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DEPARTMENT OF EDUCATIONAL POLICY STUDIES AND LEADERSHIP

**CHALLENGES HINDERING THE FULL IMPLEMENTATION OF ICT TEACHING
AND LEARNING IN PRIMARY SCHOOLS IN THE NORTHERN CENTRAL
DISTRICT IN HARARE.**

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EDUCATION IN MANAGEMENT AND LEADERSHIP**

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DEDICATION

I dedicate this study to my family for being there always throughout my studies.

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ABSTRACT

The research sought to assess the Challenges hindering the full implementation of ICT teaching and learning in Primary schools in the Northern Central District in Harare. The study was confined to Northern Central District primary schools. The research participants were the learners, heads and teachers who were selected through purposive sampling. The study was conducted because primary school teachers and school heads were not effectively implementing ICT in the teaching and learning process. This was seen to have a negative impact on the teaching and learning process in Primary schools in the District. The study was a qualitative research which was carried out through in-depth interviews with both school heads and teachers and also focus group discussions with the learners. The study found out that schools in Northern Central District of Harare faced several challenges which include; teachers' failure to use modern technology, lack of confidence on how to operate ICTs, resistance to change, technophobia and also limited ICTs in schools. The suggested solutions include: upgrading ICT facilities, training of tutors in the use of ICT, improving technical support and also improve electricity back up. The study concluded that ICT teaching has not yet been fully implemented in most of the Primary schools in the Northern Central District in Harare. The study therefore recommended that ICTs should be available in Primary schools, teachers should receive proper and adequate training on how to use ICT in the teaching and learning process and teachers should be encouraged to embrace technology and learn new skills in the teaching and learning process.

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CHAPTER 1: THE PROBLEM AND ITS SETTING

1.1 Introduction

The technological advancement has brought to the attention the inclusion of Information Communication and Technology in teaching and learning in the revised curriculum 5.0 of 2015-2022. This demands the developments in infrastructure, culture and delivery systems in schools. Thus, this research assesses challenges being faced in the implementation of ICT teaching and learning in primary schools in the Northern central Districts in Harare. This chapter presents the introduction, background to the study, statement of the problem, research objectives and questions, significance of the study, delimitations, limitations, definition of key terms, and chapter summary.

1.2 Background to the study

The emergence of a new global economy, which has resulted from globalization and technological change, has serious ramifications for the nature and purpose of educational institutions. Schools can no longer remain mere venues for the transmission of a prescribed set of information from instructor to learner. Schools' current challenge is to promote "learning to learn"; which the acquisition of knowledge, values, attitudes and skills that make possible continuous learning over the lifetime (Commonwealth of Learning - COL, 2003).

The computer, which is an important component of ICT, provides powerful tools to inform decision-making, improve education policies and practices, and promote lifelong learning. It is generally held that computers can empower teachers and learners, advance change and foster the development of '21st century skills' (Trucano, 2005). There is widespread belief that computer technology can and will empower teachers and learners, transforming teaching and learning processes from being highly teacher-dominated to student-centred, a transformation expected to result in increased learning gains for students, creating and allowing for opportunities for learners to develop their creativity, problem-solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills. However, there is not much showing the effective implementation of ICTs since 2015 which then motivates the look into the

challenges being faced in the implementation of ICT s in teaching and learning in primary schools in the Northern Central District of Harare.

ICTs in education are featured in different modes some of which include open and distance learning, e-learning, teleconferencing, and blended learning (Tinio, 2008). Open and distance learning is defined by the Commonwealth of Learning (2003) as formats of providing learning opportunities that is marked by the separation of teacher and learner in time or place, or both time and place. E-learning (also termed ‘online learning’) encompasses learning at all levels, both formal and non-formal, that uses an information network whether wholly or in part, for course delivery, interaction, evaluation and/or facilitation. Teleconferencing refers to “interactive electronic communication among people located at two or more different places” (Rao, 2008), while blended learning is a new term that is used to refer to learning models that combine traditional classroom practice with e-learning solutions. In Zimbabwe, there is slow development of such communication and learning systems which resulted in total schools close down during this coronavirus outbreak. The challenges barring effective implementation of ICTs to the advanced stages are therefore to be investigated through this study.

The potential of each technology varies according to how it is utilized. Haddad and Draxler (cited in Tinio, 2008) have identified at least five levels of ICT use in education which are presentation, demonstration, drill and practice, interaction, and collaboration. Each of the different ICTs may be used for presentation and demonstration, the most basic of the five levels. Except for video technologies, drill and practice may likewise be performed using the whole range of technologies. Networked computers and the Internet are the ICTs that enable interactive and collaborative learning best; their full potential as educational tools will remain unrealized if they are used merely for presentation or demonstration. In Zimbabwe, the implementation of ICT might not be following the identified stages and contribute to the delay. Thus, this research aims to find out challenges barring effective implementation of ICTs in teaching and learning at Primary schools.

Countries like Kenya and South Africa, have made remarkable progress in promulgating an ICT policy framework and implementation strategy, complete with measurable outcomes and time frames (Farrell, 2007). In January 2006, Kenya put in place a National ICT Policy, whose aim is to advance the livelihoods of Kenyans by ensuring the availability of accessible, efficient,

reliable and reasonably priced ICT services (Kenya Ministry of Information, 2006). Many education institutions in Kenya have started to leverage the Internet to improve their programme's reach and quality. An example is the African Virtual University (AVU), initiated in 1997 at Kenyatta University. It uses satellite and Internet technologies to provide distance-learning opportunities to individuals in various English speaking and French-speaking countries throughout Africa (Amutabi, 2003). In case of ICT implementation, there is evidence that many educational institutions in Zimbabwe are increasingly moving towards a knowledge-based society where they have seen the role of ICT in education becoming increasingly important, (Mandoga 2013). In an effort to bring the potentially empowering benefits of ICT to the pupils, the government of Zimbabwe embarked on a massive drive to turn around the education sector by donating state of the art computers to many schools around the country mainly in the rural areas, (Mandongo2013). Manduku (2012) raised concern over delayed developments and effective implementation of ICT in teaching and learning in school. Ganyani (2016) supports that, the ICT national policy of Ministry of education in Zimbabwe seems to remain on paper without true reflection of its implementation on the ground especially at lower levels of education. Therefore, there is need to find out the challenges hindering the implementation of ICTs in teaching and learning at Primary school level in Northern Central District

The Zimbabwe 2010-2014 strategic plan for the Ministry of Information and Communication Technology with regards to education was to have one computer per class by 2014. Looking at most public school classes in the Northern Central District have an average of 40 pupils per class, this would translate to one computer for 40 pupils (Zimbabwe MICT strategic Plan 2010-2014). This ratio is clearly not workable. This is making the teaching and learning of ICT ineffective. The computer student ratio is unbelievable. Focusing on the Northern Central District, it is not a fallacy that, Zimbabwe remains at the bottom ten of ICT Network Readiness Index because in most schools the whole classroom is sharing one computer. Therefore, this study will look into the challenges hindering the effective implementation of ICTs in the teaching and learning of primary school earners in Northern Central District in Harare.

1.3 Statement of the problem

The economic challenges being faced by Zimbabwe make it doubtful that the implementation of ICT is being done effectively. Considering the aims of the ICT policy in development of knowledge through initiatives from ICT in education, the cost of setting conducive implementation environment could be the challenge. The schools might be facing funding challenges to purchase resources needed for mechanizing the infrastructure for effective implementation of ICTs in teaching and learning. In most cases teachers are failing to have experience on the use of ICT gadgets thereby leading them to ignore their use. In most cases the major barriers might be the lack of genuine software, inadequate computer in the classroom, low speed internet, lack of motivation from both teacher and student side to use ICT, lack of proper training skills, unavailability of latest ICT equipment, lack of expert technical staff, poor administrative support, poor course curriculum. This therefore motivates the study on the challenges hindering the implementation of ICTs in primary schools in Northern Central District of Harare.

1.4 Purpose of the study

The purpose of this study is to explore the teaching of ICT in primary schools in the Northern Central District. Since researches are intervention oriented to the situation at hand, the proposed research seeks to tailor make intervention measures to the problems being experienced in the teaching and learning of ICT in primary schools in the Northern Central District.

1.5 Research Objectives

1. To explore the challenges hindering the full implementation of ICT in primary schools.
2. To find the ICTs available in Primary schools in the Northern Central District of Harare.
3. To come with strategies that facilitate teachers to integrate ICT in the teaching and learning process in primary schools in the Northern Central District.

1.6 Research Questions

1. What are the challenges hindering the full implementation of ICT in primary schools?
2. Which ICTs available in Primary schools in the Northern Central District of Harare?
3. What strategies can be adopted to facilitate teachers integrate ICT in the teaching and learning process in primary schools in the Northern Central District?

1.7 Significance of the study

Learners

The study might benefit the learners as the key stakeholders in education. This study promotes learners centered learning. Through the use of ICT, learners assume greater responsibility for their own learning and working more independently and effectively (Balanskat 2006). There will be involvement of learners in the teaching and learning process. It trains learners to become independent and innovative in their learning processes.

Teachers

Teachers also will benefit since there will be strong interaction with the learners because they will be taking a lead in the teaching and learning processes. Interaction creates diversified information that will be pertinent in information sharing among teachers and learners. In other words, the use of ICT promotes child centered and investigative learning. It also draws students into the world of critical thinking (Vaugh1997).The internet is an information gold field and it is newest and most powerful in the world of educational computing (Varron2011). There will be availability of diversified and modern information in line with the new curriculum and modern day learning. Researching and lesson preparation for both teachers and learners will be improved. Therefore, there will be effective teaching and learning since learners will be able to research for themselves comprehensively being equipped with modern information. Laaria, (2013) notes that ICT can enhance teacher's efficiency and enthusiasm, encourage their planning and co-operation, helps them adopt student-centered teaching strategies, reduce their workload, and improve relationship between teachers and students.

Schools and administration

Mingaine (2013) notes that, research suggests that implementing ICT can transform the existing school system by raising the efficiency and effectiveness of teaching and learning hence increasing students' achievement. ICT improve the school system from the administration to the teaching activities. Leadership and management strategies will be easily accessible from the internet as well as strategies for effective management. Teaching materials for all the subjects will be accessible and this cuts the costs on textbook purchasing.

The government and society

ICT is a building block to a better quality of life. ICT is central to the creation of a global knowledge-based society and research has exposed increasingly benefits of computer technology. The Zimbabwean government will be having citizens fully prepared to bring economic fortunes through ICT since development theories single out ICT and science subjects as critical in spearheading economic growth and development.

Researchers

To the academic fraternity, the study serves to broaden the literature on ICT in primary schools. Students carrying out research of varied nature will have somewhere to refer to and the research can also provide some guides and information regarding the topic.

1.8 Assumptions

The study is based on the following assumptions: -

- Primary schools in the Northern District are implementing the Ministry of Education's National ICT policy.
- That there are some challenges encountered in the effective teaching and learning of ICT.
- Effective teaching and learning of ICT has positive effects on teachers, learners and Zimbabwe at large.

1.9 Delimitations of the study

Physical scope or boundary defines where the study is going to cover that is the geographical location to which the proposed research is going to be focused. The study is going to be focused on in Primary Schools in the Northern Central District and all the relevant stakeholders to the learning institutions. The researcher was able to have access to the respondents who lived on that geographical area.

Again, this study focuses on the challenges hindering the implementation of Information Communication Technology in teaching and learning of primary schools in Northern Central District. It will interrogate on the availability of both human and material resources in schools for effective implementation of ICT policy. An assessment of the skills in implementing the ICT and how educational stakeholders can assist in the effective implementation of ICT in primary schools will also be looked into.

1.10 Limitations

Creswell (2003) defines a limitation as a possible shortcoming or influence that either cannot be controlled or is the result of the delimitations imposed by or on the investigator. In relation to this, the limitations can include the lockdown due to Covid19 pandemic and schools operation, time for duty and school demands, expenses for interviews and or transport, technical challenges.

The first limitation that can affect the research process is withholding information by research participants. It is a norm that workers in the public service sign code of ethics which bounds them on what to disclose and not. The information therefore can be withheld due to the stipulations of the code of ethics and the educational circulars. The researcher shall seek consent and participants will be given room to opt in or out. To avoid closure of information by teachers, the researcher will assure confidentiality and anonymity to research subjects.

The researcher's multi-task can affect the research schedule. The researcher carries a number of duties in the school that the time can be scarce for the study. Due to the lecture demands, the researcher can face challenges in attending lectures and having interviews scheduled with the participants of the research. For effective study, the researcher shall make use of electronic

means of communication so as to cut costs and time expenses. The researcher also took advantage of the semester breaks to gather information.

Since the research will be likely to be done through telephone interviews, the researcher can face challenges in terms of cost of telephone calls which can go beyond her pocket. The researcher can face challenges in getting enough funds for effective study. Kinnear, (2009) asserts that researchers face challenges in sponsorship. This means that to carry out a study, there are financial requirements. This may however hinder effective gathering of data since most of the literature will be gathered from the internet, which is costly. The researcher shall make use of the schools in Arcturus only to avoid extended use of resources and the interviews will be scheduled for 5 minutes to 10 minutes. To foot the costs, the researcher was assisted financially to purchase data bundles for the study.

Lack of literature can hinder the effective gathering of data. The library may not have related reading resources in the school. This means that there is need for resourcefulness by the researcher. Therefore, the researcher shall make use of internet in researching.

1.11 Definition of key terms

School

A school is an institution for educating children. In other words a school is a learning environment for pupils under the tutelage of teachers. Zinth (2005) defines a school as an institution on instructional purposes on an elementary, middle or junior, high school or any other level authorized by the State Board of Education.

Strategy

A strategy is a high level plan of action to achieve a desired long term aim. In broader terms, a strategy is a well-defined roadmap of an organization towards attaining certain deliverables. A strategy is a pattern of decisions that determines and reveals organizational objectives, purpose, policies and plans to achieve prescribed goals Nickols (2012).

ICT

Makhanu, (2010) describes ICTs as technologies that are used to create, manage, communicate and distribute information. According to Laaria, (2013) ICTs includes telephones, televisions, radios, computers, internet and audio-visual equipment. Makhanu, (2010) note that ICT is any application and device used to manage, access, create, evaluate, integrate and communicate information and knowledge. Ghavifekr and Rosdy (2015) view ICT as a short hand for computers, software, networks, satellite links and related systems that allow people to access and share information and knowledge in a variety of forms.

Implementation

Andoh, (2012) defines implementation as processes and decisions made by individuals every time they consider adopting innovation. Khan (2012) describes implementation of ICT in schools as the decision made by school leaders and teachers to make use of technology as the best course of action available. Menjo and Boit, (2012) notes that implementation of ICT in schools involves the extent to which teachers use computers, multimedia projectors, overhead projectors and other technology tools in their day today activities.

1.12 Summary

This chapter is an introductory part of the discussion and it focuses on the problem and its setting. It introduced the much needed information resulting in the pursuit to come up with an intervention in primary schools in the Northern Central District to improve ICT teaching and learning for the betterment of the educational system at the schools. The chapter explored issues such as background of the study, statement of the problem, purpose of the study, research objectives and questions. It also explained the significance of the study, assumptions, and delimitations, limitations of the study as well as the definition of key terms. The next chapter is on the research methodology.

1.13 Organisation of the rest of the study

The chapter has been segmented into five interwoven chapters. Chapter one provides an introduction to the study that is focusing on the problem and its setting, chapter two provides the

review of the literature surrounding the concept of the barriers faced in the implementation of ICT in the teaching and learning process. Chapter four presents the data and analysis of the findings. Chapter five is the concluding chapter and it focuses on conclusions and recommendations for future studies.

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

There is no academic work which can emerge from the vacuum. Literature review is what other people have written about one's research area, gathering information to support one's arguments and one's findings. Literature review can also be explained as the purpose of evaluating books and articles that might have bearing on a given research. In this chapter, related content from various researches carried out before will be reviewed to clarify research gaps and addressing the research questions. The Change Theory and the Modernization Theory will be used in undertaking the proposed research topic.

2.2 Conceptual Framework

Several studies revealed that the use of new technologies in most European countries and America has been essential for providing opportunities for students to learn to operate in an information age. It is evident, as Yelland (2016) argued that traditional educational environments do not seem to be suitable for preparing learners to function or be productive in the workplaces of today's society. She claimed that organizations that do not incorporate the use of new technologies in institutions cannot seriously claim to prepare their students for life in the twenty-first century. This argument is supported by Grimus (2015) who pointed out that by teaching ICT skills in educational institution the students are prepared to face future developments based on proper understanding. Similarly, Bransford et al. (2016) reported that what is now known about learning provides important guidelines for uses of technology that can help students and teachers develop the competencies needed for the twenty-first century.

Although Information and Communication Technologies (ICT) in education can be viewed as being driven by business and industrial representatives in the private sector (Becta 2002), a substantial number of central government initiatives around the world have encouraged the implementation of computers in schools (Selwyn 1999) which had begun in Europe which are the developed countries. The implementation of computers in schools started in the 1980's when Computer Assisted Instruction (CAI) was introduced. The ongoing innovations in technology

have informed changes in the implementation of computers in education (Ravenscroft 2001), hence today we have open learning through the use of telecommunications and the Web (Watson 2016).

Having considered the fact that the core implementation of computers takes place in the classroom where teachers teach, the researcher will examine how the implementation of computers (from CAI to telecommunication and the Web) affect teaching practice. Watson (2001) argues that the implementation of computers demands consideration of some more fundamental educational issues. In addressing these educational issues the researcher will examine the implementation of ICT in education using the central object in the process, that object is the teacher. Kearsley, Hunter and Furlong (2014) argue that teachers teach the way they were taught. This means teaching is influenced by teachers' beliefs. Teachers' beliefs are informed by the learning theories they hold.

To juxtapose these issues (the teacher, teacher's belief and the learning theories) the researcher will first look at the place of ICT within pedagogy which will inform how ICT is used within pedagogy. She will then discuss the underpinning theories and the role of the teachers as informed by learning theory.

Because this study examines the implementation of computer based teaching, it is quite imperative to discuss the concept of the implementation of computer based teaching in the teaching and learning in Primary schools in Harare's Northern Central district. She will extend the discussion to the processes that are believed to take place where ICT is integrated. She will then review the previous research on ICT integration taking cognisance of teachers' perceptions of the integration of ICT into the curriculum, with a closer analysis.

The available literature in circulation revealed that in Africa, technology has been in use for a certain period of time but certain challenges were witnessed. As Uganda adopts Information and Communication Technology (ICT) in education, it faces the same challenges like most developing countries where unstable economy, poorly developed ICT infrastructure, high bandwidth costs, unreliable supply of electricity and general lack of resources were found to be the central issues to meet a broad spectrum needs of the country (Empirical, 2015). Like other factors improper use of ICT in the classroom teaching-learning is a very important factor to be

considered in the educational context of Uganda. According to Maxwell (2013) ICT provides opportunities for teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning, and self-responsibility for learning, motivate teachers and students to continue learning even outside school hours, plan and prepare lessons, design materials and facilitate sharing of resources, expertise and advice.

It has been said that computer technology, in most developing countries including Tanzania is a new innovation. However in developed countries, computer technology is applied in different sectors long time ago to enhance effectiveness and efficiency in various aspects including education sector (Mulamula, 2013). The study conducted by Lishan and Wood (2015) in Kenya concurs with the idea as they point out that, computer technology in Kenya has changed working culture enhanced productivity in all sectors and promoted economic growth of the country. In developing countries, however, adaptation and application of technology is delayed due to different factors including lack of funds and expertise (Sahay 2016). In Tanzania, studies such as Mambo, 1993 and Irvine, 2002 show that the first computer was installed in 1965 in the government treasury to provide computing services to all government departments. Since then, computer installations have been made indifferent other sectors including education.

Computer based teaching has been dominant in the majority of the European and African countries. The advent of the new curriculum in 2005, in Southern Africa particularly in South Africa has imposed many challenges to teachers in the process of teaching and learning, amongst other things, the introduction of Information and Communication Technology (ICT) into the curriculum (Department of Education 2002:7). The purpose of integrating ICT into the curriculum was to optimize the teaching and learning strategies and also to ensure the effective use of technology in the classroom. It has been said that although the policy document of 1997 does not specify the use of computers within technology it does indicate the need for effective and critical use of the application software (such as Ms Word, Ms Excel, Ms Access, Graphics and the CD ROM) can be used in teaching.

Internet browsers form part of the software that the (RNCS) Technology policy document recommends for the integration of ICT into the curriculum. The Internet is the network of computers. Browsers software such as MS Explorer or Mozilla Firefox are the browsing software

required to access the information contained on the various computers that form part of the Internet network. This resource is needed in all learning areas (LAs’).

In South Africa ICT has been introduced as Information Technology or Computer Application Technology (CAT) in the Further Education (FET) band. It is a subject of specialization which learners who are interested in programming computers and may want to study Computer Science at University take. On the other hand, CAT enables learners to integrate ICT into their curriculum. It provides them with an opportunity to use software such as MS Word and MS Excel. In 2004 the White paper 7, on e-Education indicated that every South African learner should be able to use ICT effectively and efficiently by 2013 (DoE 2004).

Several efforts to provide the ICTs in schools and train educators to acquire ICT skills knowledge to be used in schools in Zimbabwe and across the globe has been put in place (Munaki 2017). Zimbabwe like in South Africa, also enhanced its ICT access in schools through government facilitated donations to schools and training of computer science teachers.

Schools in Zimbabwe shows that not all ICT trained teachers are utilising technologies in their classrooms (Miller, 2006) despite the efforts made to improve ICT access and usage in schools. There is need to come up with strategies which promotes the utilisation of ICTs in classrooms. This research is intended to close the gap by proffering recommendations which can be used for teachers to incorporate ICTs in schools. It is therefore the interest of the research to find out the challenges hindering the full implementation of ICT teaching and learning in primary schools in the Northern Central district in Harare.

2.2.1 Curriculum Implementation within the context of ICT

Conceptual framework represents the researcher’s synthesis of literature on how to explain a phenomenon. The conceptual framework is used to arrive at the key hypothesis. It paves the much broader framework called the theoretical framework. For the purpose of this study in light of ICT implementation in primary schools teaching and learning, two theories of Diffusion of Innovations by Rogers (2003) and Technology Acceptance Model (TAM) by Davis (2003), has been identified and adapted to the research setting as the conceptual framework for this research (Figure 1). Rogers’s theory stated as the process by which an innovation is communicated

through certain channels and over time among the members of a social system. The process will start with “knowledge” of the first channel that represents characteristics of the decision making unit by the ICT users in order to integrate the technology. And it ends with “confirmation” by the users to accept the technology and integrate it accordingly. The TAM theory comprises of various parts which is representing the process of ICT acceptance by the users including; behavioral intention, perceived usefulness and perceived ease of use. While, perceived usefulness refers to the degree to which person believes on the benefit from the use of a particular technology by improving the job performance, perceived ease of use refers to the importance of a technology in being user-friendly for the users. Generally, TAM theory was developed to measure the effectiveness or success of a technology in helping understanding the value and efficacy of a particular system. It is also considered as one of the most influential theories in contemporary information systems research. However, the theory has evolved with more specific variables explaining how a user can accept a technology over the years.

Saunders (2012) defines the theoretical framework as a guide to a study. The objective of exploring a framework is to present the study basing on theories which have been tried and tested. One of The theories that will be used in this research is the Technology Acceptance Model (TAM).

The technology acceptance model (TAM) 2.

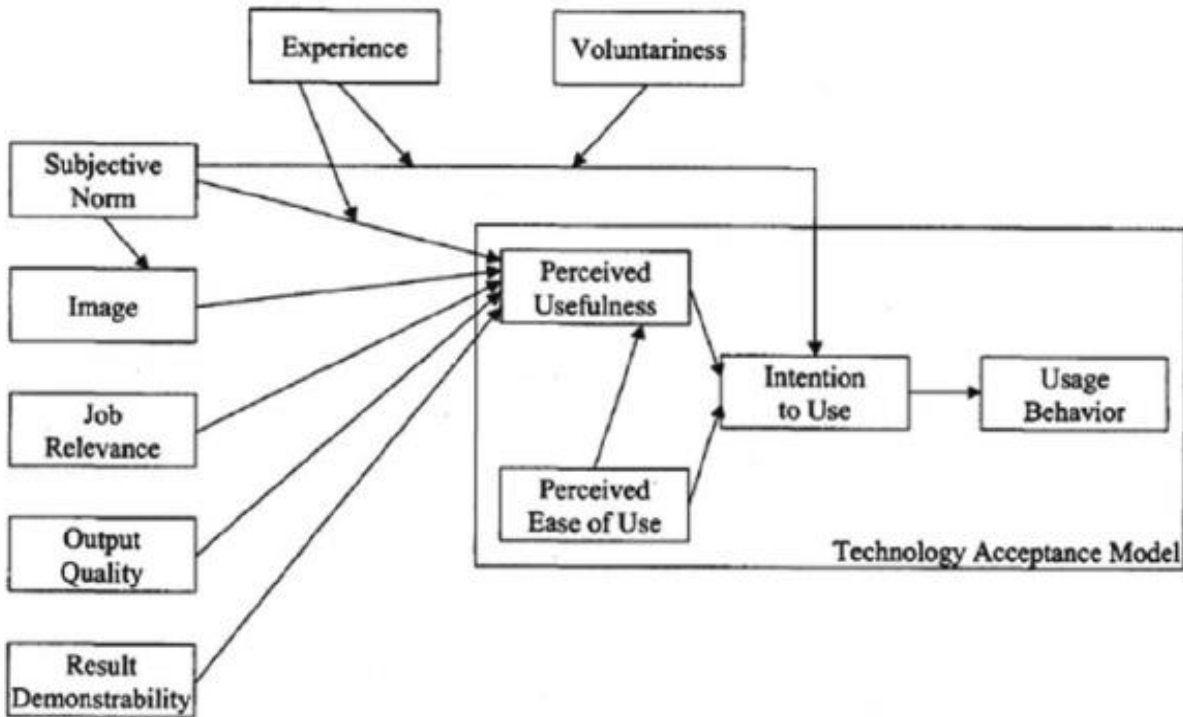


Figure 2.1: Technology Acceptance Model 2

Venkatesh and Davis (2000) discovered why certain individuals make use of ICTs and frame of mind towards them and identified it as Extended Technology Acceptance Model Two (TAM 2). The model has shown some of the barriers which make teachers hesitate to implement ICTs in the education process of today. The model reveals that the use of ICT gadgets predicts their intentions to make use the gadgets and that these intentions are strongly linked to perceived usefulness. According to the model when technology is presented to teachers, there are factors that would influence their decisions from the variables (external) that are around them about when and how they will use the new technology.

- **External variables**

These are challenges, from outside and beyond their control, which teachers come across with in trying to make use of ICTs. These include limited time, incompetence, lack of staff development network connection and limited, lack of ICT facilities, (Ghavifekr et al. 2016).

- **Perceived usefulness (PU)**

Degree to which a particular technology is used by teachers and would enhance their performance is perceived as PU. ICT tools are likely to be adopted if there is no need to question/ change their executive practices. If teachers consider ICT to be important to them, they are likely to use them in education. The elements identified to be important are increased productivity, improved job performance, work more quickly and usefulness (Ghavifekr et al. 2016)

- **Perceived ease of use. (PEOU)**

Studies have revealed numerous factors relating to PEOU of ICT. The impact project (Watson, 1993), identified competences and a wide range of expertise which tutors think they needed so as to find ICT uncomplicated to use. Some of these are controllable attitude towards, easy to use and remember, easy to learn, clear and understandable, and easy to remember

- **Attitude towards use**

This represents teachers' negative or positive performing target behaviour. Fundamentally, tutors' attitude to numerous factors will depend upon how uncomplicated they view utilising ICT tools to be on a personal level as well as for educational purposes (Ghavifekr et al. 2016).

- **Behavioural Intention**

This refers to the level to which a teacher can formulate plans to or not to perform or a specific future behaviour in relation to learning (Ghavifekr et al. 2016).

- **Cognitive instrumental process and Social influence process**

Cognitive instrumental process refers to quality output, job relevance, result demonstrability as well as PEOU as determinants of PU. Social influence process variables are voluntariness, image and subjective norm, (Ghavifekr et al. 2016).

The proposed framework includes various factors directly associated with the core aim of the study that explains how knowledge and perceptions will affect the perceived usefulness and ease of use of ICT integration. The factors embedded in the conceptual framework have been meticulously interlaced, so that the interrelationship among them constitutes to measure their

effectiveness on ICT integration by teachers. However, intension to integrate ICT by teachers is the main variable that supports the key elements in the above framework such as ease-of-use, functionality, flexibility, accessibility and integration. In addition, the intention of teachers to use the technology is strongly influenced by their perceptions on usefulness of the system as well as perceived ease of use and determines their actual use of ICT. The proposed framework has guided this research in investigating the factors affecting the technology implementation by primary school teachers in the Northern Central District in Harare.

2.3 Theoretical Framework

This research was guided by two theories, the Change theory and Modernization Theory. The Change Theory was propounded by Fullan (2006) describing it as a force for school improvement. In order to build up tailor made school improvement strategies, Fullan posed the question, under what conditions will continuous improvement happens? In line with this question, the theory dwells on three main issues, that is the flawed change theory, theories of action and prospects for future use which all explains how effective school improvement can be achieved. This relates to this study on the mechanisms that need to be put in place so ass to implement ICT effectively. These include the policies, infrastructure, and electric gadgets among others.

Under the flawed change theory, Fullan (2006) states that, if the teachers intended to help students to develop the skills and competences of knowledge creation, professional knowledge should be developed among teachers by giving necessary experience. Juxtaposing the tenants of this theory to the situation in primary schools in the Northern Central District, the state of affairs hindering fully implementation of ICT.

The theory further introduces, reform initiatives, professional learning communities and development and retention of quality leaders. The above mentioned are very critical as far as ICT teaching and learning improvement is concerned in primary schools under study. They corroborate with Hopkins (2003) ideology where he defines school improvement as a distinct approach to educational change that aims to enhance student outcomes as well as strengthening the school's capacity for managing change.

Theories of Action with Merit focuses on designing strategies that produce results. There seven premises under the theories of action with merit which are a focus on motivation; capacity building, with a focus on results; learning in context; changing context; a bias for reflective action; tri-level engagement; and persistence and flexibility in staying the course. For ICT teaching and learning improvement, all the stakeholders need to be motivated, teachers and students needs to be capacitated for the teaching and learning processes be navigable. The learning context and changing the context are critical at the school for creating a shared vision and ownership. The improvement process must be reflected on for the purposeful thinking not just doing. The tri-level engagement binds together the school, community and the state for mutual interaction and influence for school improvement. Persistence in school improvement is of paramount importance since it is a process which will never come by coincidence.

Lastly, the theory of change as explained within the prospects for future use of change knowledge is against quick fix of things. Since the proposal is trying to effect effective ICT teaching and learning improvement strategies, long term lens are of paramount importance. Brest (2010) it defines long term goals and maps backward to identify changes that needs to happen earlier (preconditions). Effective ICT teaching and learning improvement strategies must be sustainable, which is the core objective of this proposal to edify ICT teaching and learning in a way that will serve future generations. Effectiveness is measured by durability.

The study is also informed by the Modernization Theory. The major thrust of the theory is that developing countries need to go through a cultural and economic change in which traditional values are substituted by development-oriented goals. The theory presupposes that in order to depart from political, economic and social challenges to achieve development and industrialization, there is need for a change of values and attitudes of the developing world. This could be achieved through promoting savings and earnings, having capital to invest, promoting growth in entrepreneurial skills base and investing in modern technology (Moore, nd).Through these lenses therefore, the adoption of ICT skills is one way of reducing the cultural and digital divide between the two worlds. The use of ICT in education would therefore constitute the drive towards realization of this dream. There is an understanding that ICT in education is a significant

key driver for pupil achievement through enhanced production of information and knowledge (Mandoga2013). The effective use of ICT in education also has the potential to enhance achievement among the pupil through greater collaboration, improved communication and opening of wider opportunities to share information (Victoria, 2011). From a broader perspective, the benefits from advances in ICTs could also mean an acceleration of economic and social development and greater inclusion of isolated, particularly rural populations, into the mainstream of society (Kabanda2012).

The Modernisation Theory suffered severe attack from the dependency theory for not taking into consideration factors that led to the underdevelopment of the developing countries Mutunhu, (2011). However, it is important to note that some very significant insights can be drawn from this theory.

2.3.1 The diffusion of innovation theory (DOI)

The study on the implementation of computer based teaching in the teaching and learning process will also utilise the diffusion of innovation theory. The theory was developed by E.M Rogers in 1962. This is one of the oldest social science theories. It originated in communication to explain how, over time an idea or product gains momentum and diffuses or spreads through a specific population or social system. Much research from a broad variety of disciplines has used the DOI model as a framework. Dooley (1999) and Stuart (2000) mentioned several of these disciplines as political science, public health, communications, history, economics, technology, and education, and defined Rogers' theory as a widely used theoretical framework in the area of technology diffusion and adoption.

According to Medlin (2011) Rogers' diffusion of innovations theory is the most appropriate for investigating the adoption of technology in higher education and educational environments. In fact, much diffusion research involves technological innovations so Rogers (2003) usually used the word technology and innovation as synonyms. For Rogers, a technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome. It is composed of two parts: hardware and software. While hardware is the tool that embodies the technology in the form of a material or physical object,

software is the information base for the tool (Rogers, 2003). Since software (as a technological innovation) has a low level of observability, its rate of adoption is quite slow.

For Rogers (2003), adoption is a decision of full use of an innovation as the best course of action available and rejection is a decision not to adopt an innovation. Rogers defines diffusion as the process in which an innovation is communicated through certain channels over time among the members of a social system. In this regard innovation, communication channels, time, and social system are the four key components of the diffusion of innovations.

Rogers (2003) described the innovation-decision process as an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation. For Rogers (2003), the innovation-decision process involves five steps: knowledge, persuasion, decision, implementation, and confirmation. These stages typically follow each other in a time-ordered manner. The research will try to apply the theory trying to see how the implementation of computer based teaching in the teaching and learning process can be explained under the five steps propounded by Rogers (2003). This will also answer the question on why at some point in time teachers resist to implement computer based teaching in the teaching and learning in primary schools.

2.3.2 Digital pedagogy

The researcher will also attempt to explain the digital pedagogy under the premise of the implementation of computer based teaching. This basically is an attempt to use technology to change teaching and learning in a variety of ways. This includes blogging assignments, use of social media in the classroom, forking syllabi with GitHub and getting students to use digital tools to test ideas (Schoepp, 2005). Throwing a computer into a classroom could not make the learning effective. However, teachers need to understand how to use technology effectively, understand the learning theories behind the practice and know how to select the right technology for the learning outcomes they seek. In simple terms, a digital pedagogy is the study of how to teach using digital technologies. In this research the researcher will try to see how teachers are embracing digital technologies and the extent to which they implement such technologies in the teaching and learning in primary schools.

2.4. Mechanisms for the implementation of ICT

Technology-based teaching and learning can make many changes in school that requires for proper planning and policy making. Researchers and policymakers must both have the same insight about the future plan. Dudeney (2010) noted that national ICT policies can serve several crucial functions. They provide a rationale, a set of goals, and a vision of how education systems run if ICT is integrated into teaching and learning process, and they are beneficial to students, teachers, parents and the general population of a given country. Ministry of Education Malaysia has formulated three main policies for ICT in education. The first policy insists on all students are given opportunity to use ICT. This is aimed to reduce the digital gap amongst the schools. The second policy focuses on the role and function played by ICT in education. Besides that, another policy stressed on the use of ICT for accessing information, communication and as productivity tool (Chan, 2002). This has to be in Zimbabwe as well. This research looked into availability and enforcement of ICT policy in schools.

However, infrastructure and facility of ICT is then needed to supply to the schools throughout the nation. A key factor in use of ICT is sufficient computer labs and ICT equipment. This is to ensure that subject teachers are easily access to ICT tools whenever needed (Hennessy, Ruthven, & Brindley, 2005). Lack of adequate ICT equipment and internet access is one of the key problems that schools specifically in rural areas are facing now. For example, results of a research show that in Kenya, some schools have computer but this could be limited to one computer in the office only. Even in schools with computers, the student-computer ration is high. In addition, the report continues revealed that the schools with ICT infrastructure are supported by parents' initiative or community power (Chapelle, 2011).

In most schools, technical difficulties sought to become a major problem and a source of frustration for students and teachers and cause interruptions in teaching and learning process. If there is lack of technical assistance and no repair on it, teachers are not able to use the computer for temporarily (Jamieson-Proctor et al., 2013). The effect is that teachers will be discouraged from using computers because of fear of equipment failure since they are not given any assistance on the issue. Türel and Johnson's study (2012) revealed that technical problems become a major barrier for teachers. These problems include low connectivity, virus attack and

printer not functioning. However, there are a few exceptions. Schools in the countries like Netherland, United Kingdom and Malta have recognized the importance of technical support to assist teachers to use ICT in the classroom (Yang & Wang, 2012).

In addition, teachers' readiness and skills in using ICT are playing essential role in the use of ICT in education. Teachers need sufficient ICT skills to implement the technology and to have high confident level to use it in a classroom setting. Besides, teachers require insight into the pedagogical role of ICT, in order to use it meaningfully in their instructional process (Hennessy et al., 2005). According to Winzenried, Dalgarno and Tinkler (2010) teachers who have gone through ICT course are more effective in teaching by using technology tools as opposed to those that have no experience in such training. A school in Ireland reported that teachers who did not develop sufficient confidence avoided using ICT. Similar case happened in Canada, some teachers admitted they were reluctant ICT users because they worried they might get embarrassed that the students knew more about the technology than they did (Hennessy et al., 2005).

Beyond basic skill training, schools had used a variety of strategies to provide further professional development for teachers. According to Warwick and Kershner (2008) the significance and advantages of ICT should be known by teachers in order to conduct a meaningful lesson with the use of ICT. Indeed, teachers should be sent to attend training courses to learn about integration ICT in teaching and learning process. Nonetheless, many school schools used peer-tutoring systems. A more skillful teacher in ICT would assist and guide another teacher who has less experience with ICT along the preparation work for teaching and learning process. As what has been discussed, there are many factors to enable the use of ICT in classroom teaching and learning. Begin with policy, follows by the supplement of all the ICT hardware and software facilities, continued by readiness and skills of teacher to integrate it into pedagogical process (Agbatogun, 2012). Besides, technical support and continuous professional development in ICT should be conducted from time to time. In short, all parties must cooperate in order to bring the nation to become a country advance in technology.

2.5. Teachers' Belief on Technology-based Teaching and Learning

With the development of learning technologies in the late 20th century, education system has changed rapidly. This is due to the capability of technology to provide a proactive, easy access and comprehensive teaching and learning environment. Nowadays, Ministry of education in all over the world has provide a lot of facilities and training in order to enhance the use of advanced technologies in the countries' teaching and learning process. A high budget has been placed in order to provide the equipment needed by teachers to improve the education system. Despite all the efforts, most of the countries are facing similar problem whereby the teachers are not maximizing the usage of the technology provided (Albirini, 2006). This has become a serious matter as many previous researches have proven the usage of ICT in teaching and learning process could improve students' achievement (Nakayima, 2011, Jamieson-Proctor et al., 2013). Many, researchers have taken an effort to analyse the factors that affecting teachers' acceptance of ICT usage in the classrooms (Capan, 2012; Virkus, 2008; Zhang, 2013; Dudeney, 2010). It shows that, the major barrier of the implementation was the teachers' belief as the teachers are the person who implements the change in their teaching and learning process. Moreover, previous research (Cassim & Obono, 2011) shows that the correlation of teachers' belief and the use of ICT are high. Teachers' role is getting more important especially in usage of ICT in pedagogy which could increase the achievement of the students, their creativity and thinking skills.

Furthermore, a research by Chien, Wu and Hsu (2014) has shown that students in school are having high expectation on ICT integration in classroom as the new generation are born and grown with technologies and could be define as the digital – native phenomenon. The younger the students, the higher their expectation are on ICT integration in classroom. It also proved that the integration of ICT is mostly dependent on the personal factors which define as self-perceptions. This research also shows that the acceptance of ICT of teachers and students in classroom and outside of classroom whereby both are more likely to use technologies outside the classroom. They found that the barriers of ICT integration in classroom are confidence, competence and attitudes of teachers reduce the percentage of ICT integration.

Results of a previous research (Cox & Marshall, 2007) shows that teachers only need a traditional – centered approach when developing ICT skills in the classroom. The teachers are

having high confidence and competency in using ICT in classroom even though it does not represent the types of ICT used. This is because they believe that ICT is a tool that could help in the learning process especially to relate with real life practices. This factor has reform the teaching method to integrate ICT in order to create and construct knowledge for the students. The research shows that the relationship between competency and confidence could reflect the balances between training and pedagogically focused approaches in ICT professional development. With this, the school management could make sure that there are sufficient supports for the teachers to integrate ICT in the classroom.

However, teachers' efficacy in urban schools changes as the years of experience of working and age of teachers (Cuban, 2001). It shows that the teachers' efficacy are decreasing as the years of experience and age increases but somehow the decrease and the efficacy belief depend on the school management. School management here means the opportunities for collegial interaction, and the use of the instructional resources. Schools that could provide opportunities for teachers to reflect on teaching and learning with their colleagues and for administrators and teachers to collaborate and communicate, as well as support the use of instructional resources. From this research, the teachers efficacy belief is depend on the school management and culture. Therefore, if the school has always implant the culture to change and teachers are always sent for training for upgrading themselves, and then the integration of ICT in classroom will be easier to be enhanced in the classroom.

2.6 Previous researches on the implementation of ICT in schools

The process of using ICT in everyday education is very complicated. The opportunities provided by ICT to support teaching and learning are not problem-free. The virtually limitless opportunities of access to information in an educational context can pose a real danger of information overload if the teachers do not have the skills in filtering information for relevance, or are unable to establish a coherent organizing principle. Both students and teachers may lack the necessary skills to access, process and use information (Dudeney 2000). Even there are a number of difficulties which act as barriers and prevent teachers to integrate ICT into the classroom. As Schoepp (2005) defines, a barrier is considered as any condition that makes it difficult to make progress or to achieve an aim. The educators have used different categories to

classify the barriers for teachers to use ICT in the classroom. Some researchers have classified the barriers into two major categories of extrinsic and intrinsic barriers. Ertmer (1999) referred to extrinsic barriers as first-order and cited access, time, support, resources and training and intrinsic barriers as second-order and cited attitudes, beliefs, practices and resistance. Al-Alwani (2005) defined extrinsic barriers as barriers which are related to organizations rather than individuals and intrinsic barriers as those which are related to teachers, administrators, and individuals.

Some other researchers grouped the barriers into two categories of teacher-level barriers and school-level barriers. Becta classified the barriers based on whether they refer to individual (teacher-level barriers), such as lack of confidence, shortage of time, and resistance to change, or to the institution (school-level barriers), such as lack of effective training in solving technical problems and lack of access to resources. Balanskat, Blamire and Kefala (2006) classified them into micro level barriers, such as those related to teachers' attitudes and approaches to ICT, and meso level barriers, such as those related to the institutional context. They also added a third group called macro level barriers, such as those related to the wider educational framework. Additionally, another group of researchers refer to the barriers as those pertaining to two types of conditions: material and non-material. As Pelgrum (2001) classifies, the material conditions refer to the insufficient number of computers or copies of software. The non-material barriers refer to teachers' insufficient ICT knowledge and skills, the difficulty of integrating ICT in instruction, and insufficient teacher time.

In the US, the most important barriers to high school teachers' use of ICT were insufficient number of computers, lack of free time for learning and lack of classroom time for students to use computers (Smerdon, Cronen, Lanahan, Anderson, Iannotti, and Angeles 2000). Teachers in larger schools and city schools were more likely to report lack of computers as a barrier and teachers in schools with high minority student populations were more likely to report outdated, unreliable computers as a barrier. In a study in UK, Al-Alwani (2005) reported that lack of personal confidence and insufficient access to the ICT resources were the key barriers for majority of the surveyed teachers. Some other factors which were more internal to the teachers such as resistance to change and lack of awareness of the benefits of the ICTs for learning were reported in Jones' study. In the New Zealand, lack of time for professional development to learn

about the new technologies and lack of time to explore technologies such as the internet and social networking services were repeatedly reported by teachers as the significant barriers for using ICT in the classroom (Roblyer and Edwards 2000). Other factors such as ICTs not being considered as important enough to be a priority, contentment with current approaches and lack of confidence to integrate ICTs in the curriculum were reported by the teachers as well.

2.7 Challenges faced in implementing computers in the teaching and learning process

The process of implementing computer based in the teaching and learning process is a difficult process and one may face a number of challenges. A challenge is defined by Schoepp (2005) as any situation that makes the achievement of something more difficult to achieve. The challenges that most researchers identified will be explained below.

The available literature in circulation shows that lack of confidence prevents teachers from using ICT in schools (Dawes, 2001). According to BECTA (2004), most of the researchers propose that this is the key barrier to the application of ICT by teachers in the classroom. Most researchers have investigated the reasons for teachers' lack of confidence with the use of ICT. Beggs (2000) argued that teachers' fear of failure may cause lack of confidence. Balanskat et al (2006) found out that limited ICT knowledge makes them feel fearful about using ICT in classroom, thus they will not feel confident to use it in their teaching. The BECTA (2003) concluded its study by supporting the above researchers when it says many teachers who do not heed themselves to be well skilled in employing ICT feel nervous about using it in front of a class of children who maybe knowing more than they do. Lack of self-assurance and familiarity with technology affect teachers' motivation to use ICT in the classroom (Balanskat et al, 2015).

Some researches into the challenges faced in the application of ICT in education found that teacher's attitudes and intrinsic opposition to change was an essential challenge (BECTA, 2003). The BECTA (2003) also stated that one key area of teachers' attitudes towards the use of ICT is their perception on how these technologies will help their teaching and their student's learning. Schoepp's study of (2005) found that, though teachers feel that there is more than enough technology accessible, they do not believe that they are being supported, guided or rewarded in the application of technology into their teaching. Empirical (2015), noted that teachers who are

not applying modernized technology in their teaching are still of the perception that the employment of Information Communication Technology has no benefits.

According to Beggs (2000), the other challenge faced in the application of ICT is time constraints. Beggs (2000) in his study noted that computer studies as a subject was only offered to few students who had chosen it. The numbers of those who were chosen were few because they were limited according to the resources accessible. Most of the learners, therefore, had no opportunity to learn computer basics. In this case the introduction of new strategy meant that all students needed to be trained computers skills, but due to large numbers of students versus few computers, this strategy had failed (Schoepp, 2005). Schoepp found out that there are 9 to 10 lessons of 40 to 45 minutes a day respectively. On rearranging the schedule only a few slots were available. Most schools in the study of Schoepp could slot a class only once a week to the computer laboratory. This meant late training and hence late in the actual practical activity in the classroom teaching.

Schoepp's study was supported by Alwani (2015), when he purports that lack of time is a barrier that hinders the application of ICT in Saudi Arabia. This was because of busy schedules teachers work from 7:00 am until 2:00 pm and the average number of class sessions taught by teachers was 18 per week. Both teachers and students have a limited number of hours during the day to work on applying Information Communication Technology in teaching and learning of Business Studies. While this study was conducted in Saudi Arabia, this study however will be broadened in Zimbabwe focusing on the schools in Northern Central district, Harare.

Some researchers into the challenges encountered in the application of computers in education found that unavailability of technological support is one of the challenges. Lacking good technical supports in the classroom and ICT resources, teachers cannot overcome the challenges hindering them from using ICT (Lewis, 2014). Pelgrum (2001) noted that in the view of primary and secondary school teachers, one of the top challenges in using ICT in teaching and learning is lack of technical assistance. Silica (2015) supported Pelgrum (2001) when Silica said that technical challenges include waiting for websites to open, failing to connect to the internet, printers not printing, malfunctioning computers and teachers having to work on old computers. It was found out that technical challenges reduced the smooth delivery of the lesson or the other natural flow of the classroom activity (Silica, 2015). Dawes (2016) argues that ICT support from

the laboratory technicians in schools help teachers to use ICT in teaching without losing teaching time through having to fix software and hardware problems. BECTA's study of (2003) indicated that technological faults might discourage them from using ICT in their teaching because of fear of equipment breaking down during lessons. This study however will be limited to the implementation of computers in the teaching and learning process.

Silica (2015) is of the view that lack of access to resources, including home access is another complex challenge that discourages teachers from applying new technologies into education. In Silica's study of (2015) teachers complained that it is always difficult to have access to computers. Silica (2015) in his study indicated that computers had to be booked in advance and the teachers would forget to do so, or they could not book several periods in a row when they wanted to work on numerous projects with the students. BECTA (2003) postulated that inaccessibility of ICT resources is not always due to inaccessibility of the hardware and software or other ICT materials within the school. The unavailability may be caused by poor administration of resources, poor quality hardware, inappropriate software or lack of access for teachers (Becta, 2003).

In his study, Toprackci (2006) found that unavailability of computers, oldness or slothfulness of ICT systems and scarcity of educational software in the school were barriers to the successful application of ICT systems in science education in Turkish schools. Al-alwani (2015) found that having little or no access at all to the internet during the school day and lack of hardware were hindering the progress of technology application in Saudi schools. Albirini (2015) indicated that insufficient computer resources are one of the most critical obstacles to the application of technology in their teaching. Such findings will be utilised by the researcher to test their applicability in Zimbabwean schools with special reference to Northern Central district, Harare.

2.8 Ways of addressing the challenges faced in the application of computers in schools.

The available literature in circulation suggested that teachers should be thoroughly inducted on how to operate the machines (computers) before they could utilize them in their lessons. Bhasin (2012) supported the above view when he purports that it is a well-known fact that professional teacher development is a key to successful integration of ICT in the teaching and learning

process. Calson (2012) further says that teachers should not be ignored if there is need for successful use of technology in the teaching and learning process. In order to improve the use of skills of teachers, they should be developed professionally. Bhasin (2012) indicated that a digital classroom starts with the teacher. Training of teachers results in effective use of ICT tools for planning lessons. The purpose of a teacher has changed from an instructor to being a facilitator as learners discover for themselves in the ever changing world (Calson, 2012).

Access to technology resources was mentioned as a challenge in the application of ICT in teaching and learning. Ruthven et al (2004) says that there is need for accessibility and flexibility of use over and above quantity of machines. It was also found out that management should solicit for more computers from all sources possible to make learning effective and fascinating.

2.9 Summary

The literature review has focused on related theories which are going to be used in solving the ICT teaching and learning problems in primary schools in the Northern Central District. The chapter looked into the implementation of ICT in relation to what other researchers say. The literature review has also looked into the conceptual framework and theoretical framework. The following chapter will look into the methodology to be used in the study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter dwells much on explaining the methodology which was used in this research in gathering and analysing data on the challenges hindering the full implementation of ICT teaching and learning in Primary schools in the Northern Central District in Harare. This chapter therefore explains how the information was collected to fulfil the objectives of this research. The specific aspects covered in this chapter are the research design, research paradigm, data presentation techniques, sampling techniques, population, sample size, data collection methods and procedures and analysis. The chapter shall give the data sources, techniques, instruments, procedures used for sampling and research credibility.

3.1 Research Methodology

This research adopted qualitative research methodology. Denzim and Lincoln (2003) reveal that qualitative research involves naturalist interpretive approach to matter which it attempts to interpret. Maxwell (2013) points out that qualitative methods in data collection use IP. Emotions and human behaviour which cannot be adequately numbered are measures using qualitative methods. In a way, this approach gather data on the ‘why’ and ‘how’ of human behaviour which is non-numerical data for example reasons why teachers do not utilise ICTs in Primary schools and how to utilise it. As advised by Creswell (2014), qualitative approach methods are there to have a deeper understanding of the respondents’ other subjective experiences and motives. This is supported by Neuman (2000) who says that these approaches help to interpret and understand how and why people behave the way they do. In support of this, DeFranzo (2011) articulates that the approach (qualitative) is exploratory research which seeks to bring out a deeper understanding of reasons, motives or opinions. It gives an insight to the problem and its nature and it uncover past opinions and thoughts. May (2003) upholds the notion that this approach gives the why and how answers, describing relationships that cannot be quantified. The qualitative approach has assisted this study by giving depth understanding of problems that hinder the utilization of ICTs in primary schools in Northern Central District in Harare. It has

important details which is essential frequently to a qualitative researcher (Barthes, 2006). Therefore this approach suits the research question of this study.

3.2 Research Design

These methods and techniques that are chosen in order to collect various research elements in a manner that is organised in order to efficiently handle of a research problem (Bell, 2011). A design is also defined by Zikmund et al (2001) as a way in which approaches are planned when solving a problem, it is therefore a plan with specific procedures and for analysing and collecting information needed. Mullins (2000) asserts that design is there to bind a research study together. But the main research design purpose is to give structure to a study, to identify the major components of a research. Shajahan (2004) noted approaches to designs which are descriptive and causal or explanatory. A descriptive research design was employed in this research.

3.2.1 Descriptive Research Design

Descriptive design seeks to document or describe attitudes or conditions (Dawes, 2001). It helps to discover the situation which is current in the area of study. A vast amount of data is collected with ease from a number of surveys to give the researcher room to examine a variety of variables, for example, information, motives, demographic and life style, attitudes as well as intentions. On the other hand, Chiromo (2006) propounded that a survey describe the characteristics or behaviour of specific people, studies a limited cases in a logic way, which is the cases with this study. Therefore, descriptive survey was of much importance to this study to calculate and obtain accurate data on the obstacles encountered by primary school teachers in utilising technologies in primary schools in Northern Central District in Harare.

The researcher justifies the use of descriptive method in the sense that it is used to identify and obtain information on characteristics of a particular issue like community, group or people and in this case the school set up. In other words this type of research describes social events, social structure and even social situations. Descriptive research answers the questions such as what, who, where, how and when. It is used to study the current situation that is the challenges hindering the full implementation of ICT teaching and learning in Primary schools in the

Northern Central district in Harare. Descriptive research aims at portraying accurately the characteristics of a particular group or situation.

3.3 Population

Charumbira (2009) refers to it as a group people to which outcomes are generalized. Therefore, population is a particular set of people the researcher is mostly interest in. Chiromo (2006) supports this assertion saying that a population poses characteristics that are of interest to the researcher. Therefore, this study had a population which consisted of 4 Primary schools in the Northern Central District of Harare. The targeted population for this study was 100 learners, 5 heads and 10 teachers to make a total of 115 targeted participants.

3.4 Sampling Procedures

Makore (2001) defines them as a method that seeks to identify and choose a sample that represents large geographical area. According to Shajahan (2004), these procedures involve a process where participants are selected to participate in a way to yield conclusions about a particular area under study. Sampling techniques are divided into probability and non-probability or judgmental sampling. For the purpose of this research non-probability sampling was used.

3.4.1 Non-Probability Sampling

These techniques are used if the chances for each subject being selected is unknown. These include techniques in non-probability sampling include quotas, convenience, purposive and accidental. Purposive/selective was used in this research to select the teachers who might facilitate the teaching of ICT in primary schools in Harare. It is also called subjective or selective technique. It a non-probability sampling technique where researchers use their own judgment to choose respondents from population (Teddie 2003). Saunders (2012) asserts that this method is cheaper and researcher enjoys convenience since participants chosen acquire specific knowledge of the subject matter under study. Time is saved the right subjects are identified for the study. Purposive sampling is used by researchers because they want access to a particular set of people,

who they suit a particular profile. In this respect the researcher, used purposive sampling to select 8 teachers.

3.5 Sample size

Silverman (2011) says it is a subset selected from a population to represent the large geographical area. It is important to have an appropriate sample size which will be used to generate data and draw conclusions from. Saunders et al. (2007) argues that the sample size is very important in a study since it guarantees the meticulousness and exactitude of findings. Simple random and selective or judgmental sampling methods were used to have a sample for this study. The size of the sample for this study is shown in table 3.1.

Table 3.1 Population and Sample of the study

P a r t i c i p a n t s	T a r g e t e d P o p u l a t i o n	S a m p l e s i z e
L e a r n e r s		8 0
S c h o o l h e a d s	5	4
T e a c h e r s	1 0	8
T o t a l	1 1 5	9 2

3.6 Research Instruments

These are used to gather data from subjects (Annum 2014). Instruments that were used include in-depth interviews and focus group discussions.

3.6.1 In-depth Interviews

In order to gather information from school heads and teachers, in-depth interview guide was used. Borgdan and Biklen (2007) say an interview is a discussion conducted between people. In the process an interviewee responds to questions asked by the interviewer. Fraenkel and Wallen

(2003) assert that the reason of using interviews is to discover what people think and why they act the way they do in line with the area under study. There is an interaction which is purposeful where the researcher will get information important for his/her study (Cohen et al, 2011). In-depth interviews create a platform to observe non-verbal cues of the participants.

Such interviews were conducted with both school heads and teachers in this study. An opportunity for clarifications from respondents was enabled.

The researcher justifies the use of in-depth interviews because it helps to uncover more detailed and in-depth information than other data collection methods like surveys. Unlike other formats of the interview, these are intensive interviews of individuals mostly conducted from small number of respondents like the school heads and teachers in this study. The interviewer needs to create a comfortable environment for the respondent first and ask questions to uncover the best possible details from her. In-depth interviews are used to explore concepts for further investigation and descriptive analysis.

However in-depth interviews have certain disadvantages. They are time-consuming, they uses a very small sample size and they are prone to bias. To counter this the researcher was able to triangulate the sources used to gather data. This means that the researcher did not only relied on in-depth interviews as a way of gathering data but rather focus group discussions also.

3.6.2 Focus Group Discussion (FG)

The researcher conducted focus group discussions with the learners. In this study Focus Group discussions enabled the identification of a range of issues on the area under study by the researcher (Hennick, 2014) which tends to be the main objective of this research. Vast amounts of data is gathered very fast and allows brain storming mechanism (Krueger, 2000). In order to meet the objectives of this study FG discussion are an excellent. This method was used to gather information from a small group learners for them to be managed.

In conducting focus group interviews, the following steps were followed; gathering the participants, briefing them about the purpose of the discussion that was on finding out the challenges hindering the full implementation of ICT in the teaching and learning process. The learners were put in groups of 5, selecting the moderator and field team, structure and sequence

of questions and then conducting the discussion. The researcher then wrapped the discussion and collected the data. Debriefing was also done to let the learners know about the findings from the discussion regarding the implementation of ICT in primary schools.

Focus group interviews have several advantages that are worth noting. They can be used to examine how and why people think in a particular way and how this influences their beliefs and values. However they have got some disadvantages. They lack privacy, there is potential for risk of group think, potential for group to be dominated by one or two people, among other disadvantages. To counter for these demerits, the researcher tried to motivate all the participants to provide their views. Privacy was also catered for by assuring the respondents that the research findings will be for academic purposes only.

3.7 Data Collection Procedures

The researcher first sought permission from the University that is Midlands State University (MSU) to seek permission to carry out a study in the area of study that is Harare Northern Central District. The DSI of Harare North district was able to grant the permission to the researcher on behalf of the PED. The introductory letter was stamped by the DSI and the school administrators of the selected institutions. The consent of the informants was considered by the researcher where they were assured that information gathered used only for academic reasons. Confidentiality was also assured to the respondents. The researcher administered, questionnaires to the Primary teachers of the selected schools. The school heads were also interviewed to get information on the barriers of the effective implementation of computer based teaching in the primary schools. The researcher had to maintain the social distancing and also had to see that participants had protective clothing as required by World Health Organization (WHO) in line with Covid 19 preventative measures. Some of the data was collected through the use of WhatsApp platform as well as over the phone since the data was collected during Covid 19 lock down.

3.8 Data Management and analysis

Research data management is the care and maintenance of the data that is produced during the course of a research cycle. It is an integral part of the research process and helps to ensure that

the data is properly organised, described, preserved and shared. Data was collected and stored in a laptop which was secured with a password. Interview notes were typed for analysis. Numbers of focus groups depended on geographical and other variations in patterns, how quickly a robust pattern of findings emerges; and the scope for identifying and convening the appropriate groups. Whether recorded or not, the event was transcribed or documented. The collected data stored in the laptop was backed up regularly in order to avoid the likely problems with viruses. This greatly avoided data loss. The collected data was then analysed qualitatively, based on themes generated from the responses of the participants.

3.9 Ethical Consideration

Velasquez et al, (2008) is of the view that ethics are based on wrong or right that describe what humans can do for example, obligations, right, fairness or societal benefits. Basically ethics are morals that govern people's behaviour (Tuckman, 2001). In respect of that the researcher sought permission from the Ministry of Primary and Secondary Education (MoPSE) using a letter provided by the University. The researcher was able to acquire verbal consent from the subjects after they were informed of their freedom to disagree or agree to take part in the study and that the researcher protected their identity. The respondents were assured that they were protected from any harm that may be caused due to this study. By doing this, the researcher respected respondents' autonomy, freedom, self-determination rights, consent, respect volunteerism and confidentiality,

3.10 Summary

The chapter discusses the methods that were used by the researcher to gather data pertaining to the challenges hindering the full implementation of ICT in the teaching and learning process. The sub themes included in this chapter include: research methodology that is qualitative research, research design which was largely descriptive, population of the study, sampling procedures and sample size. The population encompassed participants such as school heads, teachers and learners. The total population was 115 and the sample was 92 respondents. It also discusses the research instruments such as in-depth interviews and focus group discussions. Other issues discussed in this chapter include data collection procedures, data management and also ethical considerations. Such aspects facilitated the process of conducting this research to

come up with the findings. The next chapter presents, analyse and discuss the findings of the study.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

The previous chapter dealt with the research methodology. The major thrust of this chapter is to present and discuss the findings that emanated from this study. The study was guided by the following research objectives: to explore the challenges hindering the full implementation of ICT in primary schools, to find out the ICTs available in Primary schools and to come up with strategies that facilitate teachers to integrate ICT in the teaching and learning process in primary schools in the Northern Central District. The findings are presented and analysed as per research questions and a discussion of all findings is done. Qualitative data will be analysed using themes and categories to be derived from the research questions and objectives. Data is to be presented in description form and this means telling the events as they happen. Analyses of the themes will be done strictly according to the issues pinpointed in the literature review.

4.1 BACKGROUND DATA OF THE RESPONDENTS

4.1.1 Gender of the respondents

In conducting the research out of a total sample of 92 participants, 60 of them were male while 32 were female. This was a clear indication that more men participated in the research as compared to female. The research findings indicate that gender imbalances have been common when it comes to the use of ICTs. This was in line with the views of Ndoro, (2009). The reasons for this gap is the dominance of the patriarchal societies that prevail in most setups (Ndoro, 2009). Gender stereotyping has an effect towards the development of female technologically.

4.1.2 Age characteristics of teachers and school heads

Age was considered when it comes to data collection since it determined the outcome of the research in one way or the other. The researcher found out that the participants normally teachers

and school heads have that age range between 25 and 46. According to the findings 2 of them were between 25 and 30 years, 2 of the participants again were between 31 and 45 whilst 8 were 46 years and above. Having analysed this, the researcher was able to conclude that the majority of the participants who fell in the 46 and above category could face challenges in the implementation of ICT in the teaching and learning process (Dawes, 2001). Beggs (2000) indicated as shown in the literature that technology needs people who are still young in the teaching profession and have received training on using computers. Hence computer literacy can determine the level of ICT adoption and implementation in primary schools.

4.1.3 Teachers' Professional Qualifications

Teachers' professional qualifications have a direct bearing on the adoption status of ICTs in schools. The data gathered revealed that from the 12 respondents (teachers and school heads) six of them were Diploma holders, 3 were holders of the Bachelor of Education Degrees while 3 have Master degree. The findings of this study were credible as the teachers are all well-educated as they hold degrees relevant in the teaching institution. Therefore there was the probability that they could possess the knowledge about the use of ICT gadgets used in schools. However what remains worrisome was that the majority of such teachers do not possess an ICT qualification which became one of the possible source of the barriers hindering the effective implementation of ICT in the selected schools under this study.

4.1.4 Respondents by working experience

The researcher was interested to know about the number of years of the teachers and heads in the teaching field. It was revealed that out of 12 participants, 2 of them have less than 2 years of experience, 2 of them were between 5 to 10 years of working experience. 8 teachers have more than 10 years of working experience. In support of this assertion, study by the National Center for Educational Statistics (2000) in Tedla (2012) reported that those with more years of teaching tend to utilise technologies in their classrooms than those who have few years of teaching.

4.2 Themes emerged from the research findings

This section deals with the themes that have emerged from the sources used to gather data. Such sources include in-depth interviews and Focus group discussions.

4.3 Challenges of ICT implementation

4.3.1 Teachers' skills and the Implementation of ICT

Eighty teachers and four teachers were asked about the contribution of lack of skills among the teachers towards the failure of ICT integration in primary schools. Pertaining to this question, the respondents were quite sure that this negatively affects ICT adoption. This was in line with Tedla (2012) who discovered that a number of educators lacked skills and knowledge to operate ICTs and are not ready to move from traditional methods of chalkboard use to internet and computer use. The respondents indicated that teacher incompetence may be one of the strong problems underlying the underutilization of technologies in the learning and teaching of ICT in the Northern Central district schools, Harare. Incompetence may be a cause to resistance to change which is another problems teachers face in trying to utilise ICT.

The findings from the interviews also indicated that there is a connection between teachers' computer experience and their computer attitudes. If instructors have more experience with computers, they will show positive attitudes towards them. This has been supported by the findings from chapter two where Costa (2007) declared that many teachers who had negative attitudes about the use of ICT in instruction did not have enough knowledge to make good decisions.

4.3.2 Teacher overload and ICT

The question on teacher overload and the implementation of ICT was responded to by seven teachers. One of the teachers did not provide a comment due to the reasons best known to him. Four school heads also provided their views and responses on that matter. Pertaining to the issue of work overload, the seven teachers all shared similar sentiments by saying that they are overloaded with administrative tasks such as preparation of report cards, making attendance reports, filling the record books and forms. The teachers also do not wish to incorporate ICT tools into their lessons because of their concentration on examinations and syllabi. Some teachers were afraid that they could not finish the syllabus in time. They also revealed that ICT is difficult to integrate in the classes which consist of large number of students. The teachers were burdened

with the tasks of marking examination papers, students' exercise books and workbooks. One of the teachers had this to say:

I was given pressure to finish my syllabus and the assessment and I am tired of marking the student's books and examination papers and also writing the record book every day.

Another respondent added that

We are overloaded with our tasks especially we junior teachers have to conduct the school-based assessment and this could affect us when it comes to the issue of embracing ICT in the teaching and learning.

Therefore, basing on such findings the teachers stressed that workload is a major barrier for them to integrate ICT tools in the teaching and learning process. Similar problem was highlighted by Abuhmaid (2011) in his study. He found that the primary teachers in the Northern Central district of Harare were already overloaded and they could not cope with the pressure to prepare and practice the ICT integration into lessons.

More to this extreme work load was given on teachers due to the shortage of teachers. It was found from the structured question that most of the teachers had heavy class loads approximately over 30 hours per week which put extremely pressure on them. Though some of the teachers were interested in the use of ICT for preparing their teaching-learning materials, due to the heavy load they did not get enough time to do so. Due to heavy class loads, teachers got panic and depressed about the use of ICT in primary schools.

4.3.3 Infrastructure and ICT

Out of 8 teachers who took part in the research, 6 of them shared the similar opinion that the unavailability of infrastructure at their schools became a barrier to computer-based teaching in their primary schools. According to Silica (2015) ICT infrastructure measures the perceived availability and suitability of the ICT tools such as hardware, software and peripheral equipment provided in the school. Again ICT infrastructure refers to the availability of equipment, software, Internet access and other similar resources in the school. Additionally, resources and facilities in schools are designed and enabled in the direction of supporting continuous transformation and development of various learning approaches. The researcher

noted that the majority of the schools in the Northern Central district of Harare have limited infrastructure that can support the usage of ICTs.

The researcher found information from the participants that the teachers were not able to integrate technology into instruction due to the old and outdated hardware. Conversely, one of the informants stated that limited software act as one of the antecedents that prevents the use of computers as an instructional tool. This has been supported by Shiue (2007) who argues that teachers will perceive greater control to employ technology into instructional use when they have the necessary hardware and software resources. In this regard the teachers have more prospects to utilize instructional technology when the ICT infrastructures are provided in a well manner.

4.3.4 ICT available in schools

It was found from 4 teachers and 2 that some of the primary schools have computers. However they indicated that the computers were very few. Several scholars the likes of Silica (2015), Schoepp (2005) and Dawes (2001) all shared similar sentiments that in most cases in the teaching field teachers complained about how difficult it was to always have access to computers. One teacher said:

Most of the time, our computers had to be booked in advance and the teachers would forget to do so, or they could not book them for a quite number of periods in a row when they wanted to work on several projects with the students as well as delivering lessons.

In other words, a teacher would have no access to ICT materials because most of these were shared with other teachers. Other 2 teachers identified lack of insufficient numbers of computers, insufficient peripherals, and insufficient numbers of copies of software, and insufficient simultaneous internet access as the main obstacles to the implementation of ICT in educational institutions. According to Beggs (2000) 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 problems such as lack of high quality hardware, suitable educational software, and access to ICT resources. The findings concurs with the views of Newhouse (2011) who argues that that poor choices of hardware and software and lack of consideration of what is suitable for classroom teaching are problems facing many teachers.

This concurs with the data from the focus group discussion which also pointed to the Limited ICT gadgets at the school. This was one of the major factors that made difficulties in use of ICT in the Northern Central district of Harare. The researcher found out that in most of the schools in the district, there were unreliable and pirated software that had been frequently changed in the computer labs which were difficult to use properly in teaching-learning process. In majority of the cases it had been found that the ICT facilities were limited for both the teachers and students and they had to share with other teachers. This was in line with Becta (2005) when it was found out that the inaccessibility of ICT resources is not always merely due to the non-availability of the hardware and software or other ICT materials within the institution. It may be the result of one of a number of factors such as poor organization of resources, poor quality hardware, inappropriate software, or lack of personal access for teachers.

One of the respondents said that

The computers are very few and most of the time they were being used by some students doing ICT making it difficult for other students and teachers to access them.

This therefore shows that the lack of access to technologies is one of the major obstacles to the implementation of ICT in schools in the Northern Central district of Harare.

4.3.5 Economic factors and ICT implementation

Eight teachers and four primary school heads gave their responses to the issue of economic factors and the implementation of ICT in primary school. Almost all the twelve respondents do agreed that ICT integration in schools can be connected or linked to the economy of a given country especially the Zimbabwean economy. All the four school heads emphasised that the unstable economic situation in Zimbabwe had a negative impact on ICT integration in schools. Moyo (2017) submitted that economic stagnation do have a negative impact on the smooth running of the educational sector. He tried to emphasise that it is the responsibility of the government to make sure that the economy is in good shape so that all the institutions in a given country ca operate very well without any serious problems. The economic situation of Zimbabwe has been found to be a barrier to the full implementation of ICT teaching and learning in primary schools. Nyoni (2019), posits that the month to month inflation rate in January 2019 to

December 2019 inflation rose to forty-three percent (43%). This then left very few schools to be able to afford the much expensive gadgets that are useful in the full use of ICT in primary schools. So, it becomes very expensive in terms of their purchase as well as the servicing process of the gadgets. Therefore the economic situation in Zimbabwe has a direct impact on the rate at which ICTs are to be used in schools.

Here the researcher came to the conclusion that the government of Zimbabwe is facing challenges when it comes to the issue of supporting primary schools in terms of technology. The government is failing to provide or buy computers for schools due to economic meltdown. As a result there is a correlation between economic meltdown and the inability of

4.4.6 Negative perceptions from the learners and teachers

Some students indicated that attitude plays an important role towards the adoption of ICT in the teaching and learning process. They indicated that teachers' positive attitude towards computer is an important issue because of its being implemented as a new innovation in the teaching-learning process. The success of implementing new innovation of education in schools depends on teachers' attitude. Students have suggested that if teachers believed and perceived proposed computer programs as fulfilling neither their own nor their students' needs, they are not likely to attempt to introduce technology into classroom. All of the success of utilising computer and students' achievement depend on teachers' attitude of using computer and their willingness. Other students argued that their teachers have negative attitudes towards ICT implementation in schools. This acted as a barrier or hindrance to the full implementation of ICT in the teaching and learning process. Such findings were in line with most of the studies which show that teachers gain a positive attitude towards ICT through government interventions and training programs (Balanskat and Blamire, 2016).

4.4.7 Lack of knowledge about the use of ICT gadgets from the teachers.

Findings from the focus group discussions indicated that poor ICT skills was an obstacle for teachers to incorporate the ICT tools in the classrooms. Basing on teachers' attitude and teaching of ICT lessons, students assumed that teachers did not get proper training on ICT tools and therefore, they are not confident or competent in using the ICT. In this case the teachers did not

receive any ICT training at the teachers' training colleges or universities where they will be trained and therefore, they did not get chances to understand the significant roles of the ICT tools. Moreover, the researcher also came to the conclusion that teachers do not take any initiative to learn and improve their ICT competence.

The literature reviewed in chapter 2 of this research held similar results with the findings of this research. Knezek and Christensen (2015) once said that teachers' competence with computer technology is a key factor of effective use of ICT in teaching. So, the teachers who do not have ICT competence could not integrate the ICT tools in their teaching. Koh (2010) also claimed that teachers' professional development has to concentrate on both ICT skills training and appropriate ICT integration strategies in the curriculum. Therefore, teachers in the Northern Central district of Harare faced the challenge of not receiving appropriate training in ICT. This acted as a barrier to the full implementation of ICT based teaching in the teaching and learning process.

4.4.8 Lack of technical support

Technical support can be defined as specialized skill personnel who are able to support and assist the educators in implementing technology into instruction. It has been found out that in the selected schools in Harare, there was no technical support to repair and maintain the available computers. Such a burden hinder the full implementation of ICT in those schools. For this reason, it is essential to provide guidance, support and services as parts of the technology applications. In the integration of the ICT, technical support is needed for technology use throughout the curriculum because the lack of it may create difficulties and result in diminished support for the curriculum especially in the selected schools of the present study. This has been supported by Resta (2016) who also suggested that giving more technical support might overcome the identified barriers. It is evident that technical support is important to teachers. Therefore, technical support is required in schools to facilitate the educators to use the laptop effectively in their teaching practices. The researcher therefore came to the conclusion and suggestion that teachers are in need of more technical support for them to make use of the new technologies which could be accomplished by hiring educational technology and information technology professionals to assist when need arise.

4.4.9 Resistance to change

One of the problems in the implementation of computers in teaching-learning was resistance to change on the part of the teachers. Teachers' attitudes and resistance to change have affected the full implementation of ICT teaching in Northern Central district of Harare. Students have said that the teachers were used to the use of traditional methods of teaching and as such they were not prepared to use the computers which were introduced by them. Many researches into the problems of integrating ICT in education found that teachers' reluctant to new technology was a significant problem. Watson (2015) 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. 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. Therefore the researcher came to the conclusion that one of the problems that prevent teachers from using ICT in their teaching is lack of confidence and such limitations in teachers' ICT knowledge makes them feel anxious about using ICT in the classroom and thus do not have confident in using it in their teaching and likely resisted change.

4.5 ICTs available in Primary schools

The research revealed that ICT resources were not adequate in the primary schools under investigation. One respondent said:

We normally have limited computers and tablets which are not enough to meet the needs of the learners. This is affecting the motivation of our students towards ICT learning.

School heads and teachers in some of the sampled schools in Northern Central district in Harare said that they have problems associated with funds that sometimes the internet may not be paid for by the school administration.

The findings concurs with the views of Adwaith (2020) who argues that the school authorities are unnecessarily using funds on expensive ICTs. Reasons of using ICTs for the benefit of learners are not being considered and have shifted to profit making rather than for the welfare of the future generation. He further stated that most companies are always in transit to and from school in a way to try and sell the technologies despite of selling out dated ICTs. This was in line with the literature reviewed in chapter two of this research where Schoepp (2005) said that companies may end up selling products in such a way that they clear their stocks and schools are exposed to gadgets that might not function well. This became a challenge to ICT use in the selected schools.

4.6 Ways of minimising the challenges of full ICT implementation

Respondents agreed to the notion that upgrading of ICT facilities would help facilitate ICT integration in teaching and learning. A number of the respondents were of the view that ICT facilities at their schools have to be upgraded to ease the utilisation of ICTs in schools. This means if ICT facilities upgraded teachers would embrace ICT. Most of the learners revealed that upgrading ICT facilities would help teachers not to underutilize ICT during teaching and learning. All school administrators also agreed to the notion of upgrading ICT facilities and one of them said:

Maybe if upgrading is done teachers may be attracted to the use of ICTs.

All teachers agreed that training would be essential in trying to facilitate teachers to fuse ICTs in schools. Thus teachers are eager to be trained so that they embrace ICTs. All school heads agreed that training would help teacher to utilise ICTs.

One school head said

Of course workshops at cluster level or school level will work very well in trying to help teachers to integrate ICTs. At school level we can make use of teachers trained along those lines and that would be cheap of course.

Learners also said, teachers, if trained, are likely to perform even better to the learners' benefit. One of the learners said that,

Our teachers need to get training every time because things are changing very fast so they need to be up to date.

Therefore training of tutors in the use of ICTs it's a strategy which can promote the fusion of ICTs in schools. Teachers agreed that increase of ICT access will help to embrace ICTs. This entailed the researcher that schools should increase ICT access. The majority of the school administrators agreed that instructors and students should have access to new technologies they will use in teaching and learning. Learners highlighted that schools in order to increase access, enough fuel for generators should be provided or make use of solar system which ensure enough supply of energy. Findings also reveal that learners be allowed to bring ICT gadgets to school and Wi-Fi be open to students as a way of encouraging them to integrate ICT in their learning.

Teachers agreed that technical support help them in the ICT integration during teaching and learning processes. This means schools have to give technical support to instructors to facilitate utilisation of ICTs in schools. School heads agree with this sentiment.

One school heads said,

If tutors are given the platform to perform indeed they perform even better.

Learners during the discussion also said that if teachers are given the technical knowledge they will perform. So teachers require technical support for the purpose of giving teachers the necessary teaching skills.

It emerged from the study that several strategies can be employed for the purpose of improving the teaching and learning of ICT in schools. Respondents reported that upgrading of ICT facilities, training, increase of ICT access and offering technical support might best improve the teaching and learning of ICT. Training through staff development workshops has been suggested to be one of the strategies for teachers to utilise ICTs in schools. This concurs with Marzajani et al (2010) who argues that they require a massive, ongoing exposure to technologies so that they are able to select and evaluate the most appropriate that they can use. Training enhances teachers' ICT skills. Findings revealed that school administrators should seek assistance to identify and provide ongoing training through staff development, and assist teachers get short courses on how to operate ICTs.

The study however, indicated that if learners are given the freedom to access ICTs they are capable of misusing the technologies and this has become a problem classrooms. Exposure of modern technologies that is, smartphones, and tablets has made learners vulnerable to harmful website where they access for example, pornography. Classrooms of today have been modernized through the use of technology. Chen et al (2014) blamed technology when he said that it has caused overload cognitively among learners. Therefore technology can be misused if learners are not closely monitored.

The respondents also suggested electricity back up as another strategy to improve the teaching and learning of ICT in schools. It is probable to say electricity access facilitates the introduction of ICTs into the classroom. According to Robinson (2007), electricity availability in schools enables the use of technologies. The internet has been suggested as one of the tools that are able to expose learners to the modern technologies but can only be available through electricity. Experiences and learners which can be accessed through the use of the internet help accomplish educational objectives. Therefore learning might become a problem if there is no access to electricity. However backups like use of generators would help to move towards the use of ICTs in a situation where electricity has been shut down. It also emerged from the study that the solar system is the form of energy that schools should install because it is a renewable source and guarantee availability all the time. In this regard schools should make budgets for the installation of solar systems in order for ICT to be used without power cuts problems. Interested stakeholders must also provide these facilities for smooth use of ICTs in schools.

Findings from the interviews showed that the teachers are supposed to learn new skills that are related to ICT use as they are the workforce that provides learners with future benefits. Literacy in teachers have been found to be necessary all the time in educational set ups for extreme success in ICT utilization in the teaching and learning process. Such skills are a requirement for both practical and theoretical lessons in schools and are greatly appreciated. In certain organisations workers who are computer literate are needed at all levels despite of the job to be done. Hence, the research came to the point that schools should also train their teachers for goal accomplishment. In the event that teachers are trained and attain the necessary skill enough to use in the classroom, ICT facilities must be upgraded. This means schools should equip the ICT departments with the updated ICT tools.

4.7 Discussion of the findings

The results here are discussed in line with the research questions which formulated this study. Such questions include the following:

- What challenges are faced in integrating computer-based teaching in Primary schools?
- What mechanisms have been put in place in primary schools to curb the challenges of ICT implementation?
- What are the ICTs available in the Primary schools in the Northern Central District in Harare?

Pertaining to the first research question, on the challenges faced in integrating computer-based teaching in Primary schools, the study revealed those challenges. The research revealed that limited the use of computers, lack of training, resistance to change, negative impacts of the economy and technophobia were among other challenges faced in integrating ICT in Primary schools in the Northern Central District in Harare. This was in congruence with the literature reviewed in Chapter 2 of this study where it was revealed by Beggs (2000) who argued that teachers' fear of failure may cause lack of confidence. Balanskat et al (2006) found out that limited ICT knowledge makes them feel fearful about using ICT in classroom, thus they will not feel confident to use it in their teaching. The BECTA (2003) concluded its study by supporting the above researchers when it say many teachers who do not heed themselves to be well skilled in employing ICT feel nervous about using it in front of a class of children who maybe knowing more than they do. Lack of self-assurance and familiarity with technology affect teachers' motivation to use ICT in the classroom (Balanskat et al, 2015).

4.7.1 Challenges of ICT integration in Primary schools.

Results have shown that most primary teachers lack confidence on how to operate the ICTs and this hinders its utilization in schools. Becta (2004) also establishes that much of the researches have revealed not being confident as problem to the utilisation of ICTs by educators in the classroom. Findings concur with Okolie (2017), who posit that educators decide not to use ICTs in certain situation because they lack the ability to operate the technologies. According to

Bingimlas (2009) teacher's unconfident attitude is due to fear of failure. A number of teachers who are not familiar with ICT use will not use the technologies because they may not want to be embarrassed in front of the class if they fail to operate. So experience and confidence with technology influence tutors' motivation to use ICTs in the classroom.

Lack of skills and knowledge was found to be a hindrance in ICT utilization in Primary schools in the Northern Central District of Harare. Tedla (2012) discovered that a number of educators lacked skills and knowledge to operate ICTs and are not ready to move from traditional methods of chalkboard use to internet and computer use. Teacher incompetence was found to be one of the strong problems underlying the underutilization of technologies in the learning and teaching in Primary schools in the area under investigation. Incompetence was a cause to resistance to change which is another problem teachers faced in trying to utilise ICT. However, Watson (2017) posits that making use of the technologies in education requires change and innovation and every educator will handle it differently. Taking into account teacher differences in attitude towards change, it is an important factor since they play a crucial role in day to day activities in the classroom. Johnson et al (2016) says teachers must be confident and motivated in using the abundance of educational technology available, therefore should have the ability to effectively use them. Many of the current teachers grew up during times where access was to scarce, but today learners are raised in an ICT saturated environment. These digital natives can scare teachers, especially those without technological experience. Teachers feel less in control of the class if they do not possess necessary ability to operate ICTs, so they won't make use them. These teachers are unlikely to utilize technologies in their activities and are unlikely to explore new possibilities, (Hughes, 2005, Johnson 2016).

According to Nyoni (2019), the month to month inflation rate in January 2019 to December 2019 inflation rose to forty-three. This will leave very few schools to can afford the much expensive gadgets that are useful in the full use of ICT. So, it becomes very expensive their purchase as well as the servicing process of the gadgets as some of the respondents indicated during the data collection process.

The results have revealed that limited access to ICTs hinders its use in Primary schools in the Northern Central District of Harare. The findings from the research revealed that ICT accessibility should be easy to all learners and teachers to encourage its use. Unreliable access to

existing lesson plans makes it impossible to make use of technologies in the teaching and learning process. Routine accessibility to ICT hardware, for example, tablets, laptops, software and connection to the internet is a fundamental requirement. Munaki (2017) also says that the utilisation of ICT in schools has accessibility problems associated with network connection which is poor, limited time, lack of technical support, and teachers' incompetency.

It has also been revealed from the findings that limited technical support is a cause of concern in ICT use in Primary schools. It is, therefore, evident that primary school teachers in Northern Central District of Harare do not have optimal access to technologies. Certainly with support teachers have less to worry about when conducting lessons but instead will focus on imparting knowledge to learners (Johnson et al 2016). Thus with good support from school administrators and other stakeholders interested in the educational fraternity, teachers will access resources they deserve to use for the benefit of the learners. Research revealed that teachers are in need of more technical support for them to make use of the new technologies which could be accomplished by hiring educational technology and information technology professionals to assist when need arise.

Again it was shown that in most schools, technical difficulties sought to become a major problem and a source of frustration for students and teachers and cause interruptions in teaching and learning process. If there is lack of technical assistance and no repair on it, teachers are not able to use the computer for temporarily (Jamieson-Proctor et al., 2013). The effect is that teachers will be discouraged from using computers because of fear of equipment failure since they are not given any assistance on the issue. The study findings were in line with Turel and Johnson's (2012) findings where they revealed that technical problems become a major barrier for teachers to use ICT in Primary schools in the District. These problems include low connectivity, virus attack and printer not functioning.

4.7.2 Mechanisms that have been put in place in primary schools to curb the challenges of ICT implementation.

From the data gathered, it was revealed that teachers need to receive training on how to use ICTs, learners should be motivated to develop a positive attitude towards the use of computers in

schools and also the government should provide adequate computers in primary schools so that they can be utilised. Such findings concurs with the literature reviewed in the study. The literature supports this when it was shown that teachers should be thoroughly inducted on how to operate the machines (computers) before they could utilize them in their lessons. Bhasin (2012) supported the above view when he purports that it is a well-known fact that professional teacher development is a key to successful integration of ICT in the teaching and learning process. Calson (2012) further says that teachers should not be ignored if there is need for successful use of technology in the teaching and learning process. The literature also shows some similarity to the research findings when it was revealed that in order to improve the use of skills of teachers, they should be developed professionally. Bhasin (2012) indicated that a digital classroom starts with the teacher. Training of teachers results in effective use of ICT tools for planning lessons.

Electricity back up is another strategy which was suggested in this study. Electricity access facilitates the introduction of ICTs into the classroom. Electricity availability in schools enables the use of technologies. The internet has been suggested by the participants as one of the tools that are able to expose learners to the modern technologies but can only be available through electricity. Experiences and learners which can be accessed through the use of the internet help accomplish educational objectives. So without electricity ICT integration becomes problem. However backups like use of generators would help to move towards the use of ICTs in a situation where electricity has been shut down. Respondents said that the solar system is the form of energy that schools should install because it is a renewable source and guarantee availability all the time. When making use of electricity back-up such as generators it is of great importance to take environmental issues into consideration. Sustainable development goals considers global warming where there is need to have gadgets that emit lower carbon percentages and that leaves a priority for solar system. It has been indicated that schools should make budget for the installation of solar systems in order for ICT to be used without power cuts problems.

However the research findings contradicts with the literature when it shows that access to technology resources was mentioned in the literature as a challenge in the application of ICT in teaching and learning. Ruthven etal (2004) says that there is need for accessibility and flexibility of use over and above quantity of machines. It was also found out that management should solicit for more computers from all sources possible to make learning effective and fascinating.

The disagreements emanated because the researches were conducted in different countries with different economic backgrounds and policies. Some governments can support their education systems very well which might be different in the case of Zimbabwe.

The research findings indicated that the schools have limited number of computers which made it difficult for ICT integration. The teachers and the learners had to use their mobile phones for the purpose of accessing internet. It has been revealed that a teacher would have no access to ICT materials because most of these were shared with other teachers. The research identified insufficient numbers of computers, insufficient peripherals and insufficient numbers of copies of software, and insufficient simultaneous internet access as the main obstacles to the implementation of ICT in educational institutions. One of the scholars like Beggs (2000) says that 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 problems such as lack of high quality hardware, suitable educational software, and access to ICT resources. The findings concurs with the views of Newhouse (2011) who argues that poor choices of hardware and software and lack of consideration of what is suitable for classroom teaching are problems facing many teachers. However this was contrary to the literature which shows that most of the primary schools in Zimbabwe have ICT resources for example projectors, computers and other ICT tools.

Nonetheless, this study established that lessons need to be provided with computers for planning their lessons in order to make the best use of the ICT in teaching-learning process. Some computer software were identified to be very complicated to the extent that some of the teachers who have limited skills of ICT usages faced challenges. Hence, appropriate training should occur frequently. Lack of motivation on students has been a significant factor that limited the use of ICT in the primary schools in the northern central district of Harare. It emerged from the research findings that students were reluctant to use online resources to help them in the academic process. Some students are weak and do not want to practice in using computers.

4.8 Chapter Summary

The chapter presented and discussed the research findings pertaining to the challenges hindering the full implementation of ICT teaching and learning in Primary schools in the Northern Central district in Harare. Qualitative data collected was analysed using the themes emerged from the research objectives. Findings have revealed that there are certain challenges that are faced in the implementation of ICT in the teaching and learning process in the Northern Central district in Harare. The challenges include: lack of ICT skills among the teachers, resistance to change, limited ICT resources, lack of infrastructure, economic impacts, among other factors. Strategies like training, increase of ICT access and offer technical support to primary school teachers were given so as to improve the teaching and learning of ICT in Primary schools. The next chapter focuses on summary, conclusions and recommendations of the research.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The previous chapter focused on data presentation, analysis and discussion of the findings. This chapter summarises the whole study. It also provide, constraints encountered during the conduct of the research and strategies used to minimise them, conclusions, lastly recommendations of the study which can be instituted in the education sector to facilitate ICTs utilization in the teaching and learning process especially in primary schools.

5.2 Summary

The research problem which motivated this study was that a number of Primary schools in the Northern Central District in Harare were not utilising ICT in the teaching and learning process. In support of this, the research indicated that the economic challenges being faced by Zimbabwe made it doubtful that the implementation of ICT is being done effectively. Considering the objectives of the ICT policy in development of knowledge through initiatives from ICT in education, the cost of setting conducive implementation environment could be the challenge. The research indicated that the schools might be facing funding challenges to purchase resources needed for mechanizing the infrastructure for effective implementation of ICTs in teaching and learning. In most cases teachers have been failing to have experience on the use of ICT gadgets thereby leading them to ignore their use. In most cases the major barriers might be the lack of genuine software, inadequate computer in the classroom, low speed internet, lack of motivation from both teacher and student side to use ICT, lack of proper training skills, unavailability of latest ICT equipment, lack of expert technical staff, poor administrative

support, poor course curriculum. In this regard the researcher was motivated to do a research on the challenges hindering the implementation of ICTs in primary schools in Northern Central District of Harare.

The purpose of the study therefore, was to investigate the challenges hindering the full implementation of ICT teaching and learning in Primary schools in the Northern Central District in Harare. Coupled with this, the researcher wanted to explore the teaching of ICT in primary schools in the Northern Central District. Since researches are intervention oriented to the situation at hand, the proposed research seeks to tailor make intervention measures to the problems being experienced in the teaching and learning of ICT in primary schools in the Northern Central District.

To execute the study, the descriptive research design was used. Descriptive design seeks to document or describe attitudes or conditions. It helps to discover the situation which is current in the area of study. A vast amount of data is collected with ease from a number of surveys to give the researcher room to examine a variety of variables, for example, information, motives, demographic and life style, attitudes as well as intentions. Chiromo (2006) propounded that a survey describe the characteristics or behaviour of specific people, studies a limited cases in a logic way, which is the cases with this study. Therefore, descriptive survey was of much importance to this study to calculate and obtain accurate data on the obstacles encountered by primary school teachers in utilising technologies in primary schools in Northern Central District in Harare. The researcher found the advantages of descriptive study as it is used to identify and obtain information on characteristics of a particular issue like community, group or people and in this case the school set up. The study found out that descriptive research design describes social events, social structure and even social situations. Descriptive research answers the questions such as what, who, where, how and when. This is why it was used to study the current situation that is the challenges hindering the full implementation of ICT teaching and learning in Primary schools in the Northern Central district in Harare. Descriptive research aim at portraying accurately the characteristics of a particular group or situation.

The research employed qualitative research methodology to gather data from the field for the purpose of analysis. The study consulted several sources to understand what qualitative research methodology is. It has been defined by Denzim and Lincoln (2003) as a methodology which

involves naturalist interpretive approach to matter which it attempts to interpret. Maxwell (2013) also points out that qualitative methods in data collection use Interpretivism. Emotions and human behaviour which cannot be adequately numbered are measured using qualitative methods. In a way, this approach gather data on the ‘why’ and ‘how’ of human behaviour which is non-numerical data for example reasons why teachers do not utilise ICTs in Primary schools and how to utilise it. As advised by Creswell (2014), qualitative approach methods are there to have a deeper understanding of the respondents’ other subjective experiences and motives. This is supported by Neuman (2000) who says that these approaches help to interpret and understand how and why people behave the way they do. In support of this, DeFranzo (2011) articulates that the approach (qualitative) is exploratory research which seeks to bring out a deeper understanding of reasons, motives or opinions. It gives an insight to the problem and its nature and it uncover past opinions and thoughts. May (2003) upholds the notion that this approach gives the why and how answers, describing relationships that cannot be quantified. The qualitative approach has assisted this study by giving depth understanding of problems that hinder the utilization of ICTs in primary schools in Northern Central District in Harare. It has important details which is essential frequently to a qualitative researcher (Barthes, 2006). Therefore this approach suits the research question of this study.

Data collection instruments used in the research were in-depth interviews with teachers and school heads and also focus group discussions with the students. Borgdan and Biklen (2007) say an interview is a discussion conducted between people. In the process an interviewee responds to questions asked by the interviewer. Fraenkel and Wallen (2003) assert that the reason of using interviews is to discover what people think and why they act the way they do in line with the area under study. There is an interaction which is purposeful where the researcher will get information important for his/her study (Cohen et al, 2011). In-depth interviews create a platform to observe non-verbal cues of the participants.

In-depth interviews have been found to have certain advantages. It was found out that they helps to uncover more detailed and in-depth information than other data collection methods like surveys. Unlike other formats of the interview, these are intensive interviews of individuals mostly conducted from small number of respondents like the school heads and teachers in this

study. The interviewer needs to create a comfortable environment for the respondent first and ask questions to uncover the best possible details from her. In-depth interviews have been used to explore concepts for further investigation and descriptive analysis.

However in-depth interviews have certain disadvantages which were noted during the study. They are time-consuming, they use a very small sample size and they are prone to bias. To counter this the researcher was able to triangulate the sources used to gather data. This means that the researcher did not only rely on in-depth interviews as a way of gathering data but rather focus group discussions also.

The researcher also utilised focus group discussions with the learners. In this study Focus Group discussions enabled the identification of a range of issues on the area under study by the researcher which tends to be the main objective of this research. Vast amounts of data have been gathered very fast and allows brain storming mechanism. This was in line with the views of Krueger (2000). In order to meet the objectives of this study FG discussion have been found to be excellent. This method was used to gather information from a small group learners for them to be managed.

The researcher noted some advantages of focus group interviews. They can be used to examine how and why people think in a particular way and how this influences their beliefs and values. However they have got some disadvantages. They lack privacy, there is potential for risk of group think, potential for group to be dominated by one or two people, among other disadvantages. To counter for these demerits, the researcher tried to motivate all the participants to provide their views. Privacy was also catered for by assuring the respondents that the research findings will be for academic purposes only.

The study sourced the data from a wide range of the respondents (Population). Charumbira (2009) refers to Population as a group people to which outcomes are generalized. Therefore, population is a particular set of people the researcher is mostly interested in. Chiromo (2006) supports this assertion saying that a population poses characteristics that are of interest to the researcher. In this regard, the study had a population which consisted of 4 Primary schools in the Northern Central District of Harare. The targeted population for this study was 100 learners, 5 heads and 10 teachers to make a total of 115 targeted participants.

A sample of 92 participants was used and it was selected using non-probability sampling techniques. Purposive/selective sampling was used to select the teachers and school heads whilst convenient sampling was used to select the learners. Silverman (2011) says a sample is a subset selected from a population to represent the large geographical area. It was important in this research to have an appropriate sample size which was used to generate data and draw conclusions from. Saunders et al. (2007) argues that the sample size is very important in a study since it guarantees the meticulousness and exactitude of findings. Simple random and selective or judgmental sampling methods were also used to have a sample for this study.

However, in the process of carrying out the research, the researcher faced several problems or challenges such as limited time, unavailability of resources such as finance, the respondents were not readily available on the scheduled dates for conducting the interviews, and hence the sample was limited. However despite such challenges, the researcher was able to utilise the time and resources available in order to come up with adequate findings. The researcher was also able to select the sample which was representative to the targeted population.

The major findings of the study were that the schools in the selected District faced a number of challenges in the use of ICT. Such challenges include; teachers' failure to use modern technology, lack of confidence on how to operate ICTs, resistance to change, technophobia and also limited ICTs in schools. The suggested solutions include: upgrading ICT facilities, training of tutors in the use of ICT, improving technical support and also improve electricity back up.

5.3 Conclusions of the study

This section summarises and concludes the study basing on the findings in line with the research objectives and questions of the research.

5.3.1 Challenges faced in the implementation of ICT in the Primary schools in Northern Central district in Harare

The study concluded that there were problems in the use of ICT in primary schools in the selected District. These include: lack of skills and knowledge, limited access, limited technical

support, electricity supply shortages, costs involved, shortage of building infrastructure, minimum innovation strategies, age of the teachers and technophobia. The study revealed that old aged teachers resist the use of modern technology. These barriers have to be dealt with to initiate the utilization of ICTs in learning as suggested in this study.

5.3.2 Strategies that should be adopted to facilitate teachers to integrate ICTs in teaching and learning

The study came to the conclusion that several measures can be taken to curb the challenges faced in integrating ICT in the teaching and learning process. This include upgrading ICT facilities, training teachers on how ICTs are used, increasing ICT access, offering technical support, coordination of all stakeholders and employment of qualified ICT personnel. The research also concluded that schools should have a stand-alone ICT department which ensures efficient utilization of ICTs. Some of subjects suggested that Wi-Fi passwords and access to computer rooms should be open to everyone. These strategies have to be implemented at every School to facilitate the use of ICTs in schools

5.3.3 The use of ICTs in Primary schools

The study came to conclude that the Primary schools in the Northern Central District have limited ICT tools. Gadgets like Computers, internet, television sets, tablets and iboards, are very limited in the District. The educators and students had memory devices which they use to store learning material such as memory sticks and memory cards. These findings showed the researcher that teachers and learners are not fully embracing ICT in teaching and learning. Therefore there is need for school authorities to come up with regulations and programs which encourage the utilization of ICTs in learning at their institutions as students highlighted that they have the ICTs but are not allowed to bring them into the learning institution.

5.4 Recommendations of the study

Basing on the conclusions of the study, the following recommendations have been made:

- ICTs should be available in Primary schools
- Teachers should receive proper and adequate training on how to use ICT in the teaching and learning process.
- Teachers should be encouraged to embrace technology and learn new skills in the teaching and learning process.
- The Government should create a conducive environment for education to thrive very well in the absence of economic challenges.
- Learners should be encouraged to develop positive attitudes towards the use of ICT in the learning process.
- Since this study has revealed the strategies that encourage the involvement of stakeholders to help in integrating ICTs, it is important as well to investigate the extent to which the stakeholders are to take part in upgrading learning and also to establish the stakeholders that support ICT.

5.5 Areas for further studies

The research recommended that future studies be taken on the implementation of ICT based teaching in the teaching and learning process. This study was limited to primary schools in one District. It is therefore recommended that future studies be carried out in Secondary schools in other districts in different provinces in Zimbabwe. It is important that the results of this study is inclined to a specific geographical area. The sample size used in this study was only from Northern central district of Harare. Further research can be conducted with a larger sample size in different areas throughout a number of provinces. This must be done when there are no lockdown restrictions and schools will be open during the research. This is to bring the true picture of ICT implementation in the teaching and learning process as well as the challenges hindering its full implementation.

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APPENDICES

APPENDIX A. INTERVIEW GUIDE FOR SCHOOL HEADS AND TEACHERS

- What is the contribution of lack of skills on the part of teachers towards the failure of ICT implementation in schools?
- What are the available ICT resources and facilities at your school?
- Explain the manner in which teacher overload affects the implementation of ICT based teaching in the teaching and learning process?
- In what ways do economic factors negatively impact the use of ICT at your school?
- What infrastructural facilities at your school that support the integration of ICT?
- How does teacher training affect ICT implementation at your school?
- To what extent does school ICT policy influence ICT implementation at your school?

APPENDIX B. FOCUS GROUP DISCUSSION FOR STUDENTS

- What are the ICT gadgets used at your school?
- Which ICTs does your teacher use most often in your lessons?
- Explain the impact of the following barriers towards the integration of ICTs in teaching and learning at your School?

i). Limited ICT gadgets at the school

ii). Negative perceptions from the learners and teachers

iii). Lack of knowledge about the use of ICT gadgets from the teachers.

iv). Lack of technical support

iv). Resistance to change

- Which strategies do you think can be adopted to encourage the use of ICTs in teaching and learning?