



**AN INVESTIGATION INTO THE ADEQUACY AND UTILIZATION OF
ICT RESOURCES TO FACILITATE THE TEACHING /LEARNING OF
ICT AS A LEARNING AREA IN MBARE –HATFIELD DISTRICT,
CLUSTER 16.**

BY: RWIZI JOSPHINE

**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF BACHELOR OF
EDUCATION IN COMPUTER SCIENCE.**

STUDENT NUMBER: R1815124T

DEPARTMENT OF APPLIED EDUCATION

FACULTY OF EDUCATION MIDLANDS STATE UNIVERSITY

DECLARATION

I Rwizi Josphine, declare that this is my own original work and it has never been submitted to any other educational institution for obtaining any qualification.

DEDICATION

I dedicate this work first and foremost to my loving, understanding and supportive husband Chip. To my lovely children Anesushe, Kaylah and Jayden for the love, support and selflessness that afforded me the sacrifice of time and family. I hope that my efforts have inspired you to continue to soar like eagles.

To my parents Beauty and Alex Rwizi who raised me and instilled in me the values of hard-work, honesty, and perseverance. Finally my family members for the great support and encouragement.

ABSTRACT

The study sought to look at issues pertaining to the adequacy of Information and Communication Technology resources (ICT) in primary schools in the Mbare Hatfield District, Cluster 16. The ICT resources looked at included computers, projectors, web resources, Learning management software, wireless technologies, wired technologies, video conferencing just to mention a few. It further looked at the aspect of utilization of those ICT resources to assess whether effective teaching and learning was taking place in the learning area of ICT which is now mandatory at primary level and now a testable area in the ZIMSEC public examinations. It looked into issues pertaining to lesson preparations, lesson delivery, and research, sending and returning of pupils' assignments. The research delved into the challenges that caused a hindrance in the ICT resource utilization in schools in Mbare Hatfield Cluster16. The findings of the research were tabulated and studied. Recommendations were drawn up on adequacy and utilization on the schools under study in general to aid in the improving of the effective teaching of ICT using the ICT resources required. The researcher then drew up conclusions from the findings.

ACKNOWLEDGEMENTS

I would like to acknowledge the hard work and dedication of my supervisor Dr Mapope. Thank you for your patience, persistence and encouragement. Your guidance and support was a cornerstone in this dissertation. Your genuine caring and calm nurturing manner mean more to me than I can adequately express. My gratitude is also extended to the Computer Science s Department for their great support, kind words and encouragement.

A special thank you to; Audrey Sibanda, Chikwana Lydia, Dumiso Ndomone and Nzvura Veronica for your friendship and for always being there ready to lend a hand, no matter what. You kept me going. You are the best! A very special thank you to Chipo Madamombe for his unwavering support.

My wonderful, loving and caring family and friends, thank you for believing in me when I did not believe in myself. Without your love and support, I could not have made this journey. I was not alone; you were with me every step of the way.

I am also grateful to the Ministry of Primary and Secondary Education for granting me permission to carry out the research. Thank you to the administrators and teachers who volunteered to participate in this dissertation. Without you, this would not have been possible.

TABLE OF CONTENTS

DECLARATION.....	2
DEDICATION.....	3
ABSTRACT	4
ACKNOWLEDGEMENTS.....	5
TABLE OF CONTENTS	6
CHAPTER 1: INTRODUCTION.....	9
1.0 BACKGROUND TO THE STUDY.....	9
CHAPTER 2: LITERATURE REVIEW.....	15
2.0 INTRODUCTION	15
CHAPTER 3: RESEARCH METHODOLOGY	27
3.1 INTRODUCTION	27
3.2 RESEARCH PHILOSOPHY	27
3.3 QUALITATIVE RESEARCH	28
3.4 RESEARCH DESIGN.....	29
3.4.1 CASE STUDY DESIGN	30
3.5 DATA SOURCES	32
3.5.1 PRIMARY DATA.....	32
3.5.2 SECONDARY DATA.....	33
3.6 DATA GENERATION METHODS	33

3.6.1 INTERVIEWS.....	34
3.6.1.1 UNSTRUCTURED INTERVIEWS	34
3.6.2 OBSERVATIONS.....	35
3.7 POPULATION	37
3.7.1 TARGET POPULATION	37
3.8 RESEARCH SAMPLE.....	38
3.9 SAMPLING TECHNIQUES.....	38
3.9.1 PURPOSIVE SAMPLING	38
3.10 PILOTING.....	39
3.11 VALIDITY AND RELIABILITY TEST	39
3.12 RESEARCH ETHICS	40
3.13 SUMMARY.....	40
CHAPTER 4: DATA PRESENTATION, ANALYSIS AND INTERPRETATION.....	41
4.1 INTRODUCTION	41
4.2 RESPONSE RATE.....	41
4.3 PRESENTATION OF FINDINGS FROM SCHOOL HEADS	41
QUESTIONNAIRE TO TEACHERS	43
OBSERVATION.....	44
SUMMARY.....	45
REFERENCES	55
APPENDICES	60
SEMI STRUCTURED INTERVIEW GUIDE.....	60

INTERVIEW QUESTIONS FOR SCHOOL HEADS.....**ERROR! BOOKMARK NOT
DEFINED.**

OBSERVATION CHECKLIST65

CHAPTER 1: INTRODUCTION

1.0 Background to the Study

This study builds its arguments on the Nziramasanga Commission of Inquiry into Education and Training 1998, which was put in place by the then president in 1998. The objective of the commission was to try and come up with some recommendations which will try and match the education system with the requirements of the world. Quite a number of recommendations were made by the commission in 1999. The recommendations made by the commission comprised of the content of the curriculum. extension of basic education from 7 years to 9 years and the support to broaden education further than the provision of access to education to all levels, put in place education structures that make certain that superior quality education and proficient administration of resources, widen skills necessary to improve information and communications technologies which is altering the way we live, conduct our do our business and endorse hands-on skills in Primary Schools. ICT was therefore introduced as a separate learning area from the early stages of education which is ECD to the higher levels of education, up to advanced level. This learning area was made examinable from primary education level, ordinary level and Advanced level. It being compulsory at the primary level of education. This learning area also has cross cutting themes into other learning areas such as English, Science and Technology and Heritage Studies. ICT is supposed to be taught both practically and theoretically within the schools and assessment being continuous at the various levels of education. Although the exam is theory it contains some questions which are practical in nature though answered theoretically. Regardless of it being seven years since the introduction of the updated curriculum, it would appear that most of the schools in Zimbabwe have some form of resource to teach the ICT learning area but as to whether these resources are suitable or adequate to ensure effective implementation of the updated curriculum is in question. Hence the researcher decided to embark on this research to ascertain whether or not schools have adequate ICT teaching/learning

resources.

1.1 Statement of the problem

Information and Communication Technology is one of the newly introduced practical subjects in the primary school curriculum. It being a practical subject it involves a lot of hands on and practical activities. As such there is need for resources which include computers, output devices, input devices, textbooks and topic specific software. Regardless the introduction of ICT in Primary School as an examinable subject. It is not clear whether the schools have adequate resources or at least resources that will facilitate ICT learning. It is the intention of this research is to establish the resources capacity of primary schools in teaching and learning of ICT.

1.2 Research Questions

Main Research Question

To assess the adequacy and utilization of ICT resources in the teaching/ learning of ICT at Primary level.

Research questions

1. Which ICT resources are present for the teaching of ICT learning area in Primary schools in the Mbare Hatfield District Cluster 16?
2. What ICT resources are being made use of by teachers in the teaching of the ICT learning area in Primary schools located in Mbare Hatfield Cluster 16?
3. Which ICT resources are available to learners in their learning of computer education in Mbare Hatfield Cluster 16 Primary schools?

1.3 Research objectives

The study seeks to:

- (i) Examine the extent to which the educationists know the ICT resources needed to fulfill the expectations of the updated curriculum.

- (ii) To establish the adequacy of ICT resources in schools for the implementation of the updated curriculum in the subject area of computer science.
- (iii) Identify the level of support being given to the Information and Communication Technology learning area by different stakeholders in education.
- (iv) Establish the challenges that are being faced by schools in Mbare Hatfield in the implementation of the updated curriculum in the area of ICT.
- (v) Come up with recommendations on ICT resources adequacy in the teaching of ICT in Mbare Hatfield District Cluster 16.

1.4 Significance of the study

Through this research a picture of the adequacy of ICT resources in schools as far as the implementation of the updated curriculum in the area of computer science is going to be revealed. This study also seeks to increase appreciation of ICT as a learning area and therefore some schools acquiring more ICT resources. This study will also see an increased number of schools in Mbare Hatfield District cluster 16 engaging more qualified teachers in the area of ICT. It is also hoped that the outcome of the study will help in improving the implementation of other programs in education in future. The research is hoped to encourage further studies of this nature in other areas so as to come up with a fine generality of the trends in the country.

1.5 Assumptions

- (i) Some primary schools teach ICT from ECDA to Grade 7
- (ii) Some primary schools have ICT resources at their school.
- (iii) Some of the ICT teachers have some qualification in the area of ICT.

1.6 Delimitations

The study was confined to Mbare Hatfield District Cluster 16 in Harare. It was focusing on primary schools in the cluster. The study was only looking at the adequacy of ICT resources

in the implementation of the updated curriculum specific to the learning area of Information and communication Technology. The target populations were the heads of schools, learners and teachers of classes teaching the ICT subject.

1.7 Limitations

Some of the limitations of the study include that it was difficult for the researcher to contact all the primary schools in the district to get information. As a way of trying to get information from a number of schools, the researcher used a representative sample to obtain information. Secondly, was the fact that the researcher was a classroom teacher who has a class to teach, this left her with inadequate time to conduct the research. The researcher however used the weekends and some public holidays to conduct her research. The Covid-19 Lockdown was also another limitation as the researcher was only able to get responses from heads and teachers who were available at their school at that time, not all of them were present.

1.8 Definition of terms

These terms have been cited by the researcher as requiring operational definitions;

- (i) **Information and Communication Technology (ICT):** Kanematsu and Barry(2016) articulate that it is hardware such as computers and software used for videos and websites. Food and Agriculture Organization say that ICT is a wider term for Information Technology (IT), which cite all communication technologies, inclusive of the internet, wireless and cellular networks, computers, software, middleware, video-conferencing, social networking, and other media applications and services giving users the access to retrieve, store, transmit, and manipulate information in a digital form.
- (ii) **Learning Management System (LMS):** An LMS is a certain kind of software system intended for the use by facilitators and learners to employ in teaching and learning activities. Usually LMSs proffer a variety of tools, such as course content organization

and presentation, communication tools, student assessment tools, grade book tools, and other functionality aiding classroom learning and teaching conduct (Morgan, 2003)

- (iii) **Curriculum:** Ndawi and Maravanyika (2011:23) say that, it is all the experiences pupil has under the guidance of the school.

Another definition was given by Good (1973:157) as cited by Chivore (1994) who says “curriculum is a general overall of the content or specific materials of instructions that the school should offer the student by way of qualifying him or her for graduation or certification or for entrance into profession or vocational field”

A scrutiny of the above definition of curriculum, will point to the conclusion that curriculum is an intended path of study that endow the learner with a number of learning experiences under the supervision of the school. In this research the term curriculum is taken to imply all of the imparting of knowledge of the learners which is designed and organized by the school to achieve its educational goals.

- (iv) **Implementation:** Jansen (2009) looks at this word as meaning the process of putting a decision into action or effects. In other words, this implies carrying out of a plan. In the research the word implementation is taken to denote carrying out, performing or working of a plan, technique or any design, idea, model, requirement, standard or policy for accomplishing something. As aforementioned implementation is carrying out the work that accompanies some groundwork in order for something to actually happen.

- (v) **The educationists:** Walters (1990) postulates that an educationist is a person who has a special knowledge of the principles and methods of teaching. This view is supported by Harre (2006) who states that an educationist is a professional educator. In this research educationists are the people who are involved with the daily operations of the education system. Such people include heads of schools and ICT teachers.

- (vi) **Primary Schools:** According to Sadovnik (2011) a school for the children between the ages of about five and eleven. In this research, primary schools mean schools where children receive primary or elementary education from the age of about five to twelve.

1.9 Chapter Layout

Chapter 1: This will look into the background of the study, purpose of the study, assumptions, delimitations and limitations have been highlighted. Key terms were defined. It was also stated in this chapter that a set of schools within Mbare Hatfield District Cluster 16 were used for the purpose of the study.

Chapter 2: This will look into what other scholars say about curriculum implementation. The next chapter deals with the review of related literature.

Chapter 3: It will deal with the research methodology and research instruments used in conducting the research

Chapter 4: This will look at presentation, analysis and interpretation

Chapter 5: It is the last chapter and it will conclude the research by summing up what the research would have found out during the study. The recommendations would also be given in the last chapter

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The review of related literature will be covered in this chapter. Mc Millan and Schumachu (1993:113) say “related literature is that which is obviously relevant to the problem such as previous research investigating the same variables or similar questions.” This implies that literature review is whereby the researcher reads and infers from what other researchers who had written on issues related to the one which is under research. The researcher will give literature review in relation to ICT definitions, relevance of ICT today, the relationship between ICT and education, ICT human resources, ICT equipment resources, the curriculum and challenges of digitalisation in developing countries.

2.1 Definitions of ICT

Numerous interpretations for ICTs were suggested in this review, all centered around the hardware and software used for acquiring, processing, storage and distribution of information. ICT is defined by the United Nations Development Program (UNDP), inside a UNESCO article(2008) as information manipulation apparatus , a assorted set of software and utilities whose purpose is to generate, amass, process, dispense and information interchange. They comprise of earlier ICTs such as radio, television broadcast and telephony, as well as the recent ICT end user devices such as tablets, P.Cs coupled with wireless technology and the internet network. The mentioned diverse tools collaborate to come up with the connected globe that is made up of a enormous communications of interconnected telephone services, heterogeneous computing hardware, such as the internet, radio and television which reaches into every corner of the globe. Osofisan (2013) describes ICT as an intermarriage between the computer and the communication business. It is the product of the merger between computing infrastructure and communication infrastructure. According to Oke (2012) ICT is the processing, storage and transfer of information, which can be broken down into information technology hardware and

communication. Kwache (2017) posits that it is a general-purpose technology with a major impact on process technologies and product technologies and has social and political implications. He sees ICT as diffusing widely across several industries and sectors of the economy through diverse applications. It is a wide phrase that incorporates whichever device used in communication or ICT infrastructure used in broadcasting such as the television smart phone, tablets, Wi-Fi or wired network, physical ICT devices and programs. This view is shared by Rouse (2015) who defines ICTs as an umbrella term that covers communication devices or applications that include computers, televisions, radios, networks, satellites, video conferencing and eLearning. Elmoglobal (2014) says that in the education sector which encompasses the instruction and acquisition of knowledge using ICT tools which are made up of three groups which are input devices, output devices, storage devices and networking devices. These input sources comprise of devices such as P.Cs like desktops, programs, learner interactive systems, visualizers or camera. The Output devices are made up of devices such as overhead projectors, interactive boards, visual display units and television. Inclusive are digital cameras, recorders, routers and other automation. ICTs greatly improve scholar knowledge acquisition and methodologies in teaching.

2.2 Relevance of ICT today

We exist in the “world of information”, ICT has turn out to be an integral aspect of our everyday livelihood. A lot of corporations have what is termed “IT departments” to facilitate business related Computer technologies. Through progression in ICT, people can now access their organisations system remotely. No longer is it obligatory to have ones physical presence in an office. Work can be submitted from the comfort of one’s home. Simplified accessibility to work system servers has improved production without actually going into the office. ICT professionals are now in huge demand in the different fields which include engineering, commerce, education and medicine. The demand opens a mammoth opportunity for IT specialists to discover the area and display their skills. The field of IT is diverse and is comprised of sectors such as computer

programming, system analysis, testing, software and hardware development, web application design and education. The improvement of information and communication technology, has seen the transformation of the educational sector as well. Educational institutions have embraced a contemporary technique of teaching and learning. Using the blackboard to teach has now become a thing of the past. The use of modern devices is now prevalent in schools and used by both learners and facilitators. Devices with an internet connection aid learners to acquire new skills and vast knowledge which enables them to comprehend concepts effortlessly and profoundly. ICT is seen to aid patients as well through machinery with artificial intelligent capability which can diagnose, analyse and test tissue samples as well as consult with their medical practitioners on line. Virtual healthcare applications are also available to provide guidance. Furthermore the presence of electronic health records and tele-medicines are conveying competent and excellence healthcare to patients. ICT has seen the removal of time and distance which was a major hindrance before advancements in ICT. Buying and selling goods and services has been made simpler by advancements in technology. E-commerce has enables customers to purchase from local and international vendors. Wireless communication mediums, news broadcasts have become so easier. Only a few seconds are needed to know the news from any corner of the world. The use of the internet on mobile phones, tablets, laptops, iPods, and other devices has been offering us unlimited access to entertainment mediums. People can watch movies or new songs on OTT platforms. Information and communication technology has made communication between people cheaper, easier and faster than ever before. Texting, video calling, sending e-mails are so easy these days. There are so many applications available online to provide these services like Google meet, Twitter, Skype and Microsoft teams. Information and communication technology has seen and enabled people to understand the meaning of globalization. Nowadays, the world is on one platform and there are no physical barriers between nations. Societies are now a 'global' citizens.

2.3 ICT equipment

Ngwu (2014) says that a large number of ICT resources are not sufficiently obtainable in educational institutions. This means that, although most of the educational facilitators are sufficiently qualified and prepared to pass on the knowledge they possess to learners, they are hampered from realizing this by the lack of technical infrastructure like Computer lab amenities .According to Ngwu(2014) the degree of usage of ICT resources was very minimal in schools under his study. The study suggested making available finances for the acquisition and preservation of ICT resources, to ensure availability of working computer labs, reliable electricity supplies in schools and providing internal training for facilitators to enable them to be knowledgeable with the latest trends and expansion in the area of technology. In their research paper titled Availability and utilization of ICT resources for effective instructional delivery in tertiary institutions in Crossriver state , Nigeria Egomo etal (2012) revealed that there was low availability of ICT resources to ensure efficient teaching , apart from the use of P.Cs, overhead projectors and web resources. They postulate that it has an effect on the standard of graduates brought out educational establishments. Their recommendations were that Computer resources is supposed to be made available in educational establishments and all facilitators must ensure that they obtain these resources because they are an integral component of teaching. The state must devise suitable ICT policy and staff development instruction programs for the facilitators at all the relevant levels of education. According to Adedeji (2011) States should put more funding in procuring ICT resources in educational institutions to facilitate more training since the outcomes of his study showed that in a majority of schools ICT resources available in schools are mainly being used for managerial purposes. In a study carried out by Kiptalamand Rodrigues (2011) he made it known that ICT and associated technologies are currently at an preliminary phase of improvement and realization. Whilst the speed was slow, there were some cases where absorption rate is more rapid to the scope where some schools have come up with electronic content or subject matter for their lessons. Their content is being made available in compact discs and digital versatile discs. In the research paper titled “The utilization and integration of ICT

tools in promoting English language teaching and learning :Reflections from English option teachers in Kuala Langat District, Malaysia”, Samuel and Bakar (2006) exposed that Computer Labs in schools were inadequate, internet connection was sporadic and limited, teachers lacked computers, databases were not centralized and the use of Learning management systems are unavailable. The study also exposed inadequacy of courses and training of facilitators, incorporation of ICT being poorly, most hardware like DVD and CD ROMs were hardly ever used , very little administration support, support from administration, pessimistic mind-set from other facilitators and ICT lab technicians having inadequate technical skills hence their inability to offer sufficient support needed. All in all the research showed that lack of infrastructure facilities is one of the many causes of poor ICT integration in schools .It is this researcher’s view therefore that ICTs are neither adequately available nor being fully utilized in schools .In a few cases the ICT resources are available, but not being fully utilized. Ademiluy (2019) in his research paper titled “Adequacy and Utilization of ICT Resources for Teaching Business Subjects in Senior Secondary Schools in Osun State, Nigeria” he postulates that the use of information and communication technology has become indispensable to pedagogy in the different fields of business. and that even in rural parts of Africa, increasing internet access, enhanced by expanding access to cellular telephony, implies that banking and other transactions can now be completed on line with organizations in the neighborhood and others thousands of kilometers. Therefore for students, the wide gulf which existed in Nigeria between rural and urban areas only a couple of years ago is being speedily obliterated as examination bodies insist on conducting online examinations for students irrespective of location. According to Ofori-Attah (2017) both facilities and expertise are in short supply in rural Africa. Regardless of this, social media platforms like Face book, Twitter, LinkedIn, Whatsapp, which are powered mobile devices like smart phones and computer tablets, have emerged as important instruments of education service delivery especially in tertiary institutions and urban centres. Nigerian university teachers give online assignments, feedbacks; deliver lectures on line using social media. Diverse studies in Nigeria

have identified the multifaceted problems militating against the effective use of ICT in the teaching /learning process in public schools throughout Nigeria, such as irregular power supply (Ofodu, 2017), inadequate computer literate teachers (Oyebanji, 2013), inadequate funds (Ogunmilade, 2012), reluctance to change (Ademiluyi, 2012) among others. Subjective inferences confirm that Zimbabwe is not exempt from these challenges.

While the government of Zimbabwe has endeavored to introduce basic ICT facilities in all schools, the effectiveness and adequacy of its ICT resources in the implementation of teaching ICT as a learning area remain in question. Government's desire to further set up ICT facilities in all its schools from primary to secondary appear to be inhibited by inadequate electricity facilities, funding, and trained personnel. The research seeks to determine how far the government has achieved its objectives in spite of identified inhibition

2.4 ICT and Education

Information and Communication Technologies (ICT) are becoming popular in most of the world's societies. They have not only reached in to the lives of every person living in developed nations but also in to the lives of people in developing nations too. The difference between developed and developing nation, in regards to ICT is having a quick and slow access respectively. According to Zhang and Martinovic (2008) ICT are essential for educators, for their working knowledge of media and its influence on performance and engagement.

In Zimbabwe and the world in general ICT has been incorporated into educational curriculum to promote and bridge with the digital world. This is why a huge number of computers are required by different educational institutions in most of the world's countries. The availability and exposure of computers has influenced career choices and demands for staff training, in regards to the need of teachers, students and staff. Wims and Lawler (2007) say the ICT is necessary to connect with the modern world. This is supported by the United Nations (2003) which says that ICT unlock the doors to education while education unlocks the doors to development. ICT in

important in education because it has seen the evolving of the education sector tremendously through e-learning or Online Learning which allows provides innovative methods of knowledge acquisition for both students and facilitators. Electronic-learning or virtual learning is fast turning into the standard due to various unprecedented events taking place in our lives such as pandemics like the Covid-19 which show the introduction of Lockdowns in most nations and Physical institutions of learning being closed for lengthy periods at a time. This not only ensured that vast prospects for educational institutions were made available to institutions through learner access to course materials while within the classroom but then again made sure that learners external to the classroom physical environment can still learn through homebased learning. Another benefit of ICT in education is that learners with special needs can now acquire vital study material as well as special ICT tools used by learners to meet their own educational needs hence they are no longer disadvantaged. Even with this, ICT continues to broaden the 'digital divide' as it is difficult for the less fortunate to have accesses to ICT tools and resources. A key skills for the 21st century comprises of evaluation, forecasting, keeping track, organizing and reflecting. An effectual use of ICT in education requires skills like as clarifying and justifying the usage of ICT in fabricating solutions to difficulties. Learners should deliberate, test, and infer the various approaches that they intend make use of. ICT has added numerous worth to crucial learning areas such as reading ability and mathematical ability and remains transparent in the background of subject learning by providing meaningful activities embedded in purposeful subject related concepts. ICT usage inspires partnership by logically conveying learners on a digital platform where they can dialogue and deliberate on their assignments which in turn opens up opportunities for communiqué consequently leading to language improvement. The use of ICT stimulates learning by humanity's demands for the latest technology and this has realized that learners are captivated with technical equipment. When learners are encouraged and motivated there is inclusivity in the classroom and no student is left out. The minute ICT is assimilated into lessons, learners become more affianced in their studies. The reason is that technology delivers diverse

prospects which makes learning and teaching enjoyable. This means that the same concepts can be taught in various ways. As a outcome of this amplified engagement, learners are able to remember what they learnt more proficiently and competently. According to Leach (2003) ICT can help to counter many negative factors such as high student-teacher ratios, shortage of instructional materials and poor physical infrastructure. ICT therefore plays a crucial role in education hence the need for all teacher training institutions to impart ICT skills to facilitators who will in turn pass on these skills to the learners. Unwin (2004) ICT has the greatest potential role in pre-and in-service teacher training programs.

2.5 ICT human resources

Usun (2009) says ICT are used by key persons, known as teachers and teacher educators in educational setting productively in order to get the maximum benefits for their students and integrate ICT into the curriculum and its implementation. Therefore, it can be accepted that teachers are vital players to improve the teaching and learning processes at schools, colleges, teacher education institutes and universities to achieve their goals on a large scale.

Application of ICT within the classroom has a lot of hindrances. Some elements which hinder application of ICT in the classroom are internal within the school whilst others are external within the community and some are the teacher's personal issues. While the impact factor could be dissimilar, they influence the use of ICT directly or indirectly in a large manner. These factors are categorized into non-manipulative and manipulative. Non-manipulative are those factors like age, teaching experience, computer experience, and government policy. Manipulative factors are those factors which encompass teachers' attitude towards the use of ICT, teachers' knowledge and skills about ICT and school commitment.

In the Zimbabwean context stakeholder support is required in order for schools to function. However, the Government is striving to make adequate resources available, with the most critical

resource to the system being the men and women who keep schools running on a daily basis. The Ministry is supporting them so that they continue to be creative and to be able to make the most economic use of the resources available at their schools to implement the curriculum. The Ministry continues to work with the Public Service Commission (PSC) to ensure the required teachers, where available, can be hired. There is also an effort to reassign teachers who are already in the system but who teach outside their areas of specialization, to teach in their areas of specialization.

A research carried out by Bukaliya and Mabika (2011) examined the ICT competences of rural and urban day secondary school teachers in Chegutu District, Mashonaland West Region. The study looked into the training and literacy levels of computer usage by the practitioners with a view to find out the areas of strengths and weaknesses in ICT usage. They identified weaknesses in the study aimed at providing recommendations for improvement. Their findings were that One hundred and twenty out of 320 secondary school teachers participated in the study by providing data which was sought through the use of questionnaires and a competence practical test. Furthermore results from their study revealed that the majority of the teachers were computer illiterate because they were not exposed to ICT training or the practical hands on experience. A significant number had no formal ICT qualifications. A few, however, had a diploma in computers while none had a degree. Results from the practical test given indicate that the majority of the respondents were not able to use the basic software in computers for lesson delivery. In terms of application of the software packages teachers had limited understanding of them, this shows that their capability in terms of ICT usage in education is still behind.

2.6 ICT and the curriculum

Since 2014, the Ministry of Primary and Secondary Education has been embarking on a comprehensive curriculum reform process which is intended to improve the quality of education

in Zimbabwe. A new competence-based curriculum framework was developed and finalized in 2015 whose phased implementation commenced in 2017. Ogar and Awhen (2015) view curriculum as “planned experiences offered to the learner by the school”. Similarly, the CFFPASE (GoZ 2015–2022, 4–5) conceives it as “the sum total of all learning experiences and opportunities that are provided to learners in the context of formal and non-formal education”. These two definitions imply that curriculum is a blue-print which schools adopt in order for them to translate the hopes and aspirations of the nation into tangible reality. A number of innovations were introduced in the new curriculum with wide implications for stakeholders at all levels. The competence-based curriculum seeks to achieve the following, to motivate learners to cherish their Zimbabwean identity and value their heritage, history and cultural traditions and to prepare those for participatory citizenship and to ensure learners demonstrate desirable literacy and numeracy skills including practical competences necessary for life. This was achieved through the introduction of practical subjects like Physical education, Visual and displaying arts and Information and Communication Technology.

2.7 Challenges of Digitalization in developing countries.

Mungai (2010), who is a teacher, acknowledged some elements that hamper the use of ICTs in his state such as shortage of skilled facilitators and as a result they become overwhelmed by the workload, unavailability of electricity, this is prevalent in most African countries, not enough computers, breakdown of the PCs, high procurement prices for most ICT resources, theft, technophobia both administrators and facilitators, outdated computers and amplified moral dilapidation, this refers to abuse of internet facilities through watching improper material such as pornography, cyber bullying and other unacceptable behaviors. Langat (2015) recognized obstacles hampering realization of ICTs as lack of appropriate infrastructure and resources, inadequate teachers, scarcity of lucid digital curriculum, the political aspect, bad timing and substandard planning, expensive implementation costs, barriers in communication, dishonesty,

ethical issues and escalating crime levels. Recommendations were made that would result in utilization of ICT resources improving. Stakeholders requirements analysis, founding of appropriate communication channels, professional improvement in terms of skills acquisition of facilitators and technicians, founding of digital curricula and partnerships creation in education. Mahmood et al (2014) accredited lack of ICT use in educational institutions to numerous factors. They pointed out in exposure and lack of expertise on the part of facilitators who have high computer illiteracy levels, in comparison to contemporary learners who are fast to self-educate and are extremely computer literate. Secondly is the pressurizing of teachers to use technology in the classroom devoid of providing them enough time to study, obtain and implement the technology properly. The lack of confidence amongst teachers is also another factor cited, whose cause is accredited to lack of professional training. Afshari et al (2009) says that there exists manipulative and non-manipulative schools and teacher factors that affect utilization of ICTs. Non-manipulative factors refer to those elements which cannot be influenced by the educational institution, for example the age, teacher experience or know how, and computer knowledge of the teacher, government policy and accessibility of exterior support for the educational institution. Manipulative factors on the other hand are those the school can control, for example teacher's attitudes towards ICTs, teachers ICT skills and knowledge, commitment of the school towards implementation of the learning area.

Conclusion

In the review of the related literature section, the focus was on different literature on factors affecting the adequacy of ICT resources in the teaching of ICT as a learning area. It looked at aspects of the relevance of ICT in today's world, ICT equipment used in all sectors of everyday life such as the telecommunication engineering sector and the education sector. ICT human resource was also examined. Challenges that come with digitization in the developing world were also considered. While the government of Zimbabwe has endeavored to introduce basic ICT facilities at all levels of education countrywide, the adequacy and effectiveness of its efforts

remain in question. Government's desire to further deploy ICT facilities in all its schools appear to be inhibited by inadequate electricity facilities, funding, and trained personnel. The research looked to determine the degree to which the government has achieved its objectives in spite of identified inhibitions. The upcoming chapter will look at the methodology that will be used in the study to find affecting the implementation of the updated curriculum.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter deliberates the theoretical expectations and the design approaches backing up this research. The interpretative model was recognized for the framework of the research. Additionally, this chapter will converse the methods and design used together with tactics, research instruments and data collection techniques whilst clarifying the phases and procedures involved in the research.

3.2 Research Philosophy

The researcher used a mixed methods approach which encompasses the use of both quantitative and qualitative methods. This mixed method will be outlined fully in this section. The initial part will expound on the reasons why a combination of quantitative and qualitative methodology was selected as well as issues pertaining to practicality and ethics in this study. The following part of this study will focus on the quantitative stages of the study, these are the initial or preliminary collection of data, location observations, preliminary questionnaire study, the focal questionnaire and its scrutiny. In the hindmost phase qualitative stage in the study will comprise of the following the semi-structured interviews and the validity and reliability concerns. This selected approach is also termed “multi-strategy” Brayman (2004). It was referred to as “multi-method” or “multiple methods” by O’Cathain et al (2007). The last mentioned alluded that these multiple methods are popular in the health services study (HSR) in Britain. When O’Cathain et al (2007) conducted their study, it was projected that at a minimums of half a dozen books were associated to multi - methods approach and was later on printed and distributed by people conducting studies in Britain, North America and Europe within a period of two years. In the 232 social science journal articles content analysis was done by Bryman (2006) it revealed that these articles mainly used a mixture of survey approaches and qualitative interviews. This therefore implies that both approaches which were embraced in this present research widely employed in social science

studies. According to Doyle et al (2009) eight advantages or bases making use of the multiple methods are “triangulation”, “completeness”, “offsetting weaknesses and providing stronger inferences”, “answering different research questions”, “explanation of findings”, “illustration of data”, “hypothesis development and testing” and “instrument development and testing”. Creswell (2003) proclaimed that the popular and most used strategy is the triangulation design. Multiple methods approaches have been employed as a way of triangulation for the purpose of validating the quantitative and qualitative methods. This stratagem makes available a broader verification foundation. Bryman (2006) says that “Bringing quantitative and qualitative findings together has the potential to offer insights that could not otherwise be gleaned. Thus, even when a fusion of the two sets of findings was not envisioned at the outset of a project, it may be valuable to consider whether the findings suggest interesting contrasts or help to clarify each other” (Bryman, 2007: 9). The term triangulation refers to “that the same phenomenon is investigated from different angles to determine its exact location, in the present context by including different informants and methods to determine its precise meaning and validity” Kvale, (1996: 219). Conversely, some scholars affirmed that the multiple methods technique is not only regarding triangulation. Bryman(2007) contended that the multi approach does not only validate but also brings about a rounded perception that amalgamates the outcomes of various approaches. This is reinforced by Jick (2006) who cited that triangulation aids researchers to advance their accuracy in findings and make up for the limitations of every sole approach by the equalizing the fortes of the other. This research employed the multiple methods approach in order to triangulate so as to check and to authenticate findings obtained from questionnaires, surveys and location observations with that of qualitative results gotten through interviews. Its purpose was to complement the questionnaire findings in circumstances in which asked interview questions varied from those of the questionnaire.

3.3 Qualitative Research

Qualitative research seeks to discover the issues concerning the anomalous present because little is recognized regarding the quandary, such as data that is hard to enumerate and needs clarification often referred to as soft data. This soft data that then results in rich data which is quantifiable and can be easily interpreted. Domegan and Fleming (2007). Qualitative or numerical research should aid investigators to obtain profound insight of individuals, culture and community where they are located Myres (2009). Research carried out in the qualitative approach bestow space for complexities and divergence of the worlds, being studied to be discovered and denoted Philip (1998).

According to Lincoln and Guba (1985) it is a technique which allows the investigator`s strong views, partialities, creativity, inquisitiveness or impressions of the individual conducting the research to be recognized and made unmistakable when the research is conducted. Data was collected with fairness due to the investigators sturdy attitude and mindset. On the other hand it must be acknowledged that qualitative research had its own weaknesses.

The purpose of this study was to examine the adequacy of Computer resources in the teaching and learning of ICT learning area and the finest way to collect relevant data is through the use of interviews and observations which are recommended by qualitative techniques. In addition to this a comprehensive clarification is sought-after to contextualize the data to be collected, therefore the researcher`s use of a qualitative and quantitative study in his research.

3.4 Research Design

It can be explained as the extent of reason or ostentatious plan of any research that evidently portrays how the research will be carried out. It therefore outlines all major aspects of the research such as the measures, model, treatments or programs to answer the research questions. A research design can therefore be likened to an architectural structure. In addition to this a research

design can be seen as an attainment of level-headedness in an ascertained set of procedures that increases the validity of data for a well presented research problem. The research was established on a case study design.

3.4.1 Case Study Design

A case study is defined as, “a type of descriptive research in which data are gathered directly from individuals or social community groups in their natural environment for the purpose of studying the interactions, attitudes or characteristics of individuals or groups” Leedy (1989: 90). On the other hand, Merriam (1998) affirms case studies are thorough accounts and analysis of particular component or a circumscribed structure, like a person, event, or public.

A case study strategy is normally put in place to achieve a thorough comprehension of a particular circumstance as well as elucidate actual meaning to people participating. Powerful case studies are superlatively more than narratives of events but represent large set of ideas that are worthy to reflect and deliberate. A conclusive case study is more like an evocative photograph that captures a particular subject, invites various interpretations and is rich enough to sustain repeated encounters.

The approach chosen for this particular study was a descriptive, multi-case study involving three primary schools in the Mbare- Hatfield District. Descriptive case study produces a comprehensive description of a phenomenon within its context. In so doing a descriptive case study takes into consideration the scope and depth of the phenomenon (Yin, 2003). In this situation the role of the school head takes place within a multi- faceted context of both the school and the public education system in general. A descriptive case study is thus considered an ideal way of generating an understanding of the roles of school heads within their respective contexts.

A case study is broad strategy of choice especially when the researcher has a direct interest in a certain phenomenon. The use of case studies accords an epic approach and it is an ideal method to employ when the study demands that the phenomenon (the role of school head in curriculum change implementation) be studied from within.

Yin (2003) argues that case studies should be the preferred method of study if the researcher intends to answer questions of the “how and why” nature as opposed to such questions that focus upon the incidence or frequency of particular events. Yin (2003) further contends that case studies are best suited to the study of contemporary events. This view is also seconded by Merriam (1998) who argues that case studies should be particularistic, that they must focus on a particular or specific phenomenon. The study focusing on the role of school heads particularly during a period of curriculum change was viewed as consistent with this approach.

Case study was chosen because it permitted and enriched the researcher’s aptitude to view the focus of the research and its context within a single perceptual framework. This is further echoed by Lincoln and Guba (2002) who asserts that case studies allow researchers to communicate contextual information that is embedded in the particular setting being studied. Yin (2003), further asserts that context is of particular significance in many educational studies.

Case studies recognize the role of social truth and as a result respective interpretations are offered. Additionally case studies avail a wealth of descriptive information that can be used by other researchers. Also the information is presented in a more accessible form than other types of research. Furthermore case studies allow readers to interpret the implications of the study for their own respective purposes.

The main constraint was that case study simply flourishes on data that interviewees are capable and ready to divulge particularly in relation to delicate inquiry or matters, this view was also supported by Bryman (2001).

Case study research has been subject to criticism on the basis of non-representativeness and probably lack of statistical generalisability. Likewise, the rich and complex data collected means that the data is often open to multiple interpretations, and potential researcher bias.

Case study design was one way or another inflexible in that interviewees were only restricted to answer the questions offered to them, therefore those eager to divulge more information were restricted from doing so.

The sample choice remained the call of the researcher thus the research could be prone to some form of researcher error.

3.5 Data Sources

According to Bryman and Bell (2003). Data sources are the bases on which important data is obtained. The data sources used in this research were school heads and specialist ICT teachers as well as classroom practitioners who taught the subjects in their classrooms.

3.5.1 Primary Data

It is collected initially and has not been printed and distributed. It is therefore more trustworthy, reliable and impartial. It is not been subjected to alterations people partisanship, hence its genuineness and cogency is better compared to secondary data. The primary data came from primary school Heads, learners and ICT teachers. Collecting information from the sample selected the researcher with unimpeachable pragmatic information concerning the adequacy of Information and Communication Technology resources in the training and knowledge acquisition of ICT as a subject area.

3.5.2 Secondary Data

Data collected from an authority who has already published or printed their work is called secondary data Kothari (2004). This information can be retrieved by anyone upon request and has already been exposed to scrutiny and changes.

Written records were consistently scrutinized by the researcher on the adequacy and effective utilization of ICT resources on teaching/learning of ICT as a learning area. This made the researcher to be familiar with the current works and discourse regarding different educational institutions activities in Mbare Hatfield District vis-à-vis curriculum change when it came to the teaching of the learning area. Data was therefore extracted from government publications such as national reports on education regarding the teaching and learning of ICT, inventories, reports and learners printed books by the researcher.

Secondary data enabled the investigator to obtain a preceding admiration regarding issues concerning education pertaining to the role of effective use of Information and Communication Technology tools in imparting knowledge and skills about computer science in educational institutions. This provided a foundation on which the research was conducted as the investigator made use of secondary and initial findings in tandem so as to widen the array of data accessible, therefore a further dense study conducted.

3.6 Data Generation Methods

On the basis of the interpretive paradigm that anchors this study, the researcher chose the term ‘data generation’ as opposed to ‘data collection’. This reflects the view that reality does not exist but instead ultimate reality is constructed in relation to one’s unique experiences and perceptions.

Data generation methods are the approaches which were used by the researcher in obtaining or collecting data for the purposes of the study Kothari (2004). The researcher employed the use of

questionnaires (meant for teachers) which comprised of closed ended and a few open ended questions as well as interviews (for school heads and teachers). These were the various data extraction methods used for triangulation, this implies the combination of data and collection techniques so that various viewpoints shed more insight on the topic Olsen (2004).

3.6.1 Interviews

Interviews are methods of gathering data using oral questioning employing a set of pre-arranged inquiry Miller and Brewer (2003). Interviews were extremely prolific in that the interviewer went after precise areas of concern which resulted in captivated and fruitful suggestions. Ten teachers and six Heads from the respective schools in the Mbare-Hatfield District were interviewed, so as to get a deeper understanding of the roles of school heads in the implementation of curriculum change.

The leverage of interviews were that undisturbed one on one deliberations with the respondents was carried out which resulted in productive commendations which were suited at realizing complete information using a small number of recipients Genise (2002). However overstimulation of respondents can result in made-up information which is brought about by the presence of the interviewer being there physically. As a result interviewing could lead to systematic errors Kothari (2004).

The researcher ensured that all respondents felt at ease by clearing up any misconceptions and letting them know that the purpose of the interview was purely academic. This was done as a way to reduce the potential of exaggeration.

Reliant on the purpose, interviews can be unstructured, structured and semi-structured. It can be done with individuals or focus-groups.

3.6.1.1 Unstructured Interviews

Unstructured interviews allowed the researcher to present some open-ended questions; this made interviewees to be comfortable as the entire progression became more like a discussion or brainstorming on the topic of study. The way of the interview was determined by both the interviewee and the interviewer, there was no pre-set.

Interviews on the other hand were hard to homogenize across the range of different interviewees, because each one of the interview took its own layout. However, rich data was brought about because the level of inquiry was different to suite the dissimilar contexts and the interviewer queried the interviewee in depth on particular issues as they arose Miller and Brewer (2003). In view of the fact that the information to be obtained from primary school heads and teachers should to be complete and dense so as to totally comprehend the role of adequacy of ICT resources and their utilization in schools, the researcher saw that unstructured interviews apply for the rationale of this research.

3.6.2 Observations

Observations enable a researcher to better understand a particular context, often through seeing and learning certain aspects that participants may not reveal during interviews Patton (2002). The researcher used simple observation, as the researcher observed from outside rather than being actively involved in the learning activities.

Three teachers per school were selected for observation purposes. These teachers were chosen from those interviewed. These teachers were chosen from ECD to Grade 7 teachers. The researcher observed these teachers whilst they were conducting their lessons. This enabled the researcher to ascertain whether responses given during interviews were in tandem or contradiction from what was observed.

Observations were helpful in that they allowed previously unnoticed facts or aspects to be seen. Additionally, observations forced the observer to become more familiar with the particular

subject of interest. Moreover people's actions reveal more information than their

verbal accounts, hence observing these was valuable. The biggest advantage of observations was that it could be done anywhere. However observations have their own flaws, which include the problems that a researcher has to figure out what to observe and the relationships between the observer and the observed. Observations depend on human perception. Observation reports on the same subject might be different due to the way humans perceive that particular phenomenon. Another problem with observations is that the people observed might create an artificial setup for the observer. Hence the researcher had to spend more time on the setting so as to avoid such self- styled environments.

3.7 Population

Population is the collective grouping of populace or entities from which data is sought. Tustin etal (2005). Polit and Hungler (1999) describe population as joint or total of all the matter, subjects or representatives that comply to a laid down of criterion. In this study the target group of interest was, primary school heads and teachers in Mbare-Hatfield District.

3.7.1 Target Population

This refers to the total set of factors for which the survey data is made use of when making interpretation Guy etal (1987). Mouton and Marais (1996) explain target population as a genre of the population having common noticeable traits that are of meticulous concern to the researcher. The intended populace for this research was heads of schools and teachers at three primary schools in Mbare- Hatfield District. These schools consisted of one private, one municipal and one government school.

3.8 Research Sample

This is a prearranged subsection of the populace that is specifically chosen for the purposes of the study Bryman (2001). The researcher chose 16 participants out of the intended populace that was made of 6 heads and 10 teachers, in the Mbare-Hatfield District.

3.9 Sampling Techniques

A sampling technique is the expression or other recognition of the specific technique by which the group of the sample have been chosen Cochran (1963). Bryman and Bell (2003), describe sampling techniques as the diverse ways employed researchers to obtain representative sample for the purposes of the study. The researcher employed purposive sampling.

3.9.1 Purposive Sampling

It is a non- random sampling method whereby the researcher selects information rich cases for an in depth study Patton (2002). Purposive sampling happens when the researcher selects a sample from which the most can be learned about a particular phenomenon Merriam (1998). Thus purposeful sampling is based on the assumption that the researcher intends to discover, understand and gain a thorough insight on the phenomenon of interest.

The sample of this study consisted of six primary school heads and 10 teachers in the Mbare-Hatfield District. The researcher chose teachers from each of the 3 respective schools, based on teachers who are teaching the ICT learning area practicing the new curriculum; that is ECD, Grade 1 to grade 7.

The benefit of purposive sampling was that, only respondents perceived to possess the relevant information were chosen, thereby saving time and simultaneously generating rich data that can be generalized for the entire population. However, purposive sampling was prone to some form of error due to the deliberate omission of certain individuals who might even possess more relevant information than the selected respondents.

3.10 Piloting

Piloting is the engagement of introductory research, preceding the main study Black (1993).

The researcher engaged the pilot study by inquiring colleagues whose answers showed that all the significant questions to collect information from respondents were fully provided. Conversely during interviews the researcher observed that time allocated per interview session should be cut down by only asking questions that had a relevant bearing on the outcome of the study.

Piloting helped the researcher to adjust the interview questions by removing some words which made the questions vague. Ambiguity could have caused inaccurate responses therefore it was necessary to amend the questions. Interview questions were also amended because a few of them were too open hence the responses were a bit capricious hence the researcher had to reorganize and adjust the questioning method.

3.11 Validity and Reliability Test

Validity depicts the extent of genuineness or dishonesty of the data obtained through the use of a given research instrument while reliability is the degree to which an assessment tool provides invariable and dependable results Burns and Grove (2001). In this research validity and reliability designate the measure of accuracy or falseness and uniformity of the ways that can be used to establish whether or not ICT resources are adequate and their level of utilization in Mbare Hatfield district cluster 16.

Triangulation was used by the researcher to confirm the reliability of data given by the respondents. Information from observations were correlated with those facts gotten from interviews and the whole data were positively compared, therefore the reliability and validity of the data increased.

A test retest technique was also employed by the researcher so as to authenticate specific responses from respondents. This was accomplished by asking the interviewee the same question that has been asked prior so as to determine the reliability of responses given.

Both triangulation and test retest techniques enabled the researcher to validate and to consummate that the data was reliable for the purposes of this research.

3.12 Research Ethics

Ethical requirements and guidelines must be adhered to. Leedy et al (2005) stipulates that researchers are expectant to take into consideration the following: follow well-versed agreement rules; pay strong consideration to discretion and confidentiality as well as honesty.

The researcher consequently followed all the above recommendations and guidelines so as to ensure that the research was genuine.

3.13 Summary

The chapter has looked at the research techniques employed by the researcher as well as the design engaged by the researcher. It also looked at the target populace for the study and the instruments which were used to gather data from the target population including the manner in which the instruments were used. The researcher also looked at ethical issues undertaken during the conducting of the research. The upcoming chapter deals with the investigation of the primary data with an purpose of tabulating responses to the research questions in the form of descriptive information.

CHAPTER 4: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter will focus on the presentation, analysis and interpretation of data acquired from research interviews and observations. Analysis and interpretation is followed by an attempt to link or relate the findings to the theoretical notions and prior research findings by other scholars.

4.2 Response Rate

As highlighted in the preceding chapter the researcher scheduled 16 interviews (6 for school heads and 10 for school teachers) and observations. All the scheduled interviews for school heads and teachers were successfully held.

Presentation of Findings from School Heads

Most of the heads of schools interviewed cited that they had an ICT laboratory at their school and that their laboratory was manned by an ICT teacher. The head of school 1 explained that although they had a lab where learners go to from their respective classroom to learn ICT their lab capacity cannot cater for all the learners as they have 50 learners per class and fewer computers than that. The head also cited issues of load shedding which means on other occasions they are unable to use the computer lab to disseminate lessons. The head of school 1 told the researcher that their school has only one Computer teacher who caters for all the learners from ECD to Grade 7. According to the head of school 1 the computer teacher present there holds a diploma in Education but specialized in English at college. The teacher was deployed to teach ICT due to the fact that he has some knowledge in the area. The head also told the researcher that the school had acquired some textbooks for the learning area as well as

teacher's copies to assist the computer teacher. In the interview held with the head of school 2. The head cited that he had challenges of electricity in the area where his school is located and even though electricity poles are present, the electricity has not been connected. He explained that even though the fees charged for the school development as levies are there, they are minimal and payment is staggered so it is difficult for the school to buy any meaningful ICT resources. The head explained that the school has no ICT teacher but that the learning area is taught by the class teachers and is part of their work load. Interview with the head of the third school revealed that although the teacher has two ICT teachers not all of them are qualified. One has a secretarial background and the other has both a teaching diploma and a diploma in Information Technology. The two teachers teach ICT from grades 1-7 and share the classes between them. The school is in the process of acquiring ICT pupil's textbooks and teachers guide according to the head. He further told the researcher that the school has an internet connection and all the members of staff are able to access it. The other two schools did not have a computer lab but the heads said it was within their 5 year plan to have a computer lab built but meanwhile the ICT lessons were being conducted in the classrooms by the classroom teachers. They do not have a dedicated ICT teacher.

Interviews with the teachers

In an interview with a teacher from school 1, the teacher cited that they lacked basic resources such as functional computers and internet connection which is reliable. The teacher also complained about the attitude of the administration and said it was negative towards ICT and therefore the administration was not willing to release substantive funds towards the ICT department. These sentiments were also echoed by a teacher from school 2 who stressed that the way their school administration views ICT has been a hindering block in the procurement of resources in the subject area. The teacher also mentioned on the unavailability of the latest ICT equipment. The schools using Pentium4 processors computers instead of quad core

computers. Another teacher interviewed from a different school expressed challenges in the delivery of the actual content claiming that there were not staff developed on how to teach some of the topics in the updated curriculum and further explained that she did not even know the content in depth, pertaining to topics like programming, web design and animation. A different teacher from School 3 cited limited internet coverage that does not even reach her computer lab but only covers the administration block whilst another teacher from School B expressed sentiments of teaching ICT being a mammoth task as the school had no electricity, generator or solar power to aid powering gadgets to facilitate the teaching of ICT. The teacher from School C said that their school has enough computers for learners and their pupil computer ratio is 1:1. The teacher from this school also told the researcher that they have been using internet technologies in their day to day teaching at the school. According to the teacher they make use of Learning Management Systems such as Google classroom and most learner's have a personal tablet which they purchased from the school. The school had two ICT laboratories one for infants and one for the juniors. Most teachers sentiments were that apart from the shortages of funds to buy ICT related resources the negative attitude of the administration was also a major hindrance towards the reason why some of the ICT resources were not being prioritized.

Questionnaire to teachers

The responses from the questionnaires revealed that the teachers had a large number of pupils in their classrooms and the ratio of learners to computers was 1: 4 or more. Of the schools that had internet connectivity the responses revealed that the bandwidth was between 64Kbps and 512Kbps. The majority of respondents showed that even though they had whiteboards in their schools the ones that had interactive boards were either outdated or no longer functional. The bulk of the respondents indicated that they had between 15-25 textbooks per class. Most of the respondents said that they do not refer to online web sites during their lessons. A few

respondents said that they offer online lessons at their school. Challenges cited by most of the teachers in the questionnaires included overcrowding of learner's as they share ICT resources like desktops and textbooks. Lack or limited internet connectivity, limited knowledge of content and technophobia are some members of staff and administration to embrace ICT. In the questionnaires deployed to teachers the researcher noted that most teachers said they did not have e-mail address. A large number of the teachers indicated that they were not conversant with Learning Management Systems as well as video conferencing.

Observation

The researcher noted that most schools did not have a wide coverage of internet connectivity as the signals mostly cover the administration area. Some schools had whiteboards and one school in particular had an interactive board which was nonfunctional which is in need of reinstallation of drivers. The schools mostly had desktops in their computer lab which were outdated and very few were functional. Of the computers observed by the researcher almost all of them except the ones in the administration office had outdated antivirus, other schools had no antivirus at all installed on their computers in the labs. The projectors present in the classrooms were outdated and had did not have HDMI capability which rendered them incompatible with some of the computer teacher's laptops thus making lesson delivery challenging. Some of the schools observed by the researcher had a few copies of ICT textbooks which were used by the teacher as they were not enough to cater for all the learners. Quite a number of the observed schools did not have the relevant teaching materials such as textbooks at all. When the researcher observed the lessons being delivered she observed that some of the teachers were not very knowledgeable in some of the areas stipulated by the syllabus. They lacked the proper terminology and concepts required in the learning area of ICT. Of the schools observed only two had a printer in the computer lab, of which these printers were small and did not have the capacity to cater for many learners.

Summary

Some of the challenges cited by the heads of schools, teachers and learners were lack of resources like computers, textbook, ICT consumables such as tonners or cartridges, internet connection, electricity, resistance to change, lack of proper training, rushed policy and lack of adequate prior planning by the Ministry of Primary and Secondary Education in the introduction of ICT learning area in schools.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The entire research is summarized in this chapter. A broad summary of the study detailing the problem of the statement, research questions and the methodology used in data collection is provided. This is followed by a summary of findings emanating from research questions. Lastly the conclusions, practical implications and recommendations will be looked at in detail.

5.2 Broad Summary of the Study

The introduction of the updated curriculum both at primary and secondary schools is a noble idea as it strives to empower learners with requisite skills to survive in the 21st Century. This has seen the inclusion of ICT as a testable area in the curriculum and it being compulsory at primary levels. However schools are faced with the myriad of challenges when implementing the curriculum changes. The study focused on investigating the adequacy of ICT resources in the teaching and learning of ICT as a learning area. The main research question was divided into four secondary questions listed as follows.

- i. Which Information and Communication technology assets are existing for the teaching of ICT in primary schools in Mbare Hatfield District Cluster 16?
- ii. What ICT resources are being used by the facilitators in Mbare Hatfield District Cluster 16?
- iii. Which Computer Science resources are available to the learners in the teaching of ICT in the area?
- iv. What skills do ICT teachers have to sufficiently deal with the curriculum changes pertaining to ICT in Mbare Hatfield Cluster 16.?

Both qualitative a quantitative research anchored on an interpretive research paradigm was used to undertake the study. Semi structured interviews, questionnaires and observations were

employed as the data generation methods. The collected data from the interviews were presented and analyzed under the specific research questions posed to teachers and school heads respectively.

5.3 Summary of findings

Summary of research findings are detailed under the secondary research questions crafted to provide answers to the main research question as highlighted.

5.3.1 Which Information and Communication Technology assets are existing for the teaching of computer education in Primary Schools Mbare Hatfield Cluster 16?

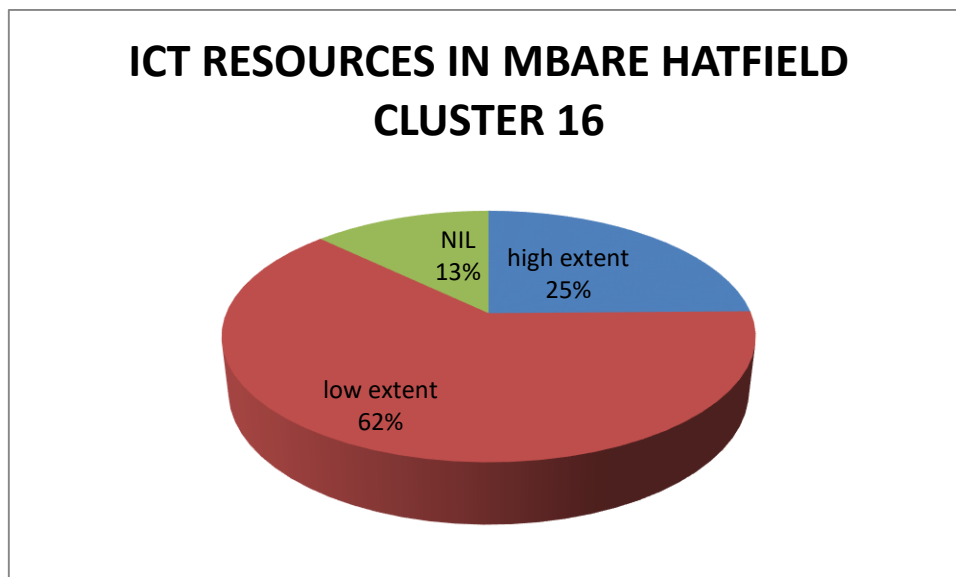
From the interviews and observations conducted the researcher observed that the ICT resources available for teaching of computer education in some schools included interactive boards, projectors, desktop computers, laptops, tablets, access points, internet connectivity, cameras/web cameras, CDs and DVDs with educational material, microphones, P.A. systems, subject specific software, thumb drives, web resources, e-readers, flipped classrooms and Learning management systems like Google classroom, textbooks and Microsoft teams. However some schools only had a few resources which included computers that were old and outdated as well as a few textbooks on ICT for each grade. Some of the schools in Mbare Hatfield District, Cluster 16 had no internet connection or a functional computer as there was no electricity connected to the school. Some schools had quite a number of resources but these resources were not fully utilized. This information is shown by table 1 below.

ICT Resource	Adequate	Inadequate	Not available	Decision
1. Internet services (bandwidth)	17%	63%	20%	Inadequate
2. Email services	5%	44%	51%	Not available
3. Wireless technology	35%	52%	13%	Inadequate
4. Projector	22%	57%	21%	Inadequate
5. Computer s	43%	34%	23%	Inadequate

6. Interactive board	18%	28%	54%	Not available
7. Television	12%	68%	20%	Inadequate
8. Printer	65%	30%	5%	Adequate
9. Scanner	35%	37%	28%	Inadequate
10. Whiteboard	72%	28%	0%	Adequate
11. e-learning /LMS	14%	28%	58%	Not available
12. LAN /WLAN	30%	62%	8%	Inadequate
13. Video conferencing	10%	35%	55%	Not available

:Table 1- ICT Resources available

From the table shown above, it is seen that 54% of ICT resources are not available at schools, 31% of the ICT resources are inadequate and 15% are believed to be adequate. Hence the complete verdict is that most Information and Communication Technology assets needed for lesson instruction and knowledge acquisition are not available in educational institutions. This statistics are abridged below.



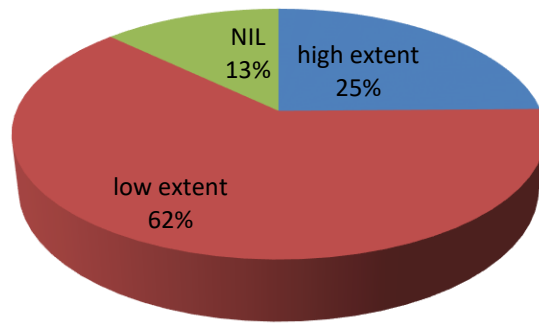
5.3.2. What are the ICT resources being utilized by teachers in the teaching of computer education in primary schools in Cluster 16 Mbare Hatfield District?

ICT Resource	High	low	Nil	Decision
1. web resources used for planning lessons	28%	67%	5%	low
2. Use of interactive board for lesson delivery	12%	52%	36%	Low
3. Use of projectors and television in teaching	21%	58%	21%	Low
4. Homework given online using LMS	32%	63%	5%	Low
5. Computers used for lesson preparation	53%	27%	20%	High
6. Use of email for teacher learner communication	31%	51%	18%	Low
7. Networked computers in the school	62%	31%	7%	High
8. Using P.A system when teaching	5%	28%	67%	Nil

:Table 2- ICT Resource Utilization in schools in Mbare Hatfield Cluster 16

From the above table, it shows the extent in which teachers in Mbare Hatfield Cluster 16. The utilization of the ICT resources is very low at 63% whereas the percentage for high utilization is 24% and 13% did not use the resources at all. Hence the decision is that the utilization of the ICT resources at Mbare Hatfield is still very minimal. The ICT resources being utilized by the computer teachers from grades 1-7 can be summarized in the graph below

ICT RESOURCES UTILIZATION IN MBARE HATFIELD CLUSTER 16



5.3.3. Which ICT resources are available to the learners in the teaching of ICT in the area?

The researcher noted that in school A , the learners made use of ICT textbooks although they were sharing a single book among two learners. At this school learners also used the desktop computers available to them in the school computer lab, however these were shared with one desktop being used by four or five learners as most were said to be not functioning. Internet access was available to the learners although it was cabled and only connected to a few functional desktops. Learners take turns when using the internet. Wi-Fi was available to the teachers although the bandwidth was low and coverage was limited. The school had two teachers who taught ICT although one had no qualification and the other had. They split the classes between them. The school also had 6 laptops which were distributed amongst the grade 6 and 7 teachers. All teachers were given a tablet however it was noted that some teachers did not know how to use the tablets and laptops given to them. Although there was an interactive board it was not fully functional as it needed reinstallation of drivers. School B had desktops and laptops available to the learners. However internet coverage was limited and slow. Learners were given access to eBooks for use on their computers but again these resources were shared

between learners. The school had pupils' textbooks for all grades though they were 40 copies per grade as well one copy of the teacher's guide per grade level. The researcher observed that school C had no electricity and a desktop computer which did not function. Only one laptop was available for use by the head of the school and could occasionally be borrowed by class teachers when the need arose. The school had 10 whiteboards in their classrooms. Teachers made use of their personal smart phones. The school had no textbooks for the learners. Only the class teachers were provided with one pupil's textbook and a teacher's guide in the ICT learning area. School D had only a few computers which were also shared among learners. The school also had projectors but not all the classrooms were fitted with the projectors. The school had ICT textbooks but these were shared, one book amongst two learners in the classroom. There was only one camera which had to be shared by all the learners. The researcher also noted that School E also had desktop and laptop computers but these were shared. Interactive boards were present in two classes only out of the 16 classes from grades 1 to 7. The school had textbooks and internet connectivity which had low coverage and only covered the administration block and not the entire classrooms.

5.5.4. What skills do ICT teachers have to sufficiently deal with the curriculum changes pertaining to teaching ICT in Mbare Hatfield Cluster 16.?

The researcher noted from the interviews and questionnaires noted that the computer teacher from School A had a diploma in Information Technology and a separate diploma in Primary Education. The second teacher did not have any computer related qualification but had a secretarial qualification and therefore was able to teach computers. School B had only one computer teacher who had a diploma in Education and an ICDL qualification. School C 's computer teacher did not have a computer related qualification but had some knowledge of computers and a diploma in education. Schools D and E did not have a dedicated computer teacher but the class teachers taught the ICT learning area within their individual classes. The computer teacher of school F had both a diploma in education and a degree in computer

science. Although all the teachers teaching ICT had been staff developed upon the integration of ICT as a learning area, this exercise was brief and as a result not all the content covered in the subject could be covered.

Training in ICT skills is crucial in implementing ICT integration in the teaching and learning of ICT as a subject area. As more teachers become competent in the use of basic ICT tools, there would be more ICT integrated activities in the classroom. Several interviews with teachers confirmed the view that the teachers who integrated ICT tools in the teaching and learning of ICT learning area have more than average ICT skills. Seeing that software and hardware are being introduced at a rapid pace in the areas of education there is need for teachers to be constantly trained as new technologies in education emerge.

5.4 Conclusions

The study found that computer teachers in Mbare Hatfield District Cluster 16 are inadequately trained to effectively teach ICT as a learning area. This scenario is further exacerbated by the lack of ICT resources at the respective schools and resistance to change which emanates from a poor preparation by the Ministry of Primary and Secondary Education coupled with lack of effective communication and lack of stakeholder participation. Thus it can be concluded that inadequate resources with include equipment and training of the ICT teachers results in poor implementation of the teaching of the ICT learning area.

5.6 Recommendations

5.6.1. Recommendations to the Ministry of Primary and Secondary Education

1. Conduct training with Computer teachers and Heads of schools so as to keep them abreast with the latest technologies used in ICT education.
2. Conduct regular workshops to impart skills to computer teachers on how to teach the ICT learning area.
3. Resources must be mobilized prior to effecting any curriculum changes in regards to ICT.

4. There should be consistent monitoring and evaluation of government policy on ICT education.
5. Technical support must be provided by the Ministry to ensure aid to those schools who may need assistance of a technical nature.

5.6.2 Recommendations to the School Heads

1. School heads must be constantly up to date with curriculum changes in regard to ICT.
2. In the absence of developmental workshops organized by the Ministry of Primary and Secondary education, school heads must initiate staff development programs at the school level.
3. Heads must through the Staff Development Committees source adequate ICT resources for their schools
4. Heads must create a favorable educational environment by effectively communicating with staff on the importance of ICT in education in the global village we live in today.

5.6.3. Recommendations to Teachers

School teachers must embrace change and lobby for curriculum related training in regards to the area of ICT.

6. Conclusions

The research focused on the adequacy of ICT resources in schools and the level of utilization of these resources in the effective teaching /learning of ICT as a learning area. The research revealed that although there was some form of training for ICT teachers those that were carried out were inadequate. It also revealed that the ICT resources available in the Mbare Hatfield District, Cluster 6 schools were inadequate. Those that are available were not being fully utilized to their full potential so as to ensure effective teaching learning in the subject area. Although it was shown that there were factors hindering the procurement of ICT resources at most schools in the Cluster,

it cannot be said that these resources are unavailable but that where they are available they are inadequate and underutilized in some cases.

REFERENCES

1. Adedeji,T,(2011) Availability and use of ICT in south–western Nigeria colleges of education. *International Multidisciplinary journal* ,5(5),315-331.
2. Ademiluyi,L. F. (2012).Wedlock of the gods: Using vocational education and ICT for the promotion of entrepreneurship and accelerated national development. *Gateway Journal of Business Education* 3(1), 77-82
3. Afshari,M,BakarK.A,Luan,W.S,Samah,B.A,&Fooi,F.S,(2009) Factors affecting teacher’s use of information and communication technology .*International journal of instruction*.2(1),77-104.
4. Bryman .A (2001). *Social Research Methods*. New York: Oxford University Press.
5. Bryman .A and Bell .E (2003). *Business Research Methods*, New York: Oxford University Press.
6. Chivore B.(1994) Factors and Determinants of Primary Teacher Effectiveness in Zimbabwe.ZJER,Vol6.No.3 Harare , Mt Pleasant :HRRC
7. Cochran, W.G. (1963), *Sampling Techniques*, 2nd Ed. New York: John Wiley & Sons.
8. Creswell, J. W. 1994. *Research Design: Qualitative and Quantitative Approaches*. New Delhi: Sage Publishers.
9. Domegan Christine and Fleming Declan (2007). *Quantitative vs. Qualitative research*.
10. Egomo, J. E, Enyi, B.I,&Tah,M.M,(2012) Availability and utilization of ICT tools for effective instructional delivery in tertiary institutions in crossriver state ,Nigeria .*Global advanced research journal of educational research and review*. 1(8), 190- 195.[5]
11. Furusa S, Mapenduka W, Sibanda M(2016) Assessment of the Availability and Utilization of ICTs for teaching and learning in Secondary Schools-Case of a high Schoolin Kwekwe,Zimbabwe. *International Journal of scientific and technology*

research volume 5. Issue 05 May 2016.

12. Good, C. V(1973) Dictionary of Education, 3rd ed. New York: McGraw-Hill
13. GoZ (Government of Zimbabwe). 2015–2022. Curriculum Framework for Primary and Secondary Education. Harare: GoZ
14. Guy, R.F., Edgley, C.E., Arafat, I. and Allen, D.E. (1987) Social Research Methods, Boston: Allyn and Bacon.
15. Jansen J1998. Curriculum reform in South Africa: Critical analysis of Outcomes-Based Education. Cambridge Journal of Education, 28(3):312-331.
16. Kanematsu, H. and Barry,D (2016) STEM and ICT Education in Intelligent Environments, Springer International Publishing, Switzerland.
17. Kanematsu, H. and Barry,D (2016) STEM and ICT Education in Intelligent Environments, Springer International Publishing, Switzerland.
18. Kiptalam, G.K&Rodrigues,A.J,(2011) Accessibility and utilization of ICTs among secondary school teachers in Kenya. Computers and education ,246-263
19. Kivuli,F.S,(2013) Factors influencing utilization of information and communication technology in secondary schools in Kitui central district in Kitui County. Submitted as a Dissertation.
20. Kothari C.R (2004), Research Methodology-Methods and Techniques,2nd Revised Edition, New Age International Limited Publishers
21. Kwache, P.Z. (2017). The imperatives of information and communication technology for teachers in Nigeria higher education. MERLOT Journal of Online learning and teaching.3(4): 359 -399.
22. Langat ,A.C,(2015) Barriers hindering implementation, innovation and adoption of ICT in primary schools in Kenya .International journal of innovative research and development

23. Leedy P (1989). Practical research. Planning and design. New York: Macmillan
24. Leedy Paul. D (1993). Practical Research: Planning and Design, Pearson Education Inc.
25. Lincoln Y. S and Guba E.G (2002). Judging the quality of case study reports. In Huberman and Miles (Ed), The qualitative researcher's companion (pp. 205-215). Thousand Oaks, CA: Sage Publications.
26. Mahmood,F, Halim,H.A,Rajindra,S,& Ghani, M.M, (2014) Factors affecting teacher's utilization of technology in Malaysian ESL classrooms. The Malaysian online journal of educational technology. 2(2),15-23
27. McMillan J H and Schumacher S (1993). Research in education: A conceptual introduction. New York: Harper Collins.
28. Merriam S.B (1998). Case Studies research in education. A qualitative approach. San Francisco: Jossey-Bass.
29. Merriam, S. B. 1988. Case Study Research in Education. A Qualitative Approach. San Francisco: Jossey-Bass.
30. Miller R.L and Brewer J.D (2003). The A-Z of Social Research: A Dictionary of key Social Science Research Concepts. London. SAGE Publications.
31. Morgan, G. (2003). Faculty use of course management systems. EDUCAUSE.
Retrieved from <http://net.educause.edu/ir/library/pdf/ers0302/rs/ers0302w.pdf>
32. Morgan, G. (2003). Faculty use of course management systems. EDUCAUSE.
Retrieved from <http://net.educause.edu/ir/library/pdf/ers0302/rs/ers0302w.pdf>
33. Mouton .J and Marais H.C (1996). Basic Concepts in Methodology of the Social Sciences.
34. Mungai,M (2011,09,12) Challenges facing computer education in Kenya schools.
Retrieved March10,2021 ,<http://www.ictworks.org/2011/09/12/12-challenges-facing-computer-education-kenyan-schools>
35. Ndawi O.,MaravanyikaO(2011) Curriculum and its building blocks: concepts and processes.Mambo Press, Gweru.

36. Ngwenya, V. C. 2016. "The Best Way of Collecting Fees without Infringing on the Liberties of Learners in Zimbabwean Primary Schools." *International Journal of Research in Business and Technology* 8 (3): 974–981.
<https://doi.org/10.17722/ijrbt.v8i3.459>.
37. Ngwu, O.G, (2014) Assessment of availability and utilization of ICT resources in teaching F.C.EEha-Amufu Enugu Nigeria. ICELW2014.[12]
38. Nziramasanga, C. 1999. Report of the Presidential Commission of Inquiry into Education and Training. Harare: Government Printers
39. Ofodu, GO (2017). Nigeria Literary educators and their technological needs in a digital age. *Education Focus* 5(1), 22 -30
40. Ofori-Attah, K., J. (2017). Challenges of Information and Communication Technology in modern organizations. Unpublished paper presented at Ghana Institute of Management and Public Administration, April 21st
41. Ogar, O. E ., Awhen F. O. (2015). "Teachers' Perceived Problems of Curriculum Implementation in Tertiary Institutions in the River State of Nigeria." *Journal of Education and Practice* 6 (19): 145–151.
42. Ogunmilade, CA (2012). Television for Instruction. *Television Quarterly* 7: 7-11.
43. Oke, J. S. (2013). The Challenge of a new reality: Information and communication technology and the new frontiers of knowledge. *Journal of Information and Communication Technology*, 5(1), 12-22
44. Olsen Marvin .E, Lodwick Dora G., Dunlop (1992). *Viewing the World Ecologically*.
45. Olsen W (2004). *Development in Sociology*. Lancashire: Causeway Press.
46. Osofisan, A. O. (2013). Information and communication technology in the new education. *Journal of Information and Communication Technology* 5(1), 2-11
47. Oyebanji P.K. (2013). Teacher training: Key technology and mathematics teaching. In M. A. G. Akale (ed) *Proceeding of the 44th Annual Conference of Science Teachers'*

Association of Nigeria pp. 265-267.

48. Patton M. Q (2002). *Qualitative Research and Evaluation Methods* 3rd Edition. London: Sage Publications.
49. Philip L J (1998). *Research Methods for Business Students*. Macmillan
50. Pretoria: Human Sciences Research Council, Sage Publications .
51. Sadovnik A(2011) *Sociology of education: a critical reader*, New York, Routledge,
52. Tustin, Ligthelm, Martins & Van Wyk. 2005. *Marketing Research in Practice*. Pretoria: Unisa Press.
53. Yin Robert K (2003). *Case Study Research: Design and Methods*. SAGE
54. Zhang, P., Aikman, S., & Sun, H. (2008). Two types of attitudes in ICT acceptance and use. *International Journal of Human Interaction*, 24(7), 628-648. doi: 10.1080/10447310802335482.
55. Zhang, P., Aikman, S., & Sun, H. (2008). Two types of attitudes in ICT acceptance and use. *International Journal of Human Interaction*, 24(7), 628-648. doi: 10.1080/10447310802335482.

<http://aims.fao.org/information-and-communication-technologies-ict>

<https://www.digitalclassworld.com/blog/importance-of-information-technology/>

APPENDICES

SEMI STRUCTURED INTERVIEW GUIDE

1. Have you conducted any Information and communication Technology lesson using ICT tools?
2. Is there any interactive whiteboard available for use in the classroom?
3. Are there computer laboratories in your school?
4. Does your school have access to the internet?
5. What is the broadband speed of your internet at your school?
6. Is internet access accessible to everyone in the school?
7. Are the workstations (computers in the lab) networked to a central server?
8. Does the school support online learning?
9. Do you make use of any Learning management Systems at your school?
10. Besides the CD-ROM materials, do teachers sometimes refer to suggested e-learning web sites during their ICT lessons?
11. Do you incorporate public addressing systems in their lesson delivery
12. Are there any computer support personnel to assist the teacher in ICT integrated activities in the computer laboratory?
13. Is there any dedicated staff computer allocated to allow staff the opportunity for professional development and teacher preparation?

Computer Adequacy Questionnaire

We are indebted for your participation and support in answering this questionnaire. We would like to be acquainted with your computer experience, understanding and skills. Your responses will be treated in austere confidence and individual teachers/schools will not be identified in any report or publication.

Please answer all the questions as accurately as you can.

Section 1

For each question please mark your response with a tick(√) unless otherwise indicated.

For “other ” response please provide a brief response.

1. Gender male female

2. Age 18-25 26-38 39-45 46-54 55+

3. What is your job and position? (Please specify)

4. Where do you currently work?

Kindergarten Primary Secondary

5. How long have you been working as a teacher? (Please specify)

6. What kind of qualification do you hold?

Diploma in Education with ICT main subject

Diploma in ICT

Diploma in Education

Undergraduate Degree in ICT/Computer Science

Postgraduate Degree in ICT/Computer Science

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Other (please specify)

7. How many classes do you teach? (Please specify)

8. How many learners are there per class?

Fewer than 10

10-15

16-20

21-35

36-40

40+

9. Teaching hours per week

Fewer than 10

10-15 hours

16-20hours

21-25hours

More than 25hours

10. Number of ICT textbooks per class (please specify)

11. Ratio of ICT devices per learner

1:1

1:2

1:3

1:4

1:5

6+

12. Does the computer lab or classrooms have internet connectivity

yes no

13. Which type of devices are accessible to the learners

desktops laptop tablets smart phones

14. How many ICT gadgets for use by learners are

functional need of repair obsolete

15. How is ICT taught to classes in your school?

ICT is taught as a separate subject

ICT is integrated in any subject

ICT is integrated in my subject because of curriculum requirements

ICT is integrated into several subjects

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

16. Is there internet access at your school?

yes no

17. What is the bandwidth of the internet at your school?

.....

18. Do you provide on-line lessons at the school?

yes no sometimes

19. Is there an interactive whiteboard available for use in the computer lab.

yes no

20. Are the school administration and Stakeholders supportive of ICT

very supportive supportive not supportive

21. Besides the CD-ROM materials, do you sometimes refer to suggested e-learning web sites during lessons(if so which ones)

.....

22. What challenges are you facing as an ICT in the teaching of the subject.

.....

.....

OBSERVATION CHECKLIST

During observations, the researcher was guided by this checklist;

- ✓ Grade

- ✓ Source of Material/Teaching Material

- ✓ Topic/Subtopic

- ✓ Lesson Duration

- ✓ Activities

- ✓ Challenges

