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RESEARCH TOPIC:

THE IMPACT OF ICT REVOLUTION IN ENHANCING RURAL EDUCATION. A CASE STUDY OF WARD 9 SCHOOLS IN MUDZI NORTH

I, the undersigned do/do not acknowledge that the above student has consulted me for

supervision on his /her research project /dissertation until completion. If therefore do/do not

advise the student to submit his/her work for assessment.

SIGNED.. DATE..

DECLARATION

I, TREVOR KUDAKWASHE NYAMAYARO, declare that the work I have submitted is my own effort and it has not been submitted anywhere for any degree purposes in any other university. I certify that the information in the Dissertation which is not my own has been identified and acknowledged. It is being submitted in partial fulfilment of the requirements of the Master of Arts in Development Studies Degree at Midlands State University, Harare.

Signature   Date

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DEDICATION

This work is dedicated to all my family members with special thanks to Mr and Mrs Nyamayaro for their relentless effort in supporting my study financially and emotionally. They have inspired me undoubtedly to be original and to always aim for the best in all endeavours be it academic, social, economic and spiritual.

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Above all, I thank the Almighty God who, through his grace and mercy, gave me the desire and strength to successfully complete this research project. He was the pillar of strength in times of doubt. May your name be glorified forever more.

ABSTRACT

The study was assessing the impact of ICT revolution in enhancing rural education. The study was carried out in three secondary schools in Ward 25 of Mudzi district. The study was conducted to assess how ICT is being used to enhance the quality of education, improving teaching and learning process, assisting educational management as well as improving educational outcomes such as better academic performances and opportunities for both pupils and the school. The study also assessed the levels of ICT access by teachers and pupils analysing whether ICT is being used for educational purposes or not. The research used a qualitative approach to explore the topic under study. Questionnaires and interviews were used as part of the data gathering instruments. On sampling, purposive sampling method was used to obtain data from participants who were themselves school teachers, school administrators and school pupils. The major findings of the study revealed that the use of ICT in the education curriculum is still at initial stages as teachers are now beginning to appreciate new technology. Few teachers and pupils were noted as having skills and competence on ICT which they were using for teaching and learning purposes. ICT was also contributing tremendously to the educational management systems in schools. Though the subject of ICT is still not popular in the district, teachers and school heads admitted that it has a potential of bringing positive changes in the learning and teaching process and can improve academic outcome, boosts student confidence and motivates them in their studies. The study also noted some challenges to the utilisation of ICT in the district with factors such as: poor electricity supply, lack of computer literacy and confidence within the teachers, poor ict infrastructure in schools, lack of financial resources to support the expansion of ICT amongst other factors. The research brought forward some recommendations to assist ICT initiative in schools such as monitoring of ICT schemes, alternative source of energy, increase computer density at schools amongst other factors.

ACRONYMES

ESAP   Economic Structural Adjustment Programs

ICT   Information and Communication Technology

IWB   Interactive White Board

NEPAD   New Economic Partnership for Africa Development

NERP   National Economic Recovery Program

NGOS   Non-Governmental Organisations

NUST   National University of Science and Technology

MDGS   Millennium Development Goals

WWW   World Wide Web

PC   Personal Computers

POTRAZ   Post and Telecommunication Authority in Zimbabwe

R&D   Research and Development

ZIMASSET   Zimbabwe Accelerated Sustainable Economic Transformation

ZIMSEC   Zimbabwe Secondary Examination Committee

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INTRODUCTION

The study highlights the impact of ICT in enhancing rural education in Zimbabwe. This research has been motivated by the fact that ICT is now regarded as one of the panacea to sustainable development and is currently at the core of all productive systems in modern societies. ICT referred to in this study is the computers and internet connections used to handle and communicate information for learning purposes.

The United Nations, through the millennium development goals in 2000, highlighted the importance of ICT as a global development agenda. In this agenda, the eighth goal stressed the need to make new technological innovations available and accessible to the whole globe (World summit On Information Society, 2003). The education sector therefore plays a fundamental role in information dissemination and production hence they is a need to make sure that both teachers and students are part and parcel of that revolution so as to fit in the modern demands of technology.

It beyond any reasonable doubt that most rural parts of Zimbabwe are still lagging behind the full utilisation of ICT Statistics has it that Zimbabwe still remains at the bottom ten of network readiness index in Africa (Reddi, 2004). On the same note, Kachembere (2011) observed that many schools are losing out on many educational opportunities and better paying jobs. For instance in Mudzi district, due to lack of connectivity to electrical power, most school are failing to fully capitalize on the use of ICT, hence teaching and learning has remained largely traditional.

However this traditional way of delivering and learning has been outpaced by the new technological revolution that has introduced new effective, efficient and innovative ways of teaching and learning. It is through this realisation that some schools in Mudzi district are now seizing opportunities to exploit the benefits of ICT for teaching and learning purposes.

Another concern of this study is to address the issue of digital divide. This phenomenon is whereby there is highly unequal access to and use of ICT both at international and at national level. This situation has created developmental challenges such as social inequalities, poverty, illiteracy and unemployment. Thus to foster sustainable development in Zimbabwe, there is a need to be part and parcel of this digital or technological revolution which has took the world by a storm and fully integrate or embrace it into the education system.

BACKGROUND OF THE STUDY

In Zimbabwe, ICT in education is not a very common phenomenon especially in rural areas and other marginalised societies where most schools are not connected to electrical power supply and where some schools hardly have any infrastructure to house those facilities. Mudzi district is largely rural with the majority of the schools unable to offer computer studies due to non-connectivity to electrical power supply. This therefore means that teaching and learning has largely remained rooted in the traditional models of delivery.

Conventional learning set-ups have been replaced by digital environments and the face-to-face mode of tuition delivery is fast being replaced by online designed learning and knowledge delivery methods (Kachembere, 2011). Education experts however argue that bringing ICTs into the learning environment will create opportunities for broader education initiatives that will bring pupils into the information era.

From the past two decades, the education status in Zimbabwe has drastically deteriorated. Amongst many other factors to this crisis is the economic meltdown that has been witnessed especially from the beginning of the 21st century. Economic policies such as the E.S.A.P were detrimental to the education system in Zimbabwe. For instance, the cutting of government expenditure on subsidies and social services resulted in Zimbabwe losing its status as having

the best educational systems in Africa. Furthermore, poor international relations with the west only helped to worsen the situation due to economic sanctions which hampered any potential development in the country. However to remedy the situation, ICT has been seen as one of the panacea to improve the education status and foster development.

One of the most important steps to address this crisis was through the Nziramasanga Commission. The Nziramasanga commission was formed to identify some challenges that were facing the education system and find ways of curbing them. The Nziramasanga Education Commission Report of 1999 recommended for the introduction and mainstreaming of computer-based teaching and learning in the pedagogy of schools, colleges, universities and other institutions of higher learning (Nziramasanga, 1999). This constituted a key element of the national ICTs policy.

More so, in an effort to bring the potentially empowering benefits of ICT to the pupils, the government of Zimbabwe embarked on a massive drive to turn around the education sector by donating state of the art computers to many schools around the country mainly in the rural areas. Concomitant with that was also an effort to train computer science teachers who were badly needed in the schools.

To that end, many Teacher Training Institutions at both primary and secondary were mandated to train computer science teachers and to offer computer appreciation courses to their student teachers among the programmes they offered. It should be noted, however, that for the past decade, Zimbabwe has been limping under the effects of an economic recession which seriously crippled the education sector and also made the country to lag behind in this vast digital revolution (BWPI, 2009).

Moreover, the Millennium Development Goals set by the United Nations in 2000 which was launched by His Excellency President R G Mugabe in September, 2005 recognised the role of ICTs as tools that add value and contribute significantly to the achievement of the MDGs by 2015. The eighth goal of this agenda drew much attention on the need to ensure that the benefits of new technologies, especially ICTs are made accessible to all (World Summit on information Society, 2003).

Some schools have however made significant progress towards harnessing computer technology for the purpose of teaching and learning through some of the above initiatives. This effort has not been without its challenges. Some of the major challenges that schools in rural areas of Zimbabwe are facing are largely associated with the prohibitive costs of purchase and maintenance of computers in the schools.

Some schools located in the remote parts of the country have also generally failed to attract not only qualified computer teachers but qualified teachers for other disciplines as well. After graduating from high school or from tertiary institutions worldwide, graduates are expected to join the working fraternity which hitherto has seen a rise in the demand for computer skills (Yelland, 2001). Indeed many jobs in Zimbabwe are increasingly requires the requisite qualification and literacy in computer technology.

It is vital therefore, that pupils are equipped with the necessary computer technology skills to fully empower them to participate in the highly digitalised world from a young age. All

sectors of education from primary, secondary, to university, as well as vocational and skills-based education need to harness this technology.

This study seeks to ascertain the level of ICT use amongst pupils at Kotwa high school in Mudzi rural district as well as to examine whether teachers and heads appreciated the rationale of introducing ICT facilities at the school. With this in mind, the objective of this paper is to identify, suggest and motivate some guidelines and mechanisms, whereby ICT could play a major contributing role in turning-around the education system in Zimbabwe.

CONCEPTUAL FRAMEWORK

The concept of ICT in this context refers to the use of computers, internet, hardware, application packages and all modern technologies aimed at capturing, storing data and information for educational purposes. The phenomenon of ICT revolution also refers to the technological innovations and breakthroughs that had taken over communication and easy spread of information.

Examples of these ICT tools include computers, calculators, photocopying and printing machines, internet, data projectors and other related gadgets used for communication. This revolution has thus replaced the traditional or the analogue ways of spreading communication. In this study ICT also relates to issues to do with access, availability and user proficiency to those tools.

Availability refers to the physical presence of ict resources and facilities. This might include availability of the internet, computers, laptops, projectors, computer laboratories and other computer hardware that might be used for academic purposes. Accessibility is the yardstick

to measure the extent to which the ict tools are accessible by all participants in the learning process. This might also refer to the availability of ICT facilities such as computer rooms, library, resource centres or lecture halls. ICT proficiency regards user's capability to utilise ict for academic purposes. These abilities refers to skills on computer applications such as Microsoft Word, spreadsheet, internet, projectors, data presentation tools and other related computer programs that can be used for academic purposes.

The term impact in this study refers to major changes or transformations that were brought in by the use of ICT in secondary schools. Emphasis of the term is much on improving the learning and teaching practice. The impact of ICT in enhancing education in this study is being measured using the following indicators:

- ❖ Pupils' academic performances
- ❖ Pupils' access to ICT facilities
- ❖ Teacher's appreciation of technology
- ❖ ICT innovations at the schools especially by the administration for educational purposes.
- ❖ Performance of tasks using ICT tools.

Learning is a term which generally refers to the process that increases the capability and capacity of students to acquire skills and knowledge, mature, grow and to adapt to new challenges and changes (Warschaure, 1996). This process of learning enables students to apply their skills to make decisive choices, break new grounds and solve day to day problems. In this study learning refers to the process in which school pupils acquire skills and knowledge delivered to them by their teachers or instructors in schools.

THEORATICAL FRAMEWORK

This study is largely informed by the Modernization Theory which rose to prominence in the 1950s and 1960s. Tenets of this school of thoughts include Adam Smith, Rostow, Sir Author Lewis and Sen Amartya amongst others. The major contribution of the theory to this study is that it calls for the developing countries to go through a cultural and economic change in which traditional values are substituted by development oriented goals so as to reach modernity. The theory presupposes that in order to depart from political, economic and social challenges to achieve development and industrialisation, there is need for a change of values and attitudes of the developing world.

This school of thought explains development as encompassing the transition and transformation from a traditional society into a modern one. The paradigm further asserts that to raise the standard of living consists of the dissemination knowledge and information on effective strategies of production. Hence ICT in education becomes vital as a key drive to promote a sustainable national development.

Some of the characteristics of modernity, as cited by Coartze et al (2007:31) include readiness to accommodate the process of transformation, continuous broadening of life experiences, planning and readiness towards new experiences. Using Rostow's model of development, one could note that most African countries falls under stage one of the five stages of development which is the traditional society largely characterised by the use of primitive technology and disconnected communities.

Using the mordenisation theory, investing heavily in modern technology increases the richness of education and can be a key driver for national development. Through these lenses, the adoption of western technology is therefore one way of reducing the cultural and digital

divide between the two worlds. The use of ICT in education would therefore constitute the drive towards realisation of this dream.

STATEMENT OF THE PROBLEM

Education is seen as the panacea to development. The research seeks to examine the effects of the ICT revolution on rural education in Zimbabwe. The research focuses on the effects of the ICT revolution on rural education in Mudzi district in ward 25. In this globalised era, ICT innovations have spread and become irresistible to the modern societies. However, most rural communities are still lagging behind some of the new technologies that have been brought forward to bring efficiency and effectiveness to modern institutes. Therefore there is a need for the Zimbabwean Government to be fully committed to the implementation of ICT in the education system. The main concern of this study is that if meaningful ICT policies are not implemented in the education system, the country may keep on producing education that is not relevant to the modernized world. Thus education in Zimbabwe will remain obsolete and irrelevant to the modern world and job market. Moreover, if schools continue to train children in yesterday's skills and technologies, they may not be effective to fit in tomorrow's world. This is a sufficient reason for ICTs to win local recognition and attention. Moreover, the technological gap or divide between rural areas and urban centres continue to increase causing unequal opportunities. This study therefore focuses on how ICT use can increase opportunities for rural schools and pupils to remain competitive in this digital era.

OBJECTIVES

The specific objectives of the study are:

- ➢ To examine how the state in Zimbabwe has embraced and implimented the ICT revolution in rural education.

- ➢ To examine the impact of the ICT revolutions on rural education focusing on ward 25 Mudzi district.

- ➢ To offer recommendation on how the state can fully embrace the ICT revolution especially in enhancing rural education.

RESEARCH QUESTIONS

Below are some of the questions that the researcher will be asking participants involved in the study.

- ❖ Howfar has the state embraced and implimented ICT in the education system of Zimbabwe?

- ❖ To what extent has ICT enhanced education in ward 25 schools in Mudzi district?

- ❖ What challenges do schools meet in the usage of ict for educational purposes?

- ❖ What are possible solutions on how the state can help to improve the maximum utilisation of ICT in the education system of Zimbabwe?

SIGNIFICANCE OF THE STUDY

Information and communication technology is now seen as central to the creation of a global knowledge-based society. Many educational institutions not only in Zimbabwe but

throughout the developing world are increasingly getting to realize the benefits of computer technology. According to the Modernisation Theory, the adoption of technology is a building block to better quality of life (Moore, nd). This is the major motivation of this study to help Zimbabwe to modernize the education system so as to catch up with other developed world and to curb the effects of digital/ technological divide.

This study may benefit the rural populace and schools in sensitizing them with the potential benefits ICT can bring to them. The study may also help the nation to reduce the effects of digital divide, a developmental challenge currently predominant in Africa. More challenges facing schools to fully utilise ICT in education maybe exposed in the study and this will help relevant authorities with credible solutions to improve ICT access. The study will also be beneficial to teachers as it is a call for them to be conversant and updated with the current technological innovations and changes so as to remain competitive and relevant professionals.

Empirica (2006) states that pupils are more motivated and they participate more actively when using a computer. Use of computers can also promote enquiry and build up the students' interest in the subject leading to child centred and investigative learning. This is because a computer can execute various tasks; it can be used as a laboratory, a teaching aid, a workbook or a personal tutor. It also draws students into the world of critical thinking (Benzion, 1994, Vaugh, 1997).

This study is therefore crucial to teaching and learning processes as it enhances wide research through the use of the internet. The internet has been regarded by Varron (2011) as an information gold field and it is newest and most powerful weapon in the world of educational computing. The study is also important in sensitising the Ministry of Education, Sport Art

and Culture, the Ministry of Information Technology and Communication and other relevant stakeholders for the need to lend the necessary support to the education sector with regards to ICT for the benefit of the pupils and improvement of the education system.

LIMITATIONS

There are quite a number of limitations that were affecting the outcome of the research. The study relied much on the willingness of the participants to fully express their perceptions on the use of ICT. Most participants were school pupils who did not fully understand the phenomenon under study. Sample selection of participants was not able to yield maximum results as only a small fraction of the population was selected due to shortage of time to carry out an extensive research. The project was time consuming since it required much of the researcher' attention in planning and developing questionnaires. However, the researcher had to be patient so as to get adequate results. Thus despite the limitations noted above, the research was carried out smoothly and the set objectives were satisfactorily met.

RESEARCH METHODOLOGY

The study is largely descriptive and exploratory in nature hence it employed a qualitative research methodology. This type of research seeks to highlight the broader perspective of a situation, phenomenon, experience or an event. This methodology allows the study to be well detailed, seeks to understand the context, to be investigative and answer questions of meanings and experiences.

The qualitative approach has been used in order to understand the determinants of computer use for teaching and learning, the feelings, opinions, attitudes and perceptions of the

participants in the study. Teachers, pupils and heads as human beings have feelings, emotions and perceptions and the qualitative research model was suitable to probe such inner feelings. The strength of the qualitative research methodology in this study is on its ability to explore individual experiences of the people under study and to enable the researcher to probe into people's perceptions, and experiences on the ICT phenomenon and how it has enhanced the education system in the area under study.

DATA GATHERING INSTRUMENTS

The research made use of various data gathering instruments to collect data in the field. The use various data gathering instruments are used to suit the nature of the study. This type of research is qualitative in nature hence tools used for data collection were very relevant to the nature of the study that were also rendered valid and very reliable. They are a lot of mean in which a researcher can acquire data from the population under study. For this study, the researcher made use of interviews and questionnaires as best for the research.

Interviews

Through interviewing both the teachers and the heads, the study was thus able to gather in-depth data on the level of computer use, impediments to effective implementation of computer studies subject in some schools, and the extent to which teachers and heads appreciated the need to offer the subject in their schools.

According to Creswell (1998), in-depth interviews are the hallmark to phenomenological research. Miller and Crabtree (2004: 200) added that, "The creative depth interview is a gateway to narrative understanding." Therefore the depth interviews that the researcher

conducted in regards to ICT use for the period 2009-2013 provides an avenue for gaining thick and rich descriptions. Thus the researcher and the subjects gained mutual understanding as Miller and Crabtree (2004) stressed as the primary focus. The semi-structured nature of depth interviewing also allowed the interviews to be organized around a group of open-ended ideas (Miller and Crabtree, 2004).

The use of interviews however had its own limitations. For instance the use of interviews gave the respondents the opportunity to be subjective. Some were also not willing to reveal all that the researcher was expecting to know for reasons best known to them. At times some respondents were not even comfortable to share out their views and opinions. However besides these setbacks, the researcher managed to get enough data essential for the research.

Questionnaires

Furthermore questionnaires were employed by the researcher as part of the data gathering proccess. A questionnaire is simply a list of questions. According to leedy (1993) a questionnaire is a common instrument of observing data that goes beyond the reach of the researcher.

It probes deeper within the mind, attitude, reactions and feelings of the people under study. The researcher adopted open-ended questionnaires. In open-ended questionnaire, respondents had freedom to structure a response and use words of their own choice in phrasing a reply. It was also used to gather a wide range of data such as demographic data, availability of infrastructure, access and use of ict facilities.

Questionnaires allowed respondents ample time to think and answer questions. Moreover questionnaires offered anonymity by making respondents free to supply information they could not be able to supply in the presence of someone. The questionnaire comprised of general questions such as the impact of ict to educational outcomes, ownership of the facilities and issues to do with access to the equipment.

In this study, a questionnaire was used to search for information that could not possibly have been found when using interviews only hence it acted as a compliment to interviews. Questionnaires ensured the respondents on issues to do with anonymity. Questionnaire proved to be a very reliable way of collecting data since it enabled respondents to feel free in responding as they was high levels of privacy and confidentiality.

Another advantage of questionnaires was that it was a very fast and efficient method of collecting data. It also helped the researcher to use less financial and human resources since the researcher was one in control of administering the distribution of questionnaires to the participants.

The use of questionnaires had its own shortcomings in as far as collecting data was concerned. For instance, the researcher had to take a while explaining to the respondents what the question was asking for. Most pupils had challenges in understanding English hence they responded poorly on the questionnaire. The collection of data was however carried out so well despite these setbacks.

SAMPLING

Considering a huge number of the population under study in ward 25 in Mudzi district, interviewing each and everyone seemed to be such a mammoth task. Therefore a sample size of ten percent from the whole population was selected to represent the whole population. Sampling is the use of a small group of people or things taken from the larger group to represent the larger group (Brekwell and Fife, 2006). Sampling in this study was vital as it served not only costs but time and resources during the study. Charmaz (2006) suggested that 25 participants are adequate enough for smaller studies. However, for this study a sample of 40 representatives in which amongst them, 10 were teachers from each school.

PURPOSIVE SAMPLING

Purposive sampling is one of the most common sampling strategies, which groups participate according to preselected criteria relevant to a particular research question (FHI, 2006). Purposive sampling was used in the selection of pupils, teachers and school administrators for interviews and questionnaires. It targeted mainly school pupils, teachers as well as the administration members of the school who had rich information needed for the study.

Purposive sampling allowed the researcher to reach a targeted sample quickly and subjects were selected basing on their knowledge or certain characteristics. This method was very useful as it enabled the researcher to gather much data against the time available for the data collection in the area of study. More so, it enabled the researcher to collect data from the relevant respondents hence saving time and resource.

TARGET POPULATION

Schaefer et al (1996), defined population as all people or items with the characteristic one wishes to understand in the study. In this research, the population under study includes school teachers, pupils, parents and the school administration. Since there is rarely enough time or money to gather information from everyone in the population, the goal was to find a representative sample of that population. Pupils and teachers of mixed sex from the school were incorporated into the study as they could have knowledge on the characteristics and nature of the phenomenon under study.

In this study, three secondary schools were purposively chosen because of their status differences as one was a boarding school Dendera high school, Kotwa high school a secondary day school with form six and Kondo secondary school with form four. The researcher chose these schools for their different conditions in terms of development so as to give a detailed explanation to various experiences.

RESEARCH ETHICS

For any research to be valid, reliable and authentic, the researcher has to take cogniscence of some ethical considerations when carrying out a research. The researcher observed some ethical principles which helped him throughout the study. These principles become moral guidelines to the study as it helped to eliminate conflicts between parties involved in the research. These ethical considerations observed by the researcher are to be alluded as below;

Permission to carry out the research was sought from the Ministry of Primary and Secondary Education and heads of the schools concerned. The relevant authorities were presented with a

letter from the midlands state university, faculty of arts department seeking permission for the researcher to be allowed to carry out his study. Participants were also fully informed about the study. Hatch (2002) noted that one aspect of respect for those individuals who are subjects is the opportunity to voluntary consent to those procedures in which they will be taking part during the research without being subjected to coercion. As such, the persons who took part in the research were provided with information that described the complete nature of the study, including the procedure, purpose and any risks or benefits associated if they exist.

The researcher also assured subjects on the issue of confidentiality. In order to obtain candid data, researchers must develop a rapport with their subjects in the research (Polkinghorne, 2005). One aspect of developing a rapport in order to establish an open relationship with the research subject is gaining the confidence of the participants (Polkinghorne, 2005). According to Rossman and Rallis (2003), maintaining confidentiality of subjects requires withholding identities, roles and assurance that names will not be associated with stories. Therefore the interviews and questionnaires that were used by the researcher as part of data gathering instruments ensured for their anonymity.

Respondents were not coerced or forced to take part in the research. They were given the freedom to withdraw from the research whenever they felt uncomfortable. After the research was done, the researcher shared the outcomes of the study with all schools involved and relevant authorities and thanking them for their unwavering support for the research to be completed.

LITERATURE REVIEW

The aspect of ICT is still a new phenomenon in the development studies but quite a number of researches had been explored by various schools of thoughts and had largely informed this study. The researcher relied heavily on scholarly journals, reports, policy documents or statements, articles and books on ICT. Leedy (1993) express that literature review provides the direction of the research and development of knowledge and therefore demonstrates the project's relevance. This literature helped the researcher to identify gaps, missing links, weaknesses and strength of previous research and to explore new areas of the aspect for the benefit of the general populace.

The concept of Information Communication Technology- refers to a big set of tools and applications aimed at capturing, storing, displaying and sharing data and information in electronic way (Debande & Ottersten, 2004). In education, ICT is playing a lot of roles ranging from mediating the teacher, the learner and the content to facilitating more interactions in a modernized and flexible way. It is arguable that, ICT has brought about substantive changes. Invariably, while teaching and learning mandatorily requires the physical presence of the teacher and the learner in a fixed place, current extensive use of ICT has challenged the educational institutions, knowledge seekers and providers by making possible the unlimited and open access to education (Namdev, 2012;Ndambayaje & Orodho,2014).

Forester (1985) sees the role of teachers as critical in assisting pupils to appreciate the working principles behind ICTs so that they stop being a mystery to them. The role of teachers according to his research is to encourage pupils to be active ICT users and to engage

the pupils in productive ICT-driven activities at school. He also noted that the new generation is expected to take leadership roles in community and economic development. Unless and until it begins to appreciate the importance of ICT and how it can empower them, the digital-divide will leave it back in the Stone Age era.

Literature search done in the developing countries revealed that ICTs can influence research through sharing of information and knowledge and the creation of new collaborations and partnerships for research. Kanyango (2005) has it that the North, comprising of developed countries of Europe and North America, has a highly developed ICT infrastructure that influences its agricultural research through the sharing of information and knowledge and the creation of new collaboration and partnerships. Success stories in developed countries demonstrate the importance of ICTs in Higher education and yet the Digital-Divide between the developed countries and less developed countries signal challenges which the later has to face such as costs, lack of resources and infrastructure being some of the major constraints.

Christie et al did a study on the impact of ICT on educational achievements. The study concluded that the adoption of ICT in education has been motivated by its evidenced positive impact on the education provision, quality and support. Christie et al. (2002) firmly contend that ICT is at the heart of life-long learning, learner-centered education, and off-campus course delivery and enhanced educational collaboration. This is actually connected with the fact that ICT forces changes in instructional process, enables easy access to a lot of E-resources, collaboration and activity of groups of learners, and provides the possibility for the teachers to offer individual support to their students (Uibu & Kikas ,2008) .

Other literature sources focused on the challenges on the utilisation and accessibility of ICT in Africa. Mpofu et al. (2013) noted that large areas in Africa are purely rural with limited or no access to computers and electricity. Additionally, African countries still lack basic ICT infrastructure in terms of telecommunication facilities. Teachers who are prime actors do acknowledge poor ICT skills in addition to low motivation and poor remuneration (Mpofu et al., 2013). Moreover ICT goals attainment is associated with cost expressed in terms of limited or even lack of funding of the programmes (Debande & Ottersten, 2004). Indeed, it is a fact that in most third world countries, many ICT initiatives come on board as projects with external source of funding that locals fail to own and sustain after the external funding has elapsed. Their study did not come up with comprehensive recommendations to improve ICT accessibility in rural areas and this gave the researcher the platform to explore the nature of ICTA use in a rural setting.

Another literature search review by Kozma (2005) suggests three significant concerns of consideration regarding ICTs impact on education. Firstly, students' outcomes such as higher scores in school subjects or the learning of entirely new skills needed for a developing economy. Secondly, they is a need to consider teachers and classroom outcomes such as development of teachers' technological skills and knowledge of new pedagogic approaches. Finally, one has to consider other outcomes such as increased innovativeness in schools and access of community members to adult education and literacy.

Literature search by Brynjolfsson and Saunders, (2010) has focused on the impact of ICT use in economy productivity. Research Suggested that this revolution had not yet had a significant impact on economy-wide productivity, except among the Asian tigers and perhaps a very few emerging economies. In order to have significant impact on growth, a country

needs to have a significant stock of ICT or users in place, and perhaps be more advanced in using that stock for economic transformation.

But even in the context of a number of middle income developing countries, studies from previous works have indicated significant ICT contribution to firm productivity. For example In Korea, a comprehensive ICT strategy has been a key driver in the quick rise of its economy from the financial turmoil; the ICT industry's contribution to economic growth rose from as low as 4.5% in 1990 to 50.5% in 2000 (www.mic.go.kr). Most current evidence on ICT contribution to growth comes from big countries such as India and China.

In Zimbabwe, a survey carried out by the strategic plan for the Ministry of Information and Communication Technology from 2010- 2014 with regards to education stated there is a need to have one computer per class by 2014. However looking at most Zimbabwean classes with an average of 40 pupils per class, this would translate to one computer for 40 pupils (Zimbabwe MICT strategic Plan 2010-2014:53). This ratio is clearly not workable. A similar trend is also evident in other developing countries like Zambia and Mozambique.

Therefore if the future generations in Zimbabwe stand to be relevant to the demands of the cyber world and if the challenges associated with the automated and highly technical society of today are to be surmountable then the education sector must guard against the threat of producing an irrelevant generation. Teachers are thus expected to convey this message to the students before they graduate from school (Cowan, 1989).

Ampofo et al. (2009) did a study on the ICT penetration and its impact on education in countries such as Rwanda, Kenya and Ghana. The findings on the research in the three

countries showed the existence of political awareness and will to make ICT a transformative and economic tool. The study reflected that practically on the ground, educational institutions and their stakeholders have already embraced ICT and their actions are portrayed in the progressive efforts to avail required basic ICT infrastructure and future roadmaps of the targets to hit. It was also noted that Rwanda is taking the lead in the achievements in ICT. It was also evident that the three countries were experiencing nearly identical challenges ranging from inadequate funding to put in place appropriate tools and infrastructure and low level of ownership and sustainability of ICT projects.

Literature search has also ventured in trying to investigate the relationship between ICT skills and its implementation in academic institutions. According to Hornby (2006) skills can be defined as the ability to do anything very excellent. Literature search has pointed that for meaningful ICT to be to be implimented in the curriculum teachers should be properly trained and equipped with adequate ICT tools and their application in the curriculum. A study in Tanzania carried out by Bates (1997) has also revealed that insufficient training of teachers is the main barrier to the application of ICT for educational purposes in academic institutions.

on the other note, Hawkins (2002) has come with another dimension on this note by arguing that academic institutions had offered teachers training in ICT but teachers themselves seems to lack confidence with technology whilst some seems to be intimidated and do feel comfortable with the traditional model of teaching and learning.

Other schools of thought have dwelt much on the role of administrative support for successful implementation of ICT in the education system. Under this study administrative support has been regarded as the contribution of administrators in providing adequate resources in

academic institutions for the integration of ICT. Their aid to computer use can also be inform of offering staff development and training of teachers in colleges for the application of ICT in the curriculum.

Sife et al. (2007) argued that the role of administrators is of paramount importance for successful integration of ICT in the education system. They further assert that the their role is essential in providing a conducive environment and conditions that favours the expansion of ICT use in the country such as issuing policies, regulations and resource of ICT. This argument can be supported by the fact that the implementation of ICT in Zimbabwe can be attributed greatly to the commitment of the government to expand the use of ICT through distribution of ICT resource across the nation and through policies on ICT use.

Davis (2000) asserts that increased availability of ICT is especially useful for students who suffer from learning disabilities since ICT use allows teachers to prepare suitable tasks for individual needs and each individual more effectively. However, authors like Cox (1999) believe that allowing certain students to use computers distracts them from focusing on the task at hand.

Central to the argument of availability of ICT facilities are the issues of whether or not the teachers and students have ample and convenient access to computers and their accessories. Furthermore, students and teachers are said that they should have confidence in that equipment, which is in turn dependant on tools' reliability or the extent to which the teachers and students are confident that they will have access to them at all expected times and utilise them predictably for the betterment of their school work.

The above noted sources all highlighted the importance of ICT in enhancing education. These sources became the basis of the research as it gave the researcher a platform to explore on other areas where ICT needs attention such as in rural areas. A very limited study had been carried out on the penetration of ICT on the marginalised societies in Zimbabwe. Most literature dwelt much on the implementation whilst others focused on its use in higher education. Thus there is a need to focus much attention on how these technologies can help to enhance rural education system to reduce technological divide and gap between the urban centres and rural areas.

CHAPTER ONE

THE EMERGENCE OF ICT REVOLUTION AND ITS IMPACT ON THE EDUCATION SECTOR IN ZIMBABWE

CHAPTER OVERVIEW

This chapter focuses on explaining certain conditions that made it possible for the embracement of ICT in the education system of Zimbabwe. Some major historical developments in the education system of Zimbabwe since the attainment of independence are to be exposed as they laid the foundation of the need to integrate ICT in the sector. The chapter also highlights the genesis and the spread of ICT and looking at the trends of its application on whether it had made a positive impact or not. The chapter also highlights developments in Africa and other regional initiatives in which Zimbabwe has participated in towards the implementation of ICT in education. The chapter then goes over the policies and efforts that have been put in place by the government of Zimbabwe in promoting ict use in education.

AN OVERVIEW OF THE EDUCATION SYSTEM OF ZIMBABWE FROM 1980

Before explaining the implementation of ICT in the education system it is worthwhile to trace the status of the education system of Zimbabwe since the time of independence and explain major developments that fuelled the need to integrate ICT into the education system. In this section major developments in the education sector will be discussed to have a general understanding of the emergence of ICT in Zimbabwe.

Before Zimbabwe attained its independence in 1980, the education system was racial and very discriminatory by nature. It was serving a parallel development which meant to reduce black Africans as unskilled labourers. This is the major reason why the colonial education system has been termed a bottle neck system. The majority of black people did not have equal access and opportunities to formal education as compared to the white minority. According to Isaacs (2007) the white settler regime made education for whites compulsory and spent as much as twenty times more than what they budgeted for the black child. This is the kind of colonial policies and legislations that the Zimbabwean government at independence inherited.

Since the attainment of independence Zimbabwe have made notable strides to redress some the colonial inequalities and repressive laws that deprived black people off their rights. In as far as education is concerned the government of Zimbabwe embarked on extending education access to the black majority by constructing schools, professional training of teachers and equitable distribution of resources. On this mission, efforts were also done to address issues of rural development under the policy "Growth with equity".

This resulted in the development of growth point centres in rural areas which were designed to foster rural development. Schools were constructed in rural areas and during the first decade since the attainment of independence primary education was made free and universal. The education system under the socialist path which was adopted since attainment of independence flourished and helped Zimbabwe to be recognised as number one country in Africa with high literacy rate.

However, despite notable achievements secured during the first decade after attaining independence, a chain of economic and political developments since the beginning of the 1990s reversed most of the gains achieved during the first decade of independence. One striking challenge to educational developments was the adoption of Structural Adjustments Programs (SAPs) that were adopted in the early 1990s.

This economic policy led to the underfunding of the education sector as it made conditionalities such as removal of government subsidies and policies towards privatisation of social services. Retrenchments also affected the education system and this resulted in massive brain drain as most experienced teachers flew to other countries to seek for greener pastures. Most rural schools faced serious shortages of qualified teachers and this led to further deterioration of the education system in Zimbabwe.

Furthermore, policies such as the Fast Track Land Reform Programme (FTLRP) adopted in the early 2000s worsened the education status as it had a negative effect to the economy of Zimbabwe. The land distribution program by the ruling party ZANU PF strained Zimbabwe's relations with the West.

This resulted in the much demonised economic sanctions that resulted in hyper inflation rate that caused serious economic meltdown. This has an adverse impact on the education system as most teachers were always on strikes since they claimed that they were being underpaid. School educational facilities were also deteriorating to an alarming scale. These were therefore some of the major calls to reform the education system of Zimbabwe.

Apart from the above, violence and intimidation has also contributed to the deterioration of the education system as it seriously disturbed peace and development in the country. Most of the elections since 2000 had been much characterised by violence, sabotage, intimidation and social insecurity. The political stalemate especially that of 2008 harmonised elections led to the mass exodus of professionals to the Diaspora and this led to the loss of human capital in the country. Moreover school fees were sky rocketing and the high costs of living during that period. To add more to that was the issue of HIV/AIDS and the cholera pandemics which also strained the country' finances.

However to remedy the situation in the education system, they have been a series of reforms that have been implimented. Notable amongst them all was the Nziramasanga commission which was assigned to craft lasting solutions to the challenges being faced in the education system. The country budget was being strained in sponsoring the purchase of books, development of educational facilities and the training and payments of teachers.

The commission therefore recommended on policies that can reduce government expenditure on education. Some of these measures include cost recovery mechanism such as the expansion of the public sector, introduction of tuition fees and also the increase in schools fees. These policies were in line with the World Bank economic policies. This adoption of neo- liberal policies marked the end of the socialist experiment into a capitalist state.

Other policies to boost the education system were the National Economic Recovery Program (NERP). This policy was crafted mainly to address current economic challenges facing the country by then. This policy was welcomed by relevant stakeholders of economic development such as the international community, donors and the private sector. However the policy did not live to its expectation as it failed to secure funds to generate foreign currency to undertake developmental schemes in the country. To emphasise its failure is the fact that the period from 2000 to 2008 the economy shrieked by approximately 40% in its gross domestic product.

Therefore the government came up with solutions to improve education for development and the role of Science and Technology was viewed as a panacea to foster a sustainable economic development in the country. Notable strides towards the use of science and technology were through the construction of the National University of Science and Technology (NUST) in 1990 in Bulawayo. The University comprised of faculties of Applied Science and Industrial Technology.

The University of Zimbabwe that was constructed during the period of the federation government in 1955 also had faculties of medicine, agriculture, veterinary science and medicine. The major objective of the implementation of science and technology policy in Zimbabwe was to promote sustainable industrial development focusing on import substitution, use of research and development to promote economically sound policies.

INITIATIVES PROMOTING THE USE OF ICT IN THE EDUCATION SYSTEM OF ZIMBABWE

The Zimbabwean government had done quite a remarkable effort to facilitate the use of ICT in Zimbabwe since attaining independence in 1980. Policies that have put forward to embrace ICT had helped to revolutionaries the education system of Zimbabwe and to elevate rural education. Most of these policies enabled the rural areas that were marginalised to development since the era of the settler regime to benefit and have access to ICT facilities.

The adoption of the National ICT policy by the government of Zimbabwe brought limelight to the widespread use of ICT in the country. Budget has been allocated on the development of ICT infrastructure and also efforts to implement it in all government ministries. In this policy they were schemes such as the connection of the country to the undersea optic fibres network through companies such as EASSY, WACS AND SEACOM. The role of the private and public sector has also been of paramount importance in increasing connectedness of the nation to the cyber world.

They are also a number of achievements that had been attained by the government to accelerate the growth of ICT use. Some of the notable strides includes: the liberalization of the telecommunications, the creation of regulatory authorities in the ICT department such as the post and telecommunications authority of Zimbabwe (POTRAZ), Broadcasting Authority of Zimbabwe as well as the Zimbabwe Media Commission. Zimbabwe government is also said to have reduced tariffs and duties on the importation of ICT equipment.

The computerization of all government ministries was also a positive step in expanding ICT use. The creation of the ministry responsible for ict has also accelerated policy making on the

expansion of ICT use in the country. Another effort by the government to promote ICT use was through the enactment of the criminal law amendment for the protection of power, water infrastructure and communications. The law is on Act number 1 of 2011 which was meant to solve the crisis of vandalism of infrastructure of power, communication and water.

The liberalization of the ICT sector resulted in the growth of internet service providers in the country. According to the National ICT Policy (2011) by August 2011 they were about nine internet service providers registered under POTRAZ with over fifty thousand internet users. On top of this they had been at least 45 private network license holders also registered under POTRAZ. These statistics only show the extent in which the government had moved forward in the expansion of ICT facilities in Zimbabwe.

For the integration of ICT in education to be on a sounder footing, the government of Zimbabwe introduced policy known as the College Information Technology Enhancement Programme (CITEP). The programme commenced on January 2003 to December 2008. According to Musarurwa (2006) the initiative involved 10 poly-technical colleges and three secondary teacher education colleges. Osborne and Hennessy (2003) have it that the integration of ICT as a learning tool enables teachers to expose students to creative ways of thinking. This initiative comes after observing that the use of ICT should begin by integrating it into the teacher's education.

The CITEP programme proved to be a fruitful adventure as it secured college readiness to comply with latest ICT developments and making ICT skills mandatory to teachers. However the main challenge of the programme implementation was that it was not open to all teaching institutions hence it left knowledge gaps within the teachers. Lack of adequate infrastructure

was also another challenge to fully implement the programme. However besides the setbacks the programme faced, its implementation had been a   leap forward in promoting ICT use in education curriculum.

They have been also efforts made by the Civil Societies (CSs) and Non-Governmental Organizations (NGOs) in Zimbabwe to promote the use of ict in Zimbabwe. Popular amongst them all is the World links Zimbabwe. World Links Zimbabwe is part of the international network of World Links organizations and has historically been a pioneer in the promotion of education through ICTs. The organization has been active in Zimbabwe since mid-1999 when 12 ICT centres were established with the support of the World Bank and in partnership with the Ministry of Education Sport and Culture.

Each of these pilot World Links centres were established near schools so that they could service both the schools and the community. In this sense World Links Zimbabwe pioneered the concept of school-based telecentres. World Links Zimbabwe was also known for its use of a bus, known as the Big Blue, installed with computers supplied by groups such as Computers for African Schools based in the UK. The bus moved to remote rural areas to encourage access to ICTs by these communities.

World Links Zimbabwe is now an independent registered trust and has established partnerships with a host of organisations and institutions including Computers for African Schools and School Net Africa, the latter for whose Campaign for 1 Million PCs it now leads and with whom, in partnership with the Open Society Initiative for Southern Africa, promoted access to open source software in schools as well as support for a local PC

refurbishment centre. It now has 43 telecentres throughout the country of which 35 have dial-up connectivity to the Internet.

Zimbabwe has to a significant extent made inroads in the implementation of the Millennium Development Goals adopted by Heads of State and Government at the fifty-fifth session of the United Nations General Assembly in September 2000. The Zimbabwe Millennium Development Goals (MDGs) Report 2005 launched by His Excellency President R G Mugabe in September, 2005 recognises the role of ICTs as tools that add value and contribute significantly to the achievement of the MDGs by 2015.

President' office also launched a campaign to provide most schools with computer related equipment. This resulted in most schools (including schools in the remote areas of the country) and universities benefitting and thus enable them to utilise ICTs in the teaching and learning process, although an audit still needs to be carried out to ascertain how far the equipment has been put to good use. However, the campaign is said to have created a mismatch in the provision of IT resources.

In a bid to improve the education standards in Africa, an initiative known as the New Partnership for Africa Development (NEPAD) designed an action plan to help Africa to reach the millennium development goals. According to the U.N (2001) more than a million in Africa do not have access to any kind of education and educational institutions fails to offer students the possibility of getting familiar with the new media such as the internet.

The NEPAD was thus designed to enable African graduates to be suitable and relevant to job markets and also to be comparative so as to stop brain drain and other related problems. Zimbabwe was part and parcel of this developmental initiative meant to foster sustainable

development in Africa. The policy crafted strategies to promote I.C.T innovations and binding guidelines in the education system. Its main agenda was that between 2006 and 2015 a well functioning education system with integrated I.C.T will be brought to effect especially in training teachers (NEPAD, 2001)

The 2001 SADC Heads of State and Government declaration in Blantyre, Malawi also recognized ICT as a fast, effective, reliable, efficient and easy way of communication and information exchange. The Heads of State and Government committed themselves and their respective countries to ensure improved living standards for their entire subject through prioritising areas of concern for bridging the technological divide in the SADC region. They further declared the following as priority areas of action: The regulatory environment for ICT; Infrastructure for ICT development; Community participation and governance in ICT development; ICT in business development; and Human resource capacity for ICT development.

The widespread use of I.C.T in Zimbabwe and other African countries can also be attributed to the efforts of the World Links Program. This program originated from the World Bank development initiatives to distribute internet-connected computers in secondary schools and train teachers in Africa, Latin America, the Middle East and the South and South East Asia. The vision and objective of the initiative was to improve educational outcomes, economic opportunities, and global understanding for youth using information technology and new approaches to learning.

Some of the services provided by the program include Internet connectivity for secondary schools in third world countries, School-to-school partnership as well as regional and global partnerships with public, private, and non-governmental organizations, Teacher professional

development on issues of technology in the context of innovative pedagogy, and Workshops for policy makers on coordination of policies and implementation strategies.

Thus With the help of the World Links program, many schools in Zimbabwe are now using ICTs as ways of providing teachers with new skills and introducing innovative pedagogies in the classroom. For example, Isaacs (2007) noted that teachers acquired familiarity with computers for tasks such as student marks, parents report and out-of-classroom tasks such as searching for educational content on the web and lesson-planning activities. The program also provided 200 hours of teacher training that include an introduction to ICT, use of the internet for teaching and learning, use of tale-collaborative learning projects, integration of ICTs into the curriculum and teaching, and innovative pedagogical approaches.

After recognizing the important role in which information and communication technologies (ICTs) play in facilitating the attainment of development goals and responding to the challenges of the Information age, the United Nations Economic Commission for Africa (UNECA) also launched the African Information Society Initiative (AISI) in May 1996 as a common vision, not only to reduce the digital divide between Africa and the rest of the world, but more importantly, to create effective digital opportunities to be developed by Africans and their partners and speed the continent's entry into the information and knowledge global economy. This initiative also helped Zimbabwe in the adoption of ICT for the development of the country.

Another important stride in the AISI was adopted by the Economic Commission for Africa (ECA) Conference of Ministers, in May 1996 and subsequently endorsed by the Organization of African Unity Heads of Summit meetings including the 1997 G-8 Summit. AISI activities among others include national and sectoral policy development and capacity building. This move accelerated the use and recognition of ICT in the education system in Zimbabwe.

Another important step towards the use of ICT in Zimbabwe came after the world summit on the information society (WSIS) was launched in 2003. The declaration was signed by dignitaries, heads of state and government in Geneva Switzerland to recommend the adoption and utilisation of ICT to meet the agreed Millennium Development Goals. The declaration put emphasis on the importance of education, knowledge, information and communication as vital for all human endeavour, progress and well-being.

The Government and other relevant stakeholders of the economic development were invited to, among other various things; provide enabling environments for the development and utilisation of ICT. The second phase of the World Summit on the Information Society (WSIS) held in Tunisia in 2005 reiterated Governments' unequivocal support for the Geneva Declaration of Principles and Plan of Action adopted at the first phase of the World Summit on the Information Society in Geneva in December 2003.

There have also been numerous organisations involved in supporting countries in Africa to prepare its teachers for the information age. Leading amongst them are UNESCO and the World Bank. While many of these are global organisations involved in all sectors of global

development, there are also programmes initiated specifically for the development of ICTs in African teacher education on the continent.

Many stakeholders are beginning to realise the potential of ICTs as the solution to the shortage of teachers in developing which would enable to realise the EFA goals as well as, in the long run, providing the most cost effective means of equipping the existing 60 million, mostly unqualified teachers, with skills to enable them to stay abreast of new developments.

In 2002 the Zimbabwean government adopted the Science and Technology policy which was a further milestone towards the embracement of the use of I.C.T in the education system. The main concern of the policy was to provide a comprehensive framework for the nation to develop and harness Science and Technology for sustainable development. The policy also sought to cater for a better coordination and direction in research and development (R&D) activities in the economy. However of paramount importance is the fact that the policy recognised the ICT sector as the key enabler of national development and accordingly directed that Zimbabwe develops a framework to guide its development and use. This alone was a major stride in embracing the use of ICT in the education system of Zimbabwe.

Amongst other key notable solutions to promote development in Zimbabwe was the ZIMASSET document of 2013. The ZIMASSET policy was an economic blueprint crafted by ZANU PF technocrats as part of their campaign in the March 2013 harmonised elections. However of paramount importance is the fact that the document recognised the role of I.C.T as a panacea to curb the developmental challenges haunting the country so as accelerate economic growth.

The ZIMASSET policy pushed for the rehabilitation of infrastructural assets and the recovery utility services in Zimbabwe with improved ICT infrastructure and enhanced access and utilisation of research and development. This policy, to some extent managed to challenge most institutes to embrace ICT use.

However critics have denounced the document as a high sounding nothing as the policy failed to meet most of targets to turn around the economy. Some had regarded it as a political tool meant to win support during the 2013 election by ZANU PF whilst some said it failed because it lacked funding. It is however not the intention of this study to review a plethora of reasons why the ZIMASSET failed. What is worth to mention is that it recognised the role of ICT as one of key drivers for a sustainable development.

Initiatives discussed above have altogether helped in sensitizing the whole nation on the need to utilise ict in the education sector and its potential benefits to the nation. All the attempts that have made have helped Zimbabwe to come up with comprehensive framework in improvising ICT policies and strategies to integrate ict in the education sector and all other sectors of the government.

These initiatives have also brought awareness to the public on the need to have ICT in schools and this has resulted in the major stakeholders participating in the expansion of ICT. The government had also made way on the use of ICT by seeing the role of the teacher as vital and playing a pivotal role in ICT implementation and integration of ICT in the education sector.

The government had also prioritized on developing pedagogical use of ICT by introducing ICT as mandatory in all academic institutions so as to improve teachers' skills and abilities to apply ICT in the curriculum. Well defined ICT goals have also provided the government with clear policies on the expansion of ICT infrastructure and this has resulted in heavy investment on ICT.

However it needs to be questioned whether these initiatives and their impact to the education sector has been much of rhetoric or a reality. It should be highlighted that most of these initiatives did not reach its intended targets and could not yield its designed outcome. Most of the challenge to these initiatives is the issue of sustainability of the programs. Of importance is the fact that these programmes greatly fascinates policy makers on their initial launch of the program but later could be sustained due to financial constrains and lack of clear policies in the maintenance of the ict facilities and regulations.

Therefore often these programs deteriorate soon as the project has been abandoned by the donors or the project facilitators. This has resulted in the failure of the expansion of ict in Zimbabwe. Another drawback to this program is that the country has been experiencing an economic meltdown since the beginning of the 21st century hence funding of the program has been constrained and limited. This retarded any positive development in the expansion of ICT. It is also a fact that ICT infrastructure is very expensive to purchase setup and this could not tally with the national budget.

A BRIEF HISTORY OF THE TECHNOLOGICAL REVOLUTION

The evolution of technology in education can be traced back from as early as 1700s. During that period the only teaching method that existed was the traditional model which was largely based on chalk and talk. This method gave teachers maximum control of the learning process and learners were completely dependent on the knowledge of the teacher. Even in this contemporary world many academic institutions are still holding on to the traditional model of teaching and learning despite all the technological innovations that have been witnessed from the past decades or so. The technological inventions that had taken course around the world were largely a product of the industrial revolution which was experienced in America and Europe centuries ago.

During the 1990s period in America, a lot of immigrants reshaped the structure of the American society. During this period they was a mass exodus of peasants and farmers from rural areas to cities and urban centres seeking for better opportunities offered in the cities. This marked the beginning of the rapid rise of urbanisation and industrialisation in America.

The economic structure in America was transformed as there was a great need for innovations to suit the demands of industrialisation. From this period onwards a lot of technological innovations have been made and have impacted positively on the economy and in the education sectors around the globe. During the industrial revolution, cities were heavily populated with people of mixed races and social cultures. The pressure in the urban centres led to the rise of new technological inventions.

A number of technological inventions were witnessed around 1940s and 1950s. During that time, a vacuum tube-based computer was invented. After the invention of computers during this period, they followed the introduction of vocational training and education in computers but however this was of little significance as most schools remained stuck to the old traditional models of teaching and learning. This was because technology had not yet penetrated the whole American society and it was still expensive to introduce it in all academic institutions. They were also a lack of proper infrastructure to accommodate those machines to be used across the curriculum. The decade from 1960 also witnessed advancement in the invention of computer technology. During that period, a number of computer languages were introduced to enabled computer programmers to punch in certain codes that were essential for the operation of computers.

Amongst computer languages that were created during that time, the most commonly used one was the COBOL which was the initial language to be used by programmers. Another positive stride towards the development of technology in America was the enactment of the Elementary and Secondary education Act in 1965. This law regulated the use of computers in schools across the curriculum. On top of that in the late 1960s the National Science foundation (NSF) promoted the spread of computer use in American schools by initiating a program known as National Computing Networks. According to Molner (1997) by the end of 1974 more than 2, 000, 000 learners across America were able to access computers.

Another turning point in the history and development of technology was the adventure of Neil Armstrong to the moon in 1969. This event marked a new era in technological inventions in the world as it inspired many people to be very creative and innovative to make the world a better place. The aftermath of the event witnessed rapid invention of more

sophisticated technologies and digitalisation which was very essential to many education institutions. Immediately after Armstrong's miraculous landing on the moon, was followed by the invention of mini-computers and mainframe computers and begun to be used in schools though they were still limited to administrative purposes. Creation of personal computers also followed the race and also spread across most academic institutions.

These technological innovations led educators around the globe to realise vast opportunities and prospects for the integration of ICT in education. Thus policies and programs were introduced aimed at increasing teacher ICT competence as well as to the children access to new technology. During the 1990s schools had begun to offer education and academic information online through the use of the internet. Introduction of devices such as the 3-d system, virtual reality and digital videos ushered a new era in the education systems across the globe.

ICT DEVELOPMENTS IN THE 21ST CENTURY

The forces of globalisation and the ICT revolution have altogether raised the need for transforming the nature of education. Starting from the mid of the 20th century and the beginning of the 21st century witnessed a plethora of technological breakthroughs that have changed the whole communication and dissemination of information around the world. ICT has become an easy tool to facilitate easy means of communicating and a new medium whereby people could interact, create and express. This section shall discuss a host of technological innovations that have transformed the education systems especially to developed countries which have greater access to those ict resources.

The use of mobile technologies had risen to prominence in most schools in the developed world. Mobile technology comprises of such gadgets like tablets and laptops and mobile phones. A lot of studies had investigated the effectiveness of such devices in the learning process. Their conclusion was that these mobile technologies had a positive impact if they are used effectively for academic purposes.

Though some studies have highlighted the negative impact which the mobile technology pose to education, its benefits outweighs its weaknesses. Most teachers have found the use laptops for academic purposes an effective teaching aid tool. Most studies have also highlighted the effectiveness of ICT in administrative issues. Laptops can help on time management, data capturing and storing of official records.

Prensky (2004) has emphasised that younger generation is so moved and motivated with the advent of this technology and teachers should capitalise on these innovations for educational experiences. It facilitates wide range of research, helps pupils to take control of their studies and improves their communication skills. Studies also reflected that most pupils are gaining access to online academic materials that are helping them in their performances.

The availability of mobile technology is also said to have helped to solve the issue of the technological divide between those who have access to it at home and those who do not have. Some pupils who have difficulties in using the laptops and desktop computers have found tablets to be more user-friendly. In the literature search it has been noted that most pupils were having challenges in moving mouse cursers whilst some had poor keyboarding techniques.

Tablets offer simple modification of text and helps pupils with impaired vision and hearing. Tablets also assisted pupils to convert handwritten text into typed text, to draw diagrams, sketches and share it with others. This innovativeness greatly motivates pupils in the learning process and hence technology has a positive impact on education.

Tablets also had striking benefits to the teachers. They enable them to move around the class and delivering their lesson rather than standing in front of the pupils with a laptop. In a nutshell of his study, Prensky (2004) concluded that new mobile technology innovations facilitates the wide range of learning material and innovative ways to manipulate the learning process.

Another innovative ICT product is the E-Learning facility. The e-learning technology had emerged to solve the old problems of distance barrier to access to education. E-learning technology helps pupils to enjoy learning whilst they are at their homes and learning materials and activities will be accessed on the internet.

Blogs or classroom web logs are also becoming increasingly popular with teachers and teacher education. Many experts predict that blogs will eventually become more successful teaching tools than web sites. A blog is also a web page made up of generally short, frequently updated posts that are arranged sequentially and chronologically-like a "what's latest" page of a journal. The contents and the purposes of blogs vary greatly from links and commentary about other web sites to news about a company, person, idea, photos, poetry, mini-essays, project updates, even fictions.

A crucial blog function is to link to other web sites and other blogs online. Most blogs that are used are very personal. Others are however collaborative efforts based on a specific topics or an area of mutual interest. The use of blogs in instructional settings is limited only by one's imagination. There are many ways teachers can use blogs, some of them include content-related blog, networking and personal knowledge sharing, instructional tips for learners, course announcements and readings, annotated links etc., most importantly for the purpose of knowledge management.

Learners can also take part in blogs by reflective writing, assignment submission, collaborative work, e-portfolios and sharing course-related resources. For teachers, blogs are attractive because it needs little efforts to maintain, unlike more elaborate classroom web sites. Teachers can build a blog or start a new topic in an existing blog by simply typing text

into a box and clicking a button. Such ease of use is the primary reason to predict that blogs are more successful teaching tools than web sites.

The technological innovations had also resulted in the widespread use of Interactive Whiteboards (IWBs) in many developed nations and other elite schools in the developing world. A plethora of literature had made a lot of investigation on the impact of these IWBs in the teaching and learning process. Higgins (2005) in his study posits that the use of IWBs assists teachers to improve the depth and quality of their lesson presentations as it gives them room to be very elaborate through the use of visual aid.

He further states that IWBs help learners to be active during lessons as it facilitates interactive learning. IWBs has also helped to motivate pupils' interest in the lessons and promoted collaborative or group work of learners which is very in the learning process. IWBs allow teachers to cover a lot of learning material within a short space of time and reduce his or her workload.

The use of electronic mail has also gone viral in the teaching realm. E-mails are said to have become indispensable in enabling teachers to students' communication and had also helped in the management and administration of education. According to OHIOU (2010) Emails reduces the costs of physical meeting or face to face interaction with parties involved.

This media liberates both teachers and students to communicate with each other at a distance and share academic resources without any physical contact. Email can also be used by

teachers and students to share academic documents at a faster pace and without delay and an involvement of paper work. This helps in reducing time spent in face to face learning and gives the teacher and students more time to concentrate on planning nd management of their work.

The use of digital video systems and technology is now popular in schools in the developed world. Traditionally videos had been used as a source of media in analogue ways in form of video cassettes recording (VCR) and televisions. However technological innovations had moved several steps ahead and now videos can be accessed in digital forms through CD-ROM, via the internet and on satellite.

These multimedia resources had boosted interactive learning in schools. Some schools of thoughts have suggested that the use of video conferencing in classrooms helps to bring the outside world into the learning environment and make the learning process much of a reality than a myth to them. It also provides visual illustrations and presentations of concepts and ideas. It brings real life situations into the classroom and helps students to construct meanings of those visuals. They are also the use of videos for delivering lessons and lectures which can benefit both the teacher and the learner as there is no need for physical presence. By the use of videos, students can record a lesson or lecture and use it later whenever they feel like.

The use of World Wide Web (WWW) has also become rampant in schools in the developed world. According to Peters (2010) World Wide Web refers to a body of software package that enables user of the internet to browse for, access, and download and up load information.

These www works with internet browsers such as Mozilla Firefox, opera, internet explorer, safari and Netscape amongst others. These web browsers make the accessibility of digitalised graphics and photographs to limitless number of users.

Most scholars have concurred that WWW is one of the most used technological facility in the learning and teaching faculties. Literature has also confirmed its application varies according to the disciplines in which it is used. Most researches have noted that www is most often used delivering learning material in electronic form whilst other re said to design the whole learning course online.

Other learning devices that are also being used for academic purposes are electronic book readers (e-books). This device is gaining much ground in most educational institutes as it has provided many advantages to the users over other ICT tools. E-books are small and portable electronic gadgets with a screen that displays digital documents.

When using E-Books one can connect it to a personal computer and access information. Others contain a data modem or a wireless card that could help the user in downloading and browse for the desired learning content from the internet. Some examples of eBook readers include soft books, pocket pc, rocket e-Books and PDAs. These gadgets have functions such as word processors, spreadsheets, access to the internet and can also play mp3 music. These devices had gained much prominence in schools because of their portability and ease of access.

In order to assist children with impaired listening and other physical abilities can be assisted through the use of voice recognition technology. These devices are often used by teachers who have pupils with listening disabilities. By using a voice recognition device, users speak through a microphone and their words instantly appear on a computer screen. This could help pupils with disabilities to catch up with other pupils.

Computer games have also been developed by software developers for academic purposes. Literature has find out that they are a lot of features and components in computer games that pupils finds useful in academic application such as improved memory, quick problem solving, visualization and logic. The advantage of these computer games are that they motivates the pupils to learn more about certain components of the learning materials while being provided with entertainment.

These games are also interactive and they help pupils to work as a team in problem solving. Some games challenges pupils to be good in calculating hence helping them to become good in mathematics. Some games deals with words and vocabulary and helps pupils with language proficiency.

Presentation tools are also becoming popular in schools for teaching and learning purposes. In these presentation tools, PowerPoint is the most widely used software package for data presentation. This software had been so powerful to replace outdated colour slides and overhead projectors. According to most scholars noted that in design the PowerPoint program was designed to serve business purposes but was quickly adopted in the education system as they find it very conducive media for teaching and learning.

CHAPTER TWO

THE IMPACT OF ICT REVOLUTION RURAL EDUCATION ON WARD 25 SCHOOLS IN MUDZI DISTRICT.

INTRODUCTION

This chapter pays more attention to the embracement of ict revolution in Mudzi district in ward 25. The section begins by looking at the situation in schools under study before the advent and embracement of the ict revolution. The chapter then goes to explore how ICT was embraced and its impact on teaching and learning purposes. The chapter will look on individual impacts on the pupils, teachers, the administration and the community. Challenges facing schools in the utilisation of ict will also be explored.

SITUATION IN WARD 9 SCHOOLS IN MUDZI DISTRICT BEFORE I.C.T EMBRACEMENT.

Unlike most urban centres, rural areas received lately the privilege of having ICT facilities and access. This phenomenon was not known to Mudzi district until the accelerated rural development policies were initiated by the government. They were a lot of factors that militated against the use of ICT in Mudzi district such as the lack of proper infrastructure to house computers and other related accessories. For instance according to Parker (2010) the learning environment in most schools was deplorable with the structures in dilapidated state.

Worse still to emphasize the serious shortage of infrastructure is the fact that most pupils learnt under tress due to shortages of classrooms. This trend is still common even up to day especially in schools such as Kondo secondary School. These harsh conditions also exposed

pupils to learn under extreme weather which at times disturbed lessons. This issue also explains why Mudzi district had lately produced poor academic results.

ICT use was also affected by the deployment of unqualified teachers in the district. This case was common since most qualified teachers opted to go for urban and peri urban centres. This left the government with no other alternative but to deploy even temporary teachers with only five o levels or better. These teachers were not acquainted to any form of computer literacy hence this militated against the use of ICT. Limited teaching aids and sources of material for teachers to effectively discharge their duties is another challenge confronting the rural teachers in Zimbabwe.

This is exercabated by the fact that most parent cannot afford to pay school fees hence school development moves on a very slow pace. For example there will be need to improve teachers welfare and accommodation, increase learning facilities and worse still electricity is a scarce commodity. In some areas they do not even have access to boards and chalks making teaching an oral process devoid of illustrations.

Thus to remedy the situation, the government of Zimbabwe reacted by embarking on a massive introduction of computer education in schools. This program included the distribution of state of art computers as well as training of teachers on computers. With His Excellence spearheading the initiative, at least 5000 computers had been distributed countrywide. However on this note most critics denounced the computer pupil ratio which is very low and has limited the success of the initiative.

ICT PROVISION AND ACCESS IN MUDZI DISTRICT SCHOOLS

A yardstick to measure the extent to which schools had embraced ICT and took advantage to ICT in learning and teaching processes lies on factors relating to infrastructure. The availability of infrastructure means access to information and communication technology. This infrastructure includes ICT resources, security, internet connectivity, teacher's confidence and capability, school policy and management of the system. On this note Shapiro (2012) notes that in one way or the other these aspects influences on the way in which ICT becomes part of the learning and teaching processes and has on impact on experiences of pupils, teachers and schools.

On access to the computers, the research noted that most pupils who were not taking computers as their practical subject were not allowed to access computers as they like. The rational of this argument lies on the issue that these schools don't have a number of qualified computer teachers hence no one could monitor pupils who would want to access computers during their spare time.

Another factor militating against pupils' access to computers in Mudzi district was the limited numbers of computers in a school. The computer–pupil ratio was said to be 1computer per five pupils. This meant that only a few numbers would have access to computers at any given time. Hence to measure the impact of ict use in this area under study one would say the computer use is very limited hence its impact is still to a lesser extent.

On teachers' access to computers the study reviewed all staff members had full access to computers and in some instance there were some computers that were designated for staff

members only. Respondents claimed that most computer use by the teachers was to prepare notes, handouts, to set an examination paper and as well to surf on the internet. Therefore in this study it is hoped that most teachers would use computers so as to enhance their teaching deliveries in the classrooms and to improve the effectiveness of their lessons.

However, on a sad note the study reviewed that the use of ICT for teaching and learning processes by the teachers is still very low. It was noted that most teachers are still heavily reliant on traditional modes of delivery with the use of chalk and talk. Some factors noted on the poor ICT use by teachers were lack of ICT competence, lack of confidence in adapting to new technologies and unwillingness by some teachers to engage with ICT.

On the issue of access to computers, the researcher noted that there was poor maintenance and replacement of damaged computers. For instance almost half of the computers at Kotwa high were only lying idle gathering dust and occupying space. The other issue is that most pupils engaged in malicious acts of misconducts as they used computers and the internet to watch pornographic materials, downloading videos and music. One student interviewed was once quoted saying, "we use the computers to burn music of our own choice because it is expensive to purchase an original disk in the street." Computer assistant at Dendera high school also said that most pupils will be very busy chatting through social media such as face book, twitter and YouTube.

However to monitor progress and proper use of ict facilities they has been put in place mechanism such as blocking all hazardous websites and filtering so as to check against

improper use of the internet. The computer assistance also walks around during computer sessions to check on proper use of computers. This has thus created a positive attitude towards the benefits of ICT.

THE IMPACT OF ICT TO TEACHING

Ict has of lately been used by teachers to improve the teaching and learning processes. One sufficient way in which ict has been used by teachers has been its ability to reduce workloads as well as reducing time spent on planning and preparing lessons and schemes of work. They are quite a number of computer applications that teachers were making use of to improve the quality of their lessons. Respondents pointed out the use of word processing templates that makes it easy and quick to draft lessons and schemes of work.

Other teachers also highlighted the use of the web based assignments which they say have a positive impact in reducing time spent on working and setting questions. Some teachers highlighted that ICT is being utilised in recording marks of students on spreadsheets as well as producing reports and setting attainment targets an easier task. On resource mobilisation, the internet has also been of paramount importance as it has been used to gather appropriate materials such as e-books, e-journals and other learning materials from curriculum specific websites.

Thus response from all schools highlighted that they were using ict for documentation, research and also to calculate student marks. Some innovative teachers are even using computers as a source of media. For example, one commercial teacher said that he downloads

material relevant to topics in the syllabus and moves around showing students pictures relevant to certain topics. This method is vital as it gives students some insight on the topic since some have never experienced some aspects.

Teachers in ward 25 of Mudzi district also highlighted that they were assisting their schools by using their own personal computers (laptops) and smart phones for academic purposes. This was facilitated by the fact that they had wifi access at the school. However some teachers said that they used ict for their own professional development such as researching for assignments for their post graduate degrees, masters' degrees from various institutes across the country. Some teachers also pointed that they only used the internet for accessing emails and for social media.

To those teachers who said they used laptops as teaching aid found laptops to be an excellent source of learning media and said that it boosted children confidence and interest in the subject. A research by Becta (2005) indicated that teachers apreciated the idea of having their own personal computers but they also needs personal access at school. They testified that most ppils were very excited and highly motivated when learning through laptops. Others pointed out that they were using their own smart phones and tablets for educational purposes.

Prensky (2004) noted that school pupils find mobile technologies extremely appealing and motivational to them and teachers should make use of them to enhance learning and ways of integrating them into their teaching disciplines. Isaacs (2010) also noted that if used innovatively, these mobile phones have the potential to transform traditional and conservative means of learning into more modern one.

Another benefit of ICT to the pupils or learners is its capacity to foster what can be termed as autonomous learning. This is a process when students had greater access to the computers and the internet and they can learn with little guide from the teacher. On this note Forsyth (1996) noted the use of ict in the classroom transforms the traditional role of the teacher and enables the students to exert more influence on their studies.

He further asserts that this practice makes the students capable of directing their own studies whilst the teacher only acts as a monitor rather than a director. For example some students were able to search materials for presentations for their seminars without much guide from their teachers and were also able to use projectors for their presentations. Thus ICT can help student to be initiative on their study and this requires minimal teacher management.

Another area of concern in the study was whether computers were being used across the curriculum. Respondents pointed out that computer were not being fully utilised in all subject areas. They pointed out that computers should fully integrate in all subjects across the curriculum than jus to act as reference or instructional tool on single subject area. Other respondents even noted that at some schools computers are only used for computer studies only. Some teachers also suggested that maximum utilisation of computer applications could be very useful to subjects like geography, art, physics, maths, biology and other subjects.

Ict use in schools has also impacted positively in the teaching and learning process. Research has noted that the application of ict has helped to motivate students in their learning

endeavours. The word motivation is derived from a Latin word "movere", meaning to move. In this respect, the word motivation is used in this study as the inner experience that excites learners to partake or engage on doing something. Elliot (2000) further states that excitement pushes us to the direction and keeps us doing something. Woolfolk (2002) argues that what motivates students are not the learning activities themselves, but what they will gain or benefit after engaging in an activity such as high marks, awards, recognition. In the study that was carried out respondents highlighted that ict did motivate students.

Ict reinforced their commitment to the studies, increased excitement and boost their self esteem when learning. Students explained that what excited them the most was the new media and learning aid that proved to be interactive. Students were excited to learn new things through ict and they acknowledged that this differs from the traditional model of teaching in which learners will be looking at the teacher with nothing of interesting.

The study also revealed that some students who did not want to participate or who were not excited with learning can thus be encouraged through the use of ICT. Pachler (1999) noted that ICT is very flexible to meet learners' abilities and needs and it also offers information in a new way that allows learners to understand certain concepts. Other learners testifies that when using ict most difficulty concepts are made and expressed easier through ict since it makes them visible in the real sense.

TRANSFORMATIONS BROUGHT BY ICT IN SCHOOLS

The integration of ICT for pedagogical practices have revolutionarised the whole teaching and learning process. The prime focus of the integration is to foster improved learning, extend individual enquiry and exploration, to motivate the learners and to create a learner centered environment. The transformation that have been brought by the advent of ICT in education had marked a paradigm shift from the traditional model of teaching and learning into a more independent, autonomous, collaborative, initiative and creative inquiry.

Before the use of ICT teachers were mere producers of knowledge, controllers of learning, deductive as ell expository. However with the use of ICT their role has changed to become more flexible, interactive, facilitator of learning and creating space for experiments. The learners are also becoming active learners, producers of knowledge, learning to create, think and communicate.

Teachers are now able to form new ways of promoting open learning environment which are collaborative, interactive, multimedia based learning and experiments. This differs from the traditional model which was rigid. According to the major impact of ICT is that it transforms the dissemination and ownership of resources in the academic realm and changes relationships between educational participants.

Table 1: Transformations on the role of teachers

Before the introduction of ICT	After the introduction of ICT
Reproducers of knowledge	Facilitator of knowledge
Controlling learning process	Creator of learning environment

Learning to use ict	Using ict to enhance learning
Always the expert	Co-learner and collaborator
Deductive/expository	Interactive/ experimental

Another striking feature ict impact to the teacher is that it is fast to deliver a lesson or learning material. Using chalks, boards and talks takes a lot of time for the teacher to effectively deliver the learning material he or she had designed but ICT facilitates interactive learning which makes learning more easier and fast. The use of powered point presentations can be at times detrimental slow learners if they are used to quicken the presentation of learning material.

PEDAGOGICAL PRACTICES OF ICT BY THE TEACHER

The study identified some teachers who were using ICT for teaching and learning purposes. Scholars have on this note argued that teachers might possess good computer skills but what's more important is applying knowledge in their pedagogical practices. This has also been identified as the major step towards the full integration of ict in the education curriculum.

Teachers admitted that they were using ICT equipment such as projectors, printing and photocopying machines to aid them in delivering their lessons. Some teachers highlighted that they used the computer to show diagrams, pictures or even play videos for deeper understanding of the concept. One teacher at Dendera high highlighted that he used to play a disk containing the life of Jesus as a teaching aid to bible studies subject.

Most teachers alluded to the use of multimedia for learning and teaching processes as it is highly interactive, interesting and motivates students for further explorations. This had helped students to become active learners. The use power point presentations had been also frequent and teachers said that it helps the teacher in explaining notes than to spend a lot of time and waste energy writing notes on the board. Power point presentations had also been used during seminars by the learners.

ICT has also proved to be useful as it has enabled teachers to control the pace of learners in the classroom. This issue has been one of the major weaknesses of the traditional model of learning. Teachers were failing to satisfy different type of learners as some were fast, medium and slow learners. Classroom lesson delivery has thus resulted in disadvantaging other groups such as those with fast learning abilities to be forced to move slowly with the pace of slow learners. However the use of ICT has provided teachers with innovativeness of how to cope up with the pace of all learners. Some students may be provided additional materials through multimedia or receive printed handout for further studies.

ICT KNOWLEDGE AND SKILLS RELEVANT TO THE SECONDARY SCHOOL TEACHER

Research has found that males, younger teachers, teachers with less teaching experience and secondary school teachers are more likely to have higher levels of ICT competence (Jegede & Adelodun, 2003). According to Jegede (2009) computer aided instruction happens to be one of the most required skills for a classroom practitioner but is the least possessed by teachers. This is because it is hardly been part of the training content. Besides, there is a need,

according to Mwamiki et al. (2005) to move from "Learning to use ICT" to "Using ICT to learn."

Other ICT packages required of a teacher are Word processing and Data processing. These are used to organise and analyse students' tests and results and have proved to be very beneficial to teachers since they can be used to create lesson plans and other forms of documents (ICT Education, 2006). According to Jegede (2006) and Jegede and Adelodun (2003) teachers that use computers and ICT in teaching must have observed their teachers using computers. The most critical factor in the successful integration of ICT into education is the extent to which teacher educators are able to prepare teachers with the required knowledge and skills to utilize ICT effectively (ICT in Education, 2006).

CHANGES IN THE LEARNER'S ROLE

The use of ICT has also impacted positively to pupils who are using it. Long before the use of ICT learners were solely dependent on the knowledge of the teacher and learning was quite affixed activity at school. With the growth of ict not only at schools but even at through the use mobile networks, learning had become so flexible. Material in the syllabus can now be accessed at real time and at a place. Therefore the access of learning materials is becoming more and more flexible through the use of network and other multimedia tools.

The use of ICT in schools by the learners has also transformed them from being passive learners to active learners. In passive learning we refer to over reliance to the teacher and the syllabus. No initiative was taken enhance individual learning of the student. However through the use of ICT learners have been transformed to active learners. In active learning students

are now able to search for relevant learning material through the web and initiate their own learning and only making the teacher a facilitator of the learning process. Below is a table of how the role of the learner has been transformed:

TABLE 2 : TRANSFORMATION TO THE LEARNERS

BEFORE THE USE OF ICT	AFTER THE USE OF ICT
Reproducer of knowledge	Producer of knowledge
Dependant learner	Independent/ autonomous learner
Passive learner	Active learner
Solitary learner	Interactive/ collaborative learner
Absolute learning content	Creative learning, thinking and communicating.

A number of literature has confirmed that the application of ict in classroom and across the curriculum have greatly motivated learners on their school work. ICT is a new phenomenon hence it makes learner more eager to explore what it might offer to their learning system. Most students interviewed showed that they were not satisfied with the traditional learning process usually with the aid of chalk and board. They said it made learning a straining activity and at times boring.

The introduction of computers gives students motivation as they would take control of the learning process and initiate the process. Robertson et al. (1995) also highlighted that most students who are not interested and motivated to their school work can be encouraged through the use of ICT. The advantage of using ICT is that it is more flexible to meet individual needs and abilities. Most teachers pointed out that ICT presents information in a

new way that can assist learners to understand the learning material. Most students also highlighted that ict could be useful to them since it can since it can provide visible and tangible learning information and data than the traditional method in which they will be over reliant on the teacher's knowledge.

Other respondents highlighted that ICT's ability to simulate data or learning materials helps to stimulate and activate and encourage broad thinking to the learners. Some have admitted that learning within the ict atmosphere makes the learning process an exciting and amusing activity during lessons. Some respondents also said that ICT boosts students' self esteem. This point can be supported by that most students during lessons will be very passive even to participate in t during the lesson. But when ICT is introduced students would become more alive as they will be motivated to learn through ict. Some students said that they just enjoy using computers and lessons are actually very straining.

In other schools the impact of ICT in motivating learners has not been of that significance as they are a low use of computers. It has been noted that in the schools most students could not use computers or any other ICT tools. Thus for there to be effective use of ict by students, they should first be educated on how to use them. This task also seems to be a mammoth task as learning ICT itself is a subject in itself.

The issue of language barrier militates against the use of computers by students in the district. Students who were acquainted to the computers were those students who were privileged than others at their homers. Some of them were relatives of teachers, or their parents were formally employed or they come from well up families. However the number of those students who could use ict is so low that we can conclude that the use of ICT by the students

in rural schools is very low and they is need for a real plan to make learners proficient users of ICT.

The study was also concerned in finding out the level of learners' ability and proficiency to ICT. To schools such as Dendera high school which is boarding school, most students acknowledged their acquaintance with most computer programmes and technology. One interviewee said that:

"Using computers and new digital technology is not a problem for most pupils; the challenge is however on selecting relevant materials best for learning purposes."

Some highlighted that they have computer desktops and laptops at home which they use for various tasks and this helps them to gain skills in operating them. More so some highlighted that they were using mobile cellophanes and tablets at home which also helped them to improve their ICT proficiency. Robertson (2006) argued that the levels of students' ICT competence depends on how much access to technology they have at home and if they have that access, Howfar do they use it for academic purposes and not for gaming and internet surfing. Some students however admitted that they often use computers especially at home to play games, watch movies and playing music.

Other students at Kotwa and kondo Secondary schools pointed out they have little access to ICT at homes and that explains their poor ict proficiency. The use of a computer for them is such a mystery experience. Some admitted that the least they could do with computers are general tasks such as transferring files, playing media and for typing purposes. This shows that ICT is of little significance especially to pupils who don't have experience with computers at their homes. This makes them heavily dependent on the teachers' delivery and knowledge.

ICT AND PUPILS PERFOMANCE

The impact of ICT in enhancing education in this research centres on improving students skills, opportunities and academic performance. Before the introduction of ICT in the district learning seemed to be a straining activity as the process was mostly manual and cumbersome. Students didn't have access to the internet, computers and other ict facilities. The advent of ICT revolutionarised the whole learning process and improved students ICT skills and performance.

Students commented that they enjoyed the freedom to explore the Internet and to dig deeper in their schoolwork. They discussed the immediacy of the information as well as the endless possibilities of finding additional information at the click of a button. One student said, "The Internet was right there, and it made it easier for social studies because you don't have to look through books. You just type the words on it and it made work much easier." Another student reported that the laptops made exploring information easy:

"Well, sometimes it was easier having the computers and the internet for your assignments. It was easy to look things up….I liked to be able to search stuff on my own."

The study also revealed that the use of the internet and the computer boosted confidence within pupils to share information and work as groups. They viewed the use of computers and the internet for homework and other school assignments as a weapon that encourages them to work hard and initiate their own studies for share personal thoughts more easily, more so than if they were physically in the classroom. One student spoke about her increased confidence to make comments in front of her peers and her teacher:

"I don't usually like to ask for help. I don't know why, but I don't do that because I get shy. I think using the laptops was better because I could do that. I asked way more questions and made way more comments when I was on the computer."

Another student also made similar remarks like the above: "when online, I could ask a lot of questions and get immediate responses than I can when asking teachers."

The study also viewed pupils' access to the computers and other ict tools as a vital step to measure the impact of ICT to the performance. The study, through interviewees and questionnaires investigated the levels of ICT access amongst school students both at school and at home. It was discovered that most pupils especially from kondo secondary school they were few pupils who had access to ICT at homes.

Some students from Dendera high school and Kotwa high school did admit that they have access to computers at home. However a large number of them did admit that they rarely use them for academic purposes. At school too students highlighted that their access to computers are very limited due to a complex of factors. Some noted that timetables at their schools are so tight that they are little space for computers. Students highlighted that they only access computers during their free periods.

This makes it two periods a week in which they have sixty minutes of using a computer. Moreover to add on to that looking at a student computer ration in which in this case ranges to about 50 to 70 students per computer. This issue limits pupils from accessing computers

and the internet since most of the time computer room would only accommodate at least 30 to 40 pupils per period. This lessons the use of ict by the pupils in schools.

ICT AND EDUCATIONAL MANAGEMENT

The research went further to probe on whether ICT for educational management has been of greater significant in bringing the quality of education and the running of school. This issue of management is key to the success of pupils and the attainment of better results. The study noted various uses of ICT by the school administration which runs from: keeping financial records and storing administrative documents such as staff records, typing official documents such as minutes and circulars, typing school examinations, school schedules, timetables, duty roasters, enrolment records, and keeping school records.

Some school heads however noted that challenges were on the shortage of computers which made it hard for the schools to properly use ICT for school management. To curb these challenge some school heads opted to assign a secretary who was to be responsible for typing all official documents. The heads emphasised that most school do not have adequate funds to purchase enough computers for the whole schools. However they acknowledged efforts from the donors, well wishers and the school development associations on their relentless effort to rectify the issue. One head was quoted saying, "we thank donors and well wishers for their support in the computer programs. If they did not assist us we could have been behind technology by far."

Amongst schools under study many school heads admitted that they were experiencing some advantages of ICT in the running of the school such effective processing of official documents, storage of information, it motivated teachers, improved decision making

processes and the scheduling of school activities. This also confirmed the study of Heek (1998) on the same subject. Most school heads acknowledged that ICT also brought forward fast communication between the school and the district education officers. They said it reduced costs of transport.

However most challenges were found in the sourcing of funds to purchase new computers and accessories to replace mal functioning machines. On top of that some problems like slow internet connectivity, load shedding of electricity and slow payment of school fees by parents which was also as low as thirty us dollar which was not adequate enough to source funds to increase computers.

The advent of ICT revolution in schools has resulted in effective school management systems. That had benefited to the educational outcomes and school development. The main use of ICT at most schools under study had been largely to manage the running of school activities and its connectivity and its connection to the outside.

Internally, the networking of resources through the internet and computers offered potential benefits of facilitating easier and fast communication within several school departments. Communication had largely been inter departmental or from the school administration to individual staff members or departments.

ICT has also been used to keep central records of administration such as number of teachers, subjects taught at schools, pass rates, school colanders, workloads of every teacher and the

monitoring of activities and assessment of teachers. Schools had also been able to improvise on the use of social media such as face book and whatsup to discuss pressing issues and to use it as a 'notice board". It was also noted that most schools have developed a central record system in the administration. Most schools heads have admitted that the use of central record keeping reduces costs it is a very effective way of managing information.

Heads stressed that they printed the records that they had entered into the computers to hardcopies and put them in files for easy access. And protection of information in case computers crash or develops a technical fault. Granville (2009) observed that teachers had confidence with ICT connectivity which they said offered better means of storing confidential material, enhanced efficient communication means and fostered collaborative work. It also connected the school with the outside world for instance communication with district education offices o and authorities of the public services.

Other school administrators noted that the use of ICT enhanced the procurement services at schools and made the use of school finances more efficient. They highlighted that they used ict to make quotations for items that the school wanted to purchase through the internet and presented it to the School Development Committee (SDC). This strengthened the financial department of the schools and also the keeping of school financial records.

Moreover, in the school data collection had also pointed the use of ICT for administration helps on the allocation of duties to the staff members, drafting of timetables, monitoring and assessment of teachers and updating records on school enrolments. Of all the tasks that were

being used through ict by the administration, the use of Microsoft excel spreadsheets were frequent in most schools. They admitted that spreadsheets helped in matters of calculation, presentation of items using diagrams, to check on trends and creation of schedules and timetables.

TEACHERS' COMPETENCE TO ICT SKILLS

The successful integration of ICT into the education curriculum can be attributed to a number of factors. However central to them is the level of ICT skills and knowledge possessed by the teacher. Teachers have been viewed as the facilitators of ICT application in the curriculum.

Various schools of thought have investigated on the specific ICT skills that a teacher should hold in order to be able to effective use ICT for teaching and learning purposes. Jegede (2009) pointed out that software packages such as the use of internet, email, use of spreadsheets, word processors and presentation software and database management systems are key ICT competence to be possessed by the teacher. In most cases it has been noted that technology has been provided in schools and teachers have a fair access to ICT facilities.

However the real question is though there is access to technology by the teachers, what matters the most is the level of their acquaintance, ability and skills to operate ICT tools for educational purposes. According to Miller (2010) the extent to which teachers are skilled to use ict determines its application in teaching and learning. One argument drawn from

literature review is that if a teacher does not have sufficient knowledge of applying ict in the classroom, their access to technology won't have any impact on the lessons.

Most opinions gathered from the interviews differ from teacher to teacher depending on age, sex, background and interests. Young male teachers were identified as teachers possessing knowledge of ICT operations and how it can aid teaching. These group of young male teachers said that technology is part and parcel of their lives. They have identified themselves as adventurous and would want to enjoy all the benefit that ict could offer in their field of work.

On female teachers, quite a few numbers seemed to have the ability of applying ict for teaching and learning as most of them failed to identify software or applications they have used to assist them in teaching. Majority of female teachers admitted that they have difficulties in using ICT. Some said that they are slow on the keyboard hence they find it hard to use some computer functions like word processors and spreadsheets. On their own perspectives, they regarded the old traditional way of teaching as better than trying to use computers and other technology.

The questionnaire also asked the question on how often they use ICT in their homes and at school and some gave responses like we don't have computers or laptops at home and the last time they used them was during training courses when they were typing assignments and projects probably many years ago. Teachers highlighted that they have lost track and interests

in the use of computers for educational purposes and highlighted that they is even a real need for them to be trained efficiently for them to be able to apply ICT in the curriculum.

When they were asked if they wanted to be trained some said it's too late for them to understand some of the literacy in technology as they are committed with other burdens such as staff developing themselves through advancing their education whilst some said they don't have extra time to focus on learning ict due to life commitments and other reasons best known to them.

Some teachers who were of age above forty highlighted that they had never been exposed to technology when they were growing up and it's hard for them to copy and adapt to new demands of the curriculum. What has been drawn from their line of arguments was that they were too conservative with the old ways of teaching. Most elderly teachers acknowledged that they have achieved a lot without using ict and have a good pass rate records in the schools they have taught. Some just generally showed little interest and enthusiasm in adopting ICT for teaching.

What can be generally drawn on the issue concerning the ability of teachers to use ict for educational purposes is that younger generations of teachers have greater ICT skills than older generations. Moreover, those who have the ability to use and apply ict for teaching purposes have witnessed endless possibilities and benefits ict could offer to them. Most of these young teachers are fresh from colleges and they have adapted easily to new technologies as most of them uses gadgets such as smart phones, I-pads, laptops and tablets

on a daily basis. The older generation have revealed that that they rarely use these technologies for educational purposes and some even pointed out that they don't even use ICT for leisure.

Researches elsewhere have put emphasis on the importance of basic software and keyboard skills for lesson delivering purposes. In the district however, it has been noted that most schools are not connected to the internet hence web skills are not really of any significance use. Basic ICT skills such as the use of Microsoft excel, Microsoft word and power point presentations are a must have ICT skills. These are therefore some of the ict skills that is used trace if the teachers have and Howfar are they applying it in the curriculum.

The study from previous literature on ICT had pointed the centrality of teachers as facilitators of ICT use in schools. However its application by teachers is determined the level of access they have to ICT tools. Interviews with most teachers were however disappointing on that matter as most teachers revealed that they have very limited access to ICT facilities. They indicated that most teachers have little access to computers at school because they are few computers at school.

The challenge to the access of computers by teachers is that they are a lot of classes at their schools compared to the number of computers at school. In the schools under study, most computers were situated in one computer room which was open to the whole school. Worse still they also highlighted that most of their classes would have 35 to 40 students facing only 12 computers. This makes the use computers difficulty for teaching and learning purposes.

Teachers also highlighted that this causes students to have one lesson in the computer room the whole week. Teachers also highlighted that they seldom use their personal computers for teaching purposes as schools don't have ones for them. Most interviewees strongly agreed with the fact that:

"there is a strong desire and positive attitude towards the use of computers by the teachers, but issues of finance and availability of ICT infrastructure pulls them back."

TEACHERS' ATTITUDE TOWARDS USING ICT

Using literature that has been used in this dissertation, it has identified attitude of the teacher on the use of ICT as major determinant to ICT use for teaching and learning. Pressure is also coming from various angles demanding the application of ICT in teaching practices especially from national agencies of primary and secondary education and also from civil societies and other pressure groups.

Information obtained from interviews and through questionnaires pointed out that a large number of teachers in schools are quite positive towards the use of ICT in the curriculum. However they are few cases that have been noted on teachers who are against the use of ict in education. Their pessimism has however been for reasons such as inability to adapt to technology or lack of experience with ICT tools. This negative element is however in lesser numbers.

In the research it has been noted that younger teachers of between 20 years to 35 years have the zeal and enthusiasm in applying ICT for teaching purposes. Factors explaining this are that the younger generation is exposed to such technology as they are involved in it in their day to day life. The older generation showed little enthusiasm to the use of technology. Some revealed that they had eyesight problems whilst others said that they have never been exposed to such technology since birth hence copying up will be such a mammoth task.

A reason that has been noted on why these older generation don't want to adapt to the technology was the issue of reluctance and too much faith in the traditional forms of teaching. One interviewee noted that:

"I've a lot of experience in this business and have produced a good pass rate on my subject and I don't think adopting ICT will be of any significant use."

However the main reason behind their reluctance to adapt to new technology lies in the fact that these teachers haven't received any training on the use of ICT in the curriculum. It could have been better if they had seen their tutor or teachers during their school time teaching them through ICT maybe they could have adapted it much better.

PROSPECTS OF ICT USE TO SCHOOLS IN MUDZI DISTRICT

The research further investigated the potential benefits that ict use might bring if meaningful integration and reforms had been taken. The research comes out with a plethora of

possibilities which could transform the educational system into a more productive system and modern one. These benefits are to be discussed as below.

The availability of internet at schools in Mudzi district might have the potential of empowering teachers with wide range of resources to apply in lesson delivery. Internet will help them to improve their researching techniques and strengthen the depth of their knowledge. Findings from the study on teachers highlighted that searching for relevant data and making notes from textbooks in school libraries is sometimes difficulty and takes a lot of time to prepare notes from textbooks.

However the use of internet through web search engines can make the lesson planning and notes making process very easy task. Web search engines provides teachers with a lot of learning material which the teacher can make use of by just typing key words on the search engines such as Google, yahoo, Wikipedia, bing and other common web search engines. The internet also provides the teacher with online books, e-journals and articles that he or she can download and print. This use of internet can also assist schools with library resources and help to curb the textbook shortages and other learning materials.

It has been noted that most schools can't afford to purchase up to date syllabuses and learning materials and resources due to financial strains and weak revenues at schools. Some teachers and headmasters revealed that learning material they have was donated by the government and NGOs such as CAMFED, UNICEF and World Vision. Without help of the aforementioned groups these rural schools could have been serious crises. Therefore the

availability of the internet could be utilised to boost the availability of learning materials and resources that can be easily accessed through the internet by downloading and making hardcopies to be used by both the teachers and learners.

The increase in the number of computer availability in schools can also help to transform the pedagogical practices which are still largely using traditional means of teaching. Improved access to computers to both teachers and students will transform their roles in the teaching and learning process. To the teacher, it will make their work easier as they can perform task through the computers and internet.

Innovations such as e-learning would also make teaching and learning more easily as learning won't require physical presence of the teacher and the Lerner. This technological innovation is already on its course in higher tertiary education institutes, colleges and universities in Zimbabwe. The concept has also been introduced in primary and secondary schools in developed countries and other elite schools in developing countries. Hence the adoption of ICT has much to offer in the educating system to rural schools. Another potential benefit of ict use in schools in rural areas is that it will help to reduce the digital or technological divide between rural schools and urban schools.

Sillinger (2004) noted that the use of ICT will transform teaching and learning will be shaped in way to promote individualisation, personalisation and localisation. Teachers' role will be to make learners able to search for relevant information to their studies, enable them to analyse the credibility of such material and sources, allow them to be learning partners, collaborative actions and to be responsible for their own learning initiatives. ICT has the

potential of bringing students to think for themselves and come up with ideas to solve day to day challenges in learning. Sillinger (2004) argued that giving pupils such space is motivating and prepares them to be relevant in real life complex.

ICT uses in Mudzi district can also helping school management and administrative roles. The use of computers in the administration can help to replace the old manual system of filing papers and hard files packed in shelves which at times accumulate dust and become very obsolete. They have been incidents in the districts where school heads have reported cases in which official documents were destroyed by fire.

Thus storing and keeping data in computers can make the access of information a very easy task. Most schools are also still using the method of witting schools examinations on the board using chalk. The school administration can make use of the ict facilities to upgrade and replace this old system which is very laborious and time consuming. Availability of computers, printers and photocopying machines can help to make school work easier and can assist teachers to do their work efficiently. They are also some administrative duties that are not being executed efficiently in most schools.

For example, the public service audit team have found several loopholes in the school financial systems in which they are no proper documentation on the use of school funds. This issue have resulted in the dismissal of several school heads and secretaries in the district. Thus the use of ict might strengthen schools financial system since it can offer proper storing and documentation of school activities, accounting for school expenditures. ICT can also

make duties like the creation of school timetables, budget allocations, writing of school reports and memos, duty roasters and other schedules that a school might need.

ICT use in school will also promote efficient communication with the outside world. The use of emails could replace the movements of school heads from running up and down to the district offices to collect official documents. Documents such as circulars and other reports can be accessed in electronic form through emails. Efficient communication with parents will also be improved as the school could be having landlines telephones to communicate with parents on matters concerning their children or to make special announcements.

Ict could also revolutionarise the learning and teaching process if it is effectively applied in the classroom. The availability of the internet can also help schools procurement committees to purchase items that the school might want online. Such items might be textbooks, furniture, equipment, sporting uniforms and other thing necessities that the schools need.

The use of ICT can also give pupils better opportunities after they leave school. It has been noted that most companies and even self jobs are requiring computer literacy to their workers. This is because the world has changed and companies need to copy with that technological advancement that has taken over the whole world by surprise. ICT is now regarded by many employers as a panacea to efficiency and can boost productivity at work. Therefore if students are equipped with basic ict skills they can help them to fit in the real world and can be able to survive the competition that is there. Moreover ICT competence can assist young generation to work for them through the use of ICT.

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The increase of the availability of information technology offers vast opportunities especially for the low and middle income members of the society. This is also one way of narrowing the digital divide especially between school children who do not have access to computers and the internet at home. The availability of computers at school would thus enable to reduce the threat of some students being left behind. Thus low and middle income pupils can copy up with new technologies and realize opportunities offered in this information age.

CHALLENGES FACED BY SCHOOLS IN MUDZI DISTRICT TO INTERGRATE ICT IN THE EDUCATION SYSTEM.

In this study it has been noted that are several factors impeding the maximum utilisation and realisation of ICT in the education system especially in Mudzi district. One striking aspect is the lack of adequate infrastructure to support proper housing of ICT facilities. The issue of infrastructure relates to the absence of proper buildings and rooms to accommodate technology, serious power shortage and general lack of different types of ICT. According to Isaacs (2010) this acute shortage of infrastructure makes it difficulty in the planning of ICT integration in the education system.

Related to the above challenge is the issue of language barrier and learning content that makes it difficult to integrate ICT in the education system. It should be noted that English is the dominant language in ict and computer software and programs. According to Farrel (2009) about 80 percent of internet and computer content is in English. However English proficiency in most developing countries worse still in rural areas is very low and this

militates against full integration of ict to education. Statistics from the ZIMSEC pass rates from the past decade has it that English pass rate in Mudzi district has been so low to as little as two percent pass rate. This alone magnifies how hard it is for students in Mudzi to adapt to the usage of computers for educational uses.

Another obstacle to the integration of ICT into the education system is the lack of funds to finance of the program. Tinio (2002) on the note argued that to embark on ICT in education program requires heavy capital investments. For programs like this to take place potential sources of money and resources for ICT initiatives includes government grants, fund raising program, support from well wishers and revenues from ancillary activities. If meaningful measures are put in place to curb the above mentioned challenges, they can help to integrate ICT into the education system.

However given the current government's financial status, a massive investment on ICT is to a greater extent impossible. Thus they are a need for the government to engage on the private sector or seek assistance from the international community and donors for support. The costs of ict also lie in the replacement of computer hardware and software. Moreover the need to retrain teachers to apply ict in the pedagogy is also a complicated task.

Though the availability and access to computers had been assured in many schools, the obstacle is still on the teacher's ability to use ict in the teaching and learning process. As noted from the literature search, they are a host of programs in ict that can be used as teaching aid such as the use of presentation tools, Microsoft excel, word processors, use of

W.W.W, online classes and E-learning. However a survey in the study has revealed that these programmes are rarely used for teaching purposes.

At times the use of ICT especially computers and other presentation tools are not welcomed by most teachers. For instance they are cases in which the teacher possesses little knowledge on the use of a particular technology and he or she might feel embarrassed when students ask for clarity or seems to know better than the teacher.

Educational experts in U.S strongly recommended that computer needs to be replaced after three to five years of use. Their base of argument is that new versions of software need to be compatible with the computer hardware available. They usually need new hardware to work efficiently. But the situation in the schools under study revealed that most machines being used are now outdated and they also use outdated software and applications. The most striking challenge in the schools is that their budgets do not allow them to purchase new expensive computer hardware.

Most interviewees highlighted that serious shortage of electricity in the district is also detrimental to the utilisation and integration of ICT in the education system. For devices such as laptops and desktops computers to work properly they need a continuous supply of electricity energy. UNESCO (2014) noted that integration of ICT in school requires electricity which is constant and regular.

One thing that should be noted is that rural development had took place on very slow pace especially in marginalised areas like Mudzi district. It is a fact that most countries in the Sub Saharan Africa lacks adequate ICT infrastructure such as internet, software and hardware, community access to ICT and this facilitates poor integration of ict into the education system. Amongst these factors, Majanja (2007) pointed out that poor electricity supply, network configurations challenges, poor transport networks and heavy import duties makes the integration of ICT into the education sector a mammoth task.

A plethora of literature had also confirmed that a number of African countries suffer from serious shortages of electric power. According to Farrell (2007) most of the electricity supply in the region is very limited to commercial sites and this excludes remote areas from benefiting from the fruits that ICT could bring within their communities. Moreover other alternative source of power such as wind and solar have not been fully utilised to their potential and capability. The use of biomass and petroleum had also been condemned by most governments in Africa they cause massive deforestation which works against sustainable development.

Mudada (2012) also observed that even when these rural schools are connected to electricity, faults, power cuts and massive load shedding is very common in the country. There is also a general slow ratification of faults by ZESA. This impedes maximum utilisation of ICT in schools. From the observations in the study most school heads pointed out other alternatives to supplement electric power cuts such as the use generators and solar are so expensive since rural people cannot afford to pay their school fees on time.

Another setback to the integration of ICT in Mudzi district is poor ICT competence and lack confidence to the use of new technology in the curriculum by the teachers. For ICT to be fully integrated into the education curriculum, teachers should play a vital role in this process. They should be technologically proficient, well trained and supported to enhance the use of ICT for teaching and learning process. Findings from the research noted that quite a number of teachers lack basic ICT skills and the knowledge of how to use ICT in the education curriculum.

This factor hinders the application of ICT in the classroom as most teachers haven't been adequately trained to use it. On this note teachers from Dendera high school were quoted saying that poor ICT skills hinder us from practicing it in the classroom. Few staff development on the use of ICT and workshops has been done. The research also noted that they is a need for computer experts to assist and fix technical problems in the use of computers at schools. Bordbar (2010) emphasised the fact that teacher's competence and proficiency determines the pace in which schools are to integrate ICT into the education curriculum. Aew-wani (2005) also confirms this by saying that poor ICT skill by the teachers is the main obstacle in integrating ICT for teaching and learning purposes.

Technological integration in teaching and learning can be fully enhanced if teachers possess sufficient technological pedagogical content knowledge. This calls upon teachers who are creative and have excellent design capabilities to be able to adapt as well as create learning materials that suit the needs of the learners. Classroom observations in this study have showed that teachers lack this capability. Regarding this issue one teacher from Kotwa high school had this to say

"the professional development courses as well as teacher training programs we have had have focused on the acquisition of ICT skills and not on the pedagogical practices related to ICT as a result we do not know how to use ICT in our classrooms.''

The findings of the study are consistent with those of Tsai and Chai (2012) on the importance of teachers having design thinking capacities for the effective implementation of ICT integration into teaching and learning. They further call upon the enhancement of such capacities into teachers and its inclusion into teacher training programs. Hence the design thinking capabilities should be cultivated in every classroom teacher for effective integration of ICTs into teaching and learning.

Another challenge to the integration of ICT in education in Mudzi district is the misuse of technology by pupils. Most learners are said to be using both the internet and the computer for cyber gaming. One striking effect on cyber game they play like FIFA 2016, GTA and Euro truck amongst others are very addictive. This destruct them from concentrating on school work hence sometimes ICT becomes very destructive to the pupils.

Some also highlighted that they use the internet to chat with friends through social media applications such s Whatsup, Face book, Twitter, Instagram, YouTube amongst other related sites. These social networking sites are never used for educational purposes hence pupils end up being destructed from concentrating on their school work. Some learners also said that they used computers and the internet to download movies, music and videos. This shows that at large, ICT facilities are not being used for academic purposes but to provide entertainment for the learners.

Teachers' attitude plays an important role in the teaching-learning process that utilizes computers and internet connections. Although teachers' attitude towards use of these technologies is vital, many observations reveal that teachers do not have clarity about how far technology can be beneficial for the facilitation and enhancement of learning. Of course, some teachers may have positive attitudes to the technology, but refrain from using it in teaching due to low self-efficacy, tendency to consider themselves not qualified to teach with technology.

In this respect, Bandura (1986) describes self-efficacy as "individual's opinion of capabilities to organize and perform courses of actions to achieve particular types of performances." Moreover, as identified by Brosnan (2001), attitude, motivation, computer anxiety, and computer selK2f-efficacy are factors affecting teachers' use of computers in their lessons. Teacher resistance and lack of enthusiasm

They are also economic and political factors contributing to poor utilisation of ICT in the education system in the rural areas. Various scholars had cited that ICT in Africa has not been received with much enthusiasm as a panacea to sustainable development and national priority for many countries. Many African countries are still considering the use of modern technology as leisure and luxury facilities whilst poverty drives the government efforts to exert much attention to poverty alleviation rather than investing much on ICT.

This explains why most marginalised societies in Zimbabwe haven't really gone far in integrating ict as part of teaching and learning processes. To add on to that most rural schools

are operating on very slim budget hence they have little capital to purchase ICT equipment. Majanja (2010) posits that they are a lack of clear policies and regulations that promotes greater use of ICT in the education system. For instance Majanja (2010) noted that heavy taxes and duties are imposed on such items as computers and this increases the cost to access ICT facilities. Some scholars like Mutula (2004) had reiterated the need for governments to subsidize ICT to education institutions.

The issue of computer literacy and confidence of the teachers themselves impedes against the full utilisation of ICT. Thus until current initiatives have been put in place, training facilities and programs have remained very low in availability and in poor quality. Teachers' ICT competence and proficiency for supporting learning and teaching process has also remained very low.

Some teachers also pointed out that they don't have enough time to grasp and learn the demands of new technology. they has also been a lack of adequate finances to train teachers on the use of ICT and also lack of public funds to engage into these activities. Therefore in this case integrated initiatives should be put in place with the incorporation of various stakeholders including the ministry of education for crafting a policy framework, curriculum, software developers and the training of teachers for ICT.

Furthermore school policies on ICT use affect the integration of ICT in the curriculum. For example it has been noted in the study that access to ict facilities differs amongst students. For instance in schools such as Dendera and Kotwa high, pupil who takes computer studies as their practical subject have greater access to the computers and the internet than other

students who opted to do other practical subjects not computers. Some who have access to the computers also includes students who had joined computer clubs, debate club and science students often have fair access to the computers.

Thus access to computers by pupils varies from school to school depending on the policies they adopt towards the use of computers. Student preferences and interests also determine the level of ict use within schools. Thus on this note Ndidde et al. (2009) asserted that levels of ict use by students are greatly determined by their access to ICT facilities, school regulations and ICT competence and proficiency of the learners.

Observations from the study also noted that there is a general lack of awareness in the community on the importance and efficacy of ICT in the education system. It has been noted that community at large is not even aware of how ICT is important to development and possible benefits that it can bring to the society. Another critical concern on this issue is that policy makers should first analyse the applicability of their policies, appropriateness and effectiveness in accordance to the environment and context it is to be applied. Integration of ICT in the education system should not be designed by following trends of other countries but to make a full investigation on how it can be best applied for the best outcomes.

It has also been noted that they is a general resistance to change as key players to the integration of ICT are still hesitant if not willing to apply ICT at all in the education curriculum. For instance, since the implementation of ICT into the education curriculum was endorsed, most partakers in the program were not even prepared to apply it in real sense.

Thus the document had remained nothing but paper tiger. Sometimes it also takes time to adjust to new schedules and tasks. Isaacs (2009) even noted that during the implementation of the program some policy makers were even sceptical about the whole process as they thought it won't yield intended result. Teachers themselves thought that technology might eliminate some of their duties and end up as redundant in the service.

It has also been noted that there is poor monitoring and evaluation programs in the district in as far as the use of ICT is concerned. Policy makers, educators and most donor agencies should constantly collect data on whether the indicators of ict use in education are being met in schools. However observations in the district noted that there is lack monitoring tools in the district and some factors points to poor road networks and lack of funding by the government to embark on such programs. Therefore nobody really check the progress schools have made in integrating ict use for educational purposes.

Another challenge on the utilisation and integration of ICT in the education system in Zimbabwe is that most of these policies are crafted on a top down approach. Other commentators has it that most policy implementers have attained education in countries in Europe and other developed world and they want to influence what they have experienced in their mother countries. However it is very difficult for developing countries to keep pace with the evolution and complexity in the use of ICT.

Most conditions that are favourable to ICT application in less developed countries are scarce or absent. These conditions include adequate financial resources and well trained teachers.

According to Miller (2009) developing countries should be cautious in adapting to northern technologies that are not compatible with their environment and financial resources. He further notes that for examples applications such as LOGO requires a vast amount of time and finance for the teacher to adapt to it.

CHAPTER THREE: TORWARDS THE ENHANCEMENT OF EDUCATION THROUGH ICT.

INTRODUCTION

The previous chapter discussed the impact of ICT in enhancing education in Mudzi district. They were challenges that were affecting the maximum utilisation and integration of ICT in the education system in rural areas. Some of these factors include lack of finances, poor ICT proficiency and lack of training by the teachers, misuse of ICT by the students, weak school policies on ICT and serious shortage of electric amongst other factors. This chapter therefore seeks to offer solutions and recommendations on what can be done to improve the use of ICT in the education system to foster development and modernisation. The section below will explore some of these solutions.

RECOMMENDATIONS

Most scholars had argued that for meaningful ICT integration to take place teachers should be well equipped and skilled to practice ICT for teaching and learning purposes. Thus both the government and academic institutions should play a vital role in investing on the training of teachers on ICT use for educational purposes. Therefore the Ministry of Education, Sports and Culture should organise workshops and offer facilities to train in-service teachers on the use of ICT in the curriculum. One of the respondents had this to say on what needs to be done to improve the use of ICT in schools:

'' integration of ICT into the learning spectrum demands teachers to have a better understanding of the technological equipments that will enhance student' skills and should

also know basic technological skills and ability on how to use ICTs efficiently for learning purposes.''

On this above note Ihmeideh (2009) confirms this by positing that the training of teachers is vital to enable them to apply technology in the classrooms for teaching and learning purposes. Some respondents argued that the level of ICT attained by teachers during their training courses determines the extent in which they will apply it after they finish their course. This would be beneficial to most teachers as the study observed that most of them have little technical knowhow of how to use some of the computer software packages.

Literature has also revealed that to train teachers without removing them from the classroom is economically beneficial to the government and the ministry of education. In this case, countries such as Iceland have offered distance learning to teachers on ICT education. This programme allows teachers to upgrade themselves on ICT competence whilst they are on their stations. This policy might help to curb the issue of shortages of teachers in schools and also reduces the burden of paying other temporary teachers.

The study had already highlighted that most of teachers use computers for non-academic purposes such as chatting with friends, downloading music and videos. Therefore training them on how to apply those skills for teaching and learning purposes would enhance educational outcomes. Most teachers were agreeing on the fact that teachers training institutions have been adamant to introduce ICT and they have left it for their post college experiences. Thus they is a need for teachers' training institutions to incorporate ICT in the training of teachers for pedagogical application.

The MoSAC should also work hand in glove with government parastatals such as the Zimbabwe Electricity Supply Authority (ZESA), Tel One and the Rural Electrification Agency (REA) to embark on expanding rural electricity supply to increase availability of power in most schools in rural areas. The Tel One Company would be also vital in developing tele-communication infrastructure which is important in facilitating communication for educational management. Other respondents in the study also pointed out the need to increase internet accessibility, affordability, connectivity and coverage for all schools.

Moreover for successful integration of ICT in education to take place, schools should play a key role in facilitating this process. They should be effective school leadership and management to enhance the use of ICT use for teaching and learning purposes. The school administrators should facilitates improved access to ICT by school pupils, teachers and administration staff. The school administration should make an effort to ring community awareness on the benefits that ict might bring not only to the children but to the community at large.

This could therefore enhance and push parents and the community leaders to offer support to purchase ICT facility. However on this note some respondents complained that most school administrators are involved in corrupt activities that make it hard to execute any meaningful developmental projects in the school. This demotivates the parents to pay school fees as they think their money is being used for personal gains rather that for progressive matters. Thus school administrators should be accountable to the parents and the community on how they are spending finances and school resources.

Moreover to accommodate ICT facilities, schools should embark on renovating buildings to accommodate and provide safety for computers. It has been noted that some schools are still using blocks that were constructed around 1980s and most of them had developed cracks. Therefore proper infrastructure needs to be in place to house ICT facilities so that they may survive for such a long period of time e.

Within the schools, they should also be proper maintenance of ICT equipment for them to have a longer lifespan. In the observations made around schools, most students access computers without any responsible personnel monitoring them. Some computers will be very dusty whilst some are attacked by viruses. Some teachers have also suggested that schools should train their staff on how to maintain those computers rather than to rely on technicians who are not locally available. This could also reduce costs of hiring external personnel for the maintenance of ICT facilities.

Moreover schools should be creative on how to increase the number of computers in the school. It has been noted in the previous researches that a computer lifespan is about five years or less. Moreover software developers will be creating new software's and program that won't be compatible with the old machines. According to Coartze (2009) Computer recycling is a more comprehensive solution to these challenges. It has been noted in the schools under study that some machines were still using archaic operating systems such Microsoft XP yet they are more efficient latest operating machines such as windows 8 and 10. They are some Non-Governmental Organisations that assist schools in collecting old machines for upgrading purposes and replacing them and they could also be a solution to this challenge.

For ICT to implementation to be meaningful, teachers should attend and organise workshops and seminars for professional development. In this modernised era seminars and discussions could be done through social media applications such as whatsup, or online seminars, action research and collective discussions with colleagues. Teachers should also learn to use computer software packages that could be very useful in the classrooms for delivering their lessons. For instance, teachers needs to learn how to use a projector for delivering a lesson, to use programs such as Microsoft excel for drawing diagrams, charts, drafting mark schedules and recording marks for students. Excel could also be used to make reports and calculate students' marks as well as averages.

Word processors are also equally important as they could be used to draft notes and lesson plans. Teachers are also recommended to improve their proficiency with the internet in functions such as using search engines to download books and relevant information to use it for learning purposes. Teachers should also be able to use emails to communicate with other colleagues from other schools. Thus on this note one respondent argued that teachers might have access to computers and have latest versions of ICT facilities but as long as they lack skills to operate them, they remain useless in as far as enhancing teaching and learning process is concerned.

The government is very essential in making sure that ICT programmes are being implimented in the schools and guide them on their positive impact and sustainability. In an effort to integrate ICT into the education curriculum, the government should first analyse the context and circumstances of different schools than to generalise findings on a certain school or

district to the whole country. It is a fact that most districts have unequal access to ICT facilities due to regional disparities and poor road networks amongst other factors.

The Training of teachers on ICT use should be made mandatory to all teaching training institutes. The government should also make an effort in reducing tariffs charged on imported ict equipment which are exorbitant. This would motivate schools to purchase for themselves computer hardware and software that could be used for educational purposes. On this note government could support the purchasing of ICT equipment by selling it to schools at a cheaper price or even at loan arrangement. This initiative could reduce costs of taxes charged when importing them. The government should capacitate the ICT department to be possible to offer assistance on competence required to the teachers so as to improve the benefits of ict in the teaching and learning process.

Moreover the government needs to train its own computer technicians to diagnose technical problems rather than for schools to rely on expensive technicians who are often not at station. This can be done to reduce costs of repairing machines. Government policies should also reflect high levels of commitment and political will to champion greater integration of ict not only in education system but throughout all government ministries.

The government should mobilize funds to support the integration of ICT into the education curriculum. Bi-lateral agreement with other developed world could be reached for them to support these initiatives. The current national budget is not able to support such huge projects. The government of Zimbabwe can therefore seek assistance and support from other countries such as the BRICS nations to offer assistance in the implementation of such

programs. Normalization of relations with the West would be beneficial as they are the pioneers of the ICT innovations and they could offer expertise on how best can ICT be integrated into the curriculum. Multinational cooperation might also offer current technological support to schools as part of community development schemes.

Policy makers within the Ministry of Education, government technocrats, donor members and educators should monitor on the progress made on the use of ICT and how teachers are implementing it in their schools. This could help them to provide recommendations to the relevant key stakeholders on what needs to be done to secure progress in the use of ICT in the education system.

It has been observed that monitoring in schools is at a low pace as some school heads said that at times they come once or twice in a year for supervision and auditing. This proves not to be effective if progress has to be maintained in the use of ICT. This also shows that there is lack of adequate monitoring and evaluation tools within the ministry. This might give biases towards ICT use as most of the studies are done on elite schools and then generalised to all schools yet they have different circumstances.

With the serious crises of electric power shortage in the country, it is plausible for the schools to adapt mechanism to provide or use other sources of power other than electricity. Exemplary to this is the Bangladesh National ICT Policy which provided the basis of the use of other alternate sources of power such as solar energy to compliment electric power. In Zimbabwe load shedding might go even for the whole day without electricity. One

respondent said that the use of ICT is low since at times electricity goes early in the morning and comes back late in the evening. Thus schools should come up with a solution to improvise on the acute shortage of electricity. Some have pointed that solar energy is very cheap as compared to the use of diesel or petrol generators.

Some development practitioners have also suggested the construction of community based ICT facilities which could be used by every member of the society. This could increase the rate of ICT use in the district as well as helping the community to witness the advantages of new technology. Under this scheme, the Bangladesh rural advancement committee (BRAC) embarked on this type of initiative to increase access of ICT to the community people. On this note one main centre of ICT might be created accommodating at least all schools in the ward. This ICT centre can have tools such as computers, projectors, typing machines, photocopying and laminating machines. Timetables would also be vital in allocating time for each school to have equal access to the facilities.

Other challenge in implementing such schemes also includes the distance that some schools might cover just to have access to those facilities. For example most schools in Mudzi district a heavily spaced that their frequent interaction is very limited. Some are almost 60 kilometres away from the growth centre with poor road networks and erratic mobile networks access. However it should be noted that for this project to be put in place there is need for huge capital to be invested in, therefore the government and the Civil Society should play a central role in spearheading such development.

Moreover since internet access and availability is a challenge in the district of Mudzi, relevant stakeholders should also consider the possibilities of setting up local area networks in schools. This program has been implimented in most rural schools in India where learning materials could be provided on school local area network rather than making it available online. This allows students to have access to the education material at their conveniences even in the absence of the internet. Moreover the advantage of local area networks over the internet lies on cost effective and accessibility issues.

There is also a great need for the government to make sure that all teacher education institutes spearhead the implementation of ICT by the teachers. One scholar argued that they can be electricity, computers, internet and adequate infrastructure but as long the teacher lacks competence on ict skills, we can't talk about the integration of it into the curriculum.

They should be programs such as capacity building for teachers' professional development. In these programs, training should be offered to the teachers to develop their ICT skills to use it in the curriculum. ICT experts has it that teachers must be in a position to design and make use of content materials to fit he students needs, to manage, browse and gather information and to have an awareness on the ethics, positives and negatives on the use of ICT.

Another area of concern is that the government should work towards ways of addressing the technological divide. One way to address this crisis is through prioritising on expanding rural

accessibility and connectivity to ICT facilities. Government policies and regulation should put much effort to balance development in towns and in rural areas. Most school in urban centres or boarding schools have better ICT access since their SDC and parents afford to help the school in the purchasing of ict equipment.

However in rural areas it's a different scenario as most schools depend on donor funds and government subsidies. Thus they should be proper planning for constructing ict infrastructure to facilitate its widespread use for educational purposes. This unfair access of ict has been seen by most teachers as one of the main causes for poor academic performance in the district as well as rural poverty and limited opportunities for school leavers.

CONCLUSION

Using information obtained from the research and a wide range of available literature on the internet it is plausible to say that the impact of ICT to the education system is positive especially to where it has been applied efficiently. However on a large scale especially when comparing ict levels in Zimbabwe and other countries in the developed world one can deduce that we are still a long way to go before we enjoy the fruits of ICT. It has been noted that the use of ICT in Zimbabwe as a whole country is still not effective as they are still several factors impeding to the full integration of ICT into the curriculum.

The study has revealed endless possibilities that ict could offer to the education system. To the teacher, ICT can provide them with a variety of teaching aid and materials that are not easily found in print textbooks. The phenomenon has also given teachers possibilities of choices in their teaching endeavours. ICT opens tremendous possibilities for teachers. Both the choice of the type of teaching aids and materials, as well as their availability has increased incalculably even compared only to the previous decade.

However, with increasing possibilities of choice, it is more and more important that teachers not only teach, but also dedicate themselves to training. Along with better knowledge and experience, it shall become easier for teachers tousle ICT and the use of technology would become more common and with the time ICT may slowly displace part of the classical methods of teaching. Important is, however, that teachers shall need the perfect balance between those "two worlds" and shall manage to get the most out of both.

Consistent with Vygotsky's beliefs, each environment that a distinctive individual is exposed to is not isolated from other environments, but each and every environment is a part of a bigger socio-cultural learning area. Taking this into this account, it is important that the technology shall not be seen only as a tool for fun, leisure and entertainment, but technology should also be seen as a tool that is vital for work and a great aid for learning.

The study has also revealed that the use of ICT in education has a greater potential of improving the standards and quality of education. ICT use can offer unlimited opportunities to the school, teachers and school students. This is because the world out there is now regarding ict as an efficient tool to efficiency and productivity. Moreover there is now competition in the job market in which having ICT competence is now an added advantage. The importance of learning ICT in schools nowadays reduces the danger of teaching children with yesterday skills which will make them irrelevant to tomorrow's world.

Teachers have also found ICT very important for teaching and learning practices. It offers them vast benefits when delivering lessons. The study has revealed that ict has so far benefited teachers in making their lessons easy to be understood by students especially when using ict as media aid. Other application packages such as word processors, spreadsheets and presentation tools have also proved effective in lesson deliveries. ICT has not only assisted them in lesson delivery only, it has also helped them in data and information capturing and keeping. They applied ICT in making registers, checking students' performance, recording marks and calculating their marks too.

To the schools administration ICT has also revolutionarised the old administration system that was slow and manual in nature. As has been noted in the study, data capturing in schools was often done on hand written documents which could end up piling a lot of files in the offices. Some data had became very inaccessible as some papers could be lost and misplaced. However the advent of ICT had reshaped the whole administration as it has offered new ways of data capturing and recording that is so efficient and effective.

Due to the availability of computer hardware such as printers and photocopying machines, schools can now set their examinations whenever they want. This was different from previous years before the advent of computers when they used to travel to growth point centers to have access to printing and photocopying facilities. The ICT facilities are also enabling the administrations to communicate effectively with the outside world. Long time ago communication with the administration was through the use of telephones and letters. However the internet has offered new platform in which the administration can use to retrieve and send information. One such platform can be through the use of e-mails and web pages.

In administrative issues ICT can also reduce costs of purchasing learning materials such as textbooks and question papers. Most of the syllabus content nowadays can be accessed through the internet where there is an endless list of academic books, texts, journals, researches, articles and other academic related materials. The use of the internet can help schools who are in serious shortage of textbooks. Material can be downloaded and printed as hardcopies and can be distributed amongst learners.

In a nutshell, meaningful ICT integration in the education system in Zimbabwe is an important step towards the realisation of millennium development goal set by the UN in 2005. ICT has been viewed as one of the means of promoting a sustainable development in the country. Its impact will be empowering human capital with skills to fit well in the modernised world and copy with the changes that had took place. However given the current state of the education sector in the country which is bedevilled with a multitude of challenges such as poor financial resources, weak administration, lack of meaningful ICT national policies to support education amongst other factor mentioned earlier full potential benefits of ict will be enjoyed much later till drastic measures had been introduced as was in the recommendations. Thus until the government is fully committed to give credible support to the schools in the expansion of ict facilities, the dream of educational transformations and improvement of standards and quality will remain nothing but flirting illusion to be pursued but never attained.

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APPENDIX ONE: INFORMATION SHEET

Midlands State University

Faculty of Arts

Department of Development Studies

P. Bag 9055

Gweru

FEBRUARY 2016

To whom it may concern

My name is Trevor Nyamayaro. I am a student at Midlands State University, Gweru doing a post graduate program in the Faculty of Arts. I am carrying out a research with the topic: **The impact of ICT revolution in enhancing rural education: A case of schools in ward 9, Mudzi North.** The research seeks to investigate the contribution of ICT in improving the teaching and learning processes. It also investigates how the introduction of ICT in schools has transformed the education system. I have provided a questionnaire soliciting for information on the research topic under study. May you please answer the attached questionnaire? All the information you provide will be treated as confidential and used for academic purposes only. If there are any questions relating to the topic, feel free to ask before you answer any question that will be asked to you.

Your co-operation is greatly appreciated.

Yours faithfully

Trevor nyamayaro

APPENDIX TWO: CONSENT FORM

CONSENT FORM

I_____ hereby consent to participate in an interview for the research project conducted by Trevor Nyamayaro. The purpose and procedures of the study have been explained to me. I understand that participation is voluntary and that all my responses will be kept confidential. I also understand that I may withdraw from the study at any time and that I may refuse to answer any questions that I feel uncomfortable with answering. I am aware that there will be no direct benefits or rewards for my participation in the study.

Name of participant…………………………….

Signature……………………………………..

Date…………………………………………….

APPENDIX THREE: QUESTIONNAIRE

I am **Trevor Nyamayaro a Master of Arts in Development studies student at Midlands State University** conducting a study on the impact of ICT revolution in enhancing rural education: A case of ward 25 schools in Mudzi West. Your community has been selected to participate in this important exercise. You are therefore kindly asked to answer the following questions. The information you provide will be treated confidentially and is used for academic purposes only.

Instructions
- **Please answer all questions**
- **Indicate your response with a tick in a given box or space provided to add in your explanations, opinions and answers to the questions**

Section A: Demographic data

Gender…………………………………………..
Age……………………………………………….
Occupation…………………………………………
Level of education…………………………………
School…………………………………………………………………………………………….

Which subjects do you teach…………………………………………………………………….

Do you have access to ICT facilities? (Explain)……………………………………………………

What type of ICT do you use as aid to learning?

A computer
 B data projectors
C internet
D smart phones

E any other……………………………….

How do you apply ICT in teaching?

A for communicating with students
B during lessons
C in preparation for the lesson
D for presentations
E for personal research
F any other

…………………………………………………………

Which computer programs do you often use for teaching?

A Word processor
Spreadsheet
PowerPoint
Database management

Any other (Specify)………………………………………………………………………………………………………

Where you trained to apply ICT in the curriculum

Yes

No

What has been done at your school to improve the use of ICT by teachers?

……
……
……
……
……………………………

What changes had been brought by ICT to the teacher

……
……
……
……
………………………..

Howfar is the access of ICT by the students

Low
Very low
Relatively low
Moderate
High
Very high
Do not know

Are they able to use it for academic purposes?

Yes
No

How is ICT benefiting students

……
…… .

What are the challenges being faced in the use of ICT for teaching

……
……
……
………………

What are the prospects of the use of ICT to the community?

……
……
……
……………..

What can be done to increase access of the school to ICT and its application in the learning process?

……
……
……
……
……
………………………………….

In what ways can ICT benefit students on their school work?

……
……
……
………………………………………………………………….

Does ICT has any impact on student performances

Yes
(explain)……
……………………………………………………………………

No
(explain)……
…………………………………………………………….

How has ICT assisted the school administrators?

……
……
…………………………………………………….

APPENDIX FOUR: INTERVIEWS FOR KEY INFORMANTS

I am Trevor Nyamayaro a **Master of Arts in Development studies** student at **Midlands State University** conducting a study on the impact of ICT revolution in enhancing rural education: A case of schools in ward 9 in Mudzi North**.** Your community has been selected to participate in this important exercise. You are therefore kindly asked to answer the following questions. The information you provide will be treated confidentially and is used for academic purposes only.

Semi Structured Interview

KEY INFORMANT INTERVIEW GUIDE

NAME OF RESPONDENT …………………………………………..

NAME OF SCHOOL……………………………………………………….

ROLE (POSITION)……………………………………………………

INTERVIEW QUESTIONS

1. What position do you occupy at school?
2. Which subject do you teach?
3. In what ways do you use ICT at school?
4. What changes has been brought by the introduction of ICT on your role as a teacher?
5. In what ways do ICT aid teaching and when have you applied it?
6. Is there any staff development to ICT use that you have done?
7. What skills do you possess or you have trained on ICT?
8. What is the level of your access to ICT facilities at school?
9. How has the application of ICT changed the teaching process?
10. The introduction of computers has caused more problems or is an advantage at school?
11. What ICT tools do you use as teaching aid?
12. In what way do use ICT to assist your work?
13. What challenges do you face on using ICT as a teaching aid?
14. How often do school pupils use computers and the internet at school?
15. How do learners use ICT in their school work?
16. What positive impacts have ICT brought to the pupils?
17. What tools do learners often use for academic purposes?
18. What are the levels of computer literacy on pupils?
19. Does ICT helps or disturbs pupils on their school work?
20. Explain how?
21. What views and attitude do students have on the use of computers?
22. What are the general advantages and disadvantages of ICT?
23. What can be done to improve the access and proper application of ICT at your school?