of ICT in teaching and learning needs the user of the technology used to be confident in the way he does his teaching (Hayati, Cakiroglu & Kuruyer, 2014). Lack of confidence can result in teachers having negative attitudes towards ICT integration and resisting change. Hussian, Al-Jumeily & Morgan (2011) argue that an inherent resistance to change was identified as one significant barrier to the integration of ICT into education. Pelgrum (2009) claimed that "resistance to change is an indication that something is wrong, there are reasons why resistance to change occurs thus he does not see it as a barrier itself. Lack of confidence will make the teachers teach learners the way they were being taught by their teachers.

If teachers have a negative attitude towards the use of ICT, then it will be impossible for them to integrate it into their lessons (Archar et al., 2012). Negative attitudes and resistance to change can be caused by teachers not understanding the benefits it may have on the learners. Resistance to change also regulates teachers' attitudes, if teachers have a negative attitude towards change, be it in changing their teaching style or their view towards the benefits of ICT integration in lessons, then they will not incorporate ICT in their lessons (Voogt, 2008). Another factor directly linked to lack of confidence is the lack of knowledge on how to integrate ICT into teaching. If teachers lack the knowledge and skills on how to operate ICT equipment, then the integration of ICT will be impossible, as the teachers will also be afraid of making mistakes, with the thought that the learners will laugh and scorn at them (Burns, 2009). If a teacher is unskilled then he/she lacks the necessary understanding of how to manoeuvre the ICT equipment such as computers.

Global investment in ICT improves teaching and learning in schools and has been initiated by many governments, for example in the United Kingdom the government spending on educational ICT in 2008–09 was £2.5bn (Merrill, Read & Barnett, 2013). In the United States, the expenditure on K-12 schools and higher education institutions was $6 billion and $4.7 billion respectively in

2009 (Jackson, Von Eye, Witt, Zhao & Fitzgerald, 2014), and in New Zealand, the government spends over $ 410 million every year on school's ICT infrastructure (Archar et al., 2012). Despite all these investments in ICT infrastructure, equipment and professional development to improve education in many countries, Jericho (2015) claimed that huge educational investment has produced little evidence of ICT adoption and use in teaching and learning especially in Turkey. Evidence suggests that the education sector is investing heavily in ICT but ICT adoption in the education sector lagged behind the business sector (Spijkerman, Vanen & Huiberts, 2010). Strategies, plans and guidelines of ICT implementation into educational systems were prepared in various countries and it has become an essential part of educational reforms (Akram & Malik, 2010). These strategies often envisage high investment to computerize schools and extend the infrastructure of computers connected to the world Internet. However, the integration of information and communication technologies into the system of education is a more complex and more complicated process related to the change in teaching (Archar et al., 2012).

These barriers related to the school environment prevent teachers from integrating ICT in their teaching. In most cases, these barriers are beyond the teachers' control. McIntosh & Moses, (2009) noted that many teachers who have competencies and confidence in using computers in the classroom, made little use of technology because they did not have ample time. Time allocation for each lesson is less; it prevents teachers from using ICT equipment as they consume more time fixing and organizing the equipment (Wyse & Goswami, 2008). If the teachers do not have effective training on how to make use of the ICT equipment, then this also serves as a great obstacle to the integration of ICT in teaching. Teachers need effective training to keep up with new technology demands. Most of the teachers in the Namibian schools do not have the necessary knowledge needed to use the ICT equipment due to a lack of appropriate training (Shifonono,

2013). There are also no ICT technicians in schools with computers, in case the teachers need technical ICT support. Though the government has put in considerable efforts to improve teachers' ICT skills, it is unknown whether junior primary school teachers in Oshana Region also took part in this noble government initiative.

McLeod (2019) identified several barriers related to the lack of support and technical problems: technical problems, poor funding, poor administrative support, lack of incentives, scheduling difficulties, poor training opportunities and lack of appropriate skills in how to integrate ICT in teaching and learning. As explained above, technical support has to do with many other things such as technical problems, poor funding and poor school and ministerial support. In this instance, if the ICT equipment breaks or experience some technical problems that need to be fixed and there are no funds available to pay the specialist to operate on the equipment, then it will be another barrier to the integration of ICT (Shifonono, 2013). Equipment can be available but again if the teachers did not get the appropriate training on how to use this equipment then this is another root cause of the failure of ICT integration. The ICT equipment may be available at a school but due to certain reasons that are faced by teachers for example breakdowns, teachers do not get to have access to use this equipment (Shamoo & Resnik, 2010).

One of the most important trends in the present education system is the change and restructuring in the teaching/learning process integrating technological innovations. The main restructuring element of the change of the teaching practice is that teachers need to be innovative and integrate ICT in their day-to-day teaching (Spijkerman, Vanen & Huiberts, 2010). New teaching/learning methods incorporate problem-solving learning, cooperative learning, orientation to real goals and the change in the teacher roles (Shabani, Khatib & Ebadi, 2010). However, it is difficult for teachers to change according to the requirements.

Teachers should know and be able to use models of ICT skill acquisition, teachers should be conversant with virtual environments, he/she should be able to integrate ICT in the curriculum, and teachers should know main functions of operation systems etc. of the documents, which regulate ICT integration (Shifonono, 2013). Teachers may not integrate ICT in their teaching because they do not have enough ICT competency, therefore resistance to change conducted by ICT integration in the teaching and learning process appears to be barriers to the integration of information and communication technologies into the teaching/learning process appear (Murphy, Murphy & Garavan, 2014).

2.6 Barriers to integration of ICT into education

The act of integrating ICT into teaching and learning can be a complex process and one that may encounter a number of difficulties. These difficulties are known as barriers that make it difficult to make progress or to achieve an objective (Arnell, 2012).

Researchers and educators to classify barriers to teacher use of ICT in primary schools have used different categories. Several studies have divided the barriers into two categories being extrinsic and intrinsic barriers. However, what they meant by extrinsic and intrinsic differed. In one study, Brantley & Ertmer (2013) referred to extrinsic barriers as first-order and cited access, support, time, resources and training and intrinsic barriers as second-order and cited attitudes, practices, beliefs and resistance; whereas, Springer (2010) view extrinsic barriers as pertaining to organisations rather than individuals and intrinsic barriers as directed to teachers, administrators, and individuals. Another classification found in the literature can be teacher-level barriers versus school-level barriers. Hofer & Grandgenett (2012) grouped the barriers according to whether they relate to the individual (teacher-level barriers), such as lack of time, lack of confidence, and

resistance to change, or to the institution (school-level barriers), includes lack of effective training in solving technical problems and lack of access to resources. Similarly, Cox (2015) divided them into micro level barriers, including those related to teachers' attitudes and approach to ICT, and those related to the institutional context. The latter added another category called macro level or system-level barriers, which include those related to the wider educational framework. Another perspective presents the obstacles as pertaining to two kinds of conditions, material and nonmaterial (Eric, 2012). The material conditions can be the insufficient number of computers or copies of software. The non-material obstacles include teachers' insufficient ICT knowledge and skills, the difficulty of integrating ICT in instruction, and insufficient teacher time. Some of these studies dwell much on the barriers at teacher, institution, or system level. However, since the purpose of this paper is to determine the present and future barriers that face primary teachers in deploying ICT in teaching phenomes within their schools, this analysis focuses on the teacher-level and school-level barriers only as discussed in the following sections.

2.6.1 Teacher-level barriers

2.6.1.1 Lack of teacher confidence

Several researchers were of the assertion that one barrier that prevents teachers from using ICT in their teaching is lack of confidence. Fellowes & Oakley (2010) sees this as a contextual factor, which can act as a barrier. According to Hines (2009) much of the research proposed that this is a major barrier to the uptake of ICT by teachers in the classroom. In Nyambane & Nzuki survey of practitioners, the issue of lack of confidence was the area that attracted most responses from those that took part. Some studies have investigated the core reasons for teachers' lack of confidence with the use of ICT. Harry (2013) asserted that teachers' fear of failure caused a lack of confidence. Hayati, Cakiroglu & Kuruyer (2014) found that limitations in teachers' ICT

knowledge makes them feel anxious about using ICT in the classroom and thus eliminating their confident in using it in their teaching. Similarly, Freel (2014) concluded that many teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of children who perhaps know more than they do. Soradova, Kralova & Birova (2018) survey, many of the teacher respondents who identified their lack of confidence as a barrier reported being particularly afraid of entering the classroom with limited knowledge in the area of ICT with their students knowing that this was the case. It was argued that lack of confidence and experience with technology influence teachers' motivation to use ICT in the classroom (Ghavifek & Sufean, 2011). Teachers who confidently use technologies in their classrooms understand the usefulness of ICT. Hu & Garimella (2014) found that teachers who have confidence in using ICT admit that technologies are helpful in their teaching and personal work and they need to extend their use further in the future.

2.6.1.2 Lack of teacher competence

Another barrier, which is directly related to teacher confidence, is teachers' competence in integrating ICT into pedagogical practice (Ultanir, 2012). Hodgson, Heather, Conridge, Gibbons & Robinson (2018) found that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices. In developing countries, research reported that teachers' lack of technological competence is a main barrier to their acceptance and adoption of ICT (Afreen, 2014). In Africa, for example, teachers' lack of technological competence has been cited as the main barrier (Brantley & Ertme, 2013). Barasa & Odeo (2011) produced a report on the use of ICT in primary schools and the findings show that teachers who do not use computers in classrooms claim that the lack of skills are a constraining factor preventing teachers from using

ICT for teaching. Another worldwide survey conducted by Hatlevik & Arnseth (2012) of nationally representative samples of schools from 26 countries, found that teachers' lack of knowledge and skills is a serious obstacle to using ICT in primary and secondary schools. The results of a study conducted by Nyambane & Nzuki (2014) have shown that in Africa, many teachers still chose not to use ICT and media in teaching situations because of their lack of ICT skills rather than for pedagogical or didactics reasons. Hence, lack of teacher competence may be one of the strong barriers to the integration of technologies into education. It may also be one of the factors involved in resistance to change.

2.6.1.3 Resistance to change & negative attitudes

Much research into the barriers to the integration of ICT into education found that teachers' inherent resistance to change and attitude were a significant (Maxwell, 2012). From his/her analysis of the questionnaires, Gall et al., (2012) found that science teachers' resistance to change concerning the use of new strategies is an obstacle to ICT integration in science teaching. At a broader level, Gay, Mills & Airasian (2013) argued that resistance to change is an important barrier to teachers' use of new technologies in education. Nabeel (2012) argued that integrating the new technologies into educational settings requires change and different teachers will handle this change differently. According to him, considering different teachers' attitudes to change is important because teachers' beliefs influence what they do in classrooms. Nicholas (2011) claimed that one key area of teachers' attitudes towards the use of technologies is their understanding of how these technologies will benefit their teaching and their students' learning. Nutall (2010) found out that, although teachers felt that there was more than enough technology available, they did not believe that they were being supported, guided, or rewarded in the integration of technology into their teaching. Murphy, Murphy & Garavan (2014) supported that teachers who are not using new

technology such as computers in the classroom are still of the opinion that the use of ICT has no benefits or unclear benefits. Resistance to change seems not to be a barrier itself; instead, it is an indication that something is wrong. In other words, there are reasons why resistance to change occurs.

According to Ohata (2012) the change from a present level to a desired level of performance is facilitated by driving (encouraging) forces such as the power of new developments, rapid availability, creativity, Internet access, or ease of communication, while it is delayed by resisting (discouraging) forces such as lack of technical support, teacher expertise, or time for planning. Olugbeko (2016) found that teachers are unlikely to use new technologies in their teaching if they see no need to change their professional practice. They showed that teachers who resist change are not rejecting the need for change but lack the necessary education in accepting the changes and are given insufficient long-term opportunities to make sense of the new technologies for themselves. Obviously, not all communities have this barrier. In Europe, for example, Ertmer et al., (2012) stated that only very few teachers can be regarded as fundamentally opposing the use of ICT in the classroom. Only a fifth of European teachers believe that using computers in class does not have significant learning benefits for pupils (Althoff & Leskovec, 2015).

2.6.2 School-level barriers

2.6.2.1 Lack of time

Several recent studies indicated that many teachers have competence and confidence in using computers in the classroom, but they still make little use of technologies because they do not have enough time. A significant number of researchers identified time limitations and the difficulty in scheduling enough computer time for classes as a barrier to teachers' use of ICT in their teaching

(Al-Zaidiyeen et al., 2010). According to Chaamwe (2010), the most common challenge reported by all the teachers was the lack of time they had to plan technology lessons, explore the different Internet sites, or look at various aspects of educational software. Ertmer's study (2012) found that the problem of lack of time exists for teachers in many aspects of their work as it affects their ability to complete tasks, with some of the participant teachers specifically stating which aspects of ICT require more time. These include the time needed to locate Internet advice, prepare lessons, explore and practise using the technology, deal with technical problems, and receive adequate training. Recent studies show that lack of time is an important factor affecting the application of new technologies in science education (Arnseth & Hatlevik, 2010). According to Arnseth & Hatlevik (2010), lack of time is a barrier affecting the application of ICT in Saudi Arabia because of busy schedules. He indicated that because Saudi teachers work from about 7.00 a.m. until 2.00 p.m. and the average number of class sessions taught by science teachers is 18 per week, both teachers and students have a limited number of hours during the day to work on integrating ICT into science education. Similarly, in Canada, Asher, Schears & Miller (2011) concluded that teachers take much more time to design projects that include the use of new ICT than to prepare traditional lessons. Teachers interviewed by Nyambane & Nzuki (2014, p. 14) commented that the constraints of different class schedule contributed to the lack of time they spent together to work on planning classroom activities". Supporting this finding, the most significant constraint on use quoted by 86–88% of primary teachers surveyed by Arnseth & Hatlevik (2010) was lack of time. Warschauer et al., (2014) also concluded that one of the main reasons that primary teachers do not use ICT in the classroom is lack of the time necessary to accomplish plans.

2.6.2.2 Lack of effective training

The barrier most frequently referred to in the literature is lack of effective training (Arnell, 2012). Ghavifekr & Sufean (2011) study outlined that there were not enough training opportunities for teachers in the use of ICTs in a classroom environment. Similarly, Brantley & Ertmer (2013) found that one of the top three barriers to teachers' use of ICT in teaching students was the lack of training. Recent research in Turkey found that the main problem with the implementation of new ICT in science was the insufficient amount of in-service training programs for primary teachers. Dang (2011) concluded that limited teacher training in the use of ICT in Turkish schools is an obstacle. According to Arnseth & Hatlevik (2010), the issue of training is certainly complex because it is important to consider several components to ensure the effectiveness of the training. These were time for training, pedagogical training, skills training, and an ICT use in initial teacher training. Correspondingly, research by Hussain et al., (2011) relating to junior primary education concluded that lack of training in digital literacy, lack of pedagogic and didactic training in how to use ICT in the classroom, and lack of training concerning the use of technologies in science specific areas were obstacles to using new technologies in classroom practice. Some of the Saudi Arabian studies reported similar reasons for failures in using educational technologies: the weakness of teacher training in the use of computers, the use of a "delivery" teaching style instead of investment in modern technology (Ghavifek & Sufean, 2011) as well as the shortage of teachers who are qualified to use the technology confidently (Chang'ach et al., 2012). Providing pedagogical training for teachers, rather than simply training them to use ICT tools, is an important issue (Rubagazi et al., 2011). Hatlevik & Arnseth (2012) argued that if teachers are to be convinced of the value of using ICT in their teaching, their training should focus on the pedagogical issues.

Barasa & Odeo (2011) showed that after teachers had attended professional development courses in ICT they still did not know how to use ICT in their classrooms; instead, they just knew how to run a computer and set up a printer. They explained that this is because the courses only focused on teachers acquiring basic ICT skills and did not often teach teachers how to develop the pedagogical aspects of ICT; this is in line with the research by Barasa & Odeo (2011). Ertmer et al., (2012) indicated that inappropriate teacher training is not helping teachers to use ICT in their classrooms and in preparing lessons. They asserted that this is because training programmes do not focus on teachers' pedagogical practices in relation to ICT but on the development of ICT skills. However, beside the need for pedagogical training, according to Arnell (2012) it is still necessary to train teachers in specific ICT skills. Arnseth & Hatlevik (2010) claimed that when new technologies need to be integrated in the classroom, teachers have to be trained in the use of these particular ICTs. Ghavifekr & Sufean (2011) found that some initial training is essential for teachers to develop appropriate skills, knowledge, and attitudes regarding the effective use of computers to support learning by their students. Further, they argued that this also requires continuing provision of professional development to maintain appropriate skills and knowledge. Fundamentally, when there are new tools and approaches to teaching, teacher training is essential if they are to integrate these into their teaching (Hu & Garimella, 2014). According to Ultanir (2012), inadequate or inappropriate training leads to teachers being neither sufficiently prepared nor sufficiently confident to carry out full integration of ICT in the classroom. Barasa & Odeo (2011, p.45) assert that teachers need to not only be computer literate but they also need to develop skills in integrating computer use into their teaching/learning programmes".

Ultanir (2012) supported that teachers need training in technology education (focusing on the study of technologies themselves) and educational technology (support for teaching in the classroom).

Similarity, Chaamwe (2010) found that teachers want to learn how to use new technologies in their classrooms but the lack of opportunities for professional development obstructed them from integrating technology in certain subjects such as science or maths. Other problematic issues related to professional development in ICT are that training courses are not differentiated to meet the specific learning needs of teachers and the sessions are not regularly updated (Cleaver, 2014). Pre-service teacher education can also play a significant role in providing opportunities for experimentation with ICT before using it in classroom teaching (Arnell, 2012). Lack of on ICT focus in initial teacher education is a barrier to teachers' use of what is available in the classroom during teaching practice (Vu et al., 2014). Where training is ineffective, teachers may not be able to access ICT resources.

2.6.2.3 Lack of accessibility

Several research studies indicated that lack of access to resources, including home access, is another complex barrier that discourages teachers from integrating new technologies into education and particularly into science education as the following discussion illustrates. These studies indicated several reasons for the lack of access to technologies occurred. In Hu & Garimella (2014, p.15) study teachers complained about how difficult it was to have access to computers. The author gave reasons like 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 students. In other words, a teacher would have no access to ICT materials because most of these were shared with other teachers. According to Althoff & Leskovec (2015) the inaccessibility of ICT resources is not always merely due to non-availability of the hardware and software or other ICT materials within the school. It may be the result of one of a number of factors such as poor organisation of resources, poor quality hardware, inappropriate software, or

lack of personal access for teachers (Odera, 2011). The barriers related to the accessibility of new technologies for teachers are widespread and differ from country to country. Ertmer et al., (2012) found that lack of access is the largest barrier and that different barriers to using ICT in teaching were reported by teachers, for example a lack of computers and a lack of adequate material. Nyambane & Nzuki (2014) found that in European schools there are some infrastructure barriers such as broadband access not yet being available. They concluded that one third of European schools still do not have broadband Internet access. Afreen (2014) explored practitioners' views from 26 countries on what were the main obstacles to the implementation of ICT in schools. He concluded that four of the top ten barriers were related to the accessibility of ICT. These barriers were insufficient numbers of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient simultaneous Internet access.

Arnseth & Hatlevik (2010) stated that the low numbers of computers, oldness or slowness of ICT systems, and scarcity of educational software in the school were barriers to the successful implementation of ICT into primary schools. Dang (2011) said that having no access to the Internet during the school day and lack of hardware were impeding technology integration in Saudi schools. Research on Syrian schools indicated that insufficient computer resources were one of the greatest impediments to technology integration in the classroom (Cleaver, 2014). There are several barriers associated with the lack of access to ICT. In his study, Ghavifek & Sufean (2011) found a lack of appropriate infrastructure and a lack of appropriate material resources to be barriers. However, overcoming such hardware barriers does not ensure ICT will be used effectively. Additionally, Ghavifek & Sufean (2011) stated that the accessibility of ICT resources does not guarantee its successful implementation in teaching and this is not merely because of the lack of ICT infrastructure but also because of other barriers such as lack of high-quality hardware, suitable

educational software, and access to ICT resources. Ahmad et al., (2012) also asserts that poor choices of hardware and software and a lack of consideration of what is suitable for classroom teaching are problems facing many teachers. Jackson et al., (2011) found that the majority of teachers agreed that insufficient ICT resources in the school and insufficient time to review software prevent teachers using ICT. According to Althoff & Leskovec (2015) the limitations on access to hardware and software resources influenced teachers' motivation to use ICT in the classroom.

2.6.2.4 Lack of technical support

Without both good technical supports in the classroom and whole-school resources, teachers cannot be expected to overcome the barriers preventing them from using ICT (Althoff & Leskovec, 2015). Arnell (2012) found that in the view of primary and secondary teachers, one of the top barriers to ICT use in education was lack of technical assistance. In Dang's (2011) study, technical problems were identified to be a major barrier for teachers. These technical barriers included waiting for websites to open, failing to connect to the Internet, printers not printing, malfunctioning computers, and teachers having to work on old computers. Technical barriers impeded the smooth delivery of the lesson or the natural flow of the classroom activity (Dang, 2011). Hofer & Grandgenett (2012) argued that ICT support or maintenance contracts in schools help teachers to use ICT in teaching without losing time through having to fix software and hardware problems. The Hartoyo (2012, p. 16) report stated that "if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns" Many of the respondents to Hartoyo's (2012) surveys indicated that technical faults might discourage them from using ICT in their teaching because of the fear of equipment breaking down during a lesson. In science teaching, several studies indicated

that lack of technical support is a main barrier to using technologies. According to Eric (2012) ICT integration in science teaching needs a technician and if one is not available, the lack of technical support can be an obstacle. Chaamwe (2010) found that the lack of technical support was one of two significant barriers to the integration of ICT into science education in schools and might be considered "serious". In Saudi Arabia, science teachers would agree to introduce computers into science teaching, except that they believe they will encounter problems such as technical service or hardware problems (Cleaver, 2014).

Ertmer et al., (2012) argued that whatever kind of technical support and access teaching staff have and whether they have twenty years of experience or are novices to the profession, technical problems generate barriers to the smooth delivery of science lessons by teachers. Although lack of technical support can prevent teachers from successfully integrating ICT into education, recent research indicates that in some countries such as the United Kingdom, the Netherlands, Latvia, Malta & the Czech Republic schools have recognised the importance of technical support to assist teachers to use ICT in the classroom (Vu et al., 2014). In general, several studies have identified a range of the following or similar factors as widespread barriers: lack of computers, lack of quality software, lack of time, technical problems, teachers' attitudes towards computers, poor funding, lack of teacher confidence, resistance to change, poor administrative support, lack of computer skills, poor fit with the curriculum, lack of incentives, scheduling difficulties, poor training opportunities, and lack of skills in how to integrate ICT in education. There are complicated relationships among these barriers as discussed in the following section

2.6.3 The relationship between barriers

Bizzochi (2017) stated that there are multifaceted relationships between the barriers. Some barriers such as lack of teacher competence and lack of accessibility seem to be closely linked to others. Some barriers such as lack of teacher confidence and resistance to change seem to be more significant than others Nutall (2010). The following discussion focuses on the relationships between lack of accessibility and lack of competence and other factors such as time, training, and technical support. Consider the lack of accessibility to resources as a barrier is closely related to several other key issues, which can themselves, barriers to teachers' use of ICT. Although the resources are available in schools, the lack of time does not allow teachers to access these resources. There may be technical equipment available but there is no time for the teacher to operate and review those techniques Babu (2011). This may be because the number of lessons in one day is too many or because the time available during the class lesson is insufficient. Another example related to the accessibility barrier, as found by previous studies, is that lack of teacher training reduces the integration of technology into education. According to Babu (2011) educational technological materials may be available in schools but teachers cannot use them because of a lack of pedagogical or skills-related (practical) training in how to use these ICT resources.

On the other hand, it may be that the lack of access to resources leads to a reduction in training opportunities. It is important to remember that not only is access to resources used in the classroom for students' learning important, but also access at home will help with self-training. Access to resources might be available, but teachers cannot use ICT in the classroom because it may be difficult for them to operate ICT tools. Thus, teachers always need technical assistance because this assistance may provide them with up-to-date equipment in the new world of technology.

According to Abera (2012) technical support helps in training and training takes time. Together they allow access to ICT resources and thus help the successful integration of technology in the teaching process. Lack of competence is one of the most important obstacles to teachers' use of technology in education. It is linked to other issues such as training, time and technical support. The first problem linked to the competence barrier is the lack of effective training. Teacher training in the use of modern technology in the classroom helped to increase the teachers' efficiency in using ICT in education effectively (Arnell, 2012). Training includes training in basic skills in using technology as well as training in the integration of those technologies into interactive and effective teaching. Self-training is also important to increase competence and improve ICT use. It can happen through providing teachers with opportunities to use resources such as user guides, CDs, and IT equipment for self-training at home. The improvement of ICT skills also requires that teachers have time available. Teachers whose schools give them time to develop their skills can be more creative than teachers who do not have sufficient time. In order to achieve sufficient competence in using ICT effectively in education, a teacher also needs professional technical support (Abera, 2012).

As discussed above, the relationship between access to modern technological resources and the competence of teachers to use them is complicated. This relationship links those factors with other issues such as time, training, and technical support. In addition, there is a relationship between the barriers of lack of accessibility and lack of competence. In other words, teachers may not be able to access ICT resources unless they have skills in the use of technology and can work with it efficiently in their teaching. On the other hand, access to ICT resources can help teachers increase their competence whether by self-training through the Internet or by communication with experts. The opportunities for development of teachers' skills and their access to ICT resources can be

increased by providing them with technical support and sufficient time (Chaamwe, 2010). Another issue that has to be raised, according to previous studies, is the teachers' confidence in using ICT to help them teach effectively. The lack of confidence is a problem linked to the previous two issues: the lack of access to resources and the lack of teacher competence. Regarding the availability of ICT resources, perceived ability to use ICT and having the basic skills to operate it may increase teachers' satisfaction with modern technologies, which may motivate teachers to integrate ICT in education.

However, the researcher's view is that curriculum developer, education officer and all other stakeholders in education should not overlook the provision of training, adequate time for guidance, monitoring and technical support for effective teaching and learning. In general, it is difficult to classify the barriers into groups and think about the barriers in entirely separate categories because, as mentioned above, there are complex relationships among the barriers. For example, lack of technical support, time, and training can lead to technical problems, which can in turn lead to a lack of access to ICT resources and a lack of teachers' competence. This can lead to teachers lacking confidence and influence their motivation. Understanding the levels in this study at which these barriers prevent teachers from using ICT may help educators to decide how the barriers can be tackled. In other words, teachers should be convinced of the importance of using ICT in the classroom. Then, they should be provided with access to resources. After that, teachers need to be able to use these resources successfully. That's why Abera (2012) stresses that access to ICT and the ability to use it cannot be possible without sufficient time, effective training, and technical support.

2.6.4 Implementation

One can see that it is much easier to remove barriers by resolving and reducing the reasons for the occurrence of these barriers. Chaawe (2010) stated that, Educators, teachers, and school principals need to collaborate to overcome any of the obstacles and break down the above-mentioned barriers to the meaningful integration of ICT into teaching and learning. There are some implications for teachers and schools for successful integration of ICT into education arising from this. Schools need to provide training courses for teachers to gain experience in dealing with the new devices, modern technologies, and new pedagogical approaches (Banerjee & Chaudhury, 2010). Technical support needs to be provided in schools. Additionally, schools must provide teachers with the necessary ICT resources including hardware and software. It is important for schools to cooperate with teachers and stakeholders on the implementation of ICT strategies successfully.

2.6.5 Suggestions to improve the use of ICT in teaching phonemes in English (Solutions to Increase Acceptance of Classroom Technology)

Chaawe (2010) stated that time would inevitably bring about the increased adoption of ICT on a large scale, so some strategies that can be used by educators and researchers to encourage technology integration now. First, it is extremely important that teachers have a say in what technologies they would use in their instruction. Teaching is a deeply personal experience, and when educators feel as though they have lost the ability to teach in a manner that best suits them, it can be frustrating and discouraging (Farkas, 2013). No single educational technology would be perfect for every teacher, and educators should have the ability to select a technology that they feel most comfortable with (Gee, 2007). By allowing teachers more freedom of choice, they would retain the very important sense of classroom control. While the importance of teacher autonomy in the selection of educational technology cannot be understated, it does introduce the burden of

sifting through a vast number of available technologies. A second solution to encouraging acceptance of classroom technology is a call for better organization of available technologies (Gee, 2007). While a typical internet search would turn up thousands of results for educational technology tools, very few places effectively organize and evaluate available technologies. Teachers should be able to easily find and access rigorously tested technologies within a specific learning domain (Freel, 2018).

2.6.6 Teacher Skills and Knowledge

Pedagogical content knowledge (PCK) has been discussed as crucial for effective teaching (Vu et al., 2014). Effective educators must not only be domain experts, but also understand how to flexibly use the affordances of different pedagogies for particular content topics. With the advent of numerous novel technologies over the past decades, educators have an abundance of technologies to leverage to make their teaching more effective. Although the potential benefits are clear, the sheer number of possible combinations of technologies and pedagogies for different tasks and students is overwhelming. The TPACK framework expands on the focus of PCK also include technology as a knowledge domain (Cleaver, 2014). TPACK focuses on technology, pedagogy, and content knowledge individually, and on their interactive combinations; this leads to a sum of seven types of knowledge that TPACK supporters argue are crucial for ideal integration: content knowledge, pedagogical knowledge, technological knowledge, pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge. Clearly, educators with expertise in the three core knowledge types would have some proficiency in the combined types (Di Carlo, 2013).

However, there is specialized knowledge in the combined domains. Technological pedagogical knowledge (TPK) requires more than knowing useful pedagogical techniques and familiarity with technologies; it requires an understanding of how particular technologies can provide support for particular pedagogical strategies or techniques. As an example, the selection of a social networking tool for collaborative learning must be informed by the affordances specific to each platform (e. g. Twitter might encourage a great number of messages to be shared, but following threads of conversations between numerous students would be very difficult). According to Dang (2011) Technological pedagogical content knowledge (TPACK) additionally requires an understanding of how technologies can support pedagogies for specific domains. How can the TPACK framework be useful? It has been conceptualized in different ways, but most relevant for our current discussion is that it is often viewed as the complete set of knowledge necessary to teach with technology (Cleaver, 2014).

Thus, a goal is to promote these knowledge domains; clearly, most of these knowledge domains are already heavily emphasized during teacher training and professional development (e.g. mastering the content in which a teacher specializes). The intersections between technological knowledge and content/pedagogical knowledge, however, is more specialized and less frequently taught. For example, consider the case of writing instruction. Teaching writing techniques and strategies (requiring content knowledge) through deliberate writing practice and feedback (requiring pedagogical knowledge) is something successful writing teachers do and an example of pedagogical content knowledge.

Digital technology can further support instruction by allowing teachers to provide feedback through word documents. This is an example of TPACK; however, training on the capabilities of different technologies might allow teachers to optimize the experience for students (Kothari,

2015). Programs such as my Access or the Writing Pal can provide automated immediate feedback, increasing the efficiency with which students receive feedback (Arnseth & Hatlevik, 2010). Without training, teachers are unlikely to understand exactly how these feedback mechanisms works and therefore will not optimize their effectiveness. Thus, training on TPACK might be helpful for writing instructors. TPACK can be taught effectively, making this goal tenable. Researchers investigating how TPACK knowledge in preserve teachers developed over an 11-month Master of Arts in Education program generally showed positive increases in knowledge (Smith, 2009).

Ghavifek & Sufean (2011) urge caution in extending TPACK too far; although it might seem advantageous to encourage teachers to develop their knowledge in each of the 7 domains, there is little evidence that such a practice leads to more effective teaching. We respect this caution and view TPACK as something that teachers should be aware of and discuss, but that does not have a definitive end goal. Despite any weaknesses in the TPACK framework, there have been interesting, though not strongly empirically supported, activities and suggestions that have come from it. First, it does provide common language for educators to discuss methods and techniques for improving knowledge related to technology. Second, these discussions can be conducted into activities that promote flexible thinking about technology affordances.

2.6.7 Considerations from an International Perspective

Nicholas (2011), revealed that when educators or researchers grapple with technology integration issues in their own country, they may lose perspective regarding variables that could influence results when using technology in the classroom. Thus, examination of comparative studies across various nations may help us to reconsider important factors in the planning of school interventions.

Ample evidence indicates that, in the U.S., many first order barriers have largely been conquered (Vu et al., 2014). Thus, current challenges relate to identifying and implementing methods to most effectively integrate technology in the educational context. Measuring integration success is potentially an even more difficult task. Will it be possible to assess the progress made in the U.S. and other countries, and compare outcomes across countries? The answer is potentially linked to diverse standards adopted by different countries regarding educational technology development (Nicholas, 2011).

The U.S. follows educational technology standards defined by the ISTE, the United Kingdom the Qualified Teacher Status (QTS), and other European countries often follow the European Pedagogical Informational and Communication Technology, and so on. Because different criteria are used, researchers seeking evidence concerning international experiences in educational technology integration face substantial challenges. When considering the educational technology progress in various countries, one discovers provocative cases of failures and successes. For example, in Chile, progress may be different from other countries of Latin America. The Education Ministry of Chile has been promoting systematic development in educational technology since 1992, with the aim of contributing to improving the quality and equity of public education (Althoff & Leskovec, 2015).

In terms of access to technology, the ENLACES program has made Chile a pioneer country in Latin America. From 2000 to 2010, the number of Chilean students per computer went from 80 to approximately 10 students per computer. Furthermore, in 1998, fewer than 1,000 schools in Chile had access to the internet; in 2008, around 7,000 schools had access, reaching broad national coverage. Currently, one of the key challenges in Chile is the struggle to secure sufficient professional development and technology support to teachers through collaboration with and

support of different institutions (universities, government, administrators, ENLACES and schools). On this issue, the experiences in the U.S. could be invaluable, given its relative successes in educational technology implementation (Cleaver, 2014). Once technology integration policies are adopted, a further challenge concerns establishment of valid instruments and methods to assess the impact of programs and determine how use of technology is affecting academic learning outcomes. Policy-makers in Chile considered whether to adopt an existing international standard, eventually deciding instead to create their own separate standards related to educational technology (Ghavifekr & Sufean, 2011). Careful deliberation of comparative studies across multiple countries may also be useful in determining a sound assessment approach. For example, a 2012 international study evaluated the impact of educational technology on academic performance, examining different factors related to educational technology and their impact on the PISA test reading results (Ghavifek & Sufean, 2011). Spanish speaking countries in South America (Uruguay and Chile) were compared with countries in Europe, which share characteristics (Spain and Portugal).

Abera (2012) revealed that the use of the educational technology led to varied improvements depending on an additional factor, class time devoted to reading. Students in Spain and Portugal spent more time reading than their counterparts in Chile and Uruguay, and the correlation between use of technology in class and PISA reading scores was higher in Chile and Uruguay. One of the more interesting conclusions of the San Martin study is that when traditional reading time is low, reading through technology contributes positively to reading outcomes (Hofer & Grandgenett, 2012). Students seem to lend support to this interpretation (Afreen, 2014).

The authors concluded that more internet use over time is associated with better reading results for students with low reading skills. One explanation for this is that because the internet is largely

based on reading written text, its use encourages the students to read more than they typically do when not on the internet. Reviewing international experiences may be a valuable way to obtain essential information about public policies on educational technology, helping to generate plans for implementation of key processes like teacher training and support. Moreover, international comparison studies could serve as valuable resources for assessment adoption or development, and can help us understand how technology impact learning and when other factors moderate those effects.

As ICT integration into the learning and teaching process and the whole system of education is a rather complicated process, new conceptions, strategies, plans and models had to be developed by the Ministry of Education Arts and Culture and school administration which made full use of the potential of new technologies. The whole learning/teaching and change process of integrating the ICT has to be flexible and its efficiency depends on the motivation model developed by the school and the preparation of the completely academic staff to implement innovations. The researcher's view is that ICT integration in the teaching of phonemes in English helps learners to grasp the content much quicker and it also helps the teachers' role and relationships as learners take responsibilities for their learning outcomes, while the teachers becomes guides and facilitators.

2.7 Summary

Research cannot be completed and successful without consideration of previous studies that were done in the same field. This chapter presented the theoretical framework of the study followed by a comprehensive review of literature on investigating the junior primary teacher's use of information and communication technology. It also presented the various impediments under review such as challenges, barriers to ICT integration and some possible strategies that could be used to mitigate them.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology of the study. It covers the research design, research methods, sampling, data collection procedures, data analysis techniques, research instruments, issues of a pilot study, themes (research questions) and sub-themes (answers to the questions) on ICT integration in the teaching of phonemes, context and purpose of the study including ethical considerations of the study.

3.2 Research Design

A research design is the existing world view upon which a research study can be located (Kothari, 2015). The research design to be adopted depends mainly on the research strategy being adopted in the study and this could be qualitative or quantitative approaches (Maxwell, 2016). This study employed the case based study research design because the researcher wanted valuable rich description of complex phenomena. The best qualitative research is systematic and rigorous, and it seeks to reduce bias and error and to identify evidence that disconfirms initial or emergent hypotheses (Creswell, 2014). Thus, the researcher aims to cupture the reality of the participants' lived experiences of and thoughts about a particular situation (Cohen, Manion, & Morrison, 2011). A research philosophy is a belief about the ways in which data about a phenomenon should be collected analysed and used, while a research design is a framework of methods and techniques chosen by a research to combine various components of reseach (Springer, 2010). Springer futher explained that research philosophy is classified as ontology, epistemology and axiology whereas reseach design is a sketch of how research should be conducted to be able to use a research design for the study.

Phenomenological research designs have to do with real life lived experiences of the participants under study (Blaikie, 2014). Blaikie further elaborated that the qualitative descriptive research design allows the researcher through the use of the interviews, conversation, recordings, observations, to interpret and make sense of participants engagement/behaviour/ responses towards a phenomenon under consideration in a given setting.

Blaikie (2010) defines a research design as the plan and structure of investigation so conceived as to obtain answers to the research questions. According to Cohen, Manion & Morrison (2012), a research design is an outline, plan or strategy one intends to use to seek an answer to his or her research problem. Creswell (2014) defines qualitative research as one where the researcher explores and seeks to understand the meaning of individuals or groups assigned to a social or human problem. Creswell further defines qualitative research as an inquiry approach useful for exploring and understanding a central phenomenon. To learn about this phenomenon, the inquirer asked participants broad, general questions collect the detailed views, perceptions or opinions of participants in the form of words or images and analyses the information for descriptions and themes. Gall & Borg (2007) defines qualitative research as a design that explores issues, understanding the phenomenon associated with the issue and being able to answer questions.

There are six common types of qualitative research designs: phenomenological, ethnographic, grounded theory, historical, case study, and action research. Phenomenological studies examine human experiences through the descriptions provided by the people involved (McMillan & Schumacher, 2010). These experiences are lived experiences. The goal of phenomenological studies is to describe the meaning that experiences hold for each subject. The ethnographic study involves the collection and analysis of data about cultural groups. It is the study of the cultural patterns and perspectives of participants in the natural setting (Blaikie, 2010). Ethnographers

engage in the long-term study of particular phenomena that situate understandings about those phenomena into a meaningful context. Therefore, they describe and interpret culture, the set of attitudes, values, concepts, belief and practices shared by the members of a group.

Apart from the major methods of research used in the qualitative approach, there are also strategies used in qualitative research. University of Stavanger (2015) list some of the strategies used to collect data in the qualitative approach to research: in-depth interviewing and questionnaire for the teachers. Therefore, there are some advantages and disadvantages of qualitative research. Qualitative is a method used in different academic disciplines generally associated with the social sciences and market research (Kumar, 2015). Qualitative research investigated the what, where, when, how and the why of decision-making. Some of the advantages of qualitative research are; it leads to uncovering more about the experiences that people have. It focuses on why things may be the way they are. Small groups are the focus of qualitative research. Therefore, it is typically less expensive than quantitative research (Trochim, 2015). Trochim (2015) states that issues have to be analysed in greater details and more thoroughly due to the smaller groups that are used. The researcher is able to guide the discussion in real time rather than be limited to specific questions. The researcher structure can be quickly revised as new information comes forth. The direction of the research can be modified, by so doing this means data that is collectd comes from a few cases or subjects and cannot be universal to a larger population. The results or findings can be transferred to another setting. The experinces of human are more complex and powerful than quantitative.

The researcher used an in depth face-to-face interviews and additional open-ended questions from a questionnaire as a qualitative strategy of obtaining data. The decision to use qualitative strategy for collecting data for inquiry stemmed from the nature of the research questions where the word strategies is key in order to gather enough information. This implies that the researcher was also

interested in individual views of the junior primary school English teachers on their experiences with strategies they used in the teaching rather than information from books. This implies that the researcher was interested in subjective views of the teachers on their views on how ICT can be intergrated in the teaching of phonemes in English second language.

A qualitative method ensured that the questions were predetermined and data analysis was simple. The instruments were designed to focus directly on the ICT integration strategies as well as the challenges that are being experienced. The data obtained from both interview schedule and open-ended questionnaires were utilized to provide a descriptive profile of the challenges and behaviors associated with the use and significance of ICT integration in schools.

3.3 Population

The population refers to the totality of all elements legible to take part in a research study (Cohen, Manion & Morrison, 2012). Cox (2015) defined a population as the mother set from which the study participants were selected. The population for the study comprised 134 English teachers for a junior primary school in the Oshana Region, but sample population which was used consisted of only 15 teachers selected from the four schools in Oshana region in order to gather information about the population without having to measure the entire population since this is the easier and fast way to draw inferences about the population. The researcher has put the following into consideration, the teacher's qualification, gender, age, and education level in order to boost the study with additional information. This information is displayed on the background information where teachers were provided with space to complete the relevant questions. The information for demographic details of each teacher's gender, qualification and employment was gathered from the questionnaire using general information and open-ended questions to strengthen the qualitative data obtained from the interviews with the participants.

3.4 Sampling and sampling procedure

The study used a purposeful sampling approach. Purposive sampling, also known as judgemental, selective, or subjective sampling, is a form of non – probability sampling in which researchers rely on their own judgement when choosing members of the population to participate in their surveys (Cohen, Manion, & Morrison, 2012). This sampling procedure requires the researcher to have prior knowledge about the purpose of their studies so that they can properly choose and approach eligible participants. The researcher used purposive sampling when he/she wants to access a particular subset of people, as all participants of a study are selected because they fit a particular profile. Also, the researcher selected samples using his/her experience and knowledge of the group to be sampled using clear criteria and guide the process. Thus, this study used purposive sampling technique to select 15 teachers for English from various junior primary schools in Oshana Region**.**

Purposive sampling was suitable for this study because the aim was to collect in depth information from the right respondents and the basic benefit of this sampling technique is that rich information is possible to collect on even a low budget. Purposive sampling was suitable in that participants' responses were analysed according to each school and were compared across all schools. The selected teachers provided the researcher with the strategies used by teachers in the teaching of English Phonemes and the selected teachers are the ones who were involved with the teaching of the English language e. g. the researcher used an in-depth face-to-face unstructured interview and open-ended semi-structured questionnaire with the participants (Cohen, Manion & Morrison, 2012).

Four schools from the Oshana region were purposefully selected comprising a total number of 15 junior primary teachers that taught English second Language. Purposive sampling strategies allow

each of the participants to have equal opportunities of being selected for participation in the study (Peat, Melli, Williams & Xuan, 2014).

The sample of this study comprised only of 15 teachers out of 134 junior primary school teachers for English in the Oshana Region, of which 15 junior primary English teachers from four schools in Oshana Region were purposively sampled. Purposeful sampling is a strategy in which the researcher only selects those participants who have the potential to provide the answers, skills, and expertise to contribute to the study and this served the reason for selecting such population. This was determined in the study by choosing only junior primary qualified teachers.

3.5 Research instruments

3.5.1 Unstructured interview guide

The face-to-face indepth interviews were conducted with the English teachers from four junior primary schools to allow them to express themselves freely (See Appendix C (A) for interview guide). The unstructured interviews with open-ended questions used in research are qualitative method study with interesting properties. It is performed by planned discussion and interview with the interviewee and researcher (Somekh, 2008). The aim was to obtain knowledge of the participant's considerations and ideas on a specific topic. The method is feasible in illuminating the variety of viewpoints held in a population. It is used as a single source of data or in combination with other methods. As the method provides data in a social context, it is used as an alternative to an individual interview. The use of in-depth face-to-face interviews had several advantages. The in-depth face-to-face interview is not expensive and it is a fast method of getting valuable data because the respondent is more likely to give their full attention and the interviewer can deduce the quality of each response. On the other hand, the participants (teachers) were more comfortable voicing opinions on their own with the researcher. The dynamic discussion between each

participant and the researcher stimulates their thoughts and reminded them of their thoughts regarding the research subject. All individuals along with the researcher had a chance to ask questions and these produced more information when compared with individual interviews.

The researcher can clarify the dynamics of the interview should there be any misunderstandings. Data analysis could be time consuming and challenging task: meaning that the researcher will need enough time to listen to his/her recording before he/she comes up with the final information. In depth face-to-face interviews are usually is not replicable. The validity and dependability of the findings are tough to ascertain on their own based on this study (Somekh, 2008). The researcher tried to have less control over the discussion and had to probe only when it was necessary.

3.5.2 Semi-structured questionnaire

The researcher used both general information and open-ended questions because of their nature in order to gather opinions and thoughts from respondents, offering much deeper, more thorough, often subjective information. Therefore, the respondents are free, comfortable and have enough time to complete the questionnaire (Harry, 2013). According to Creswell (2014) open-ended questions allow respondents to go into as much detail as they care to, offer more nuance, because they are written just as the respondents speak so they can explain themselves more fluidly (See Appendix C (B) for questionnaire).

Both instruments may generate qualitative data. The interview data collection tool had several advantages. One of the advantage was that they could probe for more information from the participants. While the questionnaire could allow participate to express themselves in writing freely. The interview had the advantages that the researcher could also record the body language of the various participating members in the study (Shankweiler & Flower, 2011). However, the

researcher acknowledges the disadvantage, which this data collection tool had on the participants, which is that some participants were shy to express themselves if they are being confronted (Wong & Li, 2012).

3.6 Pilot study

A pilot study is a preliminary study, which the researcher undertook before the actual study was done. This study was conducted to check the feasibility of the study (Kumar, 2015). The pilot study was conducted at Oshakati West Primary school, the sample population for the pilot study comprises of 3 teachers including HOD for Oshikwanyama/Oshindonga first language at junior primary phase. Open-ended questionnaires were developed and mailed to the three teachers who were meant to participant in the pilot study so that they can complete the questionnaire individually. In addition, an appointment was made by the researcher to get the permission from the school principal via the HOD for Languages so that the pilot study interview could be conducted with the 3 sampled teachers as soon as possible. The HOD engaged the teachers and the interviews were conducted by the researcher by making use of the voice recorder to record the participant individually at their own convenient time. Based on the outcome of the pilot study obtained from Oshikwanyama/Oshindonga teachers from Oshakati West Primary, double-barrelled questions were rewarded to feed the study purpose and questions. Some questions on the interview and questionnaire protocol that were ambiguous were also amended based on the pilot study results.

The outcome revealed that the first language teachers in Oshindonga and Oshikwanyama integrate ICT in their teaching when they teach letter sounds. The teachers make use of photocopy machines to photocopy the letters and then teach those sounds. Preliminary pilot study findings were also used to reorder the questions on the interview and questionnaire protocol to maximize qualitative

data collection. The school also has a jolly phonic system in place that they use to teach letter sounds through the sound in the second language. The head of the department revealed that since they acquired the system the learner's performance in languages has improved a great deal.

3.7 Data Collection Procedures

The study was conducted during early 2020 school year in Oshana region. For the pilot study a general information and semi-structured questionnaire was distributed among the participants to collect preliminary qualitative data and the participants were not restricted on how they had to respond to the questions. This gave them the opportunity to express their own opinions freely regarding the ICT integration strategies used in teaching of phonemes in English. Data was collected from HOD's and teachers from four schools in the Oshana region which were randomly selected. The instrument was designed to provide first information associated with the strategies that could be implemented by Junior primary teachers to integrate ICT in teaching and learning of phonemes in English as well as the challenges involved. Firstly, the researcher attained a listing of all of the schools from the Oshana Directorate of Education in the Oshana region. The selected schools were called by the researcher to confirm the actual number of junior primary teachers at each site within the target school district. Since a previously designed instrument was not available, it was necessary to pre-test the researcher-developed instrument, and then perform a field study prior to the actual instrument distribution. A pre-test was conducted with one administrator and two educators who do not teach primary students or emergent literacy to examine the clarity of the vocabulary and comprehensiveness of the questioning presented in the instrument. Revisions were made to the instrument based on the input received through the pre-test. Using the revised instrument, a field test was completed to further insure a more reliable and valid research instruments. The researcher distributed fifteen open-ended questionnaires to five randomly chosen

junior primary school teachers, two reading specialists, one literacy consultant and a special education educator within the targeted school district to field test the contents of the instrument.

The potential participants for the field study were contacted to confirm their willingness to participate. Upon receiving the approval from each field study participant, a package was mailed containing a letter of explanation, a copy of the open-ended questionnaire and a self-addressed envelope. Those who participated in the field study were asked to return the package in the self-addressed return envelope, and acknowledge that their package had been mailed through an e-mail reply. Each participant was asked to initially complete the instrument, and then respond to some questions on the open-ended questionnaire. The responses provided by the field study participants were utilized to refine the instrument by identifying any questions that needed to be clarified or revised due to ambiguity, inadequacy, or misinterpretation. The majority of the responses pertained to the use of specific vocabulary, question formatting, and a need to include a definition of phonological awareness in the instructions. After the field test and revisions were completed, a refined open-ended questionnaire was mailed to all of the primary students' teachers within the target school in Oshana. Each of the open-ended questionnaire envelopes included a cover letter, instructions and instrument items, a self-addressed and postage-paid return envelope, and a package of sticker. Each of the open-ended questionnaires mailed was coded with a letter and number code (letter representing a particular school and number representing a particular teacher). Confidentiality and anonymity were guaranteed based on the type of study being conducted and the method of coding. Responding to the mail-in questionnaire was on a voluntary basis; therefore, as data was collected it remained nonthreatening and eliminated interviewer bias. The response period for returning the instruments was 2 weeks. Although specific teachers could not be identified, the coding assisted in indicating the number of teachers who had, or had not returned

their questionnaire. After 2 weeks, a reminder postcard was sent to all of the teachers at the schools that had not returned their questionnaires.

A reminder note was e-mailed to all of the teachers after a 3-week period and after 4 weeks; a phone call was given to each of the schools, which had answers that were not returned. The perceived potential limitations of the study included a low return rate or the possibility of a misinterpretation of the meaning of the questions asked. It was the intent of the researcher to decrease or eliminate these limitations by completing the following: (a) in regard to the low return rate and to maximize the response rates, a follow-up postcard was sent to the participants after a 2-week period; an additional e-mail was sent after a 3-week period; a follow-up phone call to each school was conducted; and a package of stickers was included in the survey mailing as an incentive to respond promptly; (b) in regard to the misinterpretation issue, it was the intent of the researcher to clarify misconceptions through the field test researcher reviewed and used the data attained through the results of the instruments to answer the guiding questions associated with the research questions. With a profile of current data, a greater awareness has been attained in regard to the establishment of the strategies that can be deployed by Junior primary teachers to integrate ICT in teaching and learning of phonemes in English.

With regards to interviews, an appointment was made with the regional office and school authorities to seek permission and to contact face-to-face interviews with teachers which involved open-ended responses for the respondents to be able to express their opinions freely on ICT integration strategies in teaching and learning. An interview guide was used to collect data whereby the teachers were interviewed on individual basis. The information gathered was recorded by using a audio-recorder. Data were grouped into themes such as; strategies to be employed by teachers to integrate ICT in the teaching and learning of phonemes in English at the junior primary

level in Oshana Region, challenges experienced by teachers in integrating ICT in the teaching of phonemes in English, and what can the teachers do to improve the integration of ICT in the teaching of phonemes in English. In addition to that each theme had sub-themes to addressing each theme, such as; use of You-tube, PC, Cell phones, Lack of technical support, In-service training and computer usage and many others that were aligned to answer the reaserch questions of the study. The topics were then clustered together into baskets that could be labeled as 'major topics', 'unique topics' and 'left-overs' in order to identify broad ideas and organise content based on the available topic, this is a way to keep similar things together and make it easier for the researcher to find related information pertaining ICT integration strategies used by the junior primary teachers in the teaching of phonemes in Oshana region.

3.8 Data Analysis Procedure

Data analysis mostly involved three major steps, i.e. cleaning and organizing of the data, describing the data and research questions, or hypotheses testing and modelling (Cohen, Manion & Morrison, 2012). In this research, all steps were used but more emphasis was given on research questions for the study (Gay, Mills & Airaian, 2009). The researcher linked analyses of the data to specific research questions. Data were grouped into themes that were aligned to answer the research questions of the study (McMillan & Schumacher, 2010). The themes in the research study are the reseach questions and the sub-theme are the answers to the research questions. The pilot study data collected through the relevant questions was analysed by the researcher through a thematice approach similar to the interview data, e. i. developing specific themes that were aligned to answer the open-ended research questions. However, other general information was listed in table format to present background information on the participants.

Kgabi (2012) defines data analysis as a search for pattern in recurrent behaviours, objects of a body of knowledge, while Marshall (2013) defines data analysis as the process of bringing order, structure, and interpretation to the mass of data collected. The audio-recorded data collected from interviews was analysed by developing themes that were aligned to answer the research questions. Thereafter, the researcher transcribed the data and then followed the eight steps for data analysis as proposed by Tesch (Creswell, 2014). The researcher categorised similar or related answers or information and put them into themes and categories. This enabled the researcher to respond to the research questions. Data collected from the interviews and open-ended questionnaires were presented and analysed. A description of collected data was used to make appropriate conclusions and interpretations and to find the basis of arguments. The data collected were presented and analysed by using thematic analysis.

This entails the following: The researcher got a sense of the study by reading all the transcripts carefully, jotting down along the margin some ideas as they came to mind in connection with each topic. Choosing the transcript on top of the pile of the transcribed interviews, the researcher read through the transcript, asking herself what it is that she is reading. This step involved thinking about the underlying meaning, rather than the "substance" of information. This process was repeated manually until a list of all the topics was acquired. The topics were then clustered together into baskets that could be labeled as "major topics", "unique topics" and "left-overs". This was done to encourage a better understanding of big ideas and new knowledge pertaing the study. With the list at hand, the data was revisited. An abbreviation for each of the topics was made in the form of codes and the codes were written next to the appropriate segments of the texts. This preliminary organizing scheme was used to see if new categories and codes emerged.

The researcher found the most descriptive wording for the topics and turned them into categories. Efforts were made to reduce the total list of categories by grouping topics that related to one another. Lines were drawn between categories to show interrelationships. The researcher then made a final decision on the abbreviation for each category and alphabetizes the codes (Hodgson et al., 2018). Pedagogical and Content Knowledge developed by Mishra & Jaisankar (2006) was used to group the different ICT strategies used by junior primary school teachers in teaching English phonemes that were incorporated in answering research questions.

3.9 Ethical Considerations

Ethical issues were applied at all stages of the research from planning, data collection, evaluation, and reporting of the research findings. The researcher applied for permission from the various relevant authorities such as the Permanent Secretary of the Ministry of Education, Arts and Culture (MOEAC), Student Clearance Certificate (Appendix A), Student's Research Permission letter from the University of Namibia to conduct Research (Appendix B), Oshana Regional Directorate of Education (Appendix E) and the respective school authorities where this study was conducted. The four basic ethical principles are autonomy, beneficence, non-maleficence, and justice. Some of the facets of ethical researching which the researcher applied are as follows:

3.9.1 Informed consent

Written consent was sought from all participants after the researcher has explained the purpose of the study prior to participation. The informed consent form to be used by the researcher in the study has been attached as Appendix B.

3.9.2 Confidentiality

The researcher observed privacy and confidentiality at all times by protecting the identity of all the participants. Raw data was filed and kept safe where access to it was restricted. Interview proceedings did not contain the names of the participants.

3.9.3 Non-maleficence

Ethics refers to the part of human philosophy concerned with appropriate conduct and virtuous living (Creswell, 2014). Ethics involves the entire research process from the nature of the problem under investigation, reporting the theoretical framework underpinning the study, the research context, and data collection instruments and methods being utilized. The research participants involved and the procedures used to analyze the data (Creswell, 2014). The researcher ensured that no harm would be placed on the participants because of the research. This should be ensured before, during, and after the research. Data was collected through an in-depth face-to-face interview, which was filed and kept safe, therefore; the researcher does not foresee any harm.

To uphold the principle of beneficence or "doing what is good", Blaikie (2014:12) suggested that the main aim of the researcher should be to produce results, which will be beneficial to the individuals and the entire society. Apart from that, consideration for the potential for harm among the participants was observed. The study involved human participants' therefore clear and careful elucidation of the risks and benefits of the study were made clear to the participants prior to the study. A clear measure of whether the risks involved would outweigh the benefits had been made. The researcher obtained a written approval clearance from the University of Namibia Ethical Clearance Committee.

The principle of respect for human dignity affirms the rights of students to self-determination and the right to decide on whether to participate in the study or not, after full disclosure of the aim and purpose of the study (Kinyanjui, Mwasa & Mbutu, 2014). Full disclosure in this respect means that prospective participants should be informed of the identity of the researcher, the purpose and nature of the study, the right to participate and the right to withdraw anytime they wish to without any penalty, the responsibility of the researcher and possible benefits of the study, measures to ensure privacy, anonymity, and confidentiality.

The principle of justice includes the participant's right to fair treatment and privacy (Somekh, 2008). This fair treatment should prevail before, during, and after their participation in the research study. Furthermore, participants were treated with respect and dignity and should always be free to ask the researcher for clarity on where they did not understand; and should they wish to withdraw from the study there should be non-prejudicial treatment.

A formal application to the University of Namibia Ethical Clearance Committee for clearance was made seven months before the study was undertaken. In making the application, a clear and detailed research proposal together with all the research instruments were submitted for ethical clearance. An informed consent form explaining the nature and purpose of the study was completed and enclosed in the application.

With regard to withdrawals, participants were told that they are free to withdraw from the study should they feel they do not want to continue participating in the study. The participants were then requested to sign consent forms before taking part in this study. Data was captured on a personal computer that was password protected. Pseudonyms were used for the research participants, they were assured of anonymity and confidentiality at all times.

3.9.4 Voluntary Participation

All participants in this study were voluntarily participating. No force, coercion, or bribery was used on participants to take part in the study. Those who refuse to take part in the study were not penalised in any way.

3.9.5 Permission to carry out the study

A formal request to carry out the study was made to the University of Namibia before data collection. The researcher only collected data after fully awarded permission to undertake this study from the University of Namibia was granted.

3.9.6 Validity and Reliability

In line with Creswell (2014), the validity of the research can be defined as the extent to which results are precise and grounded in data. Clear explanations of the purpose of the research were made and no changes were made to the original research questions after the research was completed. The collected data need to be acceptable and valid and so should be the tools employed to collect such data. In order to check the validity of the instruments used, the interview guide was submitted to the research supervisors for corrections and by so doing during the interview sessions, the researcher had to probe, to actively seek alternative explanations to what appeared to be the research results.

Buckingham (2016) explained that reliability denotes the extent to which research tools can be relied on to produce steady outcomes if employed repetitively over time on the same participant, or if employed by two different researchers. The questions were formulated in plain, clear language to avoid multiple interpretations of the question; participants were given time to answer the questions.

3.10 Summary

This chapter provided the research philosophy, research design, research methods or approaches, research instruments, population, samples, data collection and data analysis procedures which were used in the study.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter focuses on the presentation and discussion of the findings derived from the study. It focuses primarily on the presentation of data on the participants' biographical information, followed by a comprehensive discussion of the various themes such as; strategies to be employed by teachers to integrate ICT in the teaching and learning of phonemes in English at the junior primary level in Oshana Region, challenges experienced by teachers in integrating ICT in the teaching of phonemes in English, and what can the teachers do to improve the integration of ICT in the teaching of phonemes in English which emerged from the data of the study.

4.2 Demographic information of the teachers

The respondents were categorised as male and female teachers for the English Junior phase in Oshana Region. Fifteen teachers were selected (three schools had four teachers and one school had three teachers) from each of the four participating schools in Oshana Region comprising of eight male teachers and seven female English teachers. More female teachers at junior primary dominated some schools; therefore, at some schools, the gender balance was not achieved.

Both male and female teachers were qualified teachers, with different levels of qualifications ranging from Basic Education Teachers Diploma, Honour's Degree and Master's Degrees. This selection was done using the stratified purposeful sampling strategy. The figure below shows the biographical information of the teachers who took part in the study.

Table 4.1 Demographic details of teacher's gender, qualification, employment and Status

Participant	Gender	Educational level	Employment Status
1	Male	Master's Degree	English Teacher
2	Female	Honour's Degree	HOD
3	Male	Master's Degree	HOD
4	Female	Honour's Degree	English Teacher
5	Female	Honour's Degree	English Teacher
6	Male	Master's Degree	English Teacher
7	Male	honour's Degree	English Teacher
8	Female	honour's Degree	English Teacher
9	Female	Master's Degree	English Teacher
10	Male	honour's Degree	English Teacher
11	Male	BETD	English Teacher
12	Female	BETD	HOD
13	Male	Master's Degree	English Teacher
14	Male	honour's Degree	English Teacher
15	Female	BETD	HOD

4.3 Data collected and analysed from the interview and open-ended questionnaire

The data collected from the open-ended questionnaire and interview guide were analysed together since they were all qualitative in nature and designed to answer the questions of the study. The themes referred to are the research questions of the study while the sub-themes are the answers to the research questions.

Data presentation includes the description of the collected data into some form of explanation, understanding of the people and situations under study. The qualitative data collected from interview and open-ended research instruments are presented in themes with transcribed quotations of the respondents being included to support the findings. The themes and sub-themes that emerged from the collected, transcribed analysed data are tabulated in table 4.2.

4.4 Themes and sub-themes on ICT integration in the teaching of phonemes

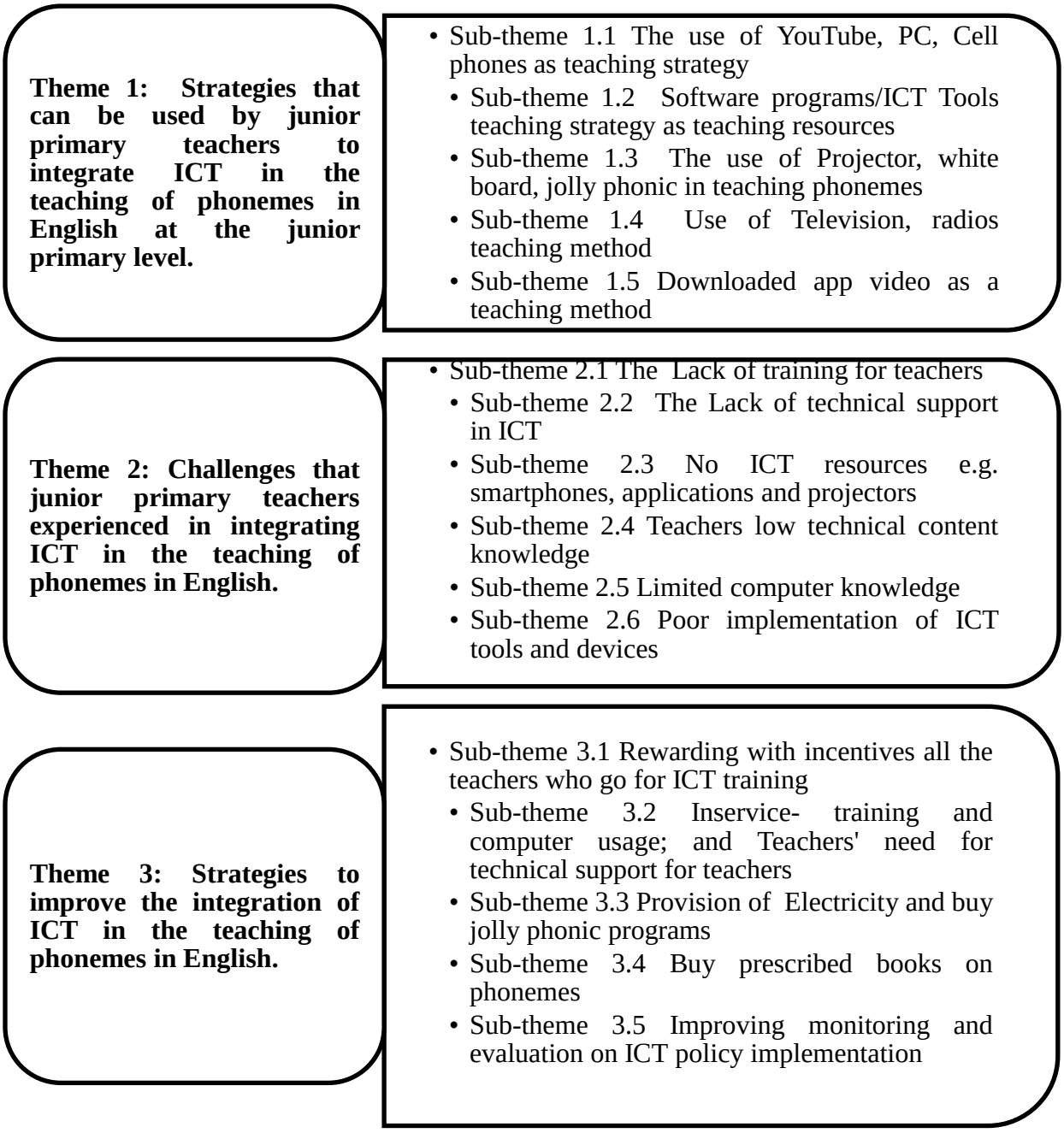


Figure 4.1: Themes (questions to the study) and sub-themes (answers to the question)

4.5 Theme 1 Strategies to integrate ICT in the teaching

Theme 1 shows the strategies that can be used by junior primary teachers to integrate ICT in the teaching of phonemes in English at the junior primary level in the Oshana Region. These

participants in the study indicated diverse varieties of ICT gadgets, which they made use of in their teaching of English phonemes in schools. On this aspect, this is what the study participants had to say. Only 2 out of 15 participants indicated the use of Rhyme generation, multi-sensory mapping strategy, picture snaps, sound sorts, treasure chest etc, but seems to have little knowledge about it. This gives evidence that teachers are aware of the integration of ICT in their teaching of phonemes.

On this issue, participant 3 had this to say, "*I am making use of videos and television sets and video recorders to teach English phonemes at my school".* This was echoed by participants 10 who also stated that "*I make use of radios and YouTube videos to teach phonemes since these are effective in allowing the learners to see and listen"*.

The use of videos and television sets and video recorder enhances the teaching and learning process as learners learn better by seeing and imitating what they see on the videos and television (Nomura, Matsuno, Muranaka & Tomita, 2019). This finding shows that both teachers made use of videos and television set to teach. Participant 3, 10 and 12 also supported the use of Television. The participants revealed that the use of Television is more widely used at the school as they usually gather the learners and learn the sounds together since they only have one television set for the entire school. This proves that the teachers can show their learners these videos in their classes during the teaching and learning.

4.5.1 Sub-theme 1.1 The use of YouTube, PC, Cell phones as teaching strategy

The participants in the study indicate that some of the most common ICT tools they use in the teaching of phonemes are YouTube videos, PCs and mobile phones. On this issue, participant 5 had this to say, *I make use of downloaded YouTube videos to teach my learners English phonemes and these have proved to be very effective ICT tools in the teaching of English.* Participant 12 also

said that *I make use of my mobile phone in the classroom to teach phonemes and this has proved to be very helpful.* Another participant, Participant 14 stated, *I make use of a personal computer to teach phonemes to lower grade.*

The use of YouTube video, PC and cell phones as stated by participant 5, 12, 13, participants have revealed that they make use of cell phones in the class. The use of cell phones to download videos and make use of them in the class is supported by three participants. This shows that teachers are making use of their PCs and cell phones for the teaching and learning process to be effective. This shows that the use of YouTube, PC, and Cell phones can be one of the strategies that can be used by the teachers to integrate ICT in the teaching of phonemes. This finding was supported by Odera (2011) who claimed that the communication in ICT is often carried out using mobile phones that offer voice, text, and other communications services that the internet may support. These findings revealed that it can be used as a strategy to integrate ICT in the teaching and learning of phonemes in English. This finding had proved that phones and videos could be used during the lesson as a teaching tool to enhance teaching and learning.

4.5.2 Sub-theme 1.2 Software programs/ICT tools strategy as teaching resources

On the buying of software program to teach English, this is what participant 1 had to say, *I make use of Aerobics various prices, which is a program, used to help learners to improve their auditory processing skills issues and videos letter sound coordination, and which letter makes what sound.* On this issue, this is what participant 6 had to say, *I make use of happy phonics software to teach learners how to pronounce letters and this software can be downloaded on a mobile phone.*

The participant had indicated that they made use of the fundraising money to purchase the jolly phonic programs they had been using in the school for the past few years and the school had seen great performance since they had acquired the program. The participant had revealed that they had other programs in place that they also use to teach spellings and it works hand in hand with teaching letter sounds. This shows that if teachers are provided with software programs they can use the program in their class teaching aids produce good results by integrating ICT in the teaching of phonemes. Without the necessary support the teachers will not teach with pride and enthusiasm. Nyathi (2010) stresses that a supportive working environment makes the teacher to go an extra mile in their teaching. A supportive working environment in regard to ICT is the one that is interactive, flexible and convenience. ICT has become the order of the day and opens up opportunities for learning because it enables learners to access, extend, transform, and share ideas and information in multi-modal communication styles and format.

4.5.3 Sub-theme 1.3 The use of projector, whiteboard, jolly phonic in teaching phonemes

Some participate have revealed that there are many advantages of using projectors ranging from producing much larger images and customizing image size is quick and easy among others. The study has also revealed that interactive whiteboard encourages learner's engagement, make the learning process more enjoyable, accommodates different learning styles and reduces classroom costs. On the use of jolly phonics, the study revealed that the program improves cognitive development, improves confidence and self – esteem, Enhanced emotional and social skills and improved oral communication and motor skills.

On this matter, this is what–participant 7 had to say, *I make use of the projectors and whiteboards and jolly phonic to teach my learners the English phonemes.* This was supported by participant 11 who said, "*The use of ICT gadget like jolly phonics makes*

learners understand phonemes better than when other methods are used, and this method allows learners to imitate letter sound, and learner formation and letter segmentation".

Participant 7 and 11 had presented another way of teaching phoneme to their junior primary learners. Participant 7 had stated that the jolly phonic program can be taught to the learners through five skills and these are learning the letter sounds, letter formation, and blending, identifying letters in words and learning tricky or difficult words. Participant 11 also support the jolly phonic program, stated that the program allowed learners to imitate the sounds. All these findings had outlined strategies that could be used to teach phonemes. This shows that it is very vital for the school and all stakeholders to support teachers in purchasing the jolly phonic program. Without the program or the knowledge on how to operate the program, it means that the integration of ICT is not effectively implemented but with the program in place, it can be used in class connect to the TV so that the learners can watch the letters and their sounds.

4.5.4 Sub-theme 1.4 the use of television, radios teaching method

On this issue, this is what teacher 14 in the study had to say, "*I make use of radios and televisions which makes the teaching of English phonemes easier and more interesting for the learners".* On the same note, participant 2 said *"I make use of radios and that makes the teaching of phonemes more meaningful to my learners and this enhances greater understanding of the phonemes. At our school, we make use of televisions in the teaching of phonemes, learners enjoy watching the development of phonetic language and using the television, learning is made more meaningful and exciting to the learners. (Participant 13)*

The above findings indicated that Television and radios could be used to teach phonemes, participant 2 had stated that radios enhanced learning and greater understanding of

phonemes. The above explanation has clearly showed that radios and television had the advantage of delivering timely messages and stimulates learning as learners enjoy watching television. This finding revealed that if teachers are provided with the necessary tools, they can teach successfully.

Schools that are led by transformational leaders have the potential to grow as they attract the best teachers who will also give their input in the development of the school (Riesen, McDonnell, Johnson, Polychronics & Jameson, 2012). This means that schools that avail Televisions and Radios to their teachers these proves that they produce good results and ensure that ICT is integrated in the teaching of phonemes successfully. Varieties of program can be shown to the learners in class.

4.5.5 Sub-theme 1.5 Downloaded app videos as a teaching method

On this issue, this is what participant 1 had to say, "*I make use of application videos and that make my teaching of English phonemes more enriching and rewarding to the learners".* On this issue, this is what participant 8 had to say*, "I normally use my cell phone to download some application videos and I use these to teach my learners how to develop phonetic understanding".*

On the downloading of app videos, the study revealed that these applications were computer or mobile based depending on what is available to the teacher. The researcher found out that the teachers use their cell phones and data to download the apps to teach phonemes because of lack of ICT facilities in the school. Even though these teachers would not explicitly say which strategy was the best, to the researcher it showed that these teachers had a taste of variety of strategies that they make use of either downloaded applications or

other strategies to make their teaching and learning conducive and effective. However, the use of smartphones to teach phonemes is only successful if the teachers have access to a smartphone and have expertise in using this type of teaching platform. Some participants revealed that they are using downloaded app to show the learners in their classes.

This shows that downloaded videos are an added advantage as one of the strategy that can be used in the teaching of phonemes. According to Ahmad et al., (2012) teachers could get motivated when their needs are met and this gives them the desire to work even harder. This means that if the school have internet connections they will be able to download videos to use in the teaching of phonemes in their lessons.

4.6 Theme 2 Challenges of integrating ICT in the teaching

Research findings obtained from this study indicated that the majority of participants face challenges in integrating ICT in the teaching of phonemes in English at junior primary face. Some participants revealed that ICT naturally brings children together where they can talk and discuss. Some participate have revealed that effective use of ICT in education demands skills such as explaining and justifying the use of ICT in producing solutions to problem. Studying the obstacles to the use of ICT in educational institution may assist educators to overcome these barriers and become successful technology adopters in the future. Theme 2 shows the challenges that Oshana junior primary teachers experience in Integrating ICT in the teaching of phonemes in English. The participants in the study indicated that they face numerous challenges in their ICT implementation processes in the teaching or English phonemes in Oshana Region junior primary grades. Research findings obtained from this study indicated that there are barriers to the integration of ICT in the teaching of phonemes ranging from Lack of training, Lack of technical

support, No ICT resources, Teachers low content knowledge, Limited computer knowledge and poor implementation of ICT tools and devices.

4.6.1 Sub-theme 2.1 Lack of training for teachers

Research findings obtained from this study indicated that the majority of participants who are utilizing ICT devices and software for teaching English phonemes are swamped with a lack of effective training. Some participate revealed that they get help or share video from other teachers. Some of the participants stated that the improper use of ICT devices in the teaching of English phonemes at lower primary levels is aggravated and emanated from the incompetence of teachers and as a result of this, most of the teachers are not able to efficiently deliver their lesson using ICT teaching devices. This in turn has a negative repercussion on learners understanding of the various English phonemes at lower primary levels.

Participate 5 stated that *"The moment we were trained at colleges and universities we were never taught how to use ICT devices in teaching learners in school that is why we are confronting various challenges in the use of ICT devices in the teaching of English phonemes". Though there is, an issue of training, participant 5 had stated that they make use of their cell phones instead of others tools because it is manageable and it only requires data to download the video. The participant further explained that once the video is downloaded, it is kept for future use.*

This was well supported by participant 11 who indicated that, given this situation, lack of technical know-how among teachers in using the devices rendered the majority of learners in poor performance in English comprehension and in other subjects which rely on English as the medium of instruction in schools, where English is the backbone. Participant 5 had

complained about a lack of training to integrate ICT in teaching phonemes in English second language, stated that they were not given proper training at the tertiary level. Based on this finding I found out that some schools have computer laboratories that are not fully utilized. Participant 5 and participant 11 have the same feelings on the integration of ICT in teaching phonemes. The participants were aware of the benefits of integration of ICT in teaching phonemes but they felt they did not receive the necessary support to facilitate the process. This is supported by Becker (2009) who found that teachers who feel demotivated do not perform. This means that if there is no proper training for teachers on how to integrate ICT in the teaching of phonemes in English second language. This means that motivated trained teachers could improve their teaching methods in their classes.

4.6.2 Sub-theme 2.2 Lack of technical support in ICT

Participant 1 said this, "*poor technical service maintenance of ICT tool and software results in poor teaching of English phonemes because of habitually technical faults of internet website connect and this forced to be not competent to conduct the lessons on phonemes".* Another participant in the study (Participant 8) also indicated that "*We do not have technical support that we need from the ICT technicians in the school and this makes it hard for us to utilize ICT in the teaching of English phonemes".* In line with this subtheme, participants 13 in the study had this to say, *"We need the circuit to work with the schools in the implementation of ICT in teaching and learning of English phonemes at lower primary levels".* Teacher 4 had this to say, *"Our circuit needs to support us in the use of ICT in the teaching of English phonemes".*

On this issue, this is what Teacher 2 had to say, *"The solution to enhance the integration of ICT tools and devices in teaching and learning process is to provide teachers with*

specific subject software and upload them onto the computers at school so as equip teachers with ICT technical support". This is further supported by teacher 8 who stated that *'We need technical support from the schools' management so that they install the relevant ICT gadgets and provide the relevant ICT software's which can be used by teachers in the teaching and learning of English phonemes".*

Participant 1 and 8 were very much concerned about poor technical support service maintenance of ICT tools and software, which they felt resulted in poor teaching of English phonemes. Based on that, the study found out we still have schools in town that do not have Wi-Fi at school and some have computers that are not used just collecting dust. At some schools, the IT support teachers were also serving as Life skills teacher putting a huge burden on this particular teacher. Participant 8 relied very much on using another teacher's PC to teach phonemes as their school did not purchase the jolly phonic program that they had requested to be purchased to enhance their teaching and learning when it comes to phonemes. According to Graaf et al., (2009) proper use of ICT tools and proper support enhance productivity. This revealed that the teaching methods could be magnified and made easier to conduct the lesson.

With regard to these challenges, this is what (participant) 15 had to say, *I do not have the relevant ICT skills to teach phonemes in my classrooms and this makes me to rather resort to other non-technological methods.* Another participant in the study was participant 13 who also said, "*We do not have the relevant ICT resources to use in the teaching of phonemes using ICT".* Participant 3 also indicated, "*I have low content ICT knowledge and this makes me not to even try using ICT in teaching phonemes in my classes".* Participant 6 alluded to the challenges faced by stating that, "*my knowledge levels and content*

*knowledge in teaching phonemes using ICT is very limited and I would rather resort to conventional methods than embarr*assing myself in front of the *learners*".

Based on the above finding, participant 3 was not confident about the integration of ICT in the teaching of phonemes in English second Language in the Oshana Region. In line with that participant, seven and nine had the same feeling about the integration process. Participant seven seek help from other teachers to orientate before the lesson presentation. Participant 3, 9 and 6 had complained about limited knowledge on integrating ICT in their teaching phonemes. The three participants had indicated that challenges vary from school to school, resources, proper training on the available gadgets and willingness to learn. The participants had indicated that workshops are usually held at the circuit level but the time is not sufficient. Though the participants felt that they have limited ICT knowledge, they could all download videos and their school had computer laboratories.

4.6.3 Sub-theme 2.3 No ICT resources e.g. smartphones, applications and projectors

Some of the teachers who were interviewed under unstructured interviews in this study had to say, *"The number of computers which we have at school is not enough to accommodate all learners in conducting their researche and some of the ICT devices are not in good working condition since they are not maintained properly and regularly". Participant 11.* From this standpoint, Participant 14 had this to say*, "The inaccessibility of ICT resources in our school affects teachers in teaching phonemes to the learners at lower grades and this later culminates in poor performances of students in class and also at the national examination".*

Based on the response by participant 11 and 14, resources are not sufficient at schools to successfully integrate ICT in the teaching of phonemes. For instance, at some schools,

teachers share computers. It, however, does not mean every teacher or learner must have a personal computer for this to be effective but there need to be sufficient computers that will allow for teaching at an efficient rate. These findings make one to conclude that teachers use and/or favour either whatever ICT tool they are comfortable with or the available approach that seems to work in the specific setting they find themselves. Graaff & Kolmos (2009) confirmed that teachers who are teaching in the remote rural schools need meaningful bush allowances which can retain in their places of work. This means that if the school is so far in the remote area the teachers need to be at schools that are electrified and where they are motivated. In addition to the lack of resources, there is also a lack of willingness and a bad attitude towards the use of ICT integration in the teaching of phoneme among some teachers in some schools at junior primary. Based on participant 11, the participant revealed that some computers were being misused and not well taken care of, resulting in damages that are costly which impacted badly on the teaching processes. Participant 14 also pointed out that, ‘’*If the learners did not master phonemes at junior primary this may have a negative effect on future performance in English as a second language and therefore the integration of ICT should be encouraged as it speeds up the learning process due to the fact that learners enjoy watching those videos.’’*

4.6.4 Sub-theme 2.4 Teachers’ low technical content knowledge

Participant 12 had this to say, *some schoolteachers are not confident in the utilisation of ICT devices in a classroom during the teaching of English phonemes*. The chief cause of this is lack of self-confidence, which prevents teachers from employing ICT tools when they are in front of the learners in classrooms. Participant 15 in the study had this to say, *it is difficult for us to integrate ICT devices and software because we do not possess the*

pedagogical implementation of it. Additionally, lack of self-confidence makes us incompetent to apply ICT devices in class when delivering a lesson. Participant 10 also had this to say, *the majority of teachers are not confident and competent in delivering a lesson using ICT devices and this, in turn, affects the teaching of English phonemes from the teacher to the learners.*

Based on participants 10 and 12. The study revealed that some teachers are not confident in integrating ICT in their teaching, especially the teaching of phonemes through ICT tools. Participant 10 had also stated that during workshops some teachers even when chosen do demonstrate a learned skill they were either shy or not confident to do so. With these findings, this means that much still needs to be done to equip the educators with the necessary knowledge and skills. Very few teachers however indicated that they have little confidence in integrating ICT in the teaching of phonemes. If teachers do not have the relevant experience and qualifications, they will not perform (Makado, 2012).

4.6.5 Sub-theme 2.5 Limited knowledge, No computer laboratory

Participant 10 in the study indicated that most of the teachers do not possess pedagogical methodology in the use of ICT and this impedes the teaching and learning especially the integration of ICT in the teaching of phonemes. This was supported by participant 4 who stated that some school teachers are not confident in the utilisation of ICT devices in a classroom though they still use ICT, such colleagues need to be empowered so they become experts that can assist others in the future. On this issue, Participant 11 highlighted that "*The chief cause of this is that we are not fully empowered to use ICT and we lack proper guidance, which prevents teachers from employing ICT tools when they are in front of the learners in classrooms*". Participant 9 in the study had this to say, "*It is difficult for us to*

integrate ICT devices and software because we do not possess the pedagogical implementation of it. Additionally, lack of ICT workshop makes us incompetent to apply ICT devices in class when delivering a lesson".

Participants 10 and 11 highlighted the need for teachers to have sufficient knowledge in using the ICT tools to enhance their teaching and learning, especially the teaching of phonemes. It is clear that the knowledge to use ICT develops, as one is being trained on how to use ICT tools. Without proper guidance, it becomes problematic for the teachers to utilize ICT devices in front of learners in the fear that some of the learners possess more knowledge and confidence pertaining to ICT compared to their teachers. Department of Education of the United Kingdom (2015) found out that, if teachers do not have relevant experiences, teaching tools and qualifications, they will not perform.

4.6.6 Sub-theme 2.6 Poor implementation of ICT tools and devices

Participant 7 said, *"Curriculum planning supported that there is indeed an issue of poor ICT implementation as this implementation is not monitored on a regularly which is another barricade, which causes teachers to be swamped in a myriad of problems in, makes use of ICT to enhance the teaching and learning process".* These sentiments were further supported by the findings of participant 13 who indicated, *"That there is a contradiction between policy and practice since the implementation of ICT is dwindling in dealing with the pre-requisite of learners with challenges with English phonemes".* On this same note, participant 2 had this to say, *"The education policy of ICT use in school is not a double-edged sword since it fails to take into consideration the fact that learner groupings are another challenge which teachers face in their desire to integrate ICT in their teaching of phonemes for English at lower primary grades".*

Participants 2, 7 and 13 talked about curriculum planning and integration and revealed that if teachers do not know how to integrate their ICT policies in their teaching, success in teaching will not take place in schools. The studies revealed that the teachers in schools are aware of the benefits of ICT integration in the teaching of phonemes; however, they just need to be empowered. Participant 7 and 8 suggested monitoring of ICT tools and team planning so that those teachers that are struggling can be helped by those that have better knowledge and understanding of ICT integration. According to Arnell (2012) appropriate training for teachers can help to retain them in their places of work and enhance productivity.

4.7 Theme 3 Strategies to improve the integration of ICT in the teaching of Phonemes in English.

Theme 3 shows how junior primary school teachers can improve the integration of ICT in the teaching of phonemes in English in the Oshana Region. The study participants highlighted the following strategies:

Participant 15 had this to say*, "There is a need for support from the ministry in ICT usage in the teaching and learning of phonemes in our circuit".* On the same issue, Participant 4 had this to say*, "The Ministry of Education need to work together with parents and other stakeholders in education in order to help teachers with the technical know-how in ICT usage in the teaching of phonemes".* Participant 1, who indicated, supporting teachers through in-service training, improving the monitoring and evaluation of ICT in schools would improve the teachers' utilisation of ICT in the teaching of phonemes, supported this ongoing debate. Participant 10 also stated, *"Strengthening the existing ICT policies for*

ICT in the teaching of phonemes in schools would mitigate on the challenges teachers are facing in their desire to utilize this teaching initiative".

Participants 5 and 6 had indicated that they enjoy watching the downloaded videos together with their learners and also reiterated that rewarding the teachers by giving incentives and providing free accommodation when giving workshops on ICT to those teachers who take a lead in advancing their ICT skills in schools would help to advance the teachers utilisation of ICT in the teaching of phonemes in school. Dang (2011) found that teachers also need proper teaching roles so that they are not left to teach subjects they are not trained for. Some teachers in remote rural areas are not adequately trained, insufficient recognition of career-long professional development, leadership in sport and cultural activities and services (Cox, 2019). Also, the study has revealed that there are several strategies in place that can be used to integrate ICT in the teaching of phonemes in English in the Oshana Region. These various strategies could be used to enhance the teaching and learning process especially the integration of ICT in the teaching of phonemes.

4.7.1 Sub-theme 3.1: Incentives for teachers' ICT training workshops

The study has revealed that the teachers are willing to attend workshops but there are conditions that hinder fully attendance of all workshops. Some teachers suggested that there is a need for travel allowances and accommodations. Some have recognised the changes of meals not provided during workshops like in the past years. Some voiced out to say rewards of any kind could motivate teachers to be more willing to attend workshops.

Participant 14 in this study had this to say*, "If the Ministry could reward those teachers who undergo ICT training this will make more teachers to pre-emptive in ICT the utilization of ICT in the teaching of phonemes and this will improve the learners*

understanding of phonemes at lower primary level". Participant 1 stated, *"The ministry needs to compensate those teachers who participate in ICT training initiatives, supported this sentiment".* On this issue, Participant 10 said*, "Teachers need to be given incentives for them to be interested to undergo ICT training initiatives so that they gain the technical know-how in teaching the lower primary school curriculum for English".*

Participants 14 and 1 felt that the Ministry of Education should reward the participants who attend workshops as this will encourage other teachers to also attend workshops on ICT. The participant will be inspired to not avoid workshops and this will enhance performance. According to Castro & Aleman (2009) teachers need their efforts to be recognised by the ministry and the school management. If teachers are not motivated they will not work with commitment, dedication and enthusiasm. It is worrisome that teachers are not assisted during workshops and they are left alone by the ministry to take care of their own meals and accommodations. One could conclude that most of the participants are in support of attending workshops, but they are facing challenges. Participants have raised their concerns about accommodation and meals abolishment making it difficult for them to attend all the workshops as it supposed to be the case.

4.7.2 Sub-theme 3.2 In-service-training and computer usage; Teachers need for technical support for teachers

Participant 1 had this to say, *"We need the circuit and the Ministry to work with the schools in the implementation of ICT in the teaching of English phonemes at lower primary level. On this issue", Participant 14 had this to say, "Our circuit needs to support us in the use of ICT in the teaching of English phonemes at lower primary grade levels".* Participant 1 and Participant 14 talked about collaboration between the circuit and the Ministry of Education Arts and Culture to work together and train teachers on how to use the computer

to integrate ICT in the teaching of phonemes. The study revealed that there needs to be a link between the Ministry and the school. These findings are supported by Monfared & Derakhshan (2015), in-service training helps teachers get the necessary information that helps them to take their responsibilities and help them achieve social and professional and academic skills. If the in-service training and teachers' needs are well addressed, one feels that these would develop skills and knowledge within the teachers so that they can perform their duties effectively and with respect to the standard of working field, by so doing this boosts up the efficiency and effectiveness of teachers.

4.7.3 Sub-theme 3.3 Provision Electricity and buy jolly phonic programs

To support this assertion, Participant 10 had this to say*, "Sustainable ICT integration and use in school can be feasible if the government put in place a solution which diminishes the recurrent occurrence of electrical power cuts".* Participant 15 also highlighted that *"Failure to take into consideration the issue of electrical power in schools is a stumbling block for teachers and learners to achieve ICT policy integration in teaching and learning".* Participant 11 also supported the same sentiment by saying that*, "The government should supply schools with electricity to prevent the disruption of internet system and utilisation of diverse ICT tools and devices. A continual supply of electricity is the remedy to achieve a sustainable ICT policy integration in schools".*

Participants 10 and 11 had spoken about the provision of electricity and the buying of the jolly phonic program in the school. Jolly Phonics is a systematic, sequential, phonics program designed to teach children to read and write. Jolly phonics teaches the letter sounds in an enjoyable, multisensory way, and enables children to use them to read and write (Nutall, 2010). The study revealed that most of the ICT gadgets are electrical powered

and cannot be used if there are no reliable sources of electricity. The study revealed that the provision of electricity could subsequently improve the implementation of ICT in the teaching of English phonemes in the Oshana Region.

These findings are supported by Nutall (2010) who stated that electricity not only plays a big role in our daily lives at home, but it is extremely important for all the things that go on in the world around us in our modern life, such as industry that we depend on, communication as in the form of radio, television, e-mail, Internet, etc. Majority of participants are in support of electricity and buying of the most wanted and useful jolly-phonic program. The study has revealed that only one school out of the four schools has bought the program. The program is said to be very useful but very expensive and this made teachers to turn their phones into teaching aids to assist the children learn better while looking for ways to raise funds in order to acquire the program. One can conclude that if all schools manage to buy the program than this is going to reduce failure and boost performances in English.

4.7.4 Sub-theme 3:4 Buy prescribed books on phonemes

On this issue, Participant 7 and 8 had this to say, *"The provision of computerized textbooks allows teachers and learners to have free accesses of information pertaining to their diverse subjects and these improve the academic performance of learners with special educational needs in an inclusive classroom".* Participant 6 also argued that *"The provision of computerized textbooks is the cure in the integration of ICT in teaching of English phonemes. These computerized textbooks can only utilize to resolve the problems of outdated sources of textbooks in schools".*

Participants 7 and 6 had revealed the importance of prescribed textbooks. The study has revealed that computerized textbooks enhanced the teaching and learning process of English phonemes through the access of resources. This finding was supported by Serhan (2009) who stated that a digital textbook or prescribed textbook allows for convenience in reading since it is downloadable, making the content available offline, and viewable across multiple electronic devices. Due to lack of prescribed textbooks one can say sometimes learners are not performing in schools due to lack of prescribed textbooks, but if textbook could be made available both to teachers and learners one strongly believe that this can impact teaching and learning positively. Both the teachers and learners can find this valuable because textbooks include suggestions such as using the textbook as a guide for students, supplementing the textbook with outside reading, and more.

4.7.5 Sub-theme 3.5 Improving monitoring and evaluation on ICT policy implementation

On this prevailing dialogue, this is what Participant 9 had this to say*, "There is lack of consistent monitoring and evaluation on ICT usage in the teaching of English phonemes".* Participant 15 stated, *"More monitoring and evaluation of the ICT innovation implementation need to be strengthened in our schools so that the ICT gadgets can be used for the right purpose".* Another participant who seconded this opinion was Participant 14 and 4 who stated*, "We need consistent monitoring and evaluation on what computers are being used for in schools because most of the schools are just keeping the computers on their desks and allow them to gather dust".*

Participants 9, 14 and 15 had revealed that there is a need to monitor the integration of ICT in the teaching of phonemes in English. Monitoring needs to be strengthened in schools so that evaluation is done on what computers are used for in our schools. These findings were supported by Nyambane & Nzuki (2014), who felt that monitoring and evaluation together

provide the necessary data to guide strategic planning, to design and implement programmes and projects, and re-allocate resources in better ways.

Even though there are a number of challenges that teachers faced in order to integrate ICT in the teaching of phonemes, the teachers had expressed their disappointment for being left alone to improvise when it comes to ICT integration in the teaching of phonemes at junior primary in schools in Oshana region. Some pointed out that computers were available but they could not operate them and sometimes they are not functioning. They suggested that the curriculum planners should protect teachers' image by making sure they train them before they effect changes in the curriculum.

4.8 Summary

This chapter presented the results of the study from the teacher's interviews and open-ended questionnaires. The findings from the selected teachers as participants were aligned to the questions of the study in order to seek answers.

CHAPTER FIVE

SUMMARY, CONCLUSION & RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusion, recommendations, observations and areas for further studies regarding the ICT integration strategies to be used by the junior primary teachers for teaching phonemes in the Oshana region. The study investigated the strategies used by junior primary teachers to integrate ICT in the teaching of phonemes in English at the junior primary level in the Oshana Region.

5.2 Summary

The study investigated the ICT integration strategies that can be used by junior primary teachers in teaching phonemes in English in Oshana region with reference to the following issues; strategies to be employed by teachers to integrate ICT in the teaching and learning of phonemes in English at the junior primary level in Oshana Region, challenges experienced by teachers in integrating ICT in the teaching of phonemes in English, and what can the teachers do to improve the integration of ICT in the teaching of phonemes in English. The study was triggered by the need to investigate if ICT integration is effectively and efficiently implemented by the junior primary teachers in teaching phonemes in the Oshana region in line with the country's Vision 2030.

The study concentrated on the four sampled schools in Oshana region, were only 15 teachers from the four sampled school participated. The researcher used in depth face-to-face interviews and open ended questionnaire as a strategy to collect qualitative data. The researcher was interested in individual's view of the junior primary school English teachers and therefore a qualitative

approach was necessary to collect data. The data collected was analysed by developing themes that were aligned with research questions.

Some major findings showed that teachers working conditions pertaining to ICT use in the teaching and learning need improvement, ICT use is low in some schools due to a lack of professional development courses, support and ICT related resources, and more ICT resources need to be deployed to schools to help mitigate this problem. Further, the study suggested better ways to improve the ICT integration strategies for teaching English phonemes such as conducting teacher's training or workshop on the use of digital tools in education sector for the benefit of all teachers.

The following findings were based on the research questions of the study.

5.2.1 Question 1: What strategies can be employed by the junior primary teachers to indicate ICT in the teaching and learning of phonemes in English at the junior primary level in Oshana Region?

Findings of the study indicated that the teachers have a strong desire to integrate ICT into their teaching and learning process even though with difficulties. To add to that the English teachers in Oshana Region acknowledged the role played by ICT in the teaching of phonemes and that they are making use of televisions, jolly-phonic programs, smartphones, PC and radios in their teaching of English phonemes. The jolly-phonic program tool is said to be very expensive but very useful strategic tool in teaching phonemes. Only one out of the four sampled school has managed to buy the jolly-phonic program, the rest are in the process to raise funds in order to purchase the program.

5.2.2 Question 2: What challenges do Oshana junior primary teachers experience in the teaching of phonemes in English?

The findings of the study further showed that teachers need incentives in their attendance of ICT training workshops and that the ministry in collaboration with the regional offices via circuit office needs more regular ICT training through the provision of ICT resources. It was discovered that there is lack of training, lack of technical support, less ICT resources e.g. smartphones, projectors and other applications. Another challenge is low content knowledge, limited computer knowledge and poor implementation of ICT tools and devices.

5.2.3 Question 3: What can junior primary teachers do to improve the integration of ICT in the teaching of phonemes in English in Oshana Region?

Based on the study, the findings indicated that average level of the perceptions in implementing ICT tools in teaching and learning among school teachers is very high though teachers' faces high level of challenges of using ICT tools in teaching and learning in the classroom. With regards to the improvement of teaching phonemes in English teachers need support from the Ministry through central government by providing more ICT resources to schools.

5.3 Conclusions

Taking into account the above findings, the researcher had the following conclusions to make based on the study that investigated the strategies to be used by junior primary teachers to integrate ICT in the teaching of phonemes in English at primarily level in the Oshana region; A qualitative methodology using a phenomenological research design was used to collect data from the junior primary teachers. The study made use of an in-depth face-to-face interview and open-ended questionnaires. Also, a qualitative method was used to collect data using interview and

questionnaire research instruments for the same teachers that were interviewed from the junior primary level teachers in Oshana region.

The findings of the study indicated that the English teacher's in the Oshana region acknowledges the role played by ICT in the teaching of phonemes and that they are making use of television, jolly-phonic programs, smartphones, PC and radios in their teaching of English phonemes. The findings further showed that teachers need incentives in their attendance of ICT training and that the Ministry in collaboration with the regional offices via circuit office needs more regular ICT training through the provision of ICT resources. Based on the study, the findings also indicate the average level of the perceptions in implementing ICT tools in teaching and learning in the classroom among school teachers, high level of challenges of using ICT tools in teaching and learning in the classroom among school teachers and recognizing the effectiveness of the extent of ICT tools in supporting teaching and learning in the classroom.

5.4 Recommendations

Therefore, the researcher provided the following recommendations which are based on the research findings of the study:

1. Regional officers should be at the forefront of making sure that Oshana Regional schools are served with basic requirements in terms of ICT logistics and equipment.
2. Schools should participate with each other in sharing the resources they have, especially at the school level and circuit level where they needed more clarity on training, ICT demonstrating program for teaching English phonemes.
3. ICT service and maintenances of school computers should be regularly addressed as a critical and urgent need that will uplift all the key areas.

4. Provision of incentives for teachers in schools on ICT training should be availed so that more teachers can become proactive in ICT implementation in administration. Most of the participants have revealed that when training is offered at the regional level, sometimes they do not have money to travel, as accommodation is no longer provided like in the past. (Some had stated in the past, lunch and dinner as well as accommodation was usually provided, but these are now outdated). Most of the participants were aware of the benefits of ICT integration and its benefits in teaching phonemes at the junior primary level.
5. School management needs to improve their monitoring and evaluation of the existing policies of ICT implementation in schools and improve in areas that need to be improved i.e. make use of available funds to buy the ICT Tools, raise fund if there is no money so that they can buy the jolly phonic program. On the issue of the jolly phonic which is a program in demand to teach phonemes only 1 out of the four schools in town have managed to acquire the program. The participants had revealed that the program is necessary to have in the school but it is expensive, therefore, stakeholders need to make contributions for more assistance.

5.5 Further research

The researcher recommends further studies to be conducted in the following two crucial areas:

1. This study was conducted in Oshana Region at junior primary schools only. More studies need to be undertaken in other circuits or regions so that these findings can be compared.
2. Another in-depth study on whether secondary schools and senior primary school teachers are trained and exposed to make use of ICT in their teaching of English in the same region in order to find out the effectiveness or impact of ICT use in the classroom.

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APPENDIX A: STUDENT CLEARANCE CERTIFICATE

UNAM
UNIVERSITY OF NAMIBIA

ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: FOE/532/2019 **Date: 22 November, 2019**

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: An Investigation Into The Challenges Of Information Communication Technology (Ict) Integration Strategies Used By Junior Primary Teachers For Teaching English Phonemes In Oshana Region

Researcher: RENATHE A IIYAMBO

Student Number: 9986189

Supervisor(s): *Dr. R.J. Kamerika (Main) Dr. Collins Kazoulo (Co)*

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.

Dr. E. de Villiers: HREC Chairperson

Ms. P. Claassen: HREC Secretary

APPENDIX B: STUDENT'S PERMISSION FROM THE UNIVERSITY OF NAMIBIA TO CONDUCT RESEARCH

CENTRE FOR POSTGRADUATE STUDIES

University of Namibia, Private Bag 13301, Windhoek, Namibia
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UNAM

24 February 2020

RESEARCH PERMISSION LETTER

Student Name: **Renathe A. Iiyambo**
Student number: **9986189**
Programme: **Master of Education (Literacy & Learning)**

Approved research title: An investigation into the challenges of Information Communication Technology (ICT) integration strategies used by Junior Primary Teachers for teaching English Phonemes in Oshana Region.

TO WHOM IT MAY CONCERN

I hereby confirm that the above mentioned student is registered at the University of Namibia for the programme indicated. The proposed study met all the requirements as stipulated in the University guidelines and has been approved by the relevant committees.

Permission is hereby granted to carry out the research as described in the approved proposal.

Best Regards,

DR. SETH J. EISEB
ACTING DIRECTOR
CENTRE FOR POSTGRADUATE STUDIES
Tel: +264 61 2063414
E-mail: seiseb@unam.na

APPENDIX C: A. INTERVIEW GUIDE FOR TEACHERS

1. From your English teacher's point of view, what are the challenges that teachers experiences in the teaching of honemes in English second language classroom?
2. What strategies can be used by junior primary teachers in the integrating ICT in the teaching of phonemes.
3. How do you prefer to phonemes to your learners to your learners?
4. What methods do you have in place that make it easy for you and your learners in enhancing better teaching and understanding phonemes?
5. How important are phonemes in language acquisition to the junior primary learners?
6. Which teaching approaches do you apply to teach phonemes to your learners? Eraborate on your answers.
7. How do phonemes affect learner's four language skills?
8. What do you think can be done so that the integration of ICT in the teaching of phonemes in English second Language can be made easier and available to all teachers in English second language in the region.
9. How do you take this idea that four Language skills are made easier by the teaching of phonemes in English second language? Elaborate your answer.
10. What are the possible recommendation can you propose that may serve as a solution to solving problems of teaching phonemes in the English second language class.

APPENDIX C: B Questionnaires for teachers

APPENDIX B: QUESTIONNAIRES FOR TEACHER

AN INVESTIGATION INTO THE INFORMATION COMMUNICATION TECHNOLOGY (ICT) INTEGRATION STRATEGIES USED BY LOWER PRIMARY TEACHERS FOR THE TEACHING ENGLISH PHONEMES IN OSHANA REGION

I, Renathe A Iiyambo, a Master student at the University of Namibia, is conducting a research on the above mentioned topic.

You have been selected to participate in this study. Please try to answer the questions with utmost sincerity because the quality of your responses will indeed determine the quality of this research. Participation is entirely voluntary and the information gathered will only be used for the purpose of this study. This research is conducted for the academic purposes and all the information will be kept confidential. It should take approximately 20 minutes to complete the questionnaire. Your support is highly appreciated.

General Instructions

1. Please answer each question by ticking or filling in the spaces provided
2. Kindly explain where explanation is needed.

Section A: BACKGROUND INFORMATION

1. Sex Male ..... Female.....
2. Age Range 18-22 ..... 23-27..... 28-40 ..... 40.....
3. Teaching Experience 1-5.... .5-10..... 10-25..... 25 and above.....
4. Teaching qualification BETD..... HONORS.....Master's degree & above.....

QUESTIONNAIRES FOR THE TEACHERS : ANSWER IN THE SPACES PROVIDED

1. How often do you use ICT in your lesson when teaching phonemes?

---

2. What type of ICT tools are in place that you use in your classroom during the teaching of phonemes?

---

3. Which specific ICT tools are effective to you and how well do you use them?

4.How do you view the level of ICT tools used in the teaching of phonemes?

---

5. How important is ICT intergration in the teaching of phonemes and what can be done so that it is benefiting both teachers and learners?

---

6. How effective is phonemes whe it comes to Language acquisitio and language development?

---

7. What challenges do junior primary teachers experience in the integration of ICT in the teaching of phonemes in English in Oshana Region?

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8. What methods can lower primary teachers use to improve the integration of ICT in the teaching of phonemes in English in Oshana Region?

The End

Thank you for your time to fill in the questionnaire

APPENDIX D: LETTER OF APPROVAL FROM OSHANA DIRECTORATE 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 Fax: 065 229833
Enquiries: Gerhard S. Ndafenongo
E-mail: ndafenongos@gmail.com
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Ms Renathe A Iiyambo
P.O. Box 11398
OSHAKATI
0814470002

Dear Ms Iiyambo

RE: PERMISSION TO CONDUCT AN ACADEMIC RESEARCH AT FOUR PRIMARY SCHOOLS IN OSHANA REGION, REPUBLIC OF NAMIBIA

1. With reference to the caption in the subject line, your letter dated 22.01.2020 is hereby acknowledged;
2. Kindly be informed that permission is hereby granted to conduct the study entitled: **"Investigation into the Information Communication Technology (ICT) integration strategies used by junior primary teachers for teaching English phonemes in Oshana Region"**. The selected sites are Oshakati West Primary School, Oshakati Primary School, Ongwediva Control Combined School and Charles Anderson Combined School. You are hereby requested to represent this letter of approval to the principal of a selected school to demonstrate that the research is legitimate, authorized and procedures are adhered to.
3. This permission is subject to the following strict conditions; (i) There should be minimal or no interruption on normal teaching and learning, during a class or scheduled afternoon session, (ii) Ethical issues of confidentiality and anonymity should be respected and retained throughout this activity i.e. voluntary participation, and consent from participants, and (iii) the permission is valid for the academic year 2020.
4. Both parties should understand that this permission could be revoked without explanation at any time.
5. 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.
6. I wish you the best in conducting your study.

Yours Sincerely
20/01/2020
HILENI M. AMUKANA
REGIONAL DIRECTOR

OSHANA REGIONAL COUNCIL
DIRECTORATE OF EDUCATION, ARTS & CULTURE
OFFICE OF THE DIRECTOR
30 JAN 2020
Private Bag 5518
OSHAKATI
REPUBLIC OF NAMIBIA

All correspondence should be addressed to the Chief Regional Officer

APPENDIX E: PERMISSION LETTER TO THE DIRECTOR OF EDUCATION OSHANA REGION TO CONDUCT RESEARCH

P. O. Box 11398
Oshakati
Contact no: +264 81 447 0002
Email: riiyambo22@gmail.com
22 January 2020

Oshana Regional Council
Directorate of Education, Arts and Culture
Private Bag 5518
Oshakati

Dear Madam

Re: Request for permission to conduct an educational research study in Oshana Educational Region

I, Renathe A Iiyambo, student number 9986189, a student at the University of Namibia pursuing a Master's degree in Education (Literacy and Learning) hereby kindly request permission from your good office to conduct an educational research at Junior Primary schools in Oshana Educational region as part of the requirement for my study during the month of February and March 2020.

My research topic is an **Investigation into the Information Communication Technology (ICT) Integration strategies used by junior primary teachers for teaching English phonemes in Oshana Region.** If granted permission; firstly, I will select four junior primary schools in Oshana Education Region offering English as a Second Language. Secondly, I will seek informed consent from the school principals and teachers of the junior primary phases from the four selected schools to conduct the study.

The data collected from the study will be treated with confidentiality and will be solely used for the purpose of this study only. Participants will have the right to withdraw from the study activities at any time. I hope that the results of this research will significantly contribute towards addressing the challenges in ICT integration strategies faced by junior primary teachers teaching phonemes in English Second Language. Hence, I am looking forward to a favorable answer from your good office.

Yours faithfully

Renathe A Iiyambo (MEd Student- University of Namibia)

APPENDIX F: CONSENT LETTER TO THE TEACHERS

Consent letter

R. A Iiyambo

P.O Box 11398

Oshakati

Dear participants

I am a master student from the University of Namibia student number (9986189) hereby conducting a research study on the bolded topic below.

You are highly invited to participate in a research project titled **An Investigation into the Information Communication Technology (ICT) Integration Strategies used by Junior Primary teachers for teaching English phonemes in Oshana Education Region.**

The aim of the study is to examine the challenges faced by the English second language teachers in the integration of ICT in the teaching of phonemes in delivering instructions to the learners at junior primary phase in Oshana Education region. You are therefore kindly requested to participate in this study as your inputs and feedback are imperative to this study.

You have been selected to participate in this study. Please try to answer the questions with utmost sincerity because the quality of your responses will indeed determine the quality of this research. Participation is entirely voluntary and the information gathered will only be used for the purpose of this study. This research is conducted for academic purposes and all the information will be kept confidential. It should take approximately 20 minutes to complete the questionnaire and 15 minutes for an interview.

If you are willing to participate in the study, kindly fill in your particulars in this letter below as a declaration of your consent.

Thank you for your consideration

_____

Yours in education

Renathe A Iiyambo (MED STUDENT- UNAM)