INSTITUTIONAL FACTORS INFLUENCING ICT INTEGRATION IN PRIMARY SCHOOLS IN MWINGI CENTRAL SUB-COUNTY, KITUI COUNTY IN KENYA

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DECLARATION

This research report is my original work and has not been submitted to any University or any other institution for any academic award

___________________                                                    _____________________
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This research report has been submitted for examination with my approval as the University supervisor

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DEDICATION

This study is dedicated to my lovely mom Florence Mutheki Kinyali, for the support, encouragement and understanding throughout the research project.
ACKNOWLEDGEMENT
The preparation of this research report has taken the efforts of various persons. First my Supervisor, Mr. Mumo Mueke my lovely Archbishop, Most Rt. Rev. Anthony Muheria, dear Rector, Rev. Fr. Jeremiah Munyoki for ensuring timely guidance making it possible for me to be through with this report within required period of time. I am grateful to them. Sincere gratitude to my student colleagues at University of Nairobi for their assistance in discussions which helped in developing my research report. I would like to appreciate all the respondents for generously providing information required during the time of data collection.

I am also grateful to my family members for their support in developing this report. Above all, I thank the almighty God for his guidance provision and protection throughout my work.
This study investigated factors influencing integration of ICT in public primary teacher education. The rational was based on the view that ICT has become a principal driver in socio-economic change worldwide, thus there is a move towards its integration in teaching and learning process. However, this is not necessarily the case in public primary teacher education in Kenya. The literature review focused on the concept of integration of ICT in teacher education, government policies on integration of ICT in education and challenges in the integration of ICT in teaching and learning process. This descriptive survey study sought to investigate the extent to which public primary teacher training colleges in the central region of Kenya have integrated ICT in teaching and learning process. Further, the study looked at the challenges facing the integration of ICT in primary teacher education and finally established the factors influencing integration of ICT in primary teacher education. The study was carried out in four (4) public primary teachers' training colleges located in the central region of Kenya with a target population of 261 academic staff. A total of 176 respondents were picked from the institutions using proportionate sampling which targeted administrators, and teacher trainers randomly chosen from each of the eight (8) academic departments, however 148 responded. Data were collected using questionnaires and interview schedules. The obtained data were analyzed systematically using descriptive statistics and presented with help of frequency table, graphs and percentages in the Statistical Package for Social Sciences (SPSS) version 17. The study found that the factors that influenced integration of ICT in the primary teacher training colleges were: adequacy of internet connectivity, adequacy of computer hardware, adequacy of computer software, maintenance of ICT infrastructure, and training of personnel in ICT, teacher workload, teacher gender, teacher age, and presence of ICT policy and adequacy of funds. The study therefore recommends that primary teacher training colleges should develop strategies to identify strengths and weakness of various technological resources as well as an evaluation framework. Teacher trainers should also be provided with regular trainings and seminars on how to integrate ICT in teaching and learning process and adopt policies that enhance integration of ICT in the teaching and learning process.
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CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Education in the world over has been recognized as an important means for promoting economic and social development both at individual and national levels. The growth of the global economy and the information based society has pressured education systems around the world to use technology to teach students the knowledge and skills they need (World Bank 2004). According to UNESCO (2002), integration of ICT has brought about profound changes in the world today especially in the way people communicate and do business. Further, it has brought about highly important transformations in Agriculture, Medicine, Engineering, Education and other fields as Bitter & Pierson (2005), notes that technology literacy is a given order in our society.

It is assumed that integration of ICT brings revolutionary changes in teaching methodologies. The innovation lies not per se in the introduction and use of ICT, but in its role as a contributor towards students-centered form of teaching and learning (Scrimshaw, 2004). Integration of ICT provides the tool needed by the information knowledge society.

Despite of the pilot test and unexpected integration outcome in USA, ICT remains important in the development of education system in the country. Just like we have seen that there are gaps and unexpected outcome of ICT pilot test and integration in USA, other developed and developing countries are also facing the challenges which were never projected to come up.

In UK, education stake holder, have developed national guidelines to lead to increased use of ICT as a tool for learning in their primary schools. However, Bank (1999) argues that despite this great UK policies on education, the incorporation of Information and Communications Technology in classrooms has been difficult for the education systems of all region in the UK that work towards being ready to put up with the needs and the demands of this century. Although ICT is now the key element of education change, this benefit of technological advancement in education is not being
enjoyed by all countries (Kozma Anderson 2002). Barriers that are known as “digital divide” hinder the ability of certain countries to make maximum gain of technological advancement (Kozma, Anderson, 2002).

Unlike in the developed world like UK and US-, African countries which host majority of developing countries lag behind in computer integration in the education system which widens the digital and knowledge divides between students in the regions (Farrell, 2007).

And this ration was attributed to poor ICT infrastructure among the primary schools in the continent (Omwenga, 2007). Furthermore, Low computer literacy among students in most African countries was further fueled by 4 infrastructure related challenges like: shortage of appropriate rooms/buildings, safety concerns and availability of electricity. It is therefore important that these factors be investigated to be able to come up with ways to overcome them.

Poor policy framework is also a notable challenge for the few African countries that have attempted to introduce ICT programs in their education system.

These countries continue to experience numerous challenges. In Nigeria for example, where computer adoption was attempted in 1988, the plan did not go beyond distribution and installation of personal computers due to lack of a complete proper integration formula (Okebukola, 1997). Although Nigeria finalized the computer program in secondary schools in 2004, several challenges have led to low adoption rate of the program.

These factors include: 5 limited/poor infrastructure, inadequate ICT facilities in the schools, frequent electricity interruptions, inadequate manpower and high cost of ICT facilities (Adomi, 2006). In Zimbabwe as another example, studies show that some computers have been lying idle in classrooms due to lack of trained personnel, electricity or proper facilities like computer laboratories (Kabanda, 2012).

In Kenya things are not any different, despite the continued increase in the numbers of computers installed by schools in Kenya, in the recent years and the lots of money allocated to acquire them,
the actual statistics of their use is not encouraging (Judson, 2010; Wims& Lawler, 2007). In most cases, computers are installed in schools in Kenya without a proper plan of how they was integrated into the learning process (Hawkins, 2002).

According to (Becta 2003), a number of factors influence the chances that a good ICT learning environment was created in a school; availability of ICT infrastructure, support of ICT integration by administration, ICT teaching, sound school leadership and overall teaching. The government has gone further and committed itself to give free laptops to all class one pupils and introduce ICT education to all other classes in primary school in the year 2018. However this will not be easily achieved as said. Schools that have attempted to introduce ICT education at primary school level have faced insurmountable challenges that some have had to drop it altogether. Actually, data show that of the government-sponsored ICT initiatives in third world countries, 35% are considered to have totally failed, 50% to have partially failed and only 15% to have succeeded (Heeks, 2010).

The scope of the research was primary schools in Mwingi Central Sub-County. The sub-county is located in the northern part of the larger Kitui County, which lies in the south western edge of the country. The county covers an area of approximately 108km2.

It is subdivided into two educational zones namely Kitui, and Mwingi. The sub-County is metropolitan with the rural areas occupied by the native Kamba community while peri-urban areas have a mixture of most communities in Kenya.

There are a total of twenty two public schools with the rest being private schools. The main economic activity in the sub-county is livestock farming, which is practiced majorly in the rural areas where people mainly rear cattle, goats and sheep in large scale. Business is also another key economic activity in the region, especially in the urban setups of Mwingi, Mwingi.

The ICT education programs are being implemented in all public primary schools by the Central government starting with grade 1. The rest are being implemented in most of the private primary
schools at the cost of the parents (SCDE, 2017). Despite the huge financial commitment to the National ICT strategy for education and training, it’s not clear why only a few public primary schools have functional ICT education programs in this Sub-County.

Factors affecting integration of ICT education are not well established especially in Mwingi Central Sub-County. Motivated by this background, this study investigated factors affecting integration of ICT education in Mwingi Central Sub-County.

1.2 Statement of the Problem

The issue of integration of ICT education in primary school is very important especially in the overall academic performance of pupils, growth of education and to keep pace with the rapidly changing education and job market (Grace, 2012). Despite of the much hyped increased computer installation in public primary schools, many schools are yet to reap the dividends of their integration into the learning process was due to a myriad of obstacles that ranged from infrastructural challenges, lack of qualified teachers, and low administrative support among various schools in Mwingi Central Sub-County.

Mwingi Central Sub-County being an arid and semi-arid land (ASAL), faces unique challenges especially in regards to the integration of ICT education in public Primary school. The efforts from various global education stakeholders in context to improving education sector, have since been crippled by poor infrastructure to Support ICT, inadequate policy, low administrative support and low levels of teacher training to implement these programs(Surry and Ely, 2001).

Several interventions have been underway to leapfrog the incorporation of ICT education. Introduction of laptop per child and connecting schools to national power grid by the government among other interventions have not effectively addressed the underlying key issues in the integration of ICT education in public primary schools.

From the review of past literature, it is clear that studies that have been carried out on ICT education. Factors including, infrastructure, policy and levels of teacher training in relation to ICT
in primary schools in other places (Grace, 2012, Farrell 2007, Omwenga, 2007). Nevertheless, none of these studies had answered the question of factors affecting integration of ICT education in Mwingi Central context.

Therefore, this study intends to investigate institutional factors influencing integration of ICT education in Mwingi Central Sub-County context.

1.3 Purpose of the Study

The purpose of this study was to examine institutional factors influencing the integration of ICT education in public primary schools in Mwingi Central Sub-County in Kenya.

Objectives of the Study

The study was guided by the following specific objectives:

1. To establish how the level of teacher training influences integration of ICT education in public primary schools in Mwingi Central Sub-County.
2. To determine how infrastructural facilities influences integration of ICT education at public primary schools in Mwingi Central sub-county.
3. To assess how monitoring and evaluation influences ICT integration in public primary schools in Mwingi central sub-county.

1.5 Research Questions

1. To what extent does the level of teacher training influence the integration of ICT education in public primary schools in Mwingi Central Sub-County?
2. To what extent does availability of infrastructural facilities influence ICT integration in public primary schools in Mwingi Central sub-county?
3. To what extent does monitoring and evaluation influence ICT integration in public primary schools in Mwingi Central Sub-County?
1.6 Research Hypothesis

The study aimed at testing the following hypothesis:

H₀₁: There is no significant correlation between teacher training and integration of ICT education in public primary schools.

H₀₂: There is no significant relationship between infrastructural facilities and integration of ICT education at public primary schools.

H₀₃: There is no significant relationship between monitoring and evaluation and ICT integration in public primary schools.

1.7 Significance of Study

The outcome of this study will be beneficial to different stakeholders in the education sector. Education policy makers will benefit from the findings of this study because they had sufficient information to help in decision-making.

Making regarding ways ICT education needs to be planned and implemented. The policy makers in Sub-Counties will also find the information provided in this study useful in planning for the project to be effective and sustainable, especially the laptop project for primary schools which is already overdue. Education administrators will find the recommendation of this project useful in preparations and overseeing the integration of the laptop project in their counties.

The study will provide information on how the content developers can effectively adapt the existing content and in converting the print–based media to digital media. The study will provide information on the level of school preparedness for the anticipated roll out of the laptop program.

This will help them to reduce the apprehension among teachers of their position being taken over by technology or being unable to be in control of the class. Teachers will also be advised on the best approach to employ in introducing ICT education to children majority of who have never encountered computers in their lives.
The findings of this study will provide information to schools/learning institutions on how best to be prepared in-terms of computer infrastructure and security. This study will advise schools on the basic infrastructural requirements.

Schools will also find information on the technical support needed to sustain successful ICT education programs. Parents and pupils will use the findings of this study to prepare themselves to welcome the laptop project once it is fully implemented in primary schools. The study will provide information on the importance of ICT modern day world.

The parents was informed about how ICT education will help their children to have an upper hand in developing new innovation to support development in the community. Lastly, the study will also provide adequate information about how pupils can get maximum benefits from ICT education in primary schools.

This study will also provide information to head teachers on how their administrative support affects the effective integration of ICT education in the school.

1.8 Limitations of the Study

There was a number of challenges which was faced in this study. Nonetheless, a major one among them was the inability of teachers to get adequate time to fill the questionnaire because of the having unbearable work load.

To overcome this limitation, the researcher created more time and finances for research and visited schools over lunch hour breaks when pupils and teachers was free. The other limitation was the vastness of the target population (teachers and schools) which will hinder effective representation. In order to get over this limitation, the researcher made use of questionnaires which could be administered simultaneously to different groups of respondents.

Questionnaires worked out well since they helped the researcher to reach more respondents without taking a lot of time.
1.9 Delimitations of the study

Delimitation describes the population from which generalizations can be carefully made and are under the control of the researcher (Simon & Goes, 2013).

Other factors may have been identified by other researchers however this research project only confined itself to the following factors: level of teacher training, availability of ICT infrastructure, administrative support and the school ICT policy.

The target population was Sub-County Director of education, head teachers, teachers and pupils in the twenty two public primary schools in Mwingi Central Sub-County.

1.10 Assumptions of the Study

For this study to be successful several assumptions were made. These are:

1. All the respondents were literate and are knowledgeable on issues affecting ICT education.
2. The schools sampled in this study would give accurate data.
3. The records to be found in the schools would be correct and reliable

1.11 Definition of Significant Terms

Computer - it is an electronic device that accepts user input (data) and processes it’s under the influence of a set of instructions referred to as programs to produce the desired output (information).

Integration - To make that has officially been decided start to happen or be used without any hesitation through action.

ICT education - it is a non-examinable subject at primary school that teaches learners about computers and how to make use of them as learning tools.

Internet – it refers to the global of computer networks for the purpose of communication and resource sharing.
Desktop Computer - it is the ordinary personal computer which is usually placed on top of a desk while being used.

Laptop - This is a portable personal computer usually placed on the laps while being used.

Education - is the process in which the knowledge, character and behavior of human being is shaped or molded.

Information - it is the processed data which makes meaning to the user and which can form bases for decision making.

Technology - An application in science to solve a problem. It can also be termed as knowledge will make to work with an intention of solving problems or come up with something useful.

Sub - County - an administrative area that is sub divided from a county.

Hotspot - an internet plug-in spot that is shared by two or more users

Infrastructure – the basic systems and services that are necessary for an organization to run smoothly.

1.12 Organization of the study

The study comprises of five chapters. Chapter one includes the background to the study, statement of the problem, purpose of the study, objectives, research questions, significance of the study, limitations of the study, research hypothesis, delimitations of the study, basic assumptions, definition of terms and organization of the study. Chapter two comprises of a review of literature on, theoretical framework and conceptual framework. Chapter three deals with research methodology, research design, target population, sample and sampling procedures, research instruments, data collection procedures and data analysis. Chapter four consists of data presentation and analysis. Chapter four presents a summary, conclusions and recommendations of the study.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction
This Chapter discusses the review of literature on the factors affecting the integration of ICT education in public primary schools in Mwingi Central Sub-county. The discussion of this chapter is based on the key objectives.

The main source of literature includes books, journal articles, web articles and online digital libraries. The Chapter is presented under the following sub-sections: an overview of importance of ICT education in primary schools, effects of the level of teacher training on integration of ICT education in primary schools, effect of infrastructural facilities on integration of ICT education in primary schools, influence of administrative support on integration of ICT education in primary schools and influence of school ICT policy on integration of ICT education in primary schools.

2.2 Teacher training and ICT integration in Primary Schools
Although countries are at the beginning of using new technology, its future use in education cannot be underestimated (Canny & Rhoten, 2002). It is assumed that integrating ICT brings fundamental changes in teaching methodologies. John & Sutherland (2005) observes that caution need to be exercised when speaking of new technologies and when assuming that a given medium or technology will automatically afford particular leaning outcomes. As new concepts of learning have evolved, teachers are expected to facilitate learning and make it meaningful to individual learners rather than just to provide knowledge and skills.

Recent developments of innovative technologies have provided new possibilities to teaching profession but at the same time have placed more demands on teachers to learn how to use these technologies in their teaching (Robinson & Latchem, 2003).
Globally integration of ICT is gaining prominence and the most important component bridging the gap of basic competence of students (Newby et al. 2006) this therefore has put educational systems under great pressure to adopt innovative methodologies and to integrate New Information and Communication Technologies the (NICT) teaching and learning process to prepare students with the knowledge and skills they need in the 21st century.

This is why Cooper (2006); Todman (2006), observe that computer anxiety is often highlighted as the problem behind the digital divide. Whereas Prensky (2001) distinguishes between ICT natives who are born in a digital world and digital immigrants who have to learn the digital language and for whom ICT will always be a second language, Cox et al. (2003) on his part expresses that it is the need to measure among other factors that teachers beliefs and understanding of the role of ICT in the subject.

Apparently, teaching profession is evolving from an emphasis on teacher-centered, lecture-based instructions to student-centered interactive learning environments. NICT integration is understood as the usage of technology seamlessly for educational processes like transacting curricular content, students working on technology to do authentic tasks and developing technology supported products, providing authentic assessments and institutional development.

Today a variety of NICT can facilitate not only delivery of instruction but also learning process itself. Moreover, NICT can promote international collaboration and networking in education and professional development.

According to IJEDICT (2007) report, integrating ICT into the education curriculum has been promoted as a key step in bridging the digital divide in Kenyan schools in the recent years and despite the sacrifices made to finance these venture, there has been little evaluation of their effectiveness. However, this did not look into integrating ICT in public primary schools which the current researcher seeks to investigate.
Murithi (2005) argues that in Kenya like most developing countries, integrating ICT is still limited to computer literacy training.

The researcher contends that the present ICT curriculum merely deals with “teaching about computers” and not how computers can be integrated to transform teaching and learning in schools. Waema (2005) did a study on the impact of ICT revolution throughout the world which cannot be ignored when he cites that most countries have gotten computers literacy. He cites that India as the country with the largest scientific management in the world, whereby the country is able to provide computer education teaching via internet.

According to New House (2005), Australia also practices ICT education. Malaysia is another country which gives ICT education priority. The Government grants tax exemption on import of multimedia equivalent as incentives to one of its ICT city referred to as Cyber Taya.


However, the studies did not look into the factors influencing integration of ICT in public primary schools which the researcher of this study seeks to investigate.

Integration of ICT education in primary schools would greatly enhance the achievement of primary schools objectives in Kenya, which are: To promote an all-round growth of the whole person by developing the mental, bodily and emotive abilities and attitudes; to pass on literacy and numeracy and cultivate scientific and social skills; promote social equity and prepare the learner for higher education (Kenya Government, 1998). 23 administrative support given in reference to ICT is not
adequate. Teachers use computers more often for their teaching-learning process if they perceived adequate support from the school administration.

Kariuki (2004) argues teachers who receive adequate ICT support from the administrators are more likely to use ICTs in their teaching practice while those who do not get ICT support from the those above them in school are less passionate in using computer or do not incorporate technology in any way.

School administrators, like the principal acts as a go-between to integrate ICT into the school system by playing an important role in encouraging, giving support, and making the teachers to adopt the use computers in their instruction process.

Sife et al (2007) argued that lack of technical, administrative and financial supports were problems that hinder teachers from making use of computers in their instruction.

The support of the school head teacher or administrator can increase teachers’ acceptance to use the computers in the teaching and learning process. Therefore, the role of the school leadership is critical in creating impetus, sustaining and an environment that enhances the use of computer in the teaching learning process. Administrative support positively influences the adoption of ICT in the school system.

Sife et al (2003) found out that for the adoption of ICTs to be successful and sustainable, head teachers as lead professionals should lead from the front in the use of the technology, as well as have broad mastery of the pedagogical, technical, administrative, social, and financial dimensions of ICTs in education.

Administrators play a key role in enhancing the adaption of new innovations and more so infusion of ICT in education (Tusubira and Mulira, 2004). Priscilla et al (2008) affirmed that guidance from a head of department is key in encouraging the preparation of electronic lesson materials which encourage computer use for a certain subject in the instruction process.
The study established that the success of integrating ICT into the instruction process among school teachers depends on the support provided by the head of the school.

Another study by Yang (2008), in a research at Curtin University of technology found out that university lecturers who received support from their seniors had a high commitment to the integration of ICT for teaching and learning. Statistics from this study suggested that the adoption of ICT in teaching and learning would be enhanced by increased support of the ICT initiatives at the management level of the University.

A major factor contributing to the enhancement of the innovation is the accessibility to ICT infrastructural facilities in terms of the number of computers in good working condition available for students and teachers for teaching learning purposes. Conversely, not just a good computer student ratio alone is sufficient to guarantee adoption but also availability of pedagogical and technical support (Nachmis et al, 2004). Aryatuha (2007) also stated that for a successful ICT adoption, adequate computer hardware and software must be accompanied with training of the users and continuous technical support. Without this, however high the quality of hardware and software deployed there will only be under-utilization and wastage of these resources.

2.2.1 Challenges in the Integration of ICT in teaching and learning process

Grabe and Grabe (1998) notes that if teachers want to search for more effective learning experiences for their students, they need to have some general ideas about productive learning experiences that integrating ICT enhances.

Danes (2001) observes that the new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have not been possible before ICT in education has the potential to be influential in bringing about changes in ways of teaching. However, this potential may not be easily realized as Dawes (2001).
Underlined when he stated that problems arise when teachers are expected to implement changes in what may well be adverse circumstances.

Due to ICT”’s importance in society and YS possibly in the future of education, identifying the possible obstacles to the integration of these technologies in schools would be an important step in improving the quality of teaching and learning.

Balansak et al. (2006), argues that although education appears to acknowledge the value of ICT in schools, difficulties continue to be encountered during the process of adopting these technologies. Integration of ICT into pre-service teachers”’ education is critical. Bromme (2005), notes that challenges come from psychological research on problem solving and creativity. A variety of action plans have been developed to effectively integrate ICT in pre-service teacher education programs, but many challenges still exist in practice. This is probably why Becker (2000) argues that computers have not transformed teaching practices. These challenges need to be identified so that they are overcome.

2.3 ICT Infrastructural Capacity for Teaching and Learning in the Integration of ICT

Projects

According to the World Bank Institute report of 2009, the backbone of ICT projects in education ties itself to infrastructural facilities that range from hard infrastructure like computer laboratories, computers and electricity and computer hardware, to software infrastructure like local internet connection and computer software.

UNESCO (2010) carried a survey report about ICT projects education in most countries in Africa while Irving and Manroth (2009) reported that most countries surveyed in LDCs have or are in the process of liberalizing their telecommunication policies to enable more competition and diversity of service providers in the industry. While this is the effect of lowering the cost of access to information and telecommunication infrastructure, the cost of connectivity remains unaffordable for most education institutions.
Additionally, there exist huge gaps between urban and rural areas with regards to success of ICT infrastructure. The access to a reliable supply of electricity has been a general problem but is particularly severe in rural areas is because of the difficulty of connecting electrical grids. Therefore, there is a general insufficiency of human resource to provide ICT training and equipment maintenance and therefore a lag exists between the availability of ICT infrastructure and the ability of agrarian societies to integrate it to benefit national development. From this report, ICT projects in schools are majorly depended on three infrastructural facilities that include electricity or power supply, computer laboratories and computers.

2.3.1 The Role of Electricity in ICT Projects Integration by Teachers in Primary Schools

Andiko (2009) reports that it is common knowledge that computers, phones, radios, projectors, televisions and even video players cannot work without power that is in the form of electricity. As stated in the National ICT in education strategy of 2006, about 32% of schools by the end of 2006 in Kenya had some computers but only a small fraction were equipped with basic ICT infrastructure necessary for and learning. The same document estimated that there are about 120-160 students per computer sharing; an abnormal ration as per the World Bank.

The situation was further aggravated by the fact that most schools were reported to use less than 40% of the available ICT infrastructure and furthermore, very few schools were using ICT as an alternative method for the delivery of the education curriculum. Bingimlas, K. (2009) suggested that the parameters to be looked into when accessing the ICT readiness for an institution include: infrastructural availability like electricity, access to infrastructure, manpower availability, policy and regulatory framework. In addition, Kenya has one of the major cited hindrances to ICT integration in schools and that's the lack of electricity power (Kenya Data Profile, 2010).

A report by the World Bank (2010) shows that about 57% of schools in Kenya up to date are still not yet connected to electricity.
According to UNESCO (2010), the public sector has not been immune to this since most offices have limited access to electricity, about 30% of the Kenyans are able to access computers with only 9% coming from rural and remote areas that are greatly and adversely affected by no electricity supply.

According to Hamilton and Paul (2010), frequent electricity interruption has been a hindrance factor in ICT projects in Nigeria and 33 Sub-Saharan Africa where Kenya is included. Regular blackouts are very common in Africa especially in areas where electricity grids are either from a neighboring country or where power is given on rationing terms. A study by “The Connect To Learn Program” (2013) pointed out that as much as electricity grids were laid in most schools in Kenya and Uganda, there was this issue of unreliability whereby power blackouts were very common thus making it difficult for administrators to rely on ICT.

Persistence of failure in accessing electricity has greatly hindered ICT projects implementation and use in Nigeria, Ghana, Uganda and Kenya among other developing countries (BECTA, 2009). Few schools with ICT facilities are unable to use them regularly as expected. Ayere Mildred et al (2010) noted that one of the biggest factors hindering ICT growth in general is the lack of electricity within an indicated figure of about 75% of both primary and secondary schools in Kenya having an alternative source of electrical power that could be from the grid lines or from generators (that are much expensive to acquire and maintain) and 25% of the primary schools have access to electrical power.

Noting that most of the schools are located in rural areas, the Kenyan government attaches situation as a constraint to ICT growth. For example, the Kenyan government in its efforts to neutralize the challenges in Northern Kenya and other arid lands in the country, allocated Ksh.200 million for the installation of solar panels at secondary schools in 2009/2010. A series of studies have been done by scholars like Cassim, K. M. and Obono S. D (2011) on factors influencing ICT implementation
in educational institutions in most parts of the country but not so much has been done in regions like Mombasa County and the Kenya Coastal at large, leaving a gap for this research.

According to Ayere, Odare and Agak (2010), schools in Kenya have tried to adopt the integration of ICT in both classrooms and administrative avenues but have a major challenge lying on a special space for these ICT lessons and computers installation. In their study, only 10 schools out of the 50 primary schools studied in the eastern, central and rift valley regions of Kenya has separate equipped computer laboratories. 6 out of 10 schools fully equipped with a computer laboratory came from private schools. This was found to discourage most of the teachers in adopting ICT in their lessons since they were greatly discouraged in carrying out their lessons in squeezed or low ventilated rooms. These have therefore left a gap that needed to be worked on by this research.

According to Miima Florence, Samson Ondigi and Rose Mavisi (2013), there is a lot that has been researched on, on the role of computer laboratory in any ICT organization especially in the education sector in the marginalized regions including Garrissa, Kwale and Turkana and by extension the Kenyan coastal regions of Tana River and its environs.
2.4 How monitoring and evaluation (M&E) influences ICT integration in public primary schools

Technological advancement has continued to evolve and proliferate and therefore it has been deemed important to incorporate the use of ICTs in classroom instructions. Nevertheless, the introduction of these ICTs in education has been quite costly in terms of up front capital costs which include but are not limited to acquiring infrastructure and the associated recurrent costs.

With constant rise in the implementation and operating costs, there is increased need to develop a Monitoring and Evaluation Framework in order to evaluate effectiveness of ICTs in primary schools. The Framework will help to learn from the previous experiences in order to help the education sector improve the integration of ICTs in education. Furthermore, Monitoring and Evaluation Framework will also help to uphold accountability which is important for various stakeholders who promote ICTs integration. Lastly, the Framework will also aid in monitoring performance indicators in order to keep the implementation and maintenance of ICTs in education checked and on course.

Monitoring and evaluation of ICTs in education. It is vital to monitor the integration of ICTs in Education particularly in the teaching and learning process since these are the pillars of education. Teachers are required to incorporate ICTs in the teaching process while at the same time using the required pedagogies of ICTs in order to effectively pass knowledge to pupils. At the same time pupils are required to effectively use ICTs to participate in the learning process.

Various studies have revealed that the continuous use of ICTs in teaching and learning by both teachers and pupils respectively highly motivates teachers to use various ICT methods and ICT related pedagogies in teaching, while in learning the pupils have become more and more autonomous, resulting to pupils attaining better ICT skills and better learner achievements. Lim and Chai (2008) noted that having skills in using productive software such as word processing, presentation, spreadsheets, PDF readers is also likely to promote use of ICTs in primary schools.
According to Giordano (2007) most of the learning materials are now available on the internet while libraries are increasingly becoming available online. In that case, for educational materials to be effectively harnessed, it is important that learners have the necessary ICT skills. There is need for better strategies to support the management of ICTs integration in teaching and learning which can be effectively done through a Monitoring and Evaluation Framework that has indicators for monitoring the inputs for ICTs integration, the processes carried out in the integration of ICTs, and the outputs, outcomes and impact of integrating ICTs in teaching and learning.

2.4.1 M&E Frameworks for ICT integration in Education

A number of frameworks have been used for monitoring and evaluating the integration of Information and Communication Technology in education and more particularly in the Teaching and Learning process. The New Partnership for Africa's Development (NEPAD) has for some time spearheaded integration of ICT in Africa through the NEPAD e-schools project. In that case CIPP Model (Context, Input, Process and Product) for NEPAD e-School Demonstration Project was developed and adopted to provide a comprehensive monitoring and evaluation of NEPAD e-schools project.

Each aspect in the CIPP Model is used to monitor and evaluate related issues in the integration of ICTs in e-schools. For example, the context aspect of this model requires collection and analysis of needs to determine objectives, set priorities and establish expected outcomes. In that case, in the context of e-schools in the NEPAD region, it was taken that issues such high level of poverty, under-development and marginalization of Africa required radical intervention. As a result, the e-school project was set to be implemented within ten years which was supposed have positive implications on the African society in terms of development. Inputs form another aspect in the CIPP model and they are related to the resources which are required to meet the required goals and objectives. Process on the other hand form the second last aspect of the model and it helps to determine how well the project is being implemented. This helps to understand issues that arise
from implementation process and help in making necessary adjustments. Lastly, the product aspect relates to the required outcomes where by the required needs are divided into subsets that answer the question; how well the planned outcomes are being achieved.

Lim et al., 2012 carried a case study on the pedagogical approaches for ICT integration into primary school English and mathematics in Singapore. The study used learning with and learning from ICT framework in reporting and analyzing how ICTs have been used in teaching mathematics and English.

The framework concentrates on the level of production (pupils’ creation of the digital work) and collaboration level where pupils learn with or from ICTs. The model holds that more passive behaviors such as listening and reading are associated with learning from ICTs while more active behaviors such as writing, creating and updating are associated with learning with ICTs. In addition, the model acknowledges that learning from computers is done through various forms such as computer assisted instructions, computer based instruction and intelligent learning system among others. In respect to learning from computers, a computer is seen as a tutor. Though the framework has been used to monitor and evaluate ICT integration, it fails in the sense that it is not able to determine moderating factors in the implementation process.

The Technological Pedagogical and Content Knowledge (TPACK) framework was formulated by Mishra and Koehler (2006). The framework attributes teachers’ expertise with respect to incorporation of ICTs into learning and teaching activities. It is based on believe that teachers need to integrate three sources of knowledge which are Pedagogical Content Knowledge, Technological Content Knowledge and Technological Pedagogical Knowledge. Moreover, this model considers demographic factors and the effect they have to pre-service teachers in obtaining ICT knowledge and skills.
2.5 Theoretical framework

The researcher based the study in the following two theories.

2.5.1 French and Bell system theory

This study was guided by a theory developed in 2005 by French and Bell systems theory. The theory states that systems view investigates the components of the phenomena, the interaction between the components and the relation of the components to their larger environment.

French and Bell (2005) defined the theory of systems as an organized unitary whole composed of two or more independent parts, components or sub systems and delineated by identifiable boundaries from its environmental supra system.

In application to this study, open systems have inputs from the environment which include energy, information and raw materials. These inputs undergo through a transformation process. This gives out an output. The theory recognizes the interdependence and interrelatedness of the different components of a system in that if there is a desired change in the output then there must be a change in the input.

In this context the school is viewed as a system with inputs like administrative support, provision of ICT infrastructural facilities, adequately teacher’s level of training and a good school ICT policy which are taken through the process of teaching and learning to produce an output of computer literate graduates. As shown in the conceptual framework below.

The open system theory also attempt to explain how, effort and raw material play a key role in the integration of a decisive component in the environment. Open system will help this study in understanding why ICT is facing various challenges in terms of support, availability of materials among other components.
2.5.2 Technological pedagogical content Knowledge (TPCK) model

The study was based on the theoretical formulation of the Technological Pedagogical Content Knowledge (TPCK) model whose aim entails the understanding and negotiating of the relationship among three knowledge components, namely technology, Pedagogy and Content. This model was developed by Koehler and Mishap (2005) for making decisions on integration of ICT that causes the representation of new concepts and requires developing sensitivity to dynamic, transactional relationship between all the three components so as to enhance effective and meaningful teaching and learning process.

TPCK is an acronym for the description of a set of tasks in three key areas of knowledge. TPCK is a framework for teacher knowledge for technology integration. It builds on Shulman's (1986) construct of Pedagogical Content Knowledge (PCK) to include technology knowledge. TPCK framework is a complex interaction among three bodies of knowledge: Content, Pedagogy, and Technology.

2.6 Conceptual Frame work

The TPCK framework focuses on designing and evaluating teacher knowledge that is concentrated on effective student learning in various content areas. Thus, TPCK is a useful frame for thinking about what knowledge teachers must have to integrate technology into teaching and how they might develop this knowledge. Using TPCK as a frame work for measuring teaching knowledge could potentially have an impact on the type of training and professional development experiences that are designed for both pre-service and in-service teachers. The belief that effective technology integration depends on content and pedagogy suggests that teachers’ experience with technology must be specific to different content areas. The Integration of ICT in Public primary schools will form the dependent or observed variables. The integration indicators here include the extent of educational computer use and degree of computer training which are influenced by various independent variables.
Conceptual framework consists of sets of three variables: independent variables, dependent variables and moderating variables. Integration of ICT in Public primary schools forms the dependent or observed variables. The integration indicators here include the extent of educational computer use and degree of computer training which are influenced by various independent variables. The independent variables include school characteristics (such as availability of computer infrastructure, access to internet, leadership and ICT policy), trainer characteristics (such as computer skills, gender, age, motivation and innovativeness,) and government policies (such as policy analysis, availability of funding, educational change and development). However, these factors are moderated by managerial effectiveness.

**Independent Variables**

- **School Characteristics**
  - Hardware
  - Software
  - Maintenance
  - Internet

- **Trainer Characteristics**
  - Skills in ICT,
  - Gender, Age
  - And workload

- **Policy framework**
  - Any policy on integration of ICT in schools

**Dependent Variables**

- **Integration of ICT in schools**
  - Extend of usage of ICT in teaching/learning

- **Government policies**
2.7 Summary of the literature review

Based on the review of literature from various scholars and past researchers collected from secondary sources i.e. textbooks, magazines, internet and journals, it can be noted that there are a number of factors that affect integration of ICT in primary school.

Mutongwa, and Farrell (2007) argue that high costs for acquisition and maintenance of ICT infrastructure is a challenge that has continued to hamper adoption and integration of ICT in schools. Infrastructure is one of the greatest challenges in integration of ICT in school is balancing educational goals with economic realities.

For the case of skills development in ICT and administrative support, most scholars and past studies suggested that to a large extent these two variables positively affected ICT implementation. For example, Farrell, Agaba and Mugisha and Holland were of the view that possessing ICT skills does not warrant use of computers in teaching.

From the review of literature, it is evident that there are a number of studies that have been conducted on infrastructure, teacher training, school ICT policy and administrative support in relation to ICT integration in primary school. However, the context, scope and contribution of the previous studies do not contextually answer the question of factor affecting integration of ICT in public primary school in Mwingi Central. Therefore, there is need to examine the factor affecting integration of ICT in public primary school in Mwingi Central.
2.7 Knowledge Gaps

Researchers across the country have carried out a number of related studies across the country, Kenya. Gode (2013) did an examination on factors influencing integration of information and Communication technologies in public primary teacher Training schools in central region of Kenya.

An examination of the National ICT policy (2006) and National ICT strategy for education and Training revealed that the government recognizes the role of ICT’s in education and development. Kenya education sector support program me (KESSP) (2005-2010) focuses on challenges facing the education sector and gives solutions on how to overcome them. The education options paper discusses the ways in which ICT can support and improve delivery of quality education to Kenyans.

Studies have shown that there is very minimal integration of ICT in teaching and learning in Githunguri sub-county secondary schools. In schools where computers and ICT infrastructure are available, its use is limited to typing exams, analysis of exam results, accessing emails, preparing lesson plans but not for use in teaching to a greater extent. In schools where computer studies as a subject is taught, the focus is for the learners to acquire basic computer skills rather than using the computer as a tool to enhance learning.
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction
This section covers the research design, target population, sample size and sampling techniques, research instruments, instruments validity, instruments reliability, data collection procedure and data analysis technique.

3.2 Research design
This study was adopted a descriptive survey design. Descriptive survey is a method of collecting information by interviewing or administering a questionnaire for a sample of individuals (Orodho 2003).

The descriptive survey was considered appropriate because it narrates facts and characteristics concerning factors affecting ICT implementation. Kothari (2004) maintains that descriptive research studies are concerned with describing the characteristics of a particular individual, or of a group.

Descriptive survey design was appropriate since it enables the researcher get information from those who have practical experience with the problem that is under study.

Further, the survey design will allow the researcher to cover a wide area using representative sample that was generalized to the entire population, which would otherwise be impossible to cover due to its intensiveness. This is in agreement with Krathwohl (1997) who argues that a survey design is used to gather data from a carefully selected sample of a population, all of whom are considered informants, and extrapolate their responses to the population. The versatility of the survey being used in the investigation of problems also prompts the researcher to use it in the current study.
3.3 Target population

A population can be referred to as a complete set of individuals, cases or objects with some common observable characteristics (Mugenda & Mugenda 1999).

Any scientific research targets a given population through which various data collection methods are used so as to get the desired or the required data for analysis (Barton, 2001).

Frankel and Wallen (2000) also indicate that the target population is the larger group to which one hopes to apply the findings.

This study was conducted in Mwingi Central sub-county. The sub county has a total of 22 public primary school administration, 390 teachers and 6,600 pupils (SCDE Mwingi Central, 2017).

3.4 Sample size and sampling procedure

Frankel & Wallen (2000) define sample as any group from which information is obtained or part of a selection of target population. The sample population is that aggregation of data from which the sample is collected (Cohen et al, 2000).

The researcher used random sampling procedure to select five public primary schools in the sub-county. This study employed simple random sampling procedure to arrive at 20% of all teachers and pupils from the purposively public primary schools. This is in accordance to Gay (2010) who observes that at least 20% of a given population is a good representative sample. As such, 73 teachers, 5 administrations and 132 pupils, in Mwingi Central Sub-County. This makes a sample size of 200 respondents. The researcher visited the sampled schools to book appointments with the head teachers, teachers and seek permission to administer a questionnaire to the pupils. This was followed by visits to the schools as per the appointments and administering of the questionnaires. After administering questionnaires in all the sampled schools and receiving the data needed the researcher proceeded to data analysis.
3.5 Research instruments

The main instrument for data collection was questionnaires but interview schedule was also used for administration. A questionnaire is a research instrument that gathers data of a large sample (Kombo & Tromp 2006). Questionnaires are cheap to administer to respondents scattered over a large area and respondents feel free to give frank answers to sensitive questions (Mulusa 1998).

Three sets of questionnaire were developed for the head teacher, the computer education teachers and for pupils. The questionnaires had both closed and open ended questions.

3.6 Instruments validity and reliability

The research instruments were discussed as follows in terms of their reliability and validity.

3.6.1 Instrument validity

As Kombo and Tromp (2006) postulates, validity is the measure of how well a test measures what it is supposed to measure. To enhance content validity, my supervisor evaluated my instrument to ascertain its validity. Then a pilot study was conducted in three randomly selected schools with three head teachers, three ICT education teachers and thirty pupils from three different schools in the neighboring county. This helped the researcher to identify items in the research instrument that are ambiguous and inappropriate so as to improve on validity.
3.6.2 Instrument reliability

Validity refers to the extent to which a research instrument measures what it is designed to measure. There are content (face and sampling validity), construct and predictive validity (Ogula, 1998). To ensure that the instruments are valid, content validity was used. Two experts in the field of research was consulted in order to verify whether the instruments are valid. After the construction of the questionnaires, the researcher reviewed each statement with the help of these experts and assess the extent to which the items are related to the topic at hand. Where there is an agreement among the experts, the instrument was considered to be valid. Modifications was made in the instruments based on the experts” observations.

3.7 Data collection procedure

Data collection is the gathering of pieces of information that are necessary for the research process. This was done through the use of research instruments (Mugenda and Mugenda, 1999). The researcher obtained all the essential documents to facilitate the process of data collection. An introduction letter was obtained from the University to introduce the researcher in the field. The researcher obtained a permit from the national council of science and technology. He then got a clearance from the SCDE Mwingi Central and head teachers so that he can administer the questionnaires in the two educational zones in Mwingi Central Sub-County.

He visited the sampled schools to book appointments with the head teachers, teachers and permission to administer a questionnaire to the pupils. He then visited the schools as per the appointments and administer the questionnaire. After administering questionnaires in all he sampled schools and receiving the data needed he thus proceeded to data analysis.
3.8 Data analysis

According to Mugenda & Mugenda 2003, data analysis is the process of bringing order, structure and meaning to the mass of the information collected.

The collected data was analyzed using quantitative data analysis approaches. Quantitative approach involved descriptive, where simple frequencies and percentages was used. Data from questionnaires was coded with the help of Statistical Package for Social Science (SPSS). The processed data was summarized using tables and figures and presented in frequencies and percentages.

On the other hand, the qualitative data generated from interview guide was categorized in themes in accordance with research objectives and reported in narrative form along with quantitative presentation. The qualitative data was used to reinforce the quantitative data.

3.9 Ethical Considerations

In this study, the rights of the research participants was ensured. This was done based on ensuring that the principles governing research participants was followed.

The principle of voluntary participation which requires that people are not coerced into participating in research was followed. The informed consent of the participants was also ensured by explaining the aim of the study and the procedures involved. The participants’ information was confidential.

Further the principle of anonymity was also adhered to.

The identity of the informants was kept secret and confidential.
### 3.10 Organization of variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicators</th>
<th>Measurement scale</th>
<th>Tools of analysis</th>
<th>Type of statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Characteristics</td>
<td>• Availability Hardware</td>
<td>-Nominal</td>
<td>Central Tendency</td>
<td>Mean, standard deviation, regression and Correlation</td>
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<td>• Availability Software</td>
<td>-Nominal</td>
<td>And dispersion</td>
<td>analysis</td>
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<td></td>
<td>• Availability Maintenance</td>
<td>-Interval</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>• Availability Internet</td>
<td>-Nominal</td>
<td></td>
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<td></td>
<td>• Skills in ICT,</td>
<td>-Nominal</td>
<td></td>
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<td></td>
<td>• Gender, Age</td>
<td>-Nominal</td>
<td></td>
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<td></td>
<td>• And workload</td>
<td>-Interval</td>
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<td></td>
<td>• Any policy on integration of ICT in schools</td>
<td>-Nominal</td>
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<td></td>
<td>• Central Tendency</td>
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<td>• And dispersion</td>
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<tr>
<td>Policy framework</td>
<td>• Any policy on integration of ICT in schools</td>
<td>-Nominal</td>
<td>Central Tendency</td>
<td>Mean, standard deviation, regression and Correlation</td>
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CHAPTER FOUR
DATA ANALYSIS, DISCUSSION AND PRESENTATION

4.1 Introduction

This chapter presents results and discussions of the study. The purpose of the study was to investigate the factors influencing integration of information and communication technologies in public Primary schools in central region of Kenya. The study had three objectives namely to: The study will be guided by the following specific objectives:

To establish how the level teacher training influences integration of ICT education in public primary schools; to determine how infrastructural facilities influences integration of ICT education at public primary schools and to assess how monitoring and evaluation influences ICT integration in public primary schools in Mwingi central sub-county.

4.2 Response Rate

This refers to the percentage of the subjects who responded to the data collection instruments as administered. In this study 200 respondents were sampled. Out of the 200 respondents 162 questionnaires were administered and 12 interviews purposed to be conducted. Of these, 140 questionnaires were returned and eight (8) interviews conducted as summarized in Table 4.1.

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>148</td>
<td>74%</td>
</tr>
<tr>
<td>Non-response</td>
<td>52</td>
<td>26%</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

From Table 4.1, out of the 200 respondents sampled, 148(74%) of the respondents participated in the study which is representative of the target population.
4.3 Demographic Characteristics of the Respondents

This section presents the demographic characteristics of the respondents. The respondents who were involved in the study were teachers and the administrators. The study sought to explore the demographic characteristics of the respondents so as to gather the background information of the people who provided the information. The demographic characteristics that were explored involved: gender, age, academic qualification, department of service and number of years stayed in the current working stations.

4.3.1 Gender of the Respondents

This section presents the gender of the respondents involved in the study. The researcher explored the gender of the teachers and the administrators and presented the findings in figure 4.1.

From figure 4.1, out of 148 respondents 86 (61.43%) teachers were male and 54 (38.57%) were female. On the part of the administrators, a total of 2 (25%) administrators were male and the other 6 (75%) were female. This results were an indication that there were more male than female who teachers while on the part of the administration were, there were more female than male teachers who rose ranks to become administrators.
4.3.2 Age Distribution

The researcher looked at the age distribution of the respondents and presented the findings in figure 4.2.

From figure 4.2, out of 148 respondents 23 (22%) teachers were aged between 31 and 40 years; a total of 84 (56%) teachers were aged between 41 and 50 years and lastly 33 (22%) teachers were over 50 years of age. On the part of the administrators, 3 (37.5%) administrators were aged between 31 and 40 years, another 3 (37.5%) administrators were aged between 41 and 50 years and lastly 2 (25%) administrators were over 50 years of age. From this findings none of the teachers or administrators were below the ages of 31 years.
4.3.3 Academic Qualification

The study explored the highest academic qualification achieved by the teachers. Knowing the highest level of academic of a person is an indicator of a person level of academic knowledge and consequently ability to understand new aspects and integrate them. Figure 4.3 shows the findings.

![Figure 4.3: Academic qualification of teachers](image)

From figure 4.3, out of 140 respondents 12 (8.57%) teachers were degree holders, a total of 80 (57.14%) teachers were certificate holders, another 41 (29.29%) teachers were diploma holders and 7 (5.00%) teachers were master’s holders. From this findings all the teachers had acquired some form of professional qualification and could therefore understand and integrate ICT in their work.
Table 4.2: Time spent using computers

From Table 4.2, out of 140 respondents, 45(32.14%) teachers had taken less than 2 years with computers, 40(28.57%) had taken between 2 and 4 years with computers, 31(22.14%) teachers had taken between 4 and 6 years with computers while 23(16.91%) teachers had taken more than 6 years with computers. This findings show that most of the teachers had taken less than 4 years with computers. Thus the teachers had little exposure with computers and computer related technologies.

<table>
<thead>
<tr>
<th>Time spent using computers</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 years</td>
<td>45</td>
<td>32.14</td>
</tr>
<tr>
<td>2 to 4 years</td>
<td>40</td>
<td>28.57</td>
</tr>
<tr>
<td>4 to 6 years</td>
<td>31</td>
<td>22.14</td>
</tr>
<tr>
<td>More than 6 years</td>
<td>23</td>
<td>17.14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

To confirm what was reported by the teachers, the study sought to know from the administrators what the teachers used computers for and presented the findings in Table 4.3.

Table 4.3 Use of computers

<table>
<thead>
<tr>
<th>Use of computers</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>3</td>
<td>37.5%</td>
</tr>
<tr>
<td>Preparation of learning content</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Teaching</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Typing examinations</td>
<td>1</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

From Table 4.3, out of 8 respondents, 3 (37.5%) administrators revealed that computers were used for research, 2(25%) administrators revealed that computers were used for preparation of learning content, 2(25%) administrators revealed that computers are used for teaching whereas 1(12.5%) administrator revealed computers are used for typing examinations. This findings show that computers were put into purposeful use.
On the same breath the researcher went further to explore the certificate to which the teachers used the internet or other internet related technologies during the teaching and learning process and presented the findings in Table 4.4.

4.3.5 Duration of stay in the current station

The study explored the duration of stay in the current stations of the teachers and presented the findings in Table 4.4. Knowing the duration of stay in a current station is a good indicator in explaining the time spent in a station so as to effectively observe how ICT was integrated in the system.

<table>
<thead>
<tr>
<th>Duration of stay in current station</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 Years</td>
<td>44</td>
<td>29.73</td>
</tr>
<tr>
<td>6-10 Years</td>
<td>56</td>
<td>38.84</td>
</tr>
<tr>
<td>11-15 Years</td>
<td>18</td>
<td>12.16</td>
</tr>
<tr>
<td>16-20 Years</td>
<td>12</td>
<td>8.11</td>
</tr>
<tr>
<td>Over 20 Years</td>
<td>18</td>
<td>12.16</td>
</tr>
<tr>
<td>Total</td>
<td>148</td>
<td>100%</td>
</tr>
</tbody>
</table>

From Table 4.4, out of the 148 respondents, 44 (29.73%) had stayed in their current stations for a period between 1 and 5 years, 56 (38.84%) teachers had stayed in their current stations for periods ranging between 6 and 10 years, 18 (12.16%) teachers had spent between 11 and 15 years in their current stations, 12 (8.11%) teachers had spent between 16 and 20 years in their current stations and lastly 18 (12.16%) teachers had spent over 20 years in their current stations.
4.4 Examine the Extent to which Primary schools have Integrated ICT in Teaching and Learning

The first objective of the study explored the extent to which Primary schools have integrated ICT in teaching and learning. The researcher began by asking the teachers whether they individually had made use to ICT in the process of teaching and learning. Table 4.5 shows the findings of the study.

<table>
<thead>
<tr>
<th>Do individual teacher integrate ICT in process of learning and teaching</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53</td>
<td>37.86%</td>
</tr>
<tr>
<td>No</td>
<td>87</td>
<td>62.14%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

From Table 4.5, out of the 140 teachers trainers that were involved in the study 53 (37.86%) agreed that they integrate ICT in the process of teaching and learning while the other 87 (62.14%) teachers reported that they did not integrate ICT in the process of teaching learning.

These results bring out the fact that an 87.86% of teachers did not make use of computers to aid the teaching/learning process.

Further the researcher sought to know from the individual teachers if they had access to computers.

**Table 4.6 shows the findings**

<table>
<thead>
<tr>
<th>Do individual teachers have access to Computers.</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>47</td>
<td>33.73%</td>
</tr>
<tr>
<td>No</td>
<td>93</td>
<td>66.43%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

From Table 4.6, out of the 140 teachers involved in the study 47 (33.75%) agreed that they had access to computers while the other 93 (66.43%) did not have access to computers. These results
collaborates the opinion of the administrators that a large number of teachers did not have access to computers to aid the teaching/learning process.

Having established that a large proportion of teachers did not have access to computers, the researcher sought to know the reason why they did not have access to computers.

Table 4.7 shows the reasons

<table>
<thead>
<tr>
<th>Inadequate computers in the laboratory</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of personal computers</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Computers</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>Too much responsibilities outside classroom</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Out of the 5 administrators who said that teachers did not access computers, 3 (60%) administrators gave inadequacy of computers as the reason why the teachers did not access computers, 1 (20%) administrator said it was because of lack of personal computers that the teachers did not access computers and another 1 (20%) administrator said that it was because of responsibilities outside classrooms that the administrators did not access computers.

Having established that the teachers did not have access to computers, the study sought to know whether the teachers had access to the internet and presented the findings in Figure 4.4.
Figure 4.4: Access to internet

From Figure 4.4, out of 8 respondents 3 (37.5%) administrators and out of 140 respondents 26 (18.57%) teachers reported that the teachers had access to the internet. Whereas 5 (62.5%) administrators and 114 (81.43%) teachers reported that teachers did not have access to the internet. This results imply that teachers did not have access to the internet and it was probably because of the fact that they did not have access to computers as presented in table 4.6.

The researcher explored the reason why the teachers did not have full access to the internet and presented the findings in Table 4.8.

Table 4.8: Reason for teachers not accessing internet

<table>
<thead>
<tr>
<th>Reason for teachers not accessing internet</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate computes in the school laboratory</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Poor network coverage</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>High internet cost</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.8, out of 8 respondents, 5 administrators who were of the opinion that teachers were not accessing internet, 3 (60%) gave the reason of inadequate computers in the computer laboratories, 1 (20%) administrator gave the reason as poor network coverage and 1 (20%) administrator gave reason as high internet cost was the reason why the teachers did not access internet every day.

The researcher sought to know the level of expertise among the teachers in computers and presented the findings in figure 4.5.
From figure 4.5, out of 8 respondents 3 (37.5%) administrators reported that the level of expertise of the teachers was very good, 1 (12.5%) administrator reported that the expertise of the teachers was average, 2 (25%) administrators said that the expertise of the teachers was below average while other 2 (25%) administrators did not know the level of expertise in ICT among the teachers in their schools. These findings show that to a large extent, the administrators were of the opinion that the teachers in their schools were either average or below average when it came to handling computers.

The study also explored the opinion of the teachers on their level of skills in computer and presented the findings in Table 4.9.
Table 4.9: Computer skills of the teachers

<table>
<thead>
<tr>
<th>Computer skills of the teachers</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No skills at all</td>
<td>9</td>
<td>6.43%</td>
</tr>
<tr>
<td>Fair</td>
<td>72</td>
<td>51.43%</td>
</tr>
<tr>
<td>Good</td>
<td>46</td>
<td>32.85%</td>
</tr>
<tr>
<td>Very good</td>
<td>9</td>
<td>6.43%</td>
</tr>
<tr>
<td>Excellent</td>
<td>4</td>
<td>2.86%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

From table 4.9, out of 140 respondents 9 (6.43%) teachers revealed that they did not have any skills in computer, 72 (51.43%) teachers rated their computer skills as fair, 46 (32.85%) teachers rated their skills as good, 9 (6.43%) teachers rated their skills as very good and whereas 4 (2.86%) teachers rated their skills as excellent. From these findings majority of the teachers rated their skills in computer as fair. This findings concur with those of the administrators who revealed that the teachers in their schools were either average or below average when it came to handling computers.

Further, the researcher wanted to know from the teachers trainers where they accessed the internet related technologies and presented the findings in table 4.9.

Table 4.10: ICT training

<table>
<thead>
<tr>
<th>Have you ever been trained on ICT</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>22</td>
<td>15.71%</td>
</tr>
<tr>
<td>No</td>
<td>118</td>
<td>84.29%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
From Table 4.10, out of 140 respondents, 22 (15.71%) teachers had some training on ICT whereas 118 (84.29%) teachers did not have any training on ICT. These findings bring out the fact that though most teachers had access to computers as presented in Figure 4.7, they did not have training on computers.

To confirm what was revealed by teachers, the researcher had an item on the administrators’ interview schedule on ICT training for the teachers and presented their findings in Figure 4.6.

![Figure 4.6: ICT training for the teachers](image)

**Figure 4.6: ICT training for the teachers**

According to figure 4.6, out of 8 respondents, 3 (37.5%) administrators reported that the teachers had ICT training whereas 5 (62.5%) administrators reported that the teachers did not have ICT training. Thus the findings concurs with what was revealed by the teachers and `presented in table 4.11 that most teachers did not have ICT training.
Table 4.11: Reasons for lack of training

<table>
<thead>
<tr>
<th>Reasons for lack of training</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of funds by the administration</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Lack of interest by the teachers</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td>Lack of mobilization by the management</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 4.11 shows the opinion of 5 administrators who reported that teachers did not get any ICT training. Lack of funds was the main reason why the teachers could not get regular training on ICT. This was according to 3(60%) administrators. It was mentioned by 2(40%) administrators that the teachers lacked interest in ICT and for that reason did not get training on ICT. Lastly 1(20%) teacher trainer reported that it was due to lack of mobilization by the management that teachers did not get training in ICT.

The findings of this study show that a large number of teachers did not have access to computers to aid the teaching/learning process and this consequently imply that teachers did not have access to the internet due to poor network coverage. This is why Tondeur, et.al (2008) in Buabeng-Andoh (2012) note that access to hardware is not only important but also the use of suitable kind of tools and program to support teaching and learning. That the teachers in their schools were either average or below average when it came to handling computers, hence had little exposure with computers and computer related technologies. Given that curriculum delivery was mostly done in classrooms one would be justified to say that computer related technologies were to a large extent not aiding curriculum delivery in the primary schools. The findings of this study concurs with Selwyn (2007) ’s study on factors influencing integration of ICT In Higher Education in Vietnam which showed that there was a disappointingly slow uptake of ICT in education even
though high investments were put in place in improving access to technologies and improving skills of teachers whereas Becker (2000) observes that computers have not transformed teaching practices.

4.5.2 Training of Personnel on ICT

The study explored the influence of training of personnel on integration of ICT. Figure 4.7 shows the response of the teachers.

![Pie chart showing response of teachers](chart.png)
4.5.3 Adequacy of Computer Software in the School

The study explored how adequacy of computer software in the schools affected the adoption of ICT in the process of teaching and learning ICT and presented the views of the teachers as shown in Figure 4.8.

![Figure 4.8: Influence of adequacy of computer software on integration of ICT](image)

From figure 4.8, out of 140 respondents, 31(22.14%) teachers reported that adequacy of computer software influenced adoption of ICT in the schools to a very large extent, 37(26.43%) teachers reported that adequacy of computer software influenced adoption of ICT in primary schools to a large extent, 29(20.71%) teachers reported that adequacy of computer software influenced adoption of ICT in primary schools to a moderate extent, 25(17.86%) teachers reported that adequacy of computer software influenced adoption of ICT in primary schools to a low extent whereas 18(12.86%) teacher trainer were of the opinion that adequacy of computer software influenced adoption of ICT in public primary schools to a very low extent. Judging with the majority response we conclude that adequacy of computer software influenced adoption of ICT to a large extent.
From the interviews, out of 8 respondents, 6 (75%) of the administrators commented on the lack of subject specific software or even other specialized software as a hindering factor in the integration of ICT into the curriculum. Further, they said that most of the software that was adopted was the basic computer packages such as Microsoft word and excel. This did not enhance the importance of computers in ensuring that tasks are made simple. One of the administrators put it that: “Presently because of lack of appropriate software the integration of ICT into curriculum is not effective."
4.5.6 Adequacy of Internet Connectivity in the School

The study explored the influence of adequacy of internet connectivity in the school on adoption of ICT in the teaching and learning process and presented the findings in Figure 4.9.

![Figure 4.9: Influence of internet connection on integration of ICT](image)

From figure 4.9, out of 140 respondents, 36 (25.71%) teachers reported that adequacy of internet connection influenced adoption of ICT in the schools to a very large extent, 33 (23.57%) teachers reported that adequacy of internet connection influenced adoption of ICT in primary schools to a large extent, 37 (26.43%) teachers reported that adequacy of internet connection influenced adoption of ICT in primary schools to a moderate extent, 23 (16.43%) teachers reported that adequacy of internet connection influenced adoption of ICT in primary schools to a low extent whereas 11 (7.86%) teacher trainer were of the opinion that adequacy of internet connection influenced adoption of ICT in primary schools to a very low extent. Judging with the majority response we conclude that adequacy of internet connection influenced adoption of ICT to a large extent.

One the same note, 2 (25%) administrators reported the lack of access to the Internet was not a problem during the study, the rest in negligible were of the opinion that lack of internet was a big
challenge in the integration of ICT in management. During the interviews one of the administrators commented: “We share one broadband modem for the whole school, and the bandwidth it has is very small”. Another administrator said that lack of Internet connectivity was a problem: “There are few computers here and we do not have internet, evidently the Internet is only accessed by the school head and the computer labs. Even though the head teachers office and the laboratory are connected to the internet it is of limited bandwidth and consequently very slow”.

Further, the researcher wanted to know to what extent does monitoring and evaluation influence ICT integration and presented the findings in table 4.12.
Table 4.12: To what extent does monitoring and evaluation influence ICT integration

<table>
<thead>
<tr>
<th>To what extent does monitoring and evaluation influence ICT integration</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>5</td>
<td>35.7</td>
</tr>
<tr>
<td>Fair</td>
<td>65</td>
<td>46.43</td>
</tr>
<tr>
<td>Good</td>
<td>60</td>
<td>42.86</td>
</tr>
<tr>
<td>Very good</td>
<td>8</td>
<td>5.71</td>
</tr>
<tr>
<td>Excellent</td>
<td>2</td>
<td>1.43</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

From table 4.12, shows 140 respondents gave their views on the extent to which monitoring and evaluation has contributed to ICT integration. 5 (35.7%) of respondents revealed it influenced poorly, 65 (46.43%) rated it fairly, 60 (42.86%) asserted it was good, 8 (5.71%) insisted it was very good and whereas 2 (1.43%) claimed it was excellent. From these findings majority of the respondents rated the extent of monitoring and evaluation influence on ICT integration as fair.
5.1 Introduction

This chapter presents the summary of study findings and their conclusions. This chapter also draws recommendations from the study findings and further presents suggestion for further study.

5.2 Summary of findings

This subsection presents a summary of the research findings. This subsection is Subdivided into three parts each representing findings from each objective.

5.1.1 Extent to which Primary schools have Integrated ICT in Teaching and Learning

The study established that the primary schools had integrated ICT in teaching and learning process to a small extent. This was because 71 (50.76%) teachers said they never used computers or their accessories in teaching and learning and that 14 (10%) teachers used computers and their accessories once a year in the teaching and learning processes. This meant that a proportion of 62.14% of the teachers had either never used ICT in the teaching and learning process or used it once a year in the teaching and learning process.

The study also found that the teachers were not using the ICT in the teaching and learning process. Out of 140 respondents, 87 (62.14%) teachers said they not used ICT in teaching and learning. This showed that more than half of the teachers were not using the ICT in developing the curriculum content.

The reason why the teachers hardly integrated ICT in the teaching and learning process was because they had not received training on ICT. Out of 140 respondents, 118 (84.29%) teachers said that they had never been given any training on ICT.

The study also found that the classrooms had not been endowed with ICT equipment to aid process of teaching and learning. For instance out of the 136 teachers who used the computer and related technologies, only 16 (11.43%) used them in the classrooms. Given that the classroom is the place
where a lot of the teaching and learning process takes place, it can be established that ICT was not well incorporated in the delivery of the curriculum in classrooms. This is collaborated well by administration perspective which showed that only 12.5% use computers and related technologies during teaching and learning process. The study shows that extent of integration of ICT in the process of teaching and learning is about 37%, since 62.14% by gender and 62.86 by age reported that they had not adopted the use of ICT in the process of teaching and learning.

5.1.2 Factors Influencing Integration of ICT in Primary Public primary Teacher Schools

The study found that adequacy of internet connectivity influenced adoption of ICT. A total of 36 (25.71%) teachers reported that adequacy of internet connection influenced adoption of ICT in the schools to a very large extent whereas 33 (23.57%) teachers reported that adequacy of internet connection influenced adoption of ICT in primary schools to a large extent.

The study also found that adequacy of computer hardware also influenced adoption of ICT in the primary schools. A total of 25 (17.86%) teachers reported that that adequacy of computer hardware influenced adoption of ICT in the schools to a very large extent whereas 34 (24.29%) teachers reported that adequacy of computer hardware influenced adoption of ICT in primary schools to a large extent.

The study further found that adequacy of computer software influenced adoption of ICT in the process of teaching and learning. A total of 31 (22.14%) teachers reported that that adequacy of computer software influenced adoption of ICT in the schools to a very large extent and 37 (26.43%) teachers reported that adequacy of computer software influenced adoption of ICT in primary schools to a large extent. Software in use should go beyond the basic computer packages and include more specialized computer packages for delivering subject specific content.

The study also found that training of personnel on ICT influenced adoption of ICT. A total of 34 (24.29%) teachers reported that the ICT training influenced adoption of ICT in the schools to a very large extent whereas 39 (27.86%) teachers reported that ICT training influenced adoption of ICT in
primary schools to a large extent. The administrators reported that training on ICT addresses technophobia which causes teachers to fail to take up tasks that require integration of ICT.

The study also found that maintenance of ICT infrastructure influenced adoption of ICT infrastructure in the schools. A total of 11(7.56%) teachers reported that availability of computer maintenance influenced adoption of ICT in the schools to a very large extent whereas 41(29.29%) teachers reported that availability of computer maintenance influenced adoption of ICT in primary schools to a large extent. The administrators observed that maintenance keeps computers from breaking down and prevents virus ensuring that computers work properly.

It was also found that monitoring and evaluation is so vital in that it helps to determine how well the project is being implemented. This helps to understand issues that arise from implementation process and help in making necessary adjustments.
5.3 Conclusion

The main question that this study endeavored to seek for an answer was factors influencing integration of information communication technologies in public Primary schools in Central Region of Kenya.

Based on the findings of the study, the following conclusions were made:

i) A large number of teachers did not have access to computers to aid the teaching/learning process and this consequently imply that teachers did not have access to the internet which means that integration is influenced to a large extent by inaccessibility of requisite ICT infrastructure.

ii. That the teachers in their schools were either average or below average when it came to handling computers, hence had little exposure with computers and computer related technologies.

iii. Given that curriculum delivery was mostly done in classrooms one would be justified to say that computer related technologies were to a large extent not aiding curriculum delivery in the primary schools and therefore trainees also lacked that exposure on integration.

iv. There were a myriad of challenges which influence integration of these technologies such as; inadequate computers in the school, high work load for the teachers and lack of interest among teachers which prevented them from integrating ICT in teaching and learning process.

Thus, posing a challenge in the integration process.

v. There was also lack of training opportunities for the staff on how to integrate ICT in the process of teaching and learning which influence a great deal the process of integrating ICT in the process of teaching and learning.

viii. Adequacy of computer hardware and software influenced adoption of ICT in the process of teaching and learning. The use of software should go beyond the use of basic computer packages such as word to the adoption of more specialized computer packages for delivering subject specific content.
5.4 Recommendations

Based on the findings, the study recommends that;

i. Primary schools should develop strategies to identify strengths and weakness of various technological resources with a view to adopting ICT in the process of teaching and learning.

ii. Primary schools should develop and an evaluation framework to help in determining level of adoption of ICT in the process of teaching and learning.

iii. Primary schools should source for partners, well-wishers, stakeholders and sponsors to finance the acquisition of more ICT infrastructure. This will ensure that the adequacy of computer in the schools so as to improve their use in the process of teaching and learning.

iv. Primary schools should lessen the workload of teacher so as to enable them find time to learn and integrate ICT in the process of teaching and learning. Adoption of ICT in the process of teaching and learning would also go a long way in ensuring that the workload of teachers is lessened.

v. Primary schools should provide teachers with regular trainings and seminars on how to adopt ICT in the teaching and learning process. The Primary schools should ensure that they provide refresher training on regular basis.

vi. Primary schools should adopt policies that guide structured integration of ICT in the process of teaching and learning. One of the policies that can be adopted can be adoption of appraisal practices that reward teachers who endeavor to use ICT in the teaching and learning process in addition to outlining ICT competency standards for the teachers.
5.5 Suggestions for further study

i. The study suggests that future researcher should conduct the same study in other areas more so in the Western or North Eastern part of Kenya so as to compare with this study which was conducted in the central part of Kenya.

ii. The study suggests that a similar study should be conducted in future in the same area so as to assess whether there has been any improvement on the challenges affecting the adoption of ICT infrastructure in the teaching and learning process.

iii. The study suggests that in future a similar research should be done incorporating the views of the students so as to make the study more inclusive.
REFERENCES


APPENDICES

Appendix I: Permission Letter

Paul M. Kinyali
P.O Box 1-90400
Mwingi.
Mobile: 0728 965 838
E-mail: kinyalimutemi015@gmail.com

I am a student at Nairobi University. As part of the requirement for the award a post graduate Diploma in education, I am conducting a research for my project on “Factors Influencing Integration of Information and Communication Technologies (ICTs) in Public Primary Teachers’ Training Colleges in Mwingi central Sub-County”

You have been selected to participate in this study. Kindly assist me in getting the required data by completing the questionnaire and interview schedule attached. This research is for academic purpose only and thus the information given will be treated with utmost confidence. The results of the study can be availed to you if you so wish. You are requested to give your responses as honestly as possible.

Thank you.

Yours faithfully,

[Signature]

Paul M. Kinyali
Appendix II: Teachers’ Questionnaire

The purpose of this questionnaire is to find out factors institutional factors influencing integration of ICT in primary schools. Please complete each section as instructed. All information provided will be highly confidential.

PART A: Teachers’ Biographical Data

Please tick your chosen response where appropriate

1. Gender: Male [ ] Female [ ]

2. Age:   a) 20 - 30 years [ ]   b) 31-40 years [ ]   c) 41 - 50 years [ ]   d) Over 50 years [ ]

3. What is your highest academic qualification?

PhD [ ]    Master [ ]    Degree [ ]    Diploma [ ]    Certificate [ ]    others (specify) _________

4. Which department do you belong to? _______________________________

5. For how long have you taught in the department?

Less than 1 years [ ] 1 – 5 years [ ] 6 – 10 years [ ] 11 – 15 years [ ] 16 – 20 years [ ] 21 years & above [ ]
PART B: Integration of ICT

6. How can you rate the level of computer usage in your normal teaching?

Excellent [ ] Very Good [ ] Good [ ] Neutral [ ] Poor [ ] Very poor [ ]

7. a) Do you use computer and related technologies in process of teaching?

Yes [ ] No [ ]

b) For how long have you been using a computer and related technologies?

Less than 2 years [ ] Less than 6 years [ ] More than 2 years [ ] More than 6 years [ ]

Others? (Specify) ______________

8. a) Does your school have computers?

Yes [ ] No [ ]

b) If yes in (8) above, are the computers adequate for pupil learning

Adequate [ ] Somehow adequate [ ] Inadequate [ ] Somehow inadequate [ ]

9. Do the computers have internet connectivity?

Yes [ ] No [ ]

10. Does your school have computers in the classroom?

Yes [ ] No [ ]
11. a) How often do you use computers and accessories in preparation for teaching and learning?

<table>
<thead>
<tr>
<th>Every Time</th>
<th>Once a Week</th>
<th>Once a Month</th>
<th>Once a Year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b) How often do you use internet in preparation for teaching and learning?

<table>
<thead>
<tr>
<th>Every Time</th>
<th>Once a Week</th>
<th>Once a Month</th>
<th>Once a Year</th>
<th>Never</th>
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12. Where do you access the usage of computers? (tick all that apply)

- Departmental office [ ]
- Staffroom [ ]
- Classroom [ ]
- Computer lab [ ]
- Library [ ]
- Others (specify) ______

13. How would you rate your skill level in usage of computers?

- No skill at all [ ]
- Fair [ ]
- Good [ ]
- Very good [ ]
- Excellent [ ]

14. Give a reason for the skill level chosen in (13).
15. Apart from computers, which other ICT equipment do you use for teaching and learning process?

   Yes    No

i. Radio [ ] [ ]

ii. Television [ ] [ ]

iii. Video recordings [ ] [ ]

iv. Digital camera [ ] [ ]

v. Any other (specify) ______________

Appendix III: Pupils’ Questionnaire

The purpose of this questionnaire is to find out factors institutional factors influencing integration of ICT in primary schools. Please complete each section as instructed. All information provided will be highly confidential.

PART A: Pupils’ Biographical Data

Please tick your chosen response where appropriate

1. Gender: Male [ ] Female [ ]
2. Age: a) 20 - 30 years [ ] b) 31-40 years [ ] c) 41 - 50 years [ ] d) Over 50 years [ ]

3. What is your highest academic qualification? B

4. Which grade/class do you belong to? ________________________________

PART B: Integration of ICT

5. What is the level of your skill in the use of ICT in learning?

No skill at all [ ] Fair [ ] Good [ ] Very good [ ] Excellent [ ]

6. a) Do you use computer and related technologies in process of learning?

Yes [ ] No [ ]

b) For how long have you been using a computer and related technologies?

Less than 2 years [ ] Less than 6 years [ ] More than 2 years [ ] More than 6 years [ ]

Others? (Specify) ____________

7. a) Does your school have computer laboratories?

Yes [ ] No [ ]

b) If yes in (8) above, what is the ratio of computer to pupils (computer: pupil(s) in your school?

e.g. 1:1

__________

8. Do the computers have internet connectivity?
9. Does your school have computers in the classroom?

Yes [ ]  No [ ]

10. a) How often do your teachers use computers and accessories for teaching you?

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<th>Every Time</th>
<th>Once a Week</th>
<th>Once a Month</th>
<th>Once a Year</th>
<th>Never</th>
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</table>

11. Where do you access the usage of computers? (Tick all that apply)

Departmental office [ ] Staffroom [ ] Classroom [ ] Computer lab [ ] Library [ ] others (specify) 
________________________

12. Apart from computers, which other ICT equipment do you use in learning process?

<table>
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<tr>
<th>Yes</th>
<th>No</th>
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</table>

i. Radio [ ] [ ]

ii. Television [ ] [ ]

iii. Video recordings [ ] [ ]
iv. Digital camera  [  ]  [  ]

v. Any other (specify)  ______________
Appendix IV: Interview Schedule for Administrators

The purpose of this interview is to find out factors influencing integration of ICT in the process of teaching and learning. Please complete each section as instructed. All information provided will be highly confidential.

1. Gender: Male [ ] Female [ ]

2. Age:
   a) 20 - 30 years [ ] b) 31-40 years [ ] d) 41 - 50 years [ ] d) Over 50 years [ ]

3. Do individual pupils have access to computers? ____________________

4. If yes in (3) above, how many hours a week would an individual pupils have to work with a computer?
   ____________________

5. If no in (4) above, why don’t the pupils have access to a computer?
   ____________________

6. Do you have internet connectivity in the school? ____________________

7. If yes in (6) above, how many hours a week would an individual pupil have to internet?
   ____________________

8. If no in (6) above, why don’t the pupils have access to internet?
   ____________________

9. How many hours a week would the computers be idle? ________________
10. Why would the computers not be in use during this time?

i. ____________________________________________________________

ii. ____________________________________________________________

iii. ____________________________________________________________

11. Averagely what is the level of expertise of the pupil in use of ICT equipment?

____________________________________________________________

12. What are some of the tasks the individual pupils use computers for?

i. ____________________________________________________________

ii. ____________________________________________________________

iii. ____________________________________________________________

13. Has there been any form of ICT training for the teachers in the last three years?

____________________________________________________________

14. If yes in (13) above, how many times? __________________________

15. If no in (13) above, please give a reason(s)

i. ____________________________________________________________

iii. ____________________________________________________________
16. Apart from computers, which other ICT equipment do the teachers use in the teaching/learning process?

i.  

ii.  

iii.  

17. Do your administration monitor and evaluate the use of ICT in teaching and learning process?

____________________________________________________________

18. List these some ways in which the administration monitor and evaluate the use of ICT in teaching and learning process?

i.  

ii.  

iii.  

19. In your opinion, what skills do you think teachers should have to enable them integrate ICT in teaching and learning process?

i.  

ii.  

iii.  

iv.  

20. Does your office face any infrastructural challenges on integration of ICT in teaching and learning process? ____________________________________________

21. If yes in (20) above, please list them.

   i.   ___________________________________________________________
   ii.  ___________________________________________________________
   iii. ___________________________________________________________
   iv.  ___________________________________________________________

22. In your opinion what are some of the policy interventions that can be put in place to increase the usage of ICT in process of teaching and learning?

   i.   ___________________________________________________________
   ii.  ___________________________________________________________
   iii. ___________________________________________________________
   iv.  ___________________________________________________________

23. Generally, how can school teacher overcome the current infrastructural factors influencing the usage of ICT in teaching and learning?

   i.   ___________________________________________________________
   ii.  ___________________________________________________________
   iii. ___________________________________________________________