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**THE CHALLENGES FACED BY PRIMARY SCHOOL TEACHERS IN INCORPORATING
ICT IN THE TEACHING AND LEARNING PROCESS AND STRATEGIES TO
MITIGATE THE CHALLENGES**

RELEASE FORM

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TITLE: An investigation on the challenges faced by primary school teachers in the integration of ICT in the teaching and learning process and strategies to mitigate those challenges.

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DECLARATION

I, Mafohla Strike declare that this research project for an Honours Bachelor of Science Education in Mathematics Degree at Bindura University is my own design and execution. I further certify that the document has not previously been submitted to this or any other University in support of an application for a post, degree or any other qualification.

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Witness

Date: 18/01/25

DEDICATION

I would like to dedicate this research project to my loving wife, Cylia Chipara, my entire family, friends, and colleagues who have supported me throughout this journey. Their encouragement, guidance, and patience have been invaluable. I also dedicate this project to the school head and teachers who participated in this study, without them this research would not have been possible. I hope this study will contribute to a better understanding of ICT integration in the education system.

ABSTRACT

The integration of information and communication technology (ICT) in the teaching and learning process has the potential to enhance effective educational outcomes. However, teachers face numerous challenges in effectively incorporating ICT into their practice. This study identifies the key barriers to ICT integration including inadequate technical support, limited digital literacy, and insufficient resources. Furthermore, it explores mitigation strategies to address these challenges, such as professional development programs, collaborative teacher networks, and innovative resource allocation models. The findings of this research study will provide valuable insights for educators, policymakers, and stakeholders seeking to promote effective ICT integration in education and bridge the digital divide in teaching and learning

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APPROVAL FORM

The undersigned certify that they have supervised, read and recommended to Bindura

University of Science Education for acceptance a research project entitled: An investigation on the challenges faced by primary school teachers in incorporating ICT in the teaching and learning process and the strategies to solve the challenges.

Submittedin partial fulfilment of the requirement of the Bachelor of Science Education Honours Degree in Mathematics

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1.0 CHAPTER ONE

1.1 INTRODUCTION

ICT focuses primarily on communication technologies that include use of the internet, wireless networks and various ICT tools. These technologies require technological requirements and expertise for them to be effectively incorporated in the educational curriculum. It was therefore the purpose of this research to investigate the challenges that hinder the effective use and adoption of ICT by teachers at Mupfurudzi Primary School, in Shamva District. It also dwelled on how the challenges can be mitigated, the educational problem resolved and deep understanding created. This chapter provides an overview of the study, encompassing the background to the study, statement of the problem, significance of the study, research objectives, research questions, and delimitations of the study, limitations of the study, definition of terms and the structure of the study.

1.2 BACKGROUND OF THE STUDY

The Zimbabwean education sector has experienced significant reforms, including the introduction of the new curriculum (2015), ICT policy (2010) and the heritage based curriculum (2024). The country has made strides in expanding ICT infrastructure, with increased internet penetration and mobile connectivity. Despite all the efforts rural school teachers are finding it hard to incorporate ICT in the teaching and learning process.

The Heritage based curriculum was introduced so as to promote the ICT –Enhanced learning activities that promotes the 21st century skills. Kaseke (2017) says that ICT integration in heritage based curriculum involves using digital technologies to preserve, promotes, and teach African cultural heritage, history, and values. This implies that the Information and Communication Technology integration aspect in the heritage based education is a necessity

As it enables learners to access, explore, and appreciate Zimbabwean cultural heritage through digital platforms and resources (Nyoni, 2016).

The UNESCO competency Framework for Teachers emphasizes the importance of teachers having basic hardware and software skills and being adaptable to utilize various subject specific tools and applications. However, limited exposure to diverse Information and Communication Technology facilities and devices can compromise teacher's confidence in using technology. Research by Zindi and Rugaranganda (2009) reveals that despite educators recognizing the value of Information and Communication Technology in Zimbabwean schools, integration challenges persist.

ICT in teaching and learning has a positive effect on the development of new innovative ways to interact and communicate with students, higher engagement rates, faster learning and improved teaching methods. According to Sunzuma (2020) Information and Communication Technology utilization create interactive, immersive, and engaging learning experiences that connect learners to their cultural roots. Students can use modern software and assistive technologies to achieve peak academic performance and master the skills needed to succeed in life and in their career. Teachers and learners develop skills and knowledge in the potential uses of Information and Communication Technology to support learning.

The use of ICT resources support the classroom curriculum and transform the process of teaching and learning, students learn in new ways. As it is now a compulsory and examinable learning area in the educational curriculum, it requires teachers to incorporate it in teaching and learning.

Zimbabwe has made significant strides in developing its ICT sector since 2002, with the government launching a national Information and Communication Technology policy in 2005 (Isaacs, 2007). The policy aimed to promote Information And Communication Technology usage in education, as recommended by the Nziramasanga commission report of 1999. Despite these efforts, the pace of integrating Information And Communication Technology in Zimbabwe's educational system remains slow (Bhukuvhani, 2011).

Based on the findings of the mathematics and science study conducted by Muzira and Maupa (2020), they say that poor mathematics achievements have been noted nationwide especially by learners at different levels. (Bondar & Shestopalova, 2020) suggested that educators should begin each lesson with a practical problem which will assist learners to develop a habit of being able to apply the knowledge acquired in solving practical challenges and as well analytical thinking.

The Ministries of Education recommended the government of Zimbabwe to introduce Information and Communication Technology in the education curriculum (Bigboy, 2008). However, there is no clear evidence of whether computers are being effectively used by educators in their instruction. As a result, one question remains unanswered whether mathematics educators need any further assistance to enable them to effectively use ICT tools in their daily teaching routine (Bigboy, 2008). It is against this background that this study sought to investigate the integration of ICT in learning and teaching mathematics at primary level.

It is unfortunate that in most rural primary schools, teachers nationwide are failing to effectively implement ICT due to factors such as digital illiteracy, lack of technical skills and lack of ICT infrastructure. Moyo (2019) says that limited digital resources and infrastructure

affects integration of ICT in the teaching and learning process. The researcher was therefore driven to investigate the challenges that are faced by Mupfurudzi primary school teachers in incorporating ICT in the teaching and learning process. He has the aim of finding solutions to these challenges so that these rural learners are equally equipped with digital skills and become digitally fluent, resulting from the teachers' competency in teaching using ICTs.

1.3 STATEMENT OF THE PROBLEM

The introduction of the new curriculum framework heralds a paradigm shift from traditional, teacher centred approaches to learner centred methodologies. This innovative approach emphasises hands on learning where learners actively engage with their environment to acquire knowledge, skills, and attitudes.

In line with this vision, the ministry of primary and secondary education advocates for integrating Information and Communication Technology into teaching learning activities. This aligns with the national Information and Communication Technology policy, which has led to the development of various platforms aimed at promoting technological gadget use in education (Davis, 2019).

However, despite the policy guidelines, the utilization of Information and Communication Technology in primary mathematics teaching learning activities at the targeted schools remains a concern. The focus of this research was to investigate the challenges faced by Mupfurudzi Primary school teachers, in Shamva District in incorporating Information and Communication Technology in teaching and learning. The researcher had been made privy by the fact that there was rampant neglect of Information and Communication Technology inclusion in the teaching and learning process at Mupfurudzi Primary School, affecting learners' performance. The researcher seeks to help teachers improve the teaching and

learning process by use of modern technology. Knowledge from this research should inform intervention measures to alleviate challenges faced by these teachers.

The slow pace of Information and Communication Technology integration in Zimbabwe's educational system, despite the existence of a dedicated Information and Communication Technology policy, necessitates an investigation into the underlying reasons. This study aims to explore the integration of Information and Communication Technology in mathematics teacher education programs and identify potential barriers to effective ICT adoption

1.4 RESEARCH OBJECTIVES

The research aimed at:

Investigating the challenges faced by primary school teachers in shamva district in integrating ICT into their teaching and learning practices

Establishing intervention strategies that can be used to alleviate digital illiteracy and lack of digital fluency among teachers that hinder effective incorporation of ICT in rural primary schools.

1.5 RESEARCH QUESTIONS

What are the major challenges faced by Primary school teachers in incorporating or integrating ICT during the teaching and learning process?

What strategies can be employed to address challenges to help teachers effectively implement ICT in teaching and learning?

1.6 SIGNIFICANCE OF THE STUDY

The research was of great significance in a number of ways which benefit educational stakeholders. It aimed at investigating the challenges that are being faced by teachers in rural primary school teachers in using Information and Communication Technology so it becomes of imperative importance to the learners, teachers, Bindura University of Education, Curriculum developers, policy makers, administration, the community as well as the Ministry.

When teachers incorporate Information and Communication Technology in the teaching and learning process, learners benefit in acquiring technological skills that are needed in this modern world of technology .This will then increase learner engagement during the learning process leading to improved learning outcomes, (Sunzuma, 2020). The gap created by the digital divide among rural learners and urban learners will be closed if the challenges are solved. Therefore the research will address digital divide in Zimbabwean schools (Moyo, 2019).

From this research's findings, teachers will note possible ways of embracing technology and the use of Information and Communication Technology tools and technologies to impact academic learning .The study will assist mathematics teachers in identifying efficient Information and Communication Technology tools for teaching and also will enable teachers to evaluate the effectiveness of computer usage in their teaching practices. In future the facilitators will explore the impact of ICT on student outcomes

Administrators or policy makers are furnished with the knowledge of the drawbacks in the implementation of ICTs in the classrooms therefore they will be encouraged to find ways of assisting teachers in effectively incorporating Information And Communication Technology

in teaching and learning .The study informs effective Information And Communication Technology policy development in Zimbabwean education system(Nyoni,2016).The policy makers will be informed in developing education policies aligned with available Information And Communication Technology tools ,resources, and challenges in Zimbabwean schools. This will enable them to identify effective Information and Communication Technology solutions tailored to the local context, ensuring educators are equipped to integrate Information and Communication Technology into mathematics learning. This means that the ministry of education is challenged to implement strategies that will help the effective employment of ICTs by rural primary school teachers to help rural learners close the technological bridge between them and their fellow urban learners. The research is also significant as it helps other researchers with a roadmap for studying more on the factors that affect the effective implementation of ICTs in rural school classrooms. The outcomes of the study will provide a researcher with a valuable insight into the context of mathematics educators in Zimbabwean schools, shedding light on the effectiveness of ICT integration in mathematics learning.

The study will also inform the Bindura University of Education authorities on measures to improve mathematics learning using Information and Communication Technology tools, addressing challenges faced by educators and learners

1.7 DELIMITATION OF THE STUDY

This study is delimited in Shamva district in Mashonaland central province, specifically at Mupfurudzi Primary School. The research was confined to a sizeable group of rural primary school teachers.

1.8 LIMITATIONS OF THE STUDY

The study faced several limitations. The research faced role conflict and this was so because the researcher is a full time employee of the Ministry of Primary and Secondary Education and at the same time required enough time to carry out the study. However, the researcher made an effort to make sure he balanced the two and came up with authentic findings. The University's allotted period of the research was insufficient ,compromising the depth and quality of the research The researcher also experienced financial constraints given the economy of the nation since the research process required finances for transport costs, making calls, typing and printing.However,this was mitigated by the use of email communication to facilitate the research process. The researcher also encountered negative attitudes from respondents. In spite of all these limitations, the researcher stood firm and persisted with the research.

1.9 DEFINITION OF TERMS

Information and Communication Technology

Sunzuma (2020) defines Information and Communication Technology as the use of digital technologies to support information processing, communication and collaboration.

Information And Communication Technology provides access to information through telecommunications. It is a set of different technological tools and resources used to create,

communicate, broadcast, store and manage information. This includes the use of internet wireless networks, cell phones, computers and other media. According to Whitty (2002) Information Communication Technology is the use of computer software and hardware for teaching. These software's and hardware's are combined to enable an organization and people to interact digitally.

Internet

According to Chinyoka (2018) Internet refers to a vast network of interconnected computers, servers and devices that enable rapid communication, information exchange and access to various online resources. It is a worldwide system of interconnected computer networks that communicates and facilitates worldwide communication and access to data resources through a vast collection of private, public, academic, and business and government networks

Digital literacy

Kaseke (2017) says that digital literacy is the ability to understand and apply digital technologies to enhance learning, communication, and productivity. It is being able to read and create digital content and to use technical skills with technologies.

Digital fluency

Digital fluency refers to the ability to seamlessly integrate digital technologies in to daily life, work, and learning, demonstrating proficiency, critical thinking, and creativity, Moyo (2019). It is the capability of being able to adapt, innovate, and evolve in response to changing digital landscapes.

Information and Communication Technology integration

Zvavahera (2016) defines ICT integration as the alignment of technology with pedagogical practices to create an interactive, collaborative, and inclusive learning environment.

Therefore the incorporation of technology into education enhances student-centered learning

1.9.1 SUMMARY

This chapter introduced the foundation of the study, providing context and background information on the research context. It articulated the problem statement, significance of the study and rationale behind the research questions guiding the investigation. The chapter also outlined the study's structure and organization, limitations, and delimitations of the research scope. Key terms related to Information and Communication Technology were defined. In a nutshell, the introductory chapter established the framework for the investigation. The next chapter will provide an in-depth review of related literature on Information and Communication Technology integration and its challenges in education

2.0 CHAPTER TWO

2. 1 LITERATURE REVIEW

2.2 INTRODUCTION

This chapter reviewed literature related to the study. The product of other similar studies done in Zimbabwe and other countries were examined. The researcher also revealed the views of other researchers and authorities who have examined the subject in order to highlight challenges faced by rural primary school teachers in incorporating ICT in the teaching and learning process and suggested ways of dealing with the challenges associated with application of ICT.

2.3 INTEGRATION OF ICT AT PRIMARY LEVEL

Information and communications technology has become an important aspect of modern life (Zhang & Aikman, 2007). Governments and their citizens seek to make their societies competitive in the emerging information economy which is centred on the employment of digital technologies. Globalization and introduction of new technology has led to an increased use of ICTs in all sectors - and education is no exception. Yelland (2014) is of the view that conventional learning environments do not seem suitable for gearing up learners to effectively function in the modern workplaces. Thus, she claims means that schools that do not incorporate the use of new technologies for learning cannot genuinely claim to prepare their learners for life in the twenty-first century. Grimus(2014:362) concurs, he asserts that “by teaching ICT skills in educational institutions the students are prepared to face future developments based on proper understanding” . Bransford (2004:206) asserts 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” .There is an indication from the views expressed by the scholars that ICTs are indispensable in preparing learners for a highly technological future.

Drury (2003) asserts that ICT tools are a part of our present reality, incorporating them is merely an extension of the modern reality. Osakwe, Dlodlo and Jere (2017) observed that teachers and learners who owned mobile devices were already using them to access the internet and search for information, which shows that they had mastered digital skills and were participating in digitally-enabled informal educational pursuits outside the school setting. The implication of this is; learning through the use of ICTs is already taking place unguided by the teacher. This means that the use of ICTs should be incorporated into the classroom so as to extend the classroom learning beyond four walls.

Brannes & Ginnis (2003) observes that ICTs are also transformational tools which when used appropriately, can promote the shift to a learner-centred environment. Learner centred learning is recognised and widely promoted as examples of “best practice” in pedagogy. ICTs such as videos, television and multimedia devices allow the teacher to have several tools with which the learners can be developed through a learner oriented approach. Facility to share resources and learning environments as well as encouraging of collaborative learning and a general move towards greater learner autonomy (Eze, Adu, & Ruramayi, 2013) are the tools in the ICTs toolbox that would enhance learner oriented learning.

Neurath and Stephens (2006) highlight the potential of ICT in fostering interaction among mathematics students. Codie and Munro (2007) found that using projectors, screens and laser pens enabled students’ to share work and engage in discussion sessions, fostering cooperation among learners. Andrew (2006) also postulates that Information and

Communication Technology integration encourages knowledge sharing and skills development. Therefore ICT integration in mathematics education can support peer to peer learning and enhances student teacher interactions. Technology integration in education supports constructivist learning theory ,where students construct their own knowledge(Brian and Malvine,2019).Technological tools such as internet enables deeper understanding of mathematical concepts through online resources.(Ramli,2006).

Research demonstrates that Information and Communication Technology integration enhances learner motivation, interest and improves learner academic performance particularly in algebra(Keong,2005).The use of tools like Microsoft excel fosters meaningful learning experience which will significantly lead to improved outcomes.

2.4 Challenges in using ICT in teaching and learning

Despite the benefits of Information and Communication Technology in the education system, several challenges hinder their effective implementation. A challenge is defined as “any condition that makes it difficult to make progress or to achieve an objective” (WordNet, 2022).In the integration of Information and Communication Technology into the teaching learning process there are obstacles that make progress difficult, these factors are going to be interrogated in this section to provide background to the broader aims of the research.

2.4.1 Financial challenges and ICT integration

Financial constraints significantly hinder Information and communication Technology integration in education. Sibanda ,Moyo(2018) observes that Information and Communication Technology is costly and financial plans for their implementation and maintenance are crucial .He further indicates that the establishment of Information and

Communication Technology is a huge and costly undertaking .So he emphasize that Information and Communication Technology implementation and mantainence require substantial financial planning

Richardson (2008) observed that teachers failed to implement ICT integration in schools because of a lack of financial resources to purchase, maintain infrastructure train individuals in their use and maintenance. The study shows that lack of finance may be the biggest challenge in the developing world. Farries, (2000) says that in developing countries, financial limitations pose significant challenges. Developing countries may introduce policies that support the employment and deployment of ICT but still find that school budgets are inadequate to cover the costs associated with them especially rural schools. Farries (2000) has argued that what makes ICT costs difficult to effectively budget for is that these cost remain hidden and difficult to analyse particularly for the new users of ICT products and this can be a major deterrent to adoption of technology in the classroom. Johnston-Wilder (2005) noted that teachers face significant barriers in integrating Information and Communication Technology due to limited availability of adequate resources and excessive time spent searching for suitable resources.

2.4.2 Limited accessibility and network connection

Mugweni and Gavaza (2017) observed that teachers faced a constraint in terms of accessing the internet and computer networks. The reasons cited for such constraints included the need to book computers in advance, or connectivity problems, the need to share resources that are scarce with other teachers

According to Becta (2004) explains that the inaccessibility of ICT resources may not be merely a result of lack of hardware since the hardware must also be accompanied by

software. Other factors identified that can result in scarcity included poor resource organisation, poor quality of hardware, inappropriate software or limitations in terms of teacher's access as a result of security concerns, (Becta, 2004).

Similarly, Mutsawzwizi (2020) found that even in developed countries the lack of access is the main barrier and that various challenges to deployment of ICTs in teaching were encountered by teachers, for instance a shortage of computers and adequate material. Similarly, Korte and Hüsing (2007) in their study of rural schools noted there are some technical barriers such as broadband access not being consistently available. Their study observed that a third of schools within the European Union still do not have broadband access. In a study by Pelgrum (2001) four of the top ten barriers to ICT integration had a link to the accessibility of ICT. The barriers identified included inadequate number of computers, inadequate accessories, unavailability of software, and poor internet connection. Toprakci (2006) asserts that limited computers units, obsolescence or inefficiencies of computer systems, and limited learning software in the school were barriers to the successful ICT implementation in Turkish schools. Similarly, Al-Alwani (2005) found that lack of access to internet was the major hindrance to integrating ICT. Recent research in Syria also show that inadequate computer resources were one of the greatest impediments to technology integration in the classroom (Albirini, 2006).

2.4.3 Insufficient training

Chiwunze (2019) identifies lack of training as the top most factors amongst others that hinder successful application of technology in the learning situation. In investigations of the challenges that result from attempts to integrate ICTs in education a lack of effective training has been cited the most, (Albirini, 2006; Ghavifekr & Wan Athirah, 2015). According to Mutawzwizi (2020) training is the complex aspect in bringing ICT to the classroom as

several components have to be seamlessly brought together for it to be effective. Amongst the factors identified were time for training, pedagogical training, skills training and availability of ICTs for training purposes. He postulates that teachers should be provided with pedagogical teaching to inform ICT application but not merely trained for use of ICT tools. A comprehensive approach is necessary for training to be effective encapsulating technology, approaches and ideological underpinnings grounded in sound pedagogy. Issues pertaining to the training of teachers include not just technical instruction in use of ICTs but also time and resources for training, didactic training to relate curricula with ICT and basic ICT training skills. It is more important for programs to focus on pedagogical training than simply technical aspects of ICT tools. Cox (2012) says that researches indicated that teachers lack the necessary professional expertise to effectively utilize ICT tools and resources. This is mainly due to limited availability of Information and Communication Technology trained specialists in most rural schools.

Mumtaz (2000) found that insufficient training time hinders Information and Communication Technology adoption in schools, making it challenging for teachers to experiment with new skills and incorporate Information and Communication Technology applications into classrooms. This implies that inadequate teacher training of teachers is a primary concern as teachers are not equipped with essential Information and Communication Technology skills. According to Koehler and Mishra, (2009), the root cause of this issue lies in the absence of clear school policies and effective leadership, which hinders teachers' ability to acquire necessary skills through training or professional development, ultimately preventing the successful integration of Information and Communication Technology into lessons.

2.4.4 Lack of teachers' competency

Competence refers to the ability to do something successfully and efficiently (Shinda and Banda, 2018). Researchers highlight that teachers competency significantly impacts their ability to integrate Information and Communication Technology into teaching and learning.

Becta (2004) observes that teacher competence can significantly curtail their ability to integrate Information and Communication Technology s to the teaching and learning process. He observed that “many teachers who do not consider themselves to be well skilled in the use of ICTs feel anxious about using it in front of a class of children who perhaps know more about ICTs than they do”. He also noted that teacher’s anxiety about using Information and Communication Technology in class stems from feeling less skilled than their students.

Newhouse (2002) found that teachers most did not have the knowledge and skills necessary in order to use computers in learning. The result was that they were not enthusiastic about the requirement to bring computers into their teaching practices. The extent to which this barrier affects teachers differs from one country to other .In third world countries such as Zimbabwe this is a significant barrier. Most teachers lacked necessary knowledge and skills to use computers in learning, leading to reluctance in adopting Information and Communication Technology.

Pelgrum (2001) noted that teachers who did not use computers in the classroom claimed that a lack of computer skills is a constraining factor that prevents teachers from using ICT in the classroom. In another research done in 26 countries Pelgrum (2001) noted that lack of knowledge and skills in ICT is a serious hindrance in using ICT in primary and secondary

schools. Therefore lack of computer skills is a significant barrier to Information and Communication Technology integration in classrooms.

2.4.5 Teacher attitudes and readiness to adopt ICT

Adame (2010) contends that the success of integration of ICT in learning depends on whether teachers deem it advantageous over the current methods of instruction. This means that the successful integration of Information and Communication Technology in learning hinges on teachers perception of its benefits over traditional instructional methods. The teachers' positive attitudes and recognition of potential advantages promotes effective integration of Information and Communication Technology. The need for training and modest competence means the instructor will only succeed through positive attitude and the perception of potential benefits that make the status quo less attractive.

In a research carried out by Shumba & Dondofema (2018) it was observed that 63% of the teachers who participated in the study were not ready to use the ICTs in the classroom as they were more comfortable with the current "chalk and talk" method. Only a paltry 37 percent indicated that they saw Information and Communication Technology adoption as a significant step forward in modern education. Meaning that most of the teachers who participated preferred traditional methods over Information and Communication Technology and just a few saw Information and Communication Technology adoption as a significant step forward in modern education.

Agbulu and Adame (2010) have argued that the negative attitudes towards ICT were due to unavailability of financial resources to deal with resource needs for a seamless integration of ICT, they further indicated that the resource constraints made it difficult for teachers to gain necessary ICT knowledge and as a result success of teaching with information

technology would be difficult due to lack of deep knowledge by the teacher and resulting negative perception of ICT.

Research has consistently shown that teachers attitudes towards Information and Communication Technology significantly impact their integration into school curricula(Stevenson,2013;Loveless,2001;Somekh,2008).Despite the benefits of ICT in education, teachers scepticism, lack of confidence, and competence hinder their effective deployment(Somekh,2008).These resistance stems from poor attitudes and lack of preparedness to utilize new technologies. Ellis(2001) says that changing these attitudes poses significant challenges due to inadequate tailored support and requires understanding teachers' expiriences.Mingaine(2013)underscored teacher's attitudes as vital for staff efficiency. This implies that teacher's attitudes significantly influence ICT integration.

2.4.6 limited access to software and hardware

Chikwama ,Ncube (2019) argue that the lack of hardware support and poor access to technical support present barriers to the successful integration of ICT tools. According to Andoh (2012), eighty percent of teachers' resistance to change and negative attitudes to ICTs due to poor software use. Worldwide surveys in secondary schools also show that the majority of teachers perceive ICT software as the greatest obstacle to ICTs integration (Leask & Pachler, 2013). The absence of technical support for software to integrate computer tools successfully is often due to schools' financial constraints, and this further discourages teachers from using ICTs. Gillespie (2006) argues that where software exists, the over-dependence of the applications has led to slower and unreliable access to internet connections.

Often schools' software applications are out dated with no proper maintenance programme in place (Gillespie, 2006). The substantial cost of ensuring that children are safe with software online also puts greater pressure on a school's financial budget, as it requires expensive software with continuous technological support in cyberspace (Gillespie, 2006). Most teachers are currently struggling with new software applications due to the high pace at which modern technologies are changing. Koehler and Mishra (2009) and Barak (2007) argue that the inability of teachers to learn and familiarise themselves with newer digital technologies and computer hardware that keep changing makes it difficult for teachers to keep up with the expected ICT competencies.

2.4.7 Strategies to solve the challenges faced by teachers to help them effectively implement ICT in teaching and learning.

The strategies to help teachers implement ICTs identified in the review of literature were those that deal with the teacher's shortcomings as information on other challenges has not widely been interrogated. Chapman(2004) Identifies the teacher as the most significant influence on the successful integration of ICTs .The teacher will have the most profound influence on the learners' development and achievement particularly were the learners are in resource constrained settings. Improving teacher effectiveness in the use of ICT alongside pedagogy is the most significant investment towards learner success.

Weimer (2018) asserts that training curriculum and programs that are to the point and sensitive to the needs of the particular teaching and learning circumstances will yield the best results. She further indicates that this teacher development must be lifelong. According to Burt (2016), teachers must also be trained to have ample subject knowledge and a variety of teaching methods. The researcher further says that teachers require comprehensive

training to effectively integrate Information and communication Technology into their teaching practice. Teacher training programs must be based on the use of ICT for all subjects in order for ICT to be viewed as a tool rather than a stand-alone subject. This means that when teachers are being trained at teachers colleges, the focus should be on incorporating Information and Communication Technology into all learning areas. This allows ICTs to be appreciated as a problem solving tool. Governments have also been identified by many researchers as having a pivotal role in ICT adoption

The researcher highlighted that staff development enhances teachers' confidence and competence in using ICT and encourages collaboration and sharing of best practices. While having an ICT specialist in the school to assist with training is vital, training can also be done through teams, as they provide the right opportunity to facilitate teachers' use ICTs (Woodcock, 2000). Working in teams has the benefit of facilitating ICTs integration because teams outperform individuals acting alone (Middlewood, 2005). However, developing teams to facilitate any initiatives requires time as the team develops and the environment evolves. Kotler and Armstrong (2006) argue that recruitment and selection of appropriate individuals for the profession is the panacea to all most organisational problems. They emphasize that those who are going to be recruited and selected for the education profession should be in a position of integrating Information and communication Technology in every teaching and learning practice. Harris(2006) says that effective recruitment and selection leads to reduced teacher turnover rates, enhanced school performance and effectiveness.

Researchers emphasize that governments of developing countries should prioritize education sector funding (UNESCO,2019;World Bank 2020) Researchers indicated that the governments of developing countries should allocate more funds for the education sector.

This adequate funding enables the development of essential infrastructure and facilitating effective Information and communication Technology integration. Kenny(2003) says that the infrastructure costs can be reduced by adopting measures such as the use of locally assembled hardware and software rather than reliance on imported and costly technologies. These imported technologies may be more costly to purchase and maintain. Baily,(2011) advocated for collaborative partnerships with private sector entities.

Access to both hardware and software, ICT tools is crucial for effective Information and communication technology integration in education. Norris (2003) emphasizes that suitable access to Information and a communication Technology tool is a key factor in the effective learning process. The Information and communication technology tools are vital in facilitating the learning process. These Information and communication technology tools include the interactive whiteboards that facilitate visual education and enhance student engagement. In general the availability of Information and communication technology tools in schools enhances teacher's confidence in sharing best practices and supports effective learning and teaching methods. Choline (2005) says that the availability of digital resources such as digital libraries makes it possible for teachers and students to access needed academic materials facilities through the use of Information and communication technology.

However Ellis and Loveness, (2001) say that excessive reliance on Information and communication technology tools may lead to the decline or loss of traditional skills, such as handwriting and mental arithmetic . They also say that overdependence on technology potentially hinders critical thinking and problem solving abilities. To maximize the benefits of Information and communication technology tools, educators should strive for a balanced

approach, incorporating technology in a way that compliments traditional teaching methods and promotes holistic learning,(Choline,2005).

This section discusses approaches employed when integrating ICTs into teaching learning activities

Learner centred approach

ICT focuses on student centred learning, utilizing technology to enhance learning experiences(Shadreck,2015).Encourages active learning , collaboration, and critical thinking. It also views learning as an active process of constructing knowledge. ICTs facilitate exploration, discovery, and reflection. Integration of technologies is vital as it contributes a lot to the pedagogical enhancement leading to effective learning with the help and support from ICT elements and components (Jamieson-Procker, et al., 2013). In support, Abobo (2018) highlighted that ICTs are not a one-step learning process, but it is continual and it provides a proactive teaching and learning environment. According to Redempta (2012), the roles of the learners and teachers can be different when computer technology is used in the curriculum. Meaning that technology changes teacher and learner roles . Integrating technologies in learning activities adds a component to the didactic triangle of teachers, learners, and knowledge (Trgalova,2018). This more extensive and multi-layered setting of mathematics learning can be understood as a techno-mathematical learning environment (Malhotra 2017). Kent (2005) describe a learning environment that can be characterized as modern and ICTs based in which teachers and learners are fluent in the language of mathematical inputs and outputs to ICTs, and can interpret and communicate with them.

Conducive teaching learning environment

Effective integration of digital technologies is crucial for fostering a conducive teaching learning environment. In terms of classroom learning, Hoyles and Noss (2003) distinguish the two categories of digital technologies, namely programmable micro tools and expressive tools, characterized by their openness and learning environments. Trouche (2005), underlines the fact that a more complex environment leads to a greater dispersion of the learners' conceptualization processes. According to Lemmer (2013), concerning technology-enhanced learning environments, the focus should not only be on technologies but on learning processes. Almanthari, et al (2020); Weinhandl, et al (2021), summarized that in their studies of mathematical education in the home-schooling - driven Covid era using new technologies is not always successful or effective. Especially when schools, teachers, and learners have little experience using technologies in formal learning settings, this causes significant challenges for schools, teachers, and learners which can be characterized as hard or soft factors (Otterstad, 2013).

Abilities, knowledge, and skills in teaching with ICTs need to be emphasized in preparation for teachers so that they can make informed decisions about which technology to use for specific teaching purposes (Leung & Lee, 2013) Barana, Fioravera, and Marchisio (2017) points that many pre- and in-service teachers believe that basic concepts should be taught before differentiating instructions to accommodate learner's learning styles and other circumstances. Yeo (2020) reports higher learner achievement, self-concepts, attitude, and teacher-student interactions as a result of interactive learning made possible via ICTs. Donveska-Todorova and Trgalova (2017) have found the benefits of using mathematics software and websites to include promoting students higher order thinking skills and developing and maintaining their computational skills.

Educating teachers on the effective use of ICTs

Trigueros and Lozano (2012) say that teachers should possess basic computer skills and confidence in using instructional software and websites. Meaning that even if teachers can be considered effective instructional designers through their work with and for resources, the common assumption is that groups of teachers are capable of designing coherent instructional sequences using ICTs (Visnovska, 2012). Larkin and Calder (2016) state that how computers are used is more important than mere usage. Wahyidi (2008), states that the challenge for schools and teachers is not whether they use ICTs or not but how they use it. ICTs should support learning objectives, rather than being used as mere technological tools (Gomba, 2016).

2.4.8 CONCLUSION

Educational reform through integration of ICT into learning requires a significant economic resource outlay so that public schools can acquire ICT structures and devices; ICT skilled teachers periodically upgrade curricula and education policy. A practical vision is crucial for the policy makers to take necessary measures for the successful integration of ICT.

Continuous professional development of the teachers will help in changing the teaching methods from teacher-centred towards the student-centred and will help students to build their knowledge rather than being merely recipients of knowledge. This will be beneficial in providing quality education and producing digital competent workforce to improve the life standard of citizens.

3.0 CHAPTER THREE

3.1 RESEARCH METHODOLOGY

3.2 INTRODUCTION

This chapter outlines the research design and approach employed in this study. Building on the literature review presented in the previous chapter, this chapter explains how the research was conducted, including the research paradigm, sampling procedures, and data collection instruments. The previous chapter delved into the literature review which sought to scrutinise previously written works in relation to the topic. This chapter focused on the research design which had unravelled how the research was carried out. The nature of the research employed in this study was also revealed including the sampling procedures. The research instruments that were used for gathering data in this study were also outlined and reasons for using them were also proffered. These crucial aspects were elaborated on sighting merits for selecting them with regards to presenting a conclusive and unbiased data for data presentation significant for the next chapter.

3.3 RESEARCH DESIGN

This is the overall plan of how the research was conducted. Hagston (2016) says that a research design is a program that guides the researcher in collecting, analysing and interpreting observed facts on a particular phenomenon. The researcher used different research instrument and methods in order to come up with a meaningful research which closed other gaps left by other researchers.

Borg and Gall (2008), state that research design is a process of creating an empirical test so as to support or refine knowledge claim. To design is to plan. A research design is a detailed

plan that assists researchers to map out the direction and the exploration route of the research in order to come up with solutions of a problem affecting a particular population.

A research design is a plan that is outlined by the researcher with the scope of seeking feedback to the questions that prompted this research being carried out. This means that, the thrust of the research design is to seek answers for questions raised by the given research. It outlines the methods and strategies employed to collect and analyse data, ensuring that research questions are addresses effectively. Taylor (2001) postulates that a research design refers to all methods and strategies a researcher will use in the data gathering process. This means that a research design is a mechanism for collecting data for a given study.

Peffer (2016) postulates that a research design specifies on how a study is going to be conducted and also how the use of empirical evidence would be used to respond to the research objectives. The definitions states that a research design seeks to address the objective of the given study hence if a research designs fails to do that then it renders the study inconclusive and inaccurate.

Daniel (2005), defines a research design as a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings. In this case the research design seeks to address the direction of the study with the means of eliminating biasness which leads to findings that are rendered inaccurate. A case study was employed in this research with the scope and notion of giving sustaining evidence and conclusive tangible results for the study. By employing a case study design, this research aimed to provide a comprehensive understanding of the challenges faced by Mupfurudzi Primary

School teachers in integrating ICT during the learning process and how this challenge can be mitigated.

3.4 RESEARCH PARADIGM

A research paradigm is a comprehensive framework that guides the design, implementation, and interpretation of research studies (Creswell, 2014). It encompasses a set of assumptions, principles, and values that shape the research process. It also encompasses assumptions about the research methods and techniques used to collect and analyse data. Research paradigms include positivism, interpretivism, pragmatism, constructivism and realism. For the study on the challenges faced by teachers in integrating ICT in the teaching and learning process, the researcher used interpretivism as a research paradigm. For this paradigm, the assumption is that the challenges faced by teachers in integrating ICT are constructed through individual experiences. The researcher needs to understand the perspectives and the experiences of the teachers, which is crucial for the research topic. This paradigm also allows the researcher for the collection of rich, qualitative data through methods such as interviews and questionnaires. The research paradigm was also used due to its exploratory nature. This means that the researcher is allowed to investigate the challenges faced by teachers in integrating ICT in the teaching and learning process without any specific hypothesis or outcome in mind from him. There is an element of flexibility, discovery and open mindedness of the participants respond which is important for the researcher to gain a deeper understanding of the research topic under study and the methodology used to collect data was the qualitative approach (Makoni, 2016). The data collection instruments used was questionnaires and interviews.

This study employed a qualitative approach to explore challenges in ICT integration and how to mitigate the challenges. MacMillan and Schumacher (2009) assert that, a qualitative research is a research that describes and analyses individual participants' actions, beliefs, thoughts and perceptions. This means that the qualitative research is subjective and based on the judgement of the researcher basing on the attitudes which are verbal or nonverbal that would have been depicted by the respondents in the study. Croswell (2011) asserts that qualitative research is a systematic, interactive and subjective approach used to describe life experiences and give their meaning. Taylor (2015) posits that qualitative research is an inquiry or naturalistic research into daily living whose aim is to understand some aspects of social life. This means that the presence of the researcher is crucial for him to observe and appreciate the respondents' behaviours as well as the environment and give a personal subjective judgement based on the analysis of what the research brings out.

The use of qualitative research in this research under interpretivism is justified due to the exploratory nature of the research question, which seeks to understand the challenges faced by teachers in integrating ICT in the teaching and learning process and how the challenges can be mitigated, Chivere (2017). Qualitative approach provides an in-depth understanding of teacher's experiences challenges and their solutions, allowing for the nuanced exploration of the complex issues surrounding ICT integration. Furthermore, qualitative research enables the researcher to prioritize the voices and perspectives of participants, providing a more detailed understanding of the challenges faced by teachers. According to Mangwende (2015) Qualitative research is also flexible and adaptable. This implies that the researcher has the ability to change his approach, methods and data collection strategies as required during the research process. For example the researcher

may change from interviews to focus groups depending on participants' feedback or any other emerging issues during the research process. It allows the researcher to adjust any approach as needed to ensure that the complexity of teachers' experiences with ICT integration is captured. The main focus of the study is for the researcher to capture all views of the participants. The sample size of ten participants also enabled the researcher to use the qualitative approach for the study. Therefore, the qualitative research methods used for the challenges faced by teachers in integrating ICT are questionnaires and interviews, where by participants will be sharing their perspectives and experiences on ICT integration.

3.5 POPULATION AND SAMPLE

Nhendera (2005) defines population as a number of species in a given area. Borg and Gall (2010) defines population as all elements of the same species or a selected part of the group. In the view of Borg and Gall the whole group is referred to as the target population and while a selection of representatives' is called a sample. Rafeedalie (2020) defines a population as a comprehensive group of individuals, institutions, objects and so forth which have common characteristics that are the interest of researcher. Cohen and Manion (2003) assert population as any group of individual that have one or more characteristics in common that one of interest to the researcher. Muchengetwa (2005) defines population as the totality of items or things under considerations. This means that a population is a group of people who share the same traits and characteristic and who probably live within proximity. This group of people that share values and same attributes would be placed under study with the scope of studying them so that a comprehensive sound conclusion is realized. The population of the study comprises of thirty teachers from Mupfurudzi Primary School and a sample size of ten participants was selected using random simple sampling

.According to Casey and Sowell (2005) a sample is a sub-group drawn from the population by a specific procedure. A sample is a smaller group of members of a population selected to represent the population (Mack, 2018) In this case a sample is an exact number of participants who were involved in the research project. Leedy (2006) writes that, a sample is a number of respondents or set of participants who define the population by virtue of containing the most characteristics or typical attributes of the population being studied. This means that a sample is a portion of the whole that has been removed from the larger population.

3.6 SAMPLING PROCEDURES

Mudapakati (2012) sampling is a methodological process aimed at selecting a smaller group from a larger population to make inferences about the population. The sampling technique according to Maree (2005) is the process of studying the population by gathering information and analysing those data .The school understudy was selected through purposive sampling method and the participants were chosen through simple random sampling. Mupfurudzi Primary School was selected from a total of fifty schools in the Shamva district due to its strategic alignment with the research focus on the integration of ICT into the teaching of mathematics. The school was selected due to convenience sake since it is close to researchers' location thereby saving time and some transportation costs . Mupfurudzi Primary School was identified as having a proactive approach to incorporating technology in teaching, making it an ideal site for investigating the challenges and successes of ICT integration. Creswell (2014) says that purposive sampling is a strategy in which the researcher selects participants or school based on their relevance to the research question. Additionally, the school's diverse student population and the availability of knowledgeable

teachers provided a rich context for gathering detailed qualitative data, ensuring that the findings would be both relevant and insightful. The researcher used purposive sampling in qualitative research so as to select participants who are information rich and relevant to the research questions. This enables the researcher to gain in-depth understanding of the research phenomenon through the provision of valuable insights from the most knowledgeable and experienced participants. Out of several sampling techniques like systematic and cluster, the researcher used the simple random sampling procedure when selecting the sample participants. Chivore(2005) says that simple random sampling is a basic probability sampling technique where each element in the population has an equal chance of being selected. It is useful for studies requiring quick and straightforward data collection (Ncube 2017). This method was used to avoid bias on selecting the participants. The researcher had ten cards written YES and the rest were written NO. The researcher gave an opportunity to all thirty teachers at Mupfurudzi Primary School. Each teacher had an equal chance or opportunity of being selected. The Yes or No cards were randomly shuffled, and the participant picked one card randomly. Those who picked a card written YES were considered in the sample to be used in the research. This technique assisted the researcher in reducing the number of facilitators to be used in the research to a manageable group. This also helped the researcher in managing time and reduced the costs on collecting data. Sampling was also done to avoid bias as the researcher used random selecting or sampling. The simple random sampling was used in qualitative research so as to select participants for the interviews and questionnaires. This ensures that a range of diverse perspectives are represented from the sample or participants. The researcher also gains a deeper understanding of the research phenomenon through ideas of the selected participants.

3.7 DATA RESEARCH INSTRUMENTS

Leedy (2016) defines research instruments as tools used in the process of collecting relevant data for a researcher. The researcher explained all the instruments used as well as outlining the advantages and disadvantages of each and every instrument used in the research study.

Leedy (2016) posits that an instrument is a device that an investigator or researcher uses to collect data. It simply means tools that were used in gathering information that is valid for this research. Harres (2009) defines research instruments as the equipment the researcher uses to carry out a research. Therefore, research instruments can be defined as techniques used to carry out a research. Casey and Sowell (2005) define research instruments as devices a researcher uses when collecting data. These are techniques used in the research study. Blakemore (2013) says that there are various data gathering techniques that include the use of available information or document analysis, observation, interviews and questionnaires. Research instruments are measurement tools designed to obtain data on a topic of interest from research subjects, (Hardy 2006). This means that research instruments are tools or rather techniques that can be employed for the purpose of obtaining data with the purpose of addressing the research topic or research objectives. This researcher employed questionnaires and interviews for data collection.

3.7.1 QUESTIONNAIRE

According to Haralambos and Holborn (2007) a questionnaire can be viewed as a list of prepared questions regarded by the researcher as comparatively cheap, fast and efficient method of gathering data. The instrument was used to dig out information from the teachers and learners. The questions were open ended questions. Responses were not guided and any information appropriate was written. The open ended questions are those that allow respondents' to express their thoughts, feelings and opinions freely without any

constraints or predetermined responses (Chivore 2015). The respondents were free to compose their own answers for example when told to state, explain and outline reasons why such kind of questions. This might provide valid information as respondents might give explanatory responses although some loopholes such as difficulties to quantify and classify if misinterpreted by the researcher.

Gillhaum (2008) in Haralambos and Holborn (2008) asserts that a questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of collecting information from the respondents. Nicolson (2002) posits that a questionnaire is a research instrument consisting of a series of questions for the purpose of gathering data. The use of questionnaires on the research question was justified. Floyd (2002) asserts that the researcher's opinion will not influence respondents to answer questions in a certain way since there is no verbal clue given resulting in honest answers being provided hence increasing validity and reliability. The respondents had their own time and privacy to complete the questionnaires, in the absence of the researcher and also the researcher had enough time to speak through the respondents' minds meaning that there was the highest degree of obtaining intended results. The questionnaires were the most convenient way of obtaining data as there were no expenses incurred for sending them as respondents were very close to the researcher's area of study. (Moyo ,2020)says that questionnaire reduce data collection costs in resource-constrained environments. The researcher suggested for questionnaires as they are easy to plan and administer and can be answered at any place. The fact that different participants were answering the same questions, the researcher obtained general overview of the problem. Open ended questions were used during the study on challenges faced by teachers at Mupfurudzi Primary School in integrating ICT in the

teaching and learning process. By asking open ended questions, a researcher can gather rich, detailed, and contextualised data that can provide valuable insights into the challenges faced by teachers in integrating ICT, (Patton 2015). The respondents were free to compose their own answers for the challenges they face in integrating ICT. Responses were not guided and any information appropriate was written. Therefore this research instrument was used to collect data on the challenges faced by teachers in integrating ICT so that the teachers could reflect on their experiences and provide a nuanced or detailed response .

3.7.2 INTERVIEWS

The researcher made use of semi-structured interviews for the research question stated above. Semi-structured interviews enable in-depth discussions with teachers about their instructional strategies and methodologies when incorporating ICT into their teaching. This approach allows participants to share their experiences, insights, and practical approaches, providing rich qualitative data that captures the nuances of their integration efforts. Schweizer (2002) says that qualitative interviews are attempts to understand the qualitative point of view to or unfold the meanings of people's experiences in their lives prior to scientific explanations. This is because interviews afford the researcher with the opportunity of having a direct encounter with the participants, whereby observations of the environment and the behaviour and character of the participants will be noted and summarized and evaluated to give a conclusive analysis by the researcher. Sajjad Kabbir (2016) is of the view that an interview involves questions and getting answers from participants in a study. Smith (2008) asserts that an interview is an oral or verbal questionnaire that can be done verbally face to face or over the telephone. In short an interview is an interaction that takes place between the researcher and her participants in which the interviewer (in this case, the researcher) asks oral questions and the interviewee

(respondent) responds to the questions. In the study interviews were carried out on the strategies that can be implemented to mitigate challenges faced by teachers in integrating ICT during the teaching and learning process. Interviews are very effective because responses are not delayed instead it is prompt. First-hand information is collected, unclear questions can be rephrased, answered immediately, clarified instantly and respondents are free to ask the interviewer some questions meaning there is effective two way communication. In terms of misunderstanding and misinterpretation of the question, the researcher was available to explain or rephrase it until the respondents understand what the question requires resulting in the obtaining of accurate and valid information. Interviews enabled the researcher to get in depth responses with each subject by asking open questions and follow up questions. The researcher can gather much information from non-verbal responses for example facial expressions and tone of voice to get a deeper understanding. Through interviews the researcher can ask additional questions to explore a particular point of interest that develop during the interview. Smith (2015) says that interviews provide rich, detailed insights into participants' experiences and perspectives. With assurance of confidentiality the interviewee would reveal information which they would not give on other circumstances.

3.8 DATA COLLECTION PLAN

The data collection procedure entails how primary and secondary data is collected, (Kotler, 2017). The researcher made use of questionnaires and interviews in collecting data. He sought permission from the University at which he is studying as well as the Province, the District and the school where he had to carry out the research. He then made appointments

with his participants on when they would work on the questionnaires and conduct the interviews. He then collected the completed questionnaires and conducted the interviews.

3.8.1 DATA GENERATION PROCEDURE

During the data generation procedure, the researcher obtained an introductory letter from the Bindura University of Science Education, Faculty of Education. The introductory letter enabled the researcher to notify the school head about the study. The researcher outlined the objectives of the study to the school head, which later included it among the activities being done at the school.

The researcher requested relevant policy documents that guided the use of ICTs in teaching-learning activities. Thereafter the researcher organized a meeting with the potential participants to highlight their role in the study as well as sought their consent. The participants were selected randomly, the researcher personally conducted interviews and questionnaire with selected teachers who were participants of the study.

3.8.2 Data analysis plan

Braun and Clarke (2006) states that thematic data analysis is a qualitative method for identifying, analysing and reporting patterns within data. The study used a qualitative approach, which demands that the researcher analyses the responses of the participants and gives subjective judgement in regards to the responses of the participants. The data will be analysed in themes so as to effectively structure its study's responses. Themes are effective at capturing important details of the study hence the reasons for employing them.

3.8.3 Validity and reliability of the instruments

Rees, (2014) defines validity as the extent to which a tool of data collection has produced what it was intended to produce. Rees (2016) states that reliability relates to the process of collecting information and states the accuracy and uniformity of the measurements

produced by the tool of collection of data. Therefore the questionnaires and interviews used in this study were intended to be valid and reliable.

3.8.4 Ethical issues and Confidentiality

Merriam (2009) says that confidentiality refers to the keeping of data of a person and how you keep it secure. This means that the researcher had not disclosed the identities of her participants to anyone. He had practiced the highest moral ethics of carrying out a project that demands that the respondents' personal information should not be included within the projects as well as being disclosed. The questionnaires and interviews were not personalised; they had no names. Therefore there was no chance of anyone knowing who and who answered which questionnaire. Confidentiality was considered. This denotes that participants' identity remained concealed. The responses gathered were not disclosed as well.

3.8.5 INFORMED CONSENT

The respondents were not coerced into being participants of the study. They had to be told about the project and what it was all about and allowed to make their own decisions in being part and parcel of the study. If they felt they wanted to pull out of the study they were allowed and be given freedom to do that and in not any means pressurized and forced into being part of the study.

3.9 SUMMARY

The chapter looked at the research methodology which revealed the research plan that was used in this study. It also unravelled the nature of the research design to be employed as well as the nature of the population and the sample. The research instruments to be used

were also highlighted in this chapter. Ethical standards required when carrying out a research were exposed such as confidentiality and informed consent.

4.0 CHAPTER FOUR

4.1 DATA ANALYSIS AND PRESENTATION

4.2 INTRODUCTION

This chapter presented the data that was captured through qualitative type of questions due to the nature of the study being qualitative. This means that the data obtained had to be presented in a thematic analysis that would expose the depth of the research. This was to be achieved by created themes derived from the research questions of study and sub themes were formulated with the scope of achieving an accurate analysis. The following main questions are where the themes of the study were derived from and subtopics developed as the data analysis and presentation progressed within the study. The following were the main questions of the research study;

What are the challenges faced by the rural primary school teachers at Mupfurudzi Primary School in integrating ICT in the teaching and learning process?

What strategies can be used to help teachers to effectively integrate ICT in teaching and learning?

4.3 DATA PRESENTATION AND ANALYSIS

The study employed a case study at least 3 scopes, the research deliberately did this with the scope and notion of achieving unbiased and inconclusive results. Diversity in a research is important since it adds weight to the findings of the study than merely using a single school or study. The participants were not identified by their specific names due to the researcher practicing highest ethical values that are demanded by the researchers when carrying out their studies. This is done so that participants will not be investigated or

persecuted or even the respondents becoming victimized for information that they might have shared through participating in the study.

The researcher obtained 100% response rate from his ten participants. This was due to the fact that the researcher had dropped more questionnaires to be filled just in case the respondents lost some they would simply get other copies from the school head. The researcher also made strict follow up on the interviews. All this persistence made the researcher obtain 100% response rate. The researcher made sure that the responses obtained had addressed the scope of the study. This was done through the advantage of using the qualitative type of research that sought detailed explanations from the respondents so as to attain and obtain real issues that led to conclusive findings of the study. The study was based on appreciating the real challenges faced by rural teachers in incorporating ICT in teaching and learning. Hence the qualitative method afforded the respondents to effectively respond at length and give their personal experience and problems without being controlled. The gathered data will be presented as themes and subthemes as shown by the table below

Research objectives	Themes	Subthemes
challenges faced by primary school teachers on integrating ICT into teaching and learning practice	-Teacher confidence and competency -Technical and Infrastructure barriers	-Lack of training and support - Lack of adequate ICT tools - poor Internet connectivity - Access to digital resources
establishing intervention strategies to mitigate challenges on ICT integration	- Institutional and administrative	- Training -collaboration

challenges faced by the rural primary school teachers at Mupfurudzi Primary School in integrating ICT in the teaching and learning process

Teacher confidence and competency

The intersection of teacher confidence and competency is critical for effective teaching to take place. This implies that those teachers who lack confidence may struggle to create engaging and supportive learning environments. Similarly those teachers who lacks competency also fails to implement effecting teaching practices.

Training and support

The research indicates that lack of training limits the potential of ICT integration into the teachers teaching practices. Most teachers lack training on necessary ICT that enables them to integrate ICT. The following is the research findings from the interviews:

Teacher 1 asserts, *“the training we received was inadequate and it didn’t prepare is for the challenges we are facing in the classroom”*.

Teacher 2 said, *“The training sessions are too generic and they don’t address the specific challenges we are facing in our classroom”*.

Teacher 3 explained, *“there are a few ICT tools but teachers here rarely used them because there are no qualified personnel and those with basic knowledge of computers are reluctant to implement ICT”*.

Teacher 4 pointed, *“I cannot teach ICT without the skills, I am a general primary school teacher and not digitally skilled.*

Teacher 5 said, *“The lack of support is demotivating. I feel like I’m not doing a good job and I’m not sure how to improve it”*.

Teacher 6 said, *“All I know is that I am a qualified teacher not specialised in ICT so teaching ICT is difficult”*.

Teacher 7 also postulated, *“I am not skilled and not trained; ICT requires experience for one to teach it”*.

Teacher 8 noted that, *“I am not qualified personnel in ICT but I know some computer basics so I can teach ICT up to a certain level”*.

Teacher 9 asserted, *“The curriculum is constantly changing and we are not given enough time to adjust and it’s overwhelming”*.

Teacher 10 said, *“I have been teaching for years but with the new curriculum, I feel like I’m starting from scratch. I need more training”*

The following are the research findings from the questionnaire

Teacher 1 indicated, *“the school administration says they are supportive but when we ask for help, they are never available never support us”*.

Teacher 2 exclaimed, *“I’m struggling to integrate technology in to his lessons and he needs training on how to use the new tools and software”*.

Teacher 3 pointed, *“I feel isolated in the classroom and wishes there were more opportunities for collaboration and support with my colleagues.*

Teacher 4 indicated, I felt overwhelmed by the amount of new technology and software and expected to use it but haven't received any training.

Teacher 5 pointed, "I have tried to integrate ICT into my lessons but encountered technical issues and don't know who to turn to for help because I'm not trained".

Teacher 6 said, "I need more hands on training and practice to feel confident using ICT tools in the classroom".

Teacher 7 indicated, "I don't have ICT skills so I need training on how to effectively integrate ICT into our teaching practices not just how to use the technology".

Teacher 8 indicated that the lack of training and support is frustrating .I feel like I'm wasting time trying to figure things out on my own".

Teacher 9 indicated, "We need to have more opportunities for peer-peer support and sharing of best practices in ICT integration".

Participant 10 noted," I was concerned that without proper training and support, we are not using ICT effectively to enhance student learning.

The participants' responses highlighted that they lack training and support for the integration of ICT into their teaching practices to be effective. This is consistent with the literature, which suggests that teachers lack the necessary professional expertise to effectively utilize ICT tools and resources Cox (2012). The researcher noted that the training they received was inadequate and did not prepare them for the challenges they faced in the classroom. Similarly, Chiwunze (2019) identifies lack of training as the top most factors amongst others that hinder successful application of technology in the learning situation.

Mumtaz (2000) also agrees that insufficient training time hinders Information and Communication Technology adoption in schools, making it challenging for teachers to experiment with new skills and incorporate Information and Communication Technology applications into classrooms.

Lack of adequate ICT tools

The research study shows that teachers lack adequate ICT tools which have hindered the integration of ICT into teaching and learning process. Teachers at the school exclaimed that lack of ICT resources has a great impact on ICT integration. The research findings from the Interviews are shown below:

Participant 1 stated, "I never really use ICT when teaching learners, I always feel as though it's a waste of time to teach with inadequate resources, why strain myself!"

As teacher 2 noted, "CT implementation is not easy in rural schools which do not have adequate infrastructure and tools".

Teacher 3 postulated, "our school has few computers, an incomplete and below standard computer lab, no internet access, and no projector how then can I teach ICT in this situation!"

Teacher 4 said, "The tools which are currently in use here in terms of ICT tools are personal tools such as laptops and phones. Computers are not adequately available, there are only a few and cannot be effectively used by the whole school".

Teacher 5 indicated, "there are a few computers and they are not adequate for use in teaching more so there is not even a projector or interactive boards which will make lesson presentation possible".

Teacher 6 said, "one cannot teach a class of 45 learners using 4 computers without a projector furthermore our schools computers are out-dated, and the internet connection is slow and it's frustrating to teach with these limitations".

Teacher 7 said, "We don't have enough devices for each student and they have to share which disrupts the learning process".

Teacher 8 asserted, "the students come from disadvantaged backgrounds and don't have access to devices or internet at home. We need to provide more support in school".

Teacher 9 responded by saying, "the ICT tools we have are not compatible with the new curriculum so we need to upgrade our technology to align with the changing curriculum requirements .I wish we had more access to educational apps and online resources as they would make lesson planning and teaching easier".

Teacher 10 said, "the schools ICT infrastructure is not reliable and they also experience frequent power outages and internet disruptions'.

The following are the research findings from the questionnaire:

Teacher 1 exclaimed, "teachers need more interactive white boards and digital tools to engage students and enhance learning" .

Teacher 2 indicated, "we don't have enough tablets or laptops for each student which limits our ability to integrate ICT in to lessons".

Teacher 3 noted, "the internet connection is unreliable and slow which makes it hard to access online resources and communicate with students".

Teacher 4 said, "the school ICT infrastructure is not sufficient to support the number of students and staff, leading to frequent technical issues".

Teacher 5 contributed by saying, "we lack access to specialized software and tools that would enhance teaching and learning in specific subjects such as graphic design or video editing".

Teacher 6 said, "The schools ICT budget is limited, which means it can't afford to upgrade technology or purchase new equipment".

Teacher 7 also said, "We need more digital resources, such as e-books and educational apps to support student learning and engagement".

Teacher 8 said, "there is need to invest in mobile devices and digital tools to support student centred learning and collaboration".

Teacher 9 indicated, "The schools computers are out dated and slow making it difficult to run educational software and access online resources".

Teacher 10 said, "the software being used is not user friendly and it's hard to navigate and students get frustrated easily".

Participants' responses indicated that teachers lack of adequate resources, including computers and internet access, makes it difficult to integrate ICT effectively during the teaching and learning process. This is in line with Sibanda, Moyo (2018) who noted that teachers face significant barriers in integrating Information and Communication Technology

due to limited availability of adequate resources and excessive time spent searching for suitable resources. This is also consistent with the literature, which suggests that inadequate infrastructure and resources are significant barriers to ICT integration in rural schools (Kreijis, 2013).

Technical and Infrastructure barriers

Technical and infrastructure barriers should be limited for effective integration of ICT in the teaching and learning process. The existence of technical and infrastructure barrier can hinder teacher's ability to harness the potential of technology to support their professional growth and student learning.

Poor Internet connectivity

The participants responses highlighted the challenges and frustrations caused by poor internet connectivity in the context of integrating ICT in teaching and learning activities.

Below are the findings from the interviews made:

Teacher 1 said, "We do not have internet access to research teaching resources and content. I cannot use my peanuts to purchase data and subsidise the school, no! Therefore it is difficult to embrace this ICT thing effectively".

Teacher 2 asserts," well honestly at my school ICT tools are there but really are a few. There is no internet access and other ICT tools to use".

Teacher 3 said "yes, I do have a qualification in ICT so I have the skills; I am digitally literate and fluent. The only challenge that I face in the implementation of ICT here is lack of equipment, infrastructure and connectivity".

Teacher 4 said, "the internet connection is so slow; it takes forever to load educational resources and websites".

Teacher 5 postulated, "They often experience internet outages which disrupts our lessons and wastes valuable class time".

Teacher 6 said, "The poor internet connectivity makes it difficult for us to access online educational platforms and tools".

Teacher 7 noted, "I tried to incorporate online learning activities but the internet connection is too unreliable. He further said that the slow internet speed affects our ability to conduct research and complete assignments".

Teacher 8 said, "internet connectivity issues are frustrating for both teachers and students and there is need for a stable internet connection to participate in virtual field trips and online collaborations".

Teacher 9 said, "We had to cancel online lessons and activities due to poor internet connectivity".

The following are the research findings from the questionnaire:

Teacher 1 pointed out that, "Our school has Poor internet connectivity and is a major obstacle to ICT integration. It's frustrating when lessons are disrupted due to slow or no internet".

Teacher2 indicated, "I've had to cancel online lessons or activities due to poor internet connectivity, which is disappointing for both me and my students".

Teacher 3 noted that, "a slow internet speed has made it difficult for students to access online resources, complete assignments, and participates in online discussions".

Teacher 4 indicated, "poor internet connectivity at our school has affected the quality of online content, making it difficult for students to engage with multimedia resources".

Teacher 5 indicated, "I've had to rely on offline resources, which limits the scope of ICT integration and reduces the effectiveness of lessons".

Teacher 6 exclaimed that, "poor internet connectivity hinders collaboration among students and teachers, making it difficult to work on projects and share resources".

Teacher 7 indicated, "It's challenging to integrate ICT when internet connectivity is unreliable. It disrupts the flow of lessons and affects student engagement".

Teacher8 said, "I've noticed that poor internet connectivity disproportionately affects students from disadvantaged backgrounds, exacerbating existing inequalities".

Teacher 9 indicated, "Poor internet connectivity limits our ability to participate in global online communities and collaborations, reducing opportunities for cultural exchange and learning".

Teacher 10 said, "reliable internet connectivity is essential for effective ICT integration. I hope our school can invest in improving our internet infrastructure to support teaching and learning".

Participants' responses highlighted that internet connectivity in the school is a challenge for ICT integration in the teaching and learning process. This is consistent with the literature, which observed that teachers face a constraint in terms of accessing the internet and

computer networks, Mugweni and Gavaza (2017). Similarly, Al-Alwani (2005) found that lack of access to internet was the major hindrance to integrating ICT during teaching and learning. This implies that lack of internet access makes it difficult to research teaching resources and content. This is consistent with the literature, which suggests that slow internet speeds can hinder the effective use of ICT in teaching and learning (Kozma, 2003). The lack of internet access makes it difficult to research teaching resources and content

Access to digital resources

The responses highlight the challenges and limitations caused by limited access to digital resources in the context of curriculum implementation. The research findings below were obtained from interviews

Teacher 1 said, " they are willing to teach ICT but there are a few computers and no computer lab, not enough furniture so it becomes difficult to conduct ICT lessons".

Teacher 2 indicated, " some of us need constant interaction with ICT tools for us to be able to effectively use them".

Teacher 3 said, "At the school there are very few functional computers from the presidential scheme but they have been locked inside for years and we not using them since there is no infrastructure like computer lab and furniture and he cannot use them in the classroom since the classrooms here are not electrified".

Teacher 4 asserted, " They are no functional computers here so as teachers we are not able to teach using computers".

Teacher 5 said, "we do not have knowledge and skills on how to operate the computers, let alone use them in other learning areas".

Teacher 6 Said, "Aaah! How can I have the zeal to teach ICT when the digital resources are scarce?"

Teacher 7 agrees, "We don't have enough digital resources to support our lessons and they have to rely on out-dated textbooks".

Teacher 8 said, "I have found some great online educational resources, but the school can't afford to subscribe to them".

Teacher 9 said, "I noted for the need for more digital resources that cater to different learning styles and abilities and the limited access to digital resources hinders our ability to provide personalized learning experiences".

Teacher 10 asserted, "The lack of digital resources creates a disadvantage for our students compared to those in more affluent schools".

Participants' responses highlighted lack of digital resources as a challenge in ICT integration in teaching. The researcher noted that teachers have to rely on out-dated textbooks and lack access to online educational resources. This is consistent with the literature, which suggests that access to digital resources is essential for effective ICT integration (Kozma, 2003). The limited access to digital resources hinders the ability to provide personalized learning experiences. This is consistent with the literature, which suggests that inadequate digital resources are a significant barrier to ICT integration (Penuel, 2006).

What strategies can be used to solve these challenges to help the teachers effectively implement ICT integration in teaching and learning?

Institutional and administrative

Training

The research has identified training as way major strategy of helping teachers effectively integrate ICT in teaching and learning. The participants' views were highlighted below from the interviews made:

Teacher 1 said, "For me I believe training is crucial for my development in terms of being able to effectively teach using ICT, without the knowledge you cannot do anything".

Teacher 2 also agrees by saying, "in-service training is important when it comes to teachers appreciating the ICT implementation at their schools" .

Teacher 3 said, "Teachers have to be trained to better understand how to use ICT to support student learning and engagement".

Teacher 4 noted that," Without training I doubt really if one will be able to implement a sound lesson".

Teacher 5 said, "I have found the training on ICT integration to be highly relevant and applicable to my teaching practice ".

Teacher 6 explained," There is need for in-service training for us teachers on this ICT thing. It has emerged in this new curriculum so we should be trained and have the knowledge and skills needed for us to implement it".

Teacher7 agrees by saying, " the system should Provide regular training and workshops for teachers to develop their ICT skills and confidence".

Teacher 8 said," we should invest in upgrading our schools ICT infrastructure, including devices, internet connectivity and software".

Teacher 9 said," Training helps teachers develop a more student centred-approach to CT integration".

Teacher 10 encouraged for collaboration and sharing of best practices among teachers to promote ICT integration .we can invite ICT experts to provide guidance and support for teachers in integrating technology in to their teaching practices.

The following are the research findings from the questionnaire:

Teacher 1said,"In service is crucial since it helps teachers stay updated on the latest ICT trends and technologies".

Teacher 2 asserted, "We need to foster for partnerships with local businesses and organizations to provide resources and support for ICT integration".

Teacher 3 said, "There is need for providing opportunities for teachers to attend conferences and workshops on ICT integration to stay updated on best practices".

Teacher4 explained, "The school should establish a school ICT committee to oversee ICT integration efforts and provide support for teachers" .

Teacher5 said, "There is need for regular training sessions on ICT tools and resources would be helpful in enhancing our teaching skills".

Teacher 6 responded by saying, “there is need for collaboration with other teachers who have experience in ICT integration would be beneficial in sharing best practices and mentorship program where experienced teachers guide new teachers on ICT integration would be very helpful”.

Teacher 7 indicated that, “there is need for hands-on training sessions which gives us the opportunity to practice using new ICT tools and technologies”.

Teacher 8 agrees by indicating, “We participate in regular professional development workshops and training sessions to learn about new ICT tools and strategies”.

Teacher 9 said, “Peer-to-peer training and collaboration would be an effective way to share knowledge and experiences on ICT integration and this was noted by another participant in the study”.

Teacher 10 indicated that,” training on how to evaluate the effectiveness of ICT integration in the classroom would be very useful. He also indicated that training on how to use ICT to enhance student engagement and motivation would be very beneficial or useful”.

Participants' responses highlighted the importance of teacher training and support for ICT integration. All participants noted that training is crucial for teacher development in terms of effective integration of using ICT teaching and learning. This is consistent with the literature, which suggests that teacher training is a critical factor in ICT integration (Kozma, 2003). Similarly, Burt (2016) agrees that teachers must also be trained to have ample subject knowledge and a variety of teaching methods. This highlights the need for on-going teacher training and support to develop their ICT skills and confidence. The researcher noted the importance of providing opportunities for teachers to attend conferences and

workshops on ICT integration to stay updated on best practices and this is consistent with the literature, which suggests that on-going professional development is critical for effective ICT integration (Mishra & Koehler, 2006).

Collaboration.

The responses from teachers have identified collaboration as another way of mitigating challenges on ICT integration. The data below was collected through interviews:

Teacher 1 said, *“collaboration with ICT experts from outside the school would provide new insights and ideas on ICT integration”*.

Teacher2 said, *“ Our school have a dedicated ICT team that provides technical support and guidance to teachers”*.

Teacher 3 pointed out that, *“ We collaborate with colleagues from other departments to develop interdisciplinary ICT-integrated projects”*.

Teacher 4 exclaimed that, *“ We need to collaborate so as to share resources and expertise through our school's online learning management system”*.

Teacher 5 explained, *“ We need to participate in online forums and communities to stay updated on the latest ICT trends and best practices”*.

Teacher 6 said, *“We have to work together to develop ICT-integrated lesson plans and share them with each other”*.

Teacher 7 narrated that, *“ Our school should have a peer coaching program that pairs experienced teachers with newer teachers to support ICT integration”*.

Teacher 8 noted that, *"We need to collaborate with students to develop student-led ICT projects and presentations"*.

Teacher 9 pointed out that, *"Teachers should participate in collaborative planning sessions to integrate ICT into our curriculum"*.

Teacher 10 said, *"We can use video conferencing tools to collaborate with teachers from other schools and districts"*.

The following are the research findings from the questionnaire:

Teacher 1 noted, *"We develop and share ICT-integrated rubrics and assessment tools with other colleagues"*.

Teacher 2 pointed out that, *"We need to work together to address technical issues and troubleshoot problems with ICT equipment"*.

Teacher 3 asserted that, *"Our school needs to have a technology committee that oversees ICT integration and provides support to teachers"*.

Teacher 4 indicated that, *"We need to participate in online webinars and conferences to learn about new ICT tools and strategies"*.

Teacher 5 pointed out that, *"Teachers should collaborate with parents and the community to develop ICT-integrated projects and events"*.

Teacher 6 indicated that, *"We use collaborative document tools to work together on ICT-integrated projects"*.

Teacher 7 indicated, "*We develop and share ICT-integrated unit plans and curriculum guides*".

Teacher 8 exclaimed, "*We participate in peer review and feedback sessions to improve our ICT-integrated teaching practices*".

Teacher 9 indicated, "*every school should have a mentorship program that pairs experienced teachers with newer teachers to support ICT integration*".

Teacher 10 noted that, "*We need to collaborate with other schools and districts to develop and share ICT-integrated resources and best practices*".

Collaboration was identified as an important strategy for effective ICT integration during the teaching and learning process. Teachers can collaborate to share knowledge and , skills and experience so as to be confidence on using ICT. The researcher has noted that collaboration can be done in partnerships with local businesses and organizations to provide resources and support for ICT integration. This is consistent with the literature, which suggests that partnerships with external organizations can provide valuable resources and support for ICT integration (Kozma, 2003).Baily,(2011) also advocated for collaborative partnerships with private sector entities.

4.4 DISCUSSION ON THE FINDINGS

The study had its focus on findings answering the research questions. Research findings showed that most teachers have the knowledge of the rationale of incorporating ICT in the learning process. The findings noted that most of the teachers at Mupfurudzi are not digitally literate and do not have the digital skills and knowledge in using ICTs and ICT tools in their teaching process. Johnston-Wilder (2005) agrees that teachers face significant

barriers in integrating Information and Communication Technology due to limited availability of adequate resources and excessive time spent searching for suitable resources. It has been indicated that lack of expertise disadvantaged the rural school as there are no qualified personnel to integrate ICT in other learning areas. In chapter 2, Beggs (2019) identifies lack of training as the top most factors amongst others that hinder successful application of technology in the learning situation. Teachers need to be trained in order for them to effectively implement ICTs in education. Some participants cited lack of accessibility and network connectivity as a major challenge at the school which hinder the effective implementation of ICT in teaching and learning. This is in line with Mugweni and Gavaza (2017) who observed that teachers faced a constraint in terms of accessing the internet and computer networks. Poor teaching and learning technology also makes it difficult for teachers in rural schools to teach using ICT.

To curb the indicated challenges, the study revealed that teachers should be trained to have knowledge and skills on how to integrate ICT and using ICT tools. It was supported by Burt (2016) who said that teachers must also be trained to have ample subject knowledge and a variety of teaching methods. The administration was encouraged to improve their institutional infrastructure, provide adequate tools and have internet connectivity for teachers to be motivated to implement ICTs.

4.5 Summary

This chapter presented the data in form of themes and the data was analysed. It provided a discussion of the findings in relation with the research questions. It did this using the qualitative method which is a subjective means that is based on the judgmental analysis of the researcher. The qualitative analysis was used alongside with the thematic analysis so

that the study could provide sound, conclusive and accurate results. Thus, the results found in this study will be used for the conclusion and the recommendations in chapter 5

5.0 CHAPTER FIVE

5.1 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.2 Introduction

This chapter focuses on the summary as an overview of the whole research, in relation to the research questions objectives and assumptions, conclusions and recommendations. The major focus will be on the challenges faced by rural primary school teachers in integrating ICT in teaching and identify strategies that can be implemented to solve those challenges. It will also focus on the theoretical framework and the conclusions drawn, the reviewed literature, the methodology and qualitative data that was presented and discussed. Recommendations will be made for further researchers to study and get an insight on the challenges faced by rural primary school teachers in integrating ICT and strategies that can be used to solve the challenges . Stakeholders in the education sector that are the learners, the teachers, parents, the community, school heads, the responsible ministries and the government at large, will be informed with a wide range of decisions on how the challenges can be mitigated.

5.3 SUMMARY OF THE STUDY

The research was based on the challenges faced by primary school teachers in integrating ICT and how these challenges can be solved. The study was carried out at Mupfurudzi Primary school in Shamva District with a population of thirty teachers which was sampled to ten participants for the study, including the school head. Research questions and objectives were laid out to guide the whole process of the research.

In chapter two, literature related to the study was reviewed which involved an expansion of the background to the study. This chapter examined other similar studies done in Zimbabwe and other countries. Views of other researchers and authorities who have examined the subject were revealed. The rationale for incorporating ICT in teaching and learning, challenges faced by rural primary school teachers as well as the ways of dealing with the challenges were outlined.

The research design utilised in this research was the Case Study. This was done with the scope and notion of giving sustaining evidence and conclusive tangible results for the study. The thrust of this design was to seek answers for the questions raised by the research. The study was carried out as a Qualitative approach which described and analysed individual participants' actions, beliefs, thoughts and perceptions.

The population of the study was thirty teachers and the sample was of ten classroom practitioners including the school head. Data was collected through the use of questionnaires and interviews.

The research questions of this study were as follows:

What are the challenges faced by the rural primary school teachers in integrating ICT in the teaching and learning?

Integrating Information and Communication Technology (ICT) in primary school teaching and learning can be a daunting task for many educators. Several challenges hinder the effective use of ICT in classrooms. One of the major challenges from the findings made is that of insufficient resources. The researcher noted that many primary schools lack suitable facilities for ICT integration, further exacerbating the problem. This is in line with, Empirica

(2006) who founded that even in developed countries the lack of access is the main barrier and that various challenges to deployment of ICTs in teaching were encountered by teachers, for instance a shortage of computers and adequate material . Similarly, (Albirini, 2006) shows that inadequate computer resources were one of the greatest impediments to technology integration in the classroom.

The research findings also indicated that internet connectivity was a great challenge in integrating ICT in teaching and learning. This is in line with Mugweni and Gavaza (2017) who observed that teachers faced a constraint in terms of accessing the internet and computer networks .This makes it difficult for teachers to implement ICT-based lessons. Similarly, Al-Alwani (2005) found that lack of access to internet was the major hindrance to integrating ICT. The school that was under study is in rural areas and there is no internet access. Even if the teachers want to demonstrate certain aspects that might be important during the lessons teachers fail because of lack of connectivity. In this case, ICT implementation cannot be effectively achieved.

The school does not have adequate ICT tools and resources to enable the implementation of ICT in teaching and learning. Some teachers at the school have the knowledge and skills as well as the zeal to teach using ICT but they are disadvantaged by this challenge.

The study noted that some of the teachers are not really willing to teach using ICT, they rather prefer to teach using traditional means. Some teachers have little knowledge on how to use ICTs but are just reluctant to implement them in their teaching. They have negative attitudes towards the use of ICT in teaching. Educators feel uncertain or uncomfortable using new technologies, hindering their ability to effectively integrate ICT into their teaching practices. Therefore, inadequate training and support for teachers can exacerbate these

concerns. This is in line with Mumtaz (2000) who pointed out that insufficient training time hinders Information and Communication Technology adoption in schools, making it challenging for teachers to experiment with new skills and incorporate Information and Communication Technology applications into classrooms.

Another challenge is incorporating ICT into the existing curriculum and teaching methods. Since most primary school teachers do not have adequate skills for teaching ICT, this implies that the rate of ICT implementation in those schools is negatively affected. Teachers must adapt their pedagogical approaches to effectively integrate ICT, which can be time-consuming and require significant effort. Becta, (2004) observes that teacher competence can significantly curtail their ability to integrate Information and Communication Technology into the teaching and learning process. Other challenges faced by primary school teachers when integrating ICT include lack of consideration for what is suitable for classroom teaching, and insufficient funding. This is in line with Richardson (2008) who observed that teachers failed to implement ICT integration in schools because of a lack of financial resources to purchase, maintain infrastructure and train individuals in their use and maintenance. Most respondents indicated that their school do not have proper infrastructure for ICT implementation. For instance, some noted that the computer lab is incomplete, there is shortage of furniture, the computers at their school are inadequate to cater for the whole school, and other ICT tools such as projectors are not available in school. Hence, failure to incorporate ICT in teaching and learning.

The findings of this study revealed that most teachers are not digitally literate. They do not know how to use these emerging technologies hence they neglect implementing them into the daily teaching and learning process. Participants also lack digital skills in ICT. It is made

worse by the fact that the rural school lag behind in technology use so the teachers are not pressurized to acquire the skills to teach ICT.

What strategies can be used to solve the challenges to help teachers effectively implement ICT in teaching and learning?

To overcome the challenges of integrating Information and Communication Technology (I.C.T) in teaching and learning, teachers can employ several strategies. The researcher noted that teachers need to seek technical support and collaborate with technical experts to resolve technical issues. This is in line with (Middlewood, 2005) who said that working in teams has the benefit of facilitating ICTs integration because teams outperform individuals acting alone.

Most teachers should stay updated with ICT skills through Participating in training and professional development to enhance ICT skills. There is also need to collaborate with colleagues, share experiences and best practices with fellow teachers. Institutions should also provide ICT training and support, offering regular training and technical assistance for teachers. This is in line with Weimer (2018) who asserts that training curriculum and programs that are to the point and sensitive to the needs of the particular teaching and learning circumstances will improve the integration of ICT in teaching and learning.

The research findings indicates that Sufficient ICT resources should be allocated in schools more so, ensuring adequate funding for ICT equipment, maintenance, and infrastructure. This is in line with Kenny(2003) who says that the infrastructure costs can be reduced by adopting measures such as the use of locally assembled hardware and software rather than reliance on imported and costly technologies. These imported technologies may be more

costly to purchase and maintain. Baily,(2011) advocated for collaborative partnerships with private sector entities.

The teacher has to encourage student-centered learning by using ICT to facilitate student-led learning and exploration. More so the utilized ICT tools should cater to different learning styles and abilities. By employing these strategies, teachers can effectively address the challenges of ICT integration and create a more engaging, inclusive, and effective learning environment.

5.4 RECOMMENDATIONS OF THE STUDY

On the basis of the findings and conclusions of the study, recommendations were made.

The government and the ministry of education have to ensure that every rural primary school have ICT infrastructure, connectivity and access to computers and other ICT gadgets.

The government should also intervene in the training of teachers in computer courses which will equip them with digital literacy, digital skills and digital fluency. Also the qualified personnel to help in developing other staff members on the implementation of ICTs in the teaching and learning process. The school administrations have to support teachers and make sure they provide adequate computers and other ICT equipment as well as connectivity for the enrichment of the teaching and learning process. Parents should also be supportive in their children's learning by strive to provide their children with smartphones which will enhance their technological learning. Finally learners should appreciate the use of technology and embrace the change it brings to their educational experiences for them to fit into this digital community

5.5 RECOMMENDATIONS FOR FURTHER STUDIES

Whilst the researcher was carrying out the study he noted that there were certain areas that needed further studies to be carried out. He therefore made some recommendations and these are listed below:

An assessment of the impact of ICT in aiding the cognitive development of students, the impact of ICT on education citing the pros and cons of ICT on education and online learning versus traditional face to face pedagogy to assess which teaching method best suits certain districts.

5.6 CONCLUSION

This chapter has served the purpose of restating the research problem and give a summary, conclusion and recommendations of the study. It outlined how the study had been conducted. Instruments used were also outlined. The research methodology was also outlined. Recommendations for further studies were deliberated on. The major aim was to create an understanding of the challenges faced by rural schools in integrating ICT in teaching and learning activities and how those challenges can be solved. The integration of Information and Communication Technology (ICT) in primary school teaching and learning is crucial for enhancing student learning outcomes and preparing students for the digital age. However, the research findings indicate that primary school teachers in rural areas face numerous challenges in integrating ICT, including insufficient resources, lack of internet connectivity, inadequate training and support, and negative attitudes towards ICT use.

To address these challenges, the study recommends that teachers seek technical support, collaborate with colleagues, and participate in training and professional development to enhance their ICT skills. Additionally, institutions should provide ICT training and support, allocate sufficient ICT resources, and encourage collaborative partnerships with private sector entities. By employing these strategies, teachers can effectively integrate ICT into their teaching practices, creating a more engaging, inclusive, and effective learning environment that prepares students for success in the digital age. The study's findings have implications for teacher training, educational policy, and the development of ICT infrastructure in rural primary schools.

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Appendix 1: Interview Guide for Selected Teachers

Introduction

My name is Strike Mafohla (B22644A), and I am a student at Bindura University of Science Education, studying towards an Honours Bachelor of Science Education degree in Mathematics(HBScEdMt). I am conducting a study titled: An Investigation on the Integration of ICT into the Teaching and learning at Mupfurudzi Primary School in Shamva district.

Research Question 1: What are the major challenges faced by Primary school teachers in incorporating or integrating ICT during the teaching and learning process ?

Sub-Questions

1. What are the technical challenges that teachers face when using ICT in the classroom?
2. How do limited teachers ICT skills and knowledge impacts their ability to integrate technology into their teaching practices?
3. What are the infrastructure-related challenges that hinder the effective integration of ICT in schools?
4. How do issues related to internet connectivity affect teacher's ability to use ICT in the classroom?
5. What role does teacher resistance to change play in hindering the adoption of ICT in teaching and learning?
6. What support systems are lacking for teachers to effectively integrate ICT into their teaching practices?

7. How do teacher's perceptions of the relevance and effectiveness of ICT in education influence their willingness to adopt technology in their teaching practices?
8. How do institutional and administrative barriers such as lack of policies or resources, impact teacher's ability to integrate ICT in education?
9. How do you handle situations where technology fails during a lesson, and what backup plans do you have in place?
10. How do you see the role of ICT evolving in the future of Mathematics education, and what implications does this have for your teaching practice?

Research Question 2: What strategies can be employed to address challenges to help teachers effectively implement ICT in teaching and learning?

Sub-Questions

1. What types of professional development opportunities can be provided to enhance teachers' ICT skills and confidence?
2. How can schools and educational institutions provide adequate infrastructure and technical support to facilitate ICT integration?
3. Which strategies can be employed to promote teacher collaboration and sharing of best practices in ICT integration?
4. How can the effectiveness of ICT integration strategies be monitored and evaluated to ensure that they are meeting their intended goals ?

5. What strategies can be employed to address issues of equity and access in ICT integration ,particularly for disadvantaged or marginalized groups?
6. How can teachers be incentivized and motivated to integrate ICT into their teaching practices?
7. What role can mentoring and coaching play in helping teachers develop their ICT skills and integrate technology into their teaching practices?
8. How can educational leaders and administrators support and encourage teachers in their efforts to integrate ICT?

Closing

Your contributions are crucial for highlighting strategies that can be employed to address challenges faced by teachers in integrating ICT in the teaching and learning at Mupfurudzi Primary School.

Appendix 2: Questionnaires for Selected Teachers

Introduction

My name is Strike Mafohla (B22644A), and I am a student at Bindura University of Science Education, studying towards an Honours Bachelor of Science Education degree in Mathematics(HBScEdMt). I am conducting a study titled: An Investigation on the Integration of ICT into the Teaching and learning process at Mupfurudzi Primary School in Shamva district

Demographic information

I. Current teaching position

.....

II. level of education

.....

III. Teaching experience

.....

IV. Subject area of specialization

.....

Research Question 1: What are the major challenges faced by Primary school teachers in incorporating or integrating ICT during the teaching and learning process?

Sub questions

1. What technical difficulties do you encounter when using ICT in the classroom?

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2. How do you troubleshoot or diagnose technical issues when they arise during lessons?

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3. Are there any specific ICT tools or platforms that you find difficult to use or integrate into your teaching practice?

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4. What resources do you need to effectively integrate ICT into your teaching practice?

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5. How do you currently access and utilize ICT resources in your school or classroom?

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6. How do you assess the effectiveness of ICT in achieving learning objectives and promoting student engagement?

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7. What institutional or administrative barriers do you face in integrating ICT into your teaching practice?

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Research Question 2: What strategies can be employed to address challenges to help teachers effectively implement ICT in teaching and learning?

Sub-Questions

1. What strategies can be employed to address issues of ICT resource scarcity and competition among teachers?

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2. How can schools ensure that teachers have access to reliable and up to date ICT infrastructure?

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3. What strategies can be employed to engage parents and the broader community in supporting students ICT based learning?

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4. How can teachers be supported in integrating ICT into their teaching practices in ways that align with curriculum goals and standards?

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5. What strategies can be employed to address the challenges of providing ICT training for teachers with varying levels of technical expertise?

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6. What kind of training or professional development do you think would be most effective in supporting teachers ICT integration efforts ?

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7. How do other teachers support you when you encounter difficulties in using ICT tools or software?

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8. What kind of technical support or services can be provided in maintaining ICT systems(hardware and software) do you think would be most helpful in addressing ICT integration challenges?

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.....

Thank you for taking the time to complete the questionnaire.

B.U.S.E PERMISSION LETTER

SAMED

P Bag 1020
BINDURA
ZIMBABWE

Tel: 0271 - 7531 ext 1038
Fax: 263 - 71 - 7616



BINDURA UNIVERSITY OF SCIENCE EDUCATION

Date: **10-10-24**

TO WHOM IT MAY CONCERN

NAME: **strike mafohla** REGISTRATION NUMBER: **B226244A**
PROGRAMME: **HBScEdMt** PART: **2.2**

This memo serves to confirm that the above is a bona fide student at Bindura University of Science Education in the Faculty of Science Education.

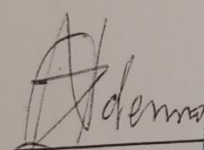
The student has to undertake research and thereafter present a Research Project in partial fulfillment of the **HBScEdMt** programme. The research topic is:

An investigation on the challenges faced by primary school teachers in ICT integration during the learning process and how the challenges can be mitigated

In this regard, the department kindly requests your permission to allow the student to carry out his/her research in your institutions.

Your co-operation and assistance is greatly appreciated.

Thank you


Z. Ndemo (Dr.)
CHAIRPERSON - SAMED

