TEACHERS’ PERCEPTIONS ON THE USE OF INFORMATION COMMUNICATION TECHNOLOGY IN THE ADMINISTRATION OF PUBLIC SECONDARY SCHOOLS IN KIMILILI DISTRICT, BUNGOMA COUNTY, KENYA

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SEPTEMBER 2013
DECLARATION

This thesis is my original work and has not been presented in any other college or university for award of a degree. All information obtained from other sources has been acknowledged.

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This research thesis is dedicated to my beloved family, my husband George Namwoso, children Lynn, June and Olive.
ABSTRACT

The purpose of this study was to ascertain the perceptions of teachers on the use of Information Communications Technology in the administration of public secondary schools in Kimilili District, Bungoma County, Kenya. The study sought to answer research questions on the perceptions of teachers regarding the level of availability of ICT facilities, the extent of use of ICT, effects of using ICT in administration and strategies that could be used to improve the use of ICT in the administration of public secondary schools. The study intended to benefit the government, teachers, parents and all relevant stakeholders in the education sector. Literature related to the subject under study was reviewed accordingly. The study was guided by the Diffusion of Innovations Theory. The target population was all the twenty-five public secondary schools, 344 teachers in Kimilili District. The researcher adopted a mixed method research paradigm where cross-sectional survey and phenomenology were used. Both probability and non-probability sampling procedures were used to select the sample which comprised twelve public secondary schools selected through stratified sampling. Head teachers were purposively selected while teachers were selected through stratified and simple random sampling. The respondents included 12 head teachers and 160 teachers. The research instruments used in the study included questionnaires for teachers, interview guide for head teachers, observation guide and document analysis guide. Quantitative data obtained was summarized for computer analysis using Statistical Package for Social Sciences (SPSS) Version 20.0 using descriptive statistics such as mean, standard deviation frequencies and percentages and presented in tables and graphs. Qualitative data was presented in narrative form. The findings of the study revealed that basic ICT hardware and software are available in most schools but they are entirely not adequate for use in performing administrative tasks. Even though the teachers were willing to fully embrace ICT in administration, its use in administration was limited to very few administrative tasks due to inadequacy of hardware or absence of relevant software. Strategies on how to improve the use of ICT in the school administration have been suggested. Recommendations on issues relating to ICT infrastructure and use have been given. Finally, a number of areas have been suggested for further research.
ACKNOWLEDGEMENTS

I am greatly indebted to my supervisors, Sr. Dr. Jacinta M. Adhiambo and Dr. Elizabeth Ngumbi for their academic guidance during the entire process of thesis writing. The successful completion of this thesis would not have been possible without their overwhelming support. Special thanks to all my lectures and staff in the department of Post Graduate Studies who supported me throughout the course.

I sincerely thank my beloved family for encouraging and motivating me during my studies. I exceptionally owe gratitude to my parents and siblings for tirelessly cheering me on. To George, Lynn, June and Olive; you are awesome people. Thank you for believing in me.

Finally, I acknowledge the support of my classmates; Julius, Dorothy, Keziah, Sr. Margret, Parenice and all participants who made it possible for me to successfully complete this thesis. Special thanks to the staff at Kimilili District Office and Kimilili Constituency Development Fund for availing information that supported my thesis writing. May God bless them abundantly.
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<td>CDF</td>
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<td>DSAID</td>
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<td>EFA</td>
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<td>KESSP</td>
<td>Kenya Education Sector Support Programme</td>
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<td>SAGA</td>
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CHAPTER ONE

INTRODUCTION

1.1 Background to the Problem

Information and Communication Technology (ICT) has become an important driver of everyday life and economic activity in the present world. The on-going technology revolution encompasses new ways of capturing, processing, storing and displaying information and is capable of increasing productivity and competitiveness through information provision (Mangesi, 2010). The importance of ICT is widely recognized both in the workplace and at home (Preston & Cox, 2000). More so, ICT has been affiliated with the ability to integrate world economies and its role in the effectiveness, efficiency and service delivery of any institution is undoubtedly vital. ICT has also contributed greatly to educational management in schools worldwide (Zhao & Frank, 2003). According to Maki (2008), ICT plays a vital role in supporting powerful efficient management and administration in the education sector and it is specified that technology can be used right from student administration to various resource administrations in an educational institution.

Developing countries particularly in Africa are expanding their educational systems at all levels making learning institutions to become more complex and multi-dimensional. The rapid expansion has brought about greater demands on educational practitioners such as: curriculum planners, evaluators and teachers in their bid to move along with the information technology of the 21st century. A head teacher of a public secondary school in Kenya has numerous roles which include: organization and management of the school curriculum, management of school finances, management and motivation of the human resource in the school, management and maintenance of school equipment and also, is a secretary to the Board of Governors and the Parents' Teachers'
Association (Teachers’ Service Commission, 2007). These responsibilities are quite enormous in detail, which calls for delegation of duties to other teachers in the school. By doing so, there is need for proper coordination for the achievement of educational objectives.

Furthermore, the increased enrolment in public schools through Free Primary Education and Affordable Secondary Education Initiatives has led to increased workload for teachers as attested by the Global e-Schools and Communities Initiatives (GeSCI, 2009). This increase in enrolment and subsequent increase in workload is bound to make administrative tasks more complex and tedious. In view of this, there is need for school administrators to revise their tools of work in order to improve teaching and learning processes as well as the management and administration of schools. Use of ICT in schools can improve the quality of education, expand learning opportunities and make education accessible.

Zhao and Frank (2003), however, argue that Africa as a region is lagging behind in adoption, use and innovation in the ICT sector. Therefore, its people are missing out on better and well managed education systems and entities considering that ICT has contributed greatly to educational management in schools worldwide. BECTA (2004) notes that the use of ICTs in educational management is greatly under-emphasized, as such, a more holistic approach requires that schools be receptive and open to the changes ICTs may make in education. This view is similar to that of Kipsoi, Chang’ach and Sang (2012), that most schools in Kenya hardly use ICT to manage the quality of output, or to raise teacher productivity, or to reduce costs through analyzing spending. This is attributed to a myriad of challenges facing most schools in Kenya with regard to adoption of ICT in education hence a slow rate of adoption of technology despite its promising and potential for use in educational administration in schools

In spite of that, evidence from countries such as Botswana, Namibia and South Africa shows that investment in ICT in education management is quite significant. For systemic impact
Educational administrators need to have basic information on how the school as a system needs to make the most basic resource allocation decisions using ICT. Kenya like many African countries has witnessed significant growth in the ICT sector as demonstrated by the number of telephone lines, Internet Service Providers (ISPs), the number of internet users, broadcasting stations and market share of each one of them (Ministry of Information and Communication, 2006). The promulgation of a National ICT Policy in January 2006 was aimed at improving the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services.

The government of Kenya has also been working towards transformation of all educational institutions in the country to be ICT compliant as attested by the interest shown on ICT in the number of government policy documents (Republic of Kenya, 2001; Republic of Kenya, 2005). Through the Ministry of Education, the government has made great initiatives towards developing ICT infrastructure in secondary schools. Some of the main organizations which have played a vital role in the development of ICT in schools include: Computers For Schools Kenya (CFSK), ICT Trust Fund, Kenya Institute of Education and Non-Governmental Organizations Network Initiative for Computers in Education (Farell, 2007).

In 2005, the Ministry of Education developed a Kenya Education Sector Support Programme (KESSP) that featured ICT as one of the priority areas with an aim of mainstreaming ICT into teaching and learning processes (MOE, 2005). The KESSP considered ICTs as one of the priority investment programme and catered for financial resources for ICT. The Ministry of Education has also adopted ICT in three ways: ICT as an administrative tool (e-Government), ICT for teaching (e-learning) and ICT for Educational Information Management System (EMIS).

Furthermore, the Ministry of Education Strategic Plan (2006-2011) emphasizes the integration of ICT in education which is expected to improve quality, teacher skills and how the
school system is managed. The integration of ICT is also aimed at improving communication between all partners including teachers, students and parents. To achieve this, a lot of effort has been made by the government towards improving ICT infrastructure in schools as well as training teachers in ICT skills.

A situational analysis for Kenya carried out by Global e-Schools and Communities Initiatives (GeSCI) between April and September 2009 had a number of revelations in relation to the country’s interest, progress and challenges of using ICTs in education. According to GeSCI (2009), ICTs offer great hope for improving access, quality and efficiency of education. There is however, a need for policy makers to understand the key issues underlying the educational problems and to formulate sensible strategies using ICTs and other tools to overcome the problems. A number of issues in relation to access, quality, relevance and efficiency in education as identified by GeSCI include: teacher shortages, inefficient management, deployment and distribution of teachers, large classes and work overload.

According to the MOE (2012), shortage of teachers has led to constrained effective delivery in the implementation of curricula and consequently resulted in poor performance in schools. Records management in most learning institutions is weak which has led to data gaps and poor response to EMIS data submissions. Furthermore, inconsistent and inaccurate statistical data from schools has led to inefficiency in administrative processes. These issues would be well managed using ICT tools. However, when ICT tools that are available in schools are not maintained, and with limited technical support available, the result is limited use of ICTs in administration. The Directorate of Policy and Planning in the Ministry of Education acknowledges that there are many infrastructural limitations to the integration of ICTs into schools (GeSCI, 2009).
Although there has been remarkable progress to put in place an ICT policy framework and implementation strategy in Kenya, universal implementation in various sectors still remains a challenge as it is the education sector which is also experiencing a myriad of challenges (Farell, 2007). The MOE (2012) outlines a number of challenges in the Task Force Report on the realignment of education in line with Constitution 2010. Among the challenges that affect the uses of ICT in schools as outlined in the report are: limited connectivity, lack of ICT infrastructure, unrealistic costing for equipment and activities. Deliberate dumping of old and used computers and ICT equipment to educational institutions has also been identified as a challenge since it contributes to the problems of e-waste. Furthermore, it is reported that the development of ICT applications has resulted in a number of security problems, including those related to system integrity and application (MOE, 2012). The above challenges have made it difficult for secondary schools in Kenya to fully embrace the use of ICT in administration and management.

1.2 Statement of the Problem

There has been an enormous increase in the student enrolment in schools in Kenya in the recent years. This increase together with new technological developments has made educational institutions in Kenya in the 21st Century to become complex multi-dimensional organizations requiring tremendous input in terms of human, financial and physical resources. The tremendous advancements in technology too have led to far-reaching developments in the administrative system. Hence, this calls for sophisticated equipment and facilities such as ICT for the processing of data and carrying out tasks concerning student, personnel, financial, timetable, test, resources and general school administration. Cost effective technology combined with the flexibility in learning and administrative activities is essential in enhancing efficiency.
Using ICT to improve administration may pay off rather well in schools rather than only adopting Computer Studies as a technical subject or just using it in teaching and learning. For instance, if teachers spend less time on administrative tasks, they will have more time for teaching and for preparing learning materials. This is a gain that evaluators rarely consider. However, it may well be the area on which schools should mainly concentrate on, rather than chasing the more elusive benefits of using ICT in teaching.

Despite the central role occupied by administration in schools, for a very long time little emphasis has been placed on the effectiveness of the delivery of service by this organ of the school as an organization. Consequently, little emphasis has been placed on embracing ICT for effective administration and management in secondary schools in Kenya. A study carried out by MOHEST (2010) revealed that although ICT in education can increase access to learning opportunities, lack of quality data in addition to the absence of standardized guidelines for establishing relevant and comparable indicators hinder policy makers in making informed decisions or in demonstration of greater commitment to integrate ICT into education systems.

In Kimilili District, it was revealed by one CDF officer that several secondary schools had acquired computers through the initiative of Kimilili Constituency Development Fund (CDF) in partnership with Digital School Aid (DSAID), Economic Stimulus Programme (ESP) and Parents Teachers Associations (PTA) (Masinde, J., Personal communication, October 23, 2011). Amidst such efforts, MOE (2012) has pointed out numerous challenges in the use of ICT in administration of secondary schools in Kenya one of them being lack of ICT skills by practicing teachers.

Boit and Menjo (2005) noted that ICT as an administrative tool in secondary schools was not used effectively to address administrative issues due to similar challenges which included: lack of adequate training in ICT for teachers and administrators, limited computer hardware
dedicated to administrative work, lack of time and absence of appropriate administrative software. All these have contributed to the limited use of ICT in school administration hence many schools particularly in rural settings continue to process and store information manually and highly rely on paperwork. Njunge, Sakwa and Mwangi (2012) argue that the pace of ICT adoption in secondary schools in Kenya is very slow. Similarly, there is limited information on the use of ICT in facilitating effective secondary school administration particularly in rural areas (Boit & Menjo, 2005). It is against this background that this study intended to examine the teachers’ perceptions in the use of ICT in administration of secondary schools in Kimilili District, Kenya.

1.3 Research Questions

i. What is the level of availability of ICT facilities for administration of public secondary schools in Kimilili District?

ii. To what extent are ICT facilities used for administration of public secondary schools in Kimilili District?

iii. What are the perceptions of teachers on the use of ICT tools in secondary school administration?

iv. What are the effects of using ICT tools for administration in secondary schools?

v. Which strategies can be used to improve the use of ICT in the administration of secondary schools in Kimilili District?

1.4 Significance of the Study

The findings of the study will inform the government on the hindrances to ICT integration in school administration. The information will enable the government to identify mechanisms that will ensure successful ICT integration in schools. The research will also guide policy-makers, decision-makers and investors to make well-informed decisions about policies
and investment in ICT as regards education at the secondary level by understanding the perceptions of teachers in line with the utilization of ICT in school administration.

Additionally, the study will be beneficial in building a knowledge base of perceptions of teachers on the use ICT tools in secondary school administration. The knowledge may serve as a guide for overcoming challenges that teachers face while using ICT as a tool in the administration of secondary schools. Furthermore, the study is intended not only to shed light on the teachers’ perceptions towards ICT integration but also to reveal the factors obstructing their positive attitudes towards the use of ICT. The knowledge from the study will enable parents and communities to consider investment in ICT as a priority for timely and efficient delivery of services. Finally, the study will help future researchers to make references on this work with the aim of building more knowledge in the field of ICT and educational administration.

1.5 Scope and Delimitations of the Study

The study focused on the teachers’ perceptions on the use of ICT in the administration of public secondary schools in Kimilili District of Bungoma County in Kenya. The ICT tools that were investigated included computer hardware and software used in administration.

Public schools in Kimilili District like many other parts of the country have made substantial gain in terms of enrolment rates through Free Primary Education and Affordable Secondary Education initiatives aimed at achieving Education For All by 2015. These changing trends require focusing education towards improving services in terms of accessing, processing and applying large volumes of information in order to meet demands of efficiency and quality in rural schools. Secondary school teachers were selected because they are the agents of the government for the implementation of ICT policies in education. Understanding their perceptions in the use of ICT is vital in determining the pace at which ICT policies are implemented in schools, specifically in administration.
1.6 Theoretical Framework

The study was guided by Diffusion of Innovations Theory (DIT) by Everett Rogers (2003). According to Rogers, diffusion is the process by which an innovation is adopted by members of a certain community. According to this theory, the four factors that influence the adoption of an innovation include: the innovation itself, the communication channels used to spread information about the innovation, time, and finally, the nature of the society to whom it is introduced. Rogers (2003) explains that there are four major theories that deal with the diffusion of innovations: innovation-decision process theory, the individual innovativeness theory, the rate of adoption theory and the theory of perceived attributes.

The innovation-decision process theory is based on time and five distinct stages. The first stage is called the knowledge stage. In this stage, potential adopters of an innovation must first learn the innovation and know how it functions. In the second stage, the potential users must be persuaded as to the merits of the innovation before they adopt it. Thirdly, they must make a decision to either adopt the innovation or not. The fourth stage is the implementation stage where users put the innovation into actual use. Finally the users must confirm that their decision to adopt the innovation was appropriate. Once these stages are achieved, the diffusion of the innovation that has been introduced takes place.

Rogers (2003) categorizes adopters of innovation as: innovators, early adopters, early majority and late majority adopters. The innovators are risk-takers and pioneers in trying out the innovation. The early adopters train early and help spread the word about the innovation to others. The early majority are convinced by the innovation. The late majority waits to make sure that adoption of any innovation will only take place if it is in their best interest. The final group is the laggards. These are individuals who are highly skeptical and resist adopting innovations
until it is absolutely necessary for them to do so. In many cases, the laggards never adopt the innovation.

The theory of rate of adoption holds that adoption of an innovation grows slowly and gradually in the beginning. It will then have a period of rapid growth that will taper off and become stable and eventually decline. According to Rogers (2003), regardless of the nature and characteristics of people, the properties of an innovation itself affects its rate of adoption in the society. He identifies five attributes of innovations that help to explain different rates of adoption.

First, the innovation must have some relative advantage over an existing innovation or the status quo. Therefore, if an individual perceives that the innovation has greater advantages, then its adoption will be rapid. Secondly, the innovation has to be compatible with existing values, experiences and needs for potential users. Thirdly, the innovation must not be too complex. This is because new ideas that are easy to comprehend are adopted more rapidly than those that require new skills. Fourthly, the innovation must have trialability for it to be tested for a limited time without adoption. Trialability provides individuals with less uncertainty and gives them an opportunity to learn and practice by doing. Finally, the innovation must offer observable results. If an innovation shows positive results, the possibility of its adoption is enhanced.

Rogers (2003), claims that 49 to 87 percent of the variance in the rate of adoption of any new technology is explained by the five attributes discussed in this section. However, he also states that the rate of adoption can be affected by other variables such as the nature of the social systems and the extent of change agents’ promotion efforts in diffusing the innovation.

1.6.1 Strength of Diffusion of Innovation Theory

The theory serves a diverse range of innovation adopters such as administrators, information technologists and change agents as well. The theory also benefits the targets of
change, since respect and consideration for all involved stakeholders are intervened with robust strategies for implementing innovative change (Kaminski, 2011).

Diffusion of Innovations Theory helps communities to identify qualities such as relative advantage, compatibility among others that will make innovation more appealing to potential users who in this case, are the teachers. Furthermore, technologies are constantly changing and new hardware and software components are being introduced. It is therefore imperative to have a solid understanding of how to introduce these new ideas in the social system. Diffusion theory helps further such understanding (Yates, 2001).

1.6.2 Limitation of Diffusion of Innovation Theory

The diffusion of innovations theory may have left out a category of adopters who have features of innovation but may quickly not adopt it due to certain beliefs that they hold about the innovation. Additionally, the theory does not adequately provide a basis for predicting outcomes as well as providing guidance as to how to accelerate the rate of adoption, it is best applied to the socio-economic issues of ICT in the social system (Minishi-Majanja & Kiplangat, 2005).

1.6.3 Application of the Theory in this Study

To apply the Diffusion of Innovations theory, teachers must have knowledge of a new technology. Qualified teachers should be introduced to ICT resources such as computers, internet and relevant software and technical support should equally be provided. Thereafter, teachers should be persuaded and be willing to actively participate in the implementation process by attending to various aspects of contexts within which the innovation is being used. At the decision level, teachers should be trained and in the process, different attitudes towards the innovation are developed. This leads to their perception towards the use of the innovation.
During the implementation process, teachers judge the worthiness of using ICT and then consistently express their commitment towards its use.

In this study, the attributes that affect both individual adoption and the larger collective diffusion of an innovation as identified by Rogers (2003) were applied. The attributes in the theory provide a framework that helps in understanding why some teachers use ICT in carrying out their administrative tasks while others do not. The diffusion theory can be used to explain, predict and account for factors that increase or impede the use of ICT in the administration of secondary schools. Diffusion of innovations theory also helps education practitioners to identify qualities that will make the use of ICT in administration of schools more appealing to potential users. The communication channels used to spread word about adoption of any innovation and the nature of the society determines the rate of adoption of a new technology. In schools, this can be achieved through training or ICT literacy upgrading courses.

The theory was found appropriate for this study because it brings out perceptions and factors affecting the use of ICT in the administration of secondary schools. The factors include: availability of facilities and technical support. According to this theory, teachers need to be sensitized about the new innovation before adopting it for use in administration. The theory further explains that some teachers are slow in taking up the new technology and applying it because they wait to see how others have benefited from it before accepting it. Others have already adopted the technology and are enjoying the benefits. All in all, technology is constantly changing and introduction of new hardware and software components is ongoing hence the theory provides an understanding of how to introduce new ideas into the social system and sustain them. The theory was therefore used to examine teachers’ perceptions regarding the use of ICT in the administration of secondary schools.
1.7 Conceptual Framework

**Figure 1.** Relationship between the variables. Conceptualized from Rogers’ Diffusion of Innovation Theory (2003).

Figure 1 shows that perception has an impact on the actual use of ICT. Perceived ease of use refers to the degree to which a teacher believes that using ICT will be free from effort. Teachers may believe that technology is useful and at the same time, they may perceive the use of technology to be too difficult and therefore performance benefits of usage are outweighed by the effort of using the technology. This in turn affects the actual use which further impacts on the efficiency and quality of carrying out administrative tasks in schools.

Perceived usefulness in this study is the degree to which a teacher believes that using ICT will enhance his or her job performance in school. There is evidence to suggest that teachers tend to use technology when they believe that it can enhance their job performance such as facilitating students to achieve learning goals, conducting administrative duties and managing students (Ma, Andersson & Streith, 2005). This reasoning is supported by Christenen (2004) who states that
perception of potential usefulness of the computer could influence attitude towards use of information technology.

Technical support includes issues like installation, operation, maintenance, network administration and security. This is an important part of the implementation and integration of ICT in administration of schools. When technical support is not available, it implies that teachers should have some basic troubleshooting skills to overcome technical problems when using ICT. Lack of these skills will negatively affect their perceptions regarding ICT hence failure to use it in carrying out a number of tasks. Jones (2000) reported that the breakdown of a computer causes interruptions and if there is lack of technical assistance, then it is likely that the regular repairs of the computer will not be carried out resulting in teachers not using computers.

The same technical problems are likely to affect teachers when carrying out their administrative tasks. Therefore, if there is no technical support for head teachers/ administrators and teachers, they become frustrated resulting in their unwillingness to use ICT due to fear of equipment failure (Tong & Trinidad, 2005). The implication is that teachers will be discouraged from using ICT even if it is available. On the other hand, effective and reliable technical support enables ICT equipment to function effectively hence teachers will be encouraged to use it in carrying out administrative tasks.

More so, computer literacy plays a significant role in determining the intention to use a technology. Computer literacy refers to awareness and competence in using computer software applications. When teachers are not computer literate, they are likely to shy away from using technology in carrying out their tasks. Computer literacy can develop favourable perceptions in teachers regarding the use of new technology, particularly when the innovation is complex in nature and causes substantial disruption to the users in their traditional work practices. Pernia
(2008) suggests that school leaders should be adequately ICT literate to integrate the new approaches into their administrative duties.

1.8 Operational Definition of Key Terms

Avakio is a computer programme developed in Greece for managing school resources.

Computer Hardware refers to the physical tangible machinery of a computer system.

Computer Software is a detailed step-by-step set of instructions specifying how to solve a certain type of problem; also called computer program.

Information Communication Technology refers to a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information. Examples of such tools include: computer and network, hardware and software, as well as the services associated with them such as electronic mail.

Netbooks are small lightweight and inexpensive computers.

Perceptions are beliefs relating to factors such as time, money, technical support, computer literacy and other issues that may constrain usage of ICT in administration of secondary schools.

School Administration refers to organizing and overseeing operations of secondary schools. These include managing students’ academic affairs such as preparation of teaching and learning materials, setting and administering of examination, record keeping, tracking academic progress, fee payments, and communication with parents and other stakeholders.

Secondary School is an institution of learning where instruction is given to learners who have completed primary level education. This is done for a period of four years in Kenya.

Stakeholders refer to persons, groups, organizations, members or system that affects or can be affected by an organization’s actions. In this study, stakeholders included the Ministry of Education officials, parents, students, teaching and non-teaching staff.
Teachers are members of staff including class teachers, heads of departments, deputy head teachers and head teachers in public secondary schools.
CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter presents a review of related literature in the study. Literature will be reviewed under the following sub-headings: ICT in education, National ICT Policy and e-Government strategy, ICT in education policy, use of ICT in school administration, perceptions, challenges and strategies of improving ICT use in school administration. The chapter also gives a summary of the reviewed literature.

2.2 ICT in Education

Computers began to appear in school and university classrooms in the more advanced countries around early 1980s while broadband connections to schools and universities became a commonplace in wealthier countries in the second half of the 1990s. In developing countries, this was more limited. The largest investments in ICT have been in the United States of America whose budget for the use of technology in schools is enormous. The US Department of Education has invested up to US$ 1 billion in the use of technology in public education (Cairncross, n.d.).

Global investments in ICT to improve teaching and learning in schools so far have been initiated by many governments. For example in United Kingdom, the government spending on educational ICT in 2008-09 was £2.5 billion (Nut, 2010). In United States, the expenditure on schools and higher education institutions was $6 billion and $4.7 billion respectively in 2009 (Nut, 2010). In New Zealand, the government spends over $410 million every year on schools ICT infrastructure (Johnson, Calvert&Raggert, 2009). Despite all these investments on ICT infrastructure, equipment and professional development to improve education in many countries, Gulbahar (2007) argued that huge educational investment have produced little evidence of ICT
adoption and use in the teaching and learning process. The question is what could be the issues behind such arguments?

It is, generally recognized that adoption of computers in education has progressed, from acquisition of basic computer skills, computer aided teaching, communications and research, to usage in every subject. This has been accelerated by convergence of the computer and telecommunication technologies, particularly e-mail and Internet. This progression has been a result of various efforts, and a wide variation on the levels of ICT integration to education curriculum, as determined by social and economic conditions of individual countries and regions.

Certainly, education and training play a critical role in social and economic development considering that one of its goals is to contribute positively in building the human capacity necessary to achieve the social pillar objectives besides achieving Education For All (EFA) goals by 2015. The MOE of Kenya however recognizes several challenges in delivery of education services so as to achieve these goals which include the need to ensure improved: access, equity and quality that require enhanced planning, management and appropriate interventions. To meet these challenges, there must be an effective Educational Management Information System (EMIS) infrastructure to support processing, use, sharing and dissemination of available data and information at all levels. This data collection infrastructure begins with the capacity of head teachers to collect uniform data from regular administrative records for effective planning and decision-making.

In Kenya, under Vision 2030 and Medium Term Plan (MTP), the aim of the government is to ensure 20,000 computers are provided to schools as a flagship project in the education sector in addition to the current efforts by the Ministry to channel more resources towards providing adequate ICT infrastructure. In line with this, the Ministry of Education proposed a
detailed costing of providing computers to schools based on the ratio of one laptop per teacher and one desktop per fifteen learners between 2010-2015 as shown in the Table 1.

Table 1

Summary of Costs (Million Kshs.) for the Duration 2010-2015

<table>
<thead>
<tr>
<th>Description</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
<th>2014/15</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. An Effective ICT Institutional Framework</td>
<td>26.66</td>
<td>41.70</td>
<td>45.66</td>
<td>50.17</td>
<td>49.18</td>
<td>213.36</td>
</tr>
<tr>
<td>2. Enhanced usage of ICT for administration and management.</td>
<td>84.00</td>
<td>83.20</td>
<td>81.39</td>
<td>84.70</td>
<td>94.72</td>
<td>428.02</td>
</tr>
<tr>
<td>3. Advice and support ICT infrastructure and educational solutions in learning Institutions.</td>
<td>4,136.20</td>
<td>4,300.97</td>
<td>4,473.01</td>
<td>4,651.93</td>
<td>4,838.01</td>
<td>23,483.39</td>
</tr>
<tr>
<td>4. Strong ICT Support for efficient operations of ICT infrastructure and systems at all levels.</td>
<td>274.90</td>
<td>282.69</td>
<td>293.99</td>
<td>307.77</td>
<td>320.08</td>
<td>1,479.42</td>
</tr>
<tr>
<td>5. Provision of connectivity to enhance collaboration and information sharing in the sector.</td>
<td>41.17</td>
<td>42.81</td>
<td>44.53</td>
<td>28.49</td>
<td>29.63</td>
<td>186.62</td>
</tr>
<tr>
<td>6. ICT Integration in the teaching and learning process.</td>
<td>354.44</td>
<td>366.76</td>
<td>338.08</td>
<td>351.61</td>
<td>367.29</td>
<td>1,778.18</td>
</tr>
<tr>
<td>7. Public Private Sector Partnership for ICT in education resource mobilization.</td>
<td>7.40</td>
<td>7.70</td>
<td>8.00</td>
<td>8.32</td>
<td>8.66</td>
<td>40.08</td>
</tr>
<tr>
<td>8. Monitoring and Evaluation of ICT usage and Integration in teaching and learning process.</td>
<td>1.70</td>
<td>1.30</td>
<td>1.82</td>
<td>1.41</td>
<td>1.95</td>
<td>8.18</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4,926.46</td>
<td>5,127.13</td>
<td>5,286.48</td>
<td>5,484.39</td>
<td>5,709.52</td>
<td>27,617.25</td>
</tr>
</tbody>
</table>

Table 1 gives a summary of the governments’ financial plan of investing in ICT implementation for education in a period of five years. The enormous financial investment of ICT in education shows the government’s commitment in ensuring that Kenya is an ICT compliant nation. From the above estimates, the government of Kenya is determined to channel over Kshs.428 million to enhance usage of ICT for administration and management at all levels of education. Amidst such efforts there is need to understand the views of teachers and how they respond towards these initiatives since they are the implementers of ICT in administration of secondary school.

2.3 National ICT Policy and e-Government Strategy, Kenya

The Government of Kenya has put in place two documents; the National ICT Policy and e-Government Strategy that provide guidelines for transformation of Kenya into a digital society. In both documents, the Government recognizes that an ICT literate workforce is the foundation on which the nation will become a knowledge-based economy. To achieve this, the government is putting in place mechanisms to make education a platform for equipping the nation with ICT skills in order to create dynamic and sustainable economic growth.

2.3.1 National ICT Policy

Kenya promulgated a national ICT policy in January 2006. The policy was aimed at improving the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services (Farell, 2007). The principal objective of the National ICT Policy is to facilitate sustainable economic growth and development, and poverty eradication through productive and effective technologies. The policy also aims at pursuing progress towards full socio-economic inclusion of citizens through universal access. Further, the policy aims at stimulating investment in ICT sector while at the same time encouraging the spirit of innovation through research and development.
The policy envisions harnessing the potential of ICTs and related emerging technologies to eradicate poverty, support universal primary education, improve maternal health, combat diseases, maximize agricultural production, ensure food security, promote trade and industry, ensure environmental sustainability, develop global partnerships for national development, and incorporate technology in mainstream implementation of development policies.

In the area of human resource development, the policy emphasizes integrating ICTs in teaching curriculum at all levels of education. This encompasses establishing educational networks for sharing educational resources and promoting e-learning at all levels; encouraging and supporting ICT training for decision-makers, community and civil society leaders. The policy aims at creating opportunities and providing assistance for the disadvantaged, women and the youth to acquire ICT competencies and skills; and enhancing capacity for research and development in ICT sector.

2.3.2 E-Government Strategy on ICT

According to the Ministry of Education (2006), the e-Government Strategy, which was adopted in 2004, emphasizes transformation of government services from manual to digital-based operations. The government’s specific objectives include improved coordination of government agencies to reduce duplication of efforts and to enhance efficiency in utilization of resources, to improve the competitive position of the country through provision of timely information and delivery of services. Other objectives are to reduce transaction costs, and to engage citizens and the private sector through digital and on-line service provision.

In pursuing these objectives, the e-Government Strategy gave considerable emphasis on the use of education to equip the nation with appropriate ICT competencies, skills and related innovations. In addition, the Strategy outlined information systems to be driven by the education sector that include operation alization of the Education Management Information System.
EMIS is intended to cover the management of the education data, provision of databases in schools and co-ordination of the administration of the entire education sector in order to meet the goals of the ICT policy in Kenya (Ministry of Education, 2006).

These strategies give a clear indication that the use of ICT in education is a priority for the government of Kenya in line with the achievement of Vision 2030. In the National ICT Policy and the e-Government Strategy, considerable attention is given to education, particularly to schools as agents with the potential to address the digital divide and the expansion of learning opportunities. The government policies reviewed provide a rationale to carry out an investigation on the perceptions of teachers on the use of ICT in secondary school administration. For the policies and strategies to be meaningful, a good implementation plan is required. Secondary school teachers are very important agents in the implementation of the policies in education. Their perceptions are therefore an essential component for management of technological change and in the execution of any planned ICT strategies.

2.4 ICT in Education Policy in Kenya

The existing education policy on ICT is imbedded in three documents namely; e-Government Strategy, National ICT Policy and Sessional Paper No. 1 of 2005 (A Policy Framework for Education, Training and Research). Although not exhaustive, the range of ICT that have been used in the delivery of education to improve access, teaching, learning, and administration includes: Electric Board, Audio Cassette, Radio for Interactive Radio Instructions (IRI), Video/TV-Learning, Computer, Integrated ICT infrastructure and Support Application Systems (SAS). This plan envisages use of these digital components to improve access and quality in the delivery of education in Kenya.

In 2005, The Ministry of Education developed Kenya Education Sector Support Program (KESSP) that featured ICT as one of the priority areas with the aim of mainstreaming ICTs into
the teaching and learning process. The document contains the investment programme to be used by the government to implement the proposals made in the Sessional Paper No. 1 of 2005. This investment addresses support to ICT for administration and use in education (e-learning). Additionally, the investment programme was intended to put in place the policy and strategy for ICT in education, development of ICT infrastructure and institutional management systems. According to the MOE (2012), a number of accomplishments during the KESSP 1 implementation period (2005-2010) were made. Among them was increased training on basic ICT literacy skills of education managers and administrators. However, it was noted that although ICT programmes have put a lot of emphasis on the use in administration, support was required to ensure appropriate utilization of ICT to support management systems in government.

To build on the achievements of KESSP 2005-2010, the Ministry of Education has developed the National Education Sector Support Programme (NESSP 2012/2013-2017/2018) also known as Sessional Paper No. 1 of 2012. The NESSP is a five-year programme developed by the MOE for delivering reforms earmarked for the education sector in the Kenya Vision 2030 and the Constitution 2010. The Sessional Paper details the need for activities to be prioritized and the funding implications for the implementation process. The paper also identifies the challenges facing the education sector and offers a clear set of policies and strategies for addressing these challenges. The overall objective of the ICT Investment Programme as articulated in the NESSP is to seamlessly integrate ICTs in education for administration, management and in teaching and learning at all levels. Among the key policy issues outlined by the NESSP is to increase use of ICT for administration and management at all levels of educational institutions.

Considering that the mission of MOE is to facilitate effective use of ICT to improve access, learning and administration in delivery of education programmes and services there is
need for every educational institution, teacher, learner and the respective community to be equipped with appropriate ICT infrastructure, competencies and policies for usage and progress. It calls for recognition of the fact that ICT provides capabilities and skills needed for a knowledge-based economy. The efforts by the Ministry of Education to increase usage of ICT in schools are a favourable strategy of improving the learning and administrative processes in schools. Therefore, knowledge on the levels of availability and usability of ICT tools in administration will go a long way in enhancing quality in service delivery. This call for continuous update of information on the use of ICT in administration of secondary schools as well as the education sector in general. The policy documents and massive programmes sponsored by the Government of Kenya to invest in ICT was the justification for this study to ascertain the perceptions of teachers in relation to the use of ICT in the administration of secondary schools.

2.5 Use of ICT in Administration

According to UNESCO (2002), Information and Communication Technology (ICT) is defined as a combination of informatics technology with other related technologies, specifically, communication technology. UNESCO further defines informatics or computer science as the science dealing with the design, realization, evaluation, use and maintenance of information processing systems, including hardware, software organizational and human aspects and industrial, commercial, governmental and political implication. Communication technology such as the internet world therefore is seen as one such area of technological application. ICT consists of hardware, software, networks and media for collection, storage, processing, transmission and presentation of information (World Bank, 2004).

The use of ICT for administration and routine tasks of classroom management seem to have developed much quicker than their use in instruction. According to the National Centre for
Statistics (2000) administrative record keeping was the second largest use made of computers by teachers after that of creating instructional materials. Another common use of computers was communication with colleagues which reported twenty-three percent, whereas communication with parents or students was only seven percent. According to Chemwa and Mburu (2007), ICT hardware includes electricity infrastructure, desktop computer, laptop computer, CD drive, printer, scanner, telephone (mobile or landline) and projector. Examples of ICT software packages that can be used in school administration tasks are application software such as word processors, spreadsheets, databases, e-mail, the internet and presentation software which enhance the quality of work. Software enables the hardware to perform its tasks at high speed. In this study, ICT is therefore a combination of infrastructure which includes hardware and application software and networks that connect them.

A number of studies across the world have revealed that ICT plays a critical role in school administration. In New Zealand, Cowie, Jones, Harlow, McGee, Miller and Gardiner (2008) did an evaluation on Laptops for Teachers Scheme. The evaluation used a mixed methods approach incorporating three yearly cycles of annual nationwide questionnaires, regional focus-groups and school-based longitudinal case studies. The purpose of the evaluation was to investigate the impact of laptops for teachers in their work for a period of four years between 2003-2006. From the evaluation, it was noted that Laptops for Teachers Scheme in New Zealand had resulted in progress towards increasing efficiencies in lesson-planning and preparation, administration and reporting. Specifically, teachers found laptops to provide flexibility in terms of time and place for administrative tasks. There had particularly been an increased use for: writing reports, checking student lists and records, checking departmental schemes and units, checking school timetable, checking school or staff notices, recording student grades and monitoring student progress as well as recording attendance.
Additionally, Cowie et al. (2008)argue that teachers had found using laptops for communication giving them time and date verification of communication that they made with colleagues. The teachers also preferred laptops to desktops because they were portable and could be taken to meetings for collaboration purposes. From the study, it is evident that a laptop is one of the ICT tools that are flexible in use if utilized in the administration of secondary schools. Although the survey was quite informative, it was done in New Zealand, a different context from that of the current study. The current study was done in Kimilili District in Kenya to establish the ICT tools that are available for use in the administration of secondary schools in light of the rural set up.

In Africa, many countries have put emphasis on the utilization of ICT in education in the process of reforming their educational systems. In Nigeria for instance, the educational reforms stressed the use of computer technology in schools during the 32\textsuperscript{nd} Ministerial Council meeting of the National Council in 1987 (Federal Republic of Nigeria, 2004). The Nigerian policy on the adoption of ICT in school emphasizes the role and utilization of Information and Communication Technology. In enhancing sustainability development in Nigeria, an internet service in schools (School Net Nigeria) was launched in September 2001 (Federal Ministry of Education, 2005). Uys (2000) reported that administrative functions in schools had become increasingly complex in terms of enrollment, population mobility and social problems. This complexity requires the use of powerful administrative tools such as computers which will result into better communication, efficient operations and better personal services. The current study examined the level of availability of ICT facilities for administration of secondary schools in Kimilili District.

The use of ICT for effective secondary school administration especially in areas of budgeting, collection of student data, administration of examinations and record keeping cannot be ignored. According to Yusuf (2005), ICT contributes to radical changes in schools that
strengthen teaching and provide opportunities for connections between the institution and the world. The use of ICT can also reduce costs and improve efficiency and productivity in educational administration. ICT is useful in Educational Management Information System (EMIS). According to the Republic of Kenya (2005), the Ministry of Education, Science and Technology (MOEST) recognize the critical role of EMIS on provision of timely, reliable and accurate education data. EMIS is used in collection, analysis, interpretation and storage of data on educational programmes in schools. EMIS is required to facilitate and enhance sharing of data by all ministerial departments, agencies and stakeholders for effective management of education and training.

Moreover, it can be used in efficient management and storage of information and for purposes of admission of students, in accounts and finance departments, in processing of examination results, storage of official records among other uses (Wango, 2009). The Republic of Kenya (2005) argues that EMIS would facilitate the measurement of achievements made towards meeting the Millennium Development Goals on Education for All. ICT is therefore a very important tool in facilitating efficient management and administration a school and its resources.

Whereas the impact of ICTs on the education goals is still inconclusive, reported observations include rapid expansion of knowledge, improved examination outcomes, enhanced communication and technical efficiency, as well as greater decentralization in the delivery of education services. It is not in doubt, however, that ICT has the potential to play a more powerful role in increasing resources and improving the environment for learning (MOE, 2006). Furthermore, ICTs can also play a role in preparing students to acquire skills and competencies that are fundamental for competing in the emerging global “knowledge” economy.
A study by Maki (2008) on ICT for administration and management of secondary schools in Cyprus revealed that ICT enabled managers and administrators to update and record changes in a school environment; to produce documents regarding operational activities of the school; to support decision and action making due to the fact that ICT systems present reality at any moment. In the same study, it was noted that the Ministry of Education in Cyprus had implemented a computer program called ‘Avakio’ which is used by all secondary schools for administrative and managerial purposes such as student administration, personnel administration and timetabling. However, she notes that the program, presents problems if a school has more than twenty-five classes. Although ICT is seen as a useful tool in areas of budgeting, collection of student data, recording of results and effective in keeping school records, the findings regarding problems presented by the program points to the need to understand the perceptions of teachers on use of ICT in school administration. Although the findings in the study identify challenges similar to those experienced in many countries, the geographical distance justified the need to carry out the current study in Kimilili District which happens to exist in a different context.

In another study, Makhanu and Kamper (2012) carried out a survey to investigate the relationship between ICT access to principals and secondary school performance in Western province of Kenya. The study was quantitative in nature and data was obtained through questionnaires. The research findings showed that a principal’s access to ICT infrastructure has a positive influence on secondary school performance in the Western province of Kenya. It also revealed that a relatively low percentage of principals (42 percent) had access to ICT facilities in schools. This study is a useful source of reference especially on the distribution of ICT infrastructure in schools in Kenya. However, the study only concentrated on principals and did not involve other teachers who happen to be agents of implementing ICT programmes in
secondary schools. The availability and accessibility of ICT facilities may not automatically translate into use. The current study therefore sought to find out the perceptions of teachers other than head teachers alone on the use of ICT in administration of secondary schools.

Boit, Menjo and Kimutai (2012), carried out another study to evaluate the implementation of ICT to support, teaching, learning, school administration and use of e-communication between co-operating rural schools in Western Kenya under Rotary Project. The study was conducted in two selected counties where a case study research design was used. The findings from the study indicate that teachers, students and the school administrators were now using ICT to carry out a number of administrative tasks. It was noted that the two schools had installed an academic programme which was being used to prepare class timetables and daily programmes for each class. The schools were also able to set examinations locally, typeset and print at a minimum cost. Analysis of the examination results in the two schools is done electronically by the computer teachers together with the academic committee. It was also established that school inventories in the two schools were now managed electronically. Furthermore, the two schools had installed a financial system to manage school accounts and prepare financial reports. This installation of financial system had led to accurate and efficient book-keeping in the schools.

The study is quite informative and forms a very vital source of empirical evidence regarding the success of implementation and use of ICT in secondary school administration. It has shown that the use of ICT enhances efficiency in performance of administrative tasks. However, the study was confined to only two schools which were under a Rotary Project. The schools that participated were also selected from Keiyo and UasinGishu counties and none from Bungoma County, specifically Kimilili District, where the current study will take place. Furthermore, findings of the case study cannot be generalized to the schools in Kimilili District.
of Bungoma County since none of the schools in the target population of the current study has benefited from the Rotary Project.

Kiptalam and Rodrigues (2010) conducted a study on accessibility and utilization of ICTs among secondary school teachers in Kenya. The study employed a cross-sectional descriptive survey design, using quantitative approaches for data collection, analyses and reporting. The survey design was used to guide the research process and participants were drawn from eleven secondary schools that were connected to the internet. The schools studied were from both rural and urban settings. The sample could, however, not be generalized to all the schools in Kenya as only schools with internet connection were selected. This implies that schools with infrastructure other than internet connectivity were not represented in the sample.

Furthermore, Kiptalam and Rodrigues (2010) used of questionnaires only to collect data collection, providing only quantitative data. However, there is need to employ qualitative approaches so as to obtain in-depth understanding as far as utilization of ICTs among secondary school teachers is concerned.

2.6 Perceptions of Using ICT in School Administration

According to Oldfield (2010), the reasons why ICT is either adopted or not in schools are complex. There could be interplay between individual factors like teachers’ lack of skills, wider system level factors such as school and national policies and the complexity of integrating ICT into the school curriculum. Organization of ICT resources that are available to teachers in schools also play a major role on how ICT is utilized. Pelgrum (2000) for example, observed that if teachers at schools with low pupil to computer ratios still complain of lack of computers, then it could be that those teachers and their school managers need to consider whether or not they are optimizing the use of available equipment. This suggests that in some cases it is the organization
of resources, rather than the physical lack of them which creates a barrier to the use of ICT by teachers.

A study was conducted by Papaionnou and Charalambous (2011) on principals’ attitudes towards ICT and their perceptions about the factors that facilitate or inhibit ICT integration in primary schools in Cyprus. The study employed a mixed method approach, where 336 primary school principals over Cyprus were targeted. Using a stratified random sampling method, 250 were selected to participate in the study. Data was collected through questionnaires which were mailed to the principals but only 130 questionnaires were returned. Eight principals were also interviewed. According to the findings of the research, primary school principals in Cyprus generally hold positive attitudes towards ICT.

However, a number of statistically significant differences were observed across gender, years of service, academic qualifications, access to a computer and the internet at home, in-service training on ICT for teaching and learning purposes, existence of a computer in the principal’s office, computer experience and the principal’s attitude towards ICT. Even though principals valued the importance of ICT in the teaching and learning process as well as the fulfillment of their managerial and administrative purposes, they still need tailor-made in-service training and incentives to transfer their theoretical enthusiasm into practice.

A number of studies have revealed that one of the important determinants to the uptake of new technologies is the teachers’ attitudes to ICT use in learning. A survey of UK teachers showed that teachers’ positivity about the possible contributions of ICT was moderated as they became ‘rather more uncertain and sometimes doubtful’ about ‘specific, current advantages’ (BECTA, 2008). To successfully initiate and implement educational technology in school's program depends strongly on the teachers' support and attitudes. It is believed that if teachers perceived technology programs as neither fulfilling their needs nor their students’ needs, it is
likely that they will not integrate the technology into their teaching and learning as well as other administrative tasks.

Among the factors that influence successful integration of ICT into teaching are teachers' attitudes and beliefs towards technology (Keengwe & Onchwari, 2008). If teachers' attitudes are positive towards the use of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. This is likely to replicate in administration since both processes are carried out by teachers in a learning environment.

Another study was conducted by Demirci (2009) on teachers' attitudes towards the use of Geographic Information Systems (GIS) in Turkey. The study used questionnaire to collect data from 79 Geography teachers teaching in 55 different high schools. The study revealed that though barriers such as lack of hardware and software existed, teachers’ positive attitudes towards GIS were an important determinant to the successful integration of GIS into geography lessons. Gaining an appreciation of the teachers’ attitudes towards computer use in teaching and learning may provide useful insights into using technology. However, the study, though quite informative, used only a questionnaire to collect data. The use of other instruments would help in revealing more information regarding the phenomenon. Other than using ICT in teaching and learning, teachers would also use ICT as a tool for accomplishing house-keeping tasks, managing their students more efficiently and communicating with parents more easily. The study was confined to the use of ICT in teaching Geography. The current study therefore sought to establish teachers’ perceptions in using ICT to perform administrative tasks other than in the teaching of Geography.

In a similar study, Teo (2008) conducted a survey on pre-service teachers' attitudes towards computer use in Singapore. A sample of 139 pre-service teachers was assessed for their
computer attitudes using questionnaire with four factors: affect (liking), perceived usefulness, perceived control, and behavioural intention to use the computer. He found that teachers were more positive about their attitude towards computers and intention to use computer than their perceptions of the usefulness of the computer and their control of the computer. The limitation with this study is that data was collected through self-reports and this may lead to a situation where the true position may be inflated hence resulting in spurious findings.

Research has further shown that teachers' attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching, (Huang & Liaw, 2005). In European Schoolnet (2010) survey on teachers' use of Acer netbooks involving six European Union countries, a large number of participants believed that the use of netbook had positive impact on their learning, promoted individualized learning and helped to lengthen study beyond school day. BECTA (2004) agrees to this by noting that it is important for teachers not only to access ICT in order to teach with it but also to consider the need for teachers to have their own personal access to ICT, to allow them to plan and prepare lessons. Therefore, teachers who use ICT regularly are likely to be confident and have a positive attitude towards it, hence perceiving ICT as a useful tool. However, BECTA (2004) argues that factors affecting the use of ICT are complex and can only be interpreted in the context of which ICT is used. Therefore, contextual factors within each country do have an influence on the extent to which ICT is used. It is for this reason the current study intends to assess the perceptions of teachers in the use of ICT in school administration in the context of Kimilili District of Bungoma County, Kenya.

Teachers' computer experience relates positively to their computer attitudes. The more experience teachers have with computers, the more likely that they will show positive attitudes towards computers (Rozell & Gardner, 1999). Positive computer attitudes are expected to foster
computer integration in the classroom (Tondeur, Valcke & van Braak, 2004). According to Cowie et al. (2008), most teachers use laptops for administrative tasks associated with their obligation for teaching. In particular teachers used laptops for recording and checking students’ grades as well as writing reports for parents. The teachers also felt that laptops were extremely useful to allowing them to complete administrative tasks with greater ease and efficiency.

A study by Unachukwu and Nwankwo (2012) on principals’ readiness for the use of ICT in school administration in Anambra State of Nigeria revealed that most principals of secondary schools in the state shy away from computers claiming that the innovation is for the new age. Furthermore, a number of administrative problems were reported in the study resulting to poor staff and student management and also poor student performance. Another argument was that only a few principals had knowledge and skills for ICT usage.

In a similar study, Mwalongo (2011) studied teachers’ perceptions about ICT for teaching, professional development, administration and personal use in Tanzania. He used a case study and his data solely depended on self-reports. In his findings, he reported that ICT was used to carry out administrative tasks such as preparing reports, letters, timetables, and schemes of work and for students’ registration. However, he agrees with Unachukwu and Nwankwo (2012) that teachers did not use ICT to bring change in their practices but rather sustain their traditional practices. Mwalongo gathered information through self-reports and this method cannot be dependable for generalization. The current study incorporated other methods of data collection like observation to ascertain the availability and actual use of ICT facilities in school administration rather than solely depending on self-reported data.

In another study conducted by Nehunge, Sakwa and Mwangi (2012) on user perception on ICT adoption in Kenya’s Thika District, a sample of 92 respondents was assessed for their attitudes. The population of the study was the school management and teachers involved in ICT
implementation in secondary schools in the district. The instrument of data collection was the questionnaire only. The study revealed that there was technology acceptance setback. However, the findings from the study cannot give an overview of the perceptions of other teachers involved in the administration of secondary. It is possible that teachers from Kimilili District have different perceptions regarding the use of ICT in administration. Furthermore, every district has its own uniqueness in context, which is why the current study was conceived to be carried out Kimilili District of Bungoma County.

Literature reviewed in this section points out that it is important to understand that for teachers to adopt and integrate ICT in carrying out their administrative tasks, they have to perceive technology as a better practice which is consistent with existing needs and ease of use. If teachers have negative perceptions towards technology, they are likely to become hesitant to technological changes and applications. Therefore, providing them with excellent ICT facilities may not influence how and when they will use it in performing administrative tasks. This research therefore sought to understand the perceptions of teachers regarding their experiences with the use of ICT in administration of public schools of Kimilili District.

2.7 Challenges to ICT Use in School Administration

With respect to the great concern about the digital divide, it was noted that access to ICT facilities is currently one of the major challenges in Africa and Kenya is no exception. While the ratio of one computer to 15 students is the norm in most developed countries, the ratio in Africa stands at one computer to 150 students. This ratio is even wider in disadvantaged regions and areas. Additionally, limited and uncoordinated approach to imparting appropriate ICT skills and competencies to teachers remains a major barrier in the integration of ICT in education in Africa and Kenya in particular (Farell, 2007).
Another challenge is inadequate connectivity and network infrastructure. As reported in the “ICTs in Education Options Paper”, one of the main problems is limited penetration of the physical telecommunication infrastructure into rural and low income areas. Specifically, the main challenge is limited access to dedicated phone lines and high-speed systems or connectivity to access e-mail and Internet resources. The EMIS Survey (2003/2004) indicated that over 70 percent of secondary schools and a much larger proportion of primary schools require functional telephones. Indeed, many parts of Kenya cannot easily get Internet services because of the poor telephone networks. About 90 percent of secondary schools need to establish standard Local Area Networks (LANs) in order to improve sharing of information and learning resources.

According to the MOE (2012), all learning institutions in Kenya are custodians of the administrative records that they rely upon to source the education data that is collected annually. The records include; school attendance registers, examination performance records, transfer forms, teachers records, income and expenditure statements. The records management at the institutions is not well updated and this creates data gaps when submitting the EMIS questionnaires. The question is, could there be a difference if ICT was perceived as a useful tool in the performance of such administrative tasks? This research is aimed at assessing the perceptions of teachers in using ICT in secondary school administration. In addition, it is noted in the Education Policy Framework (EPF) that there are a number of challenges concerning access and use of ICT in Kenya. These include high levels of poverty that hinder access to ICT facilities, limited rural electrification and frequent power disruptions.

A study by Boit and Menjo (2005) on challenges of using ICT in secondary school administration revealed that lack of electricity connection to the schools made it difficult to use ICT in school administration. Due to lack of power, infrastructure and connection to some of the institutions, two of the schools under the study had resorted to the use of diesel generators to
provide electricity to power the computers. This manner of sourcing power was highly
inconveniencing because it was mostly used at night. Consequently, few teachers and
administrators were able to utilize the technology, leading to low frequency of ICT use.

Moreover, in areas where there is electricity, hindrances to application of ICT include:
high costs of internet provision, costs associated with digital equipment and inadequate
infrastructure and support. All these challenges made it almost impossible for teachers in their
efforts to use ICT in their administrative duties. The study also identified a number of factors
which influenced ICT use in secondary school administration, either in a facilitative or hindering
way. In the study, it emerged that about 60 percent of the schools that participated were
beneficiaries of computer donations from well-wishers, either foreign or from within the country.
Only four of the schools had managed to acquire a sizable number of computers using their own
funds, ranging in number from 10-15. Two schools had entered into a contract with computer
vendors for the supply of computer hardware, software and personnel.

Whereas computers acquired by schools on their own did not present serious problems, a
number of shortcomings were however, noted with donated computers. Donated computers
could not run the latest software, such as Windows 2000, at that time limiting the number of
school administrative tasks that could be performed by the hardware and confining them mostly
to word-processing. At the same time, some of these computers lacked compatibility with the
new generation computers, thus not permitting exchange of programmes between the two types
of hardware, a handicap recorded in a similar study done 18 years ago by Scott (1987). In the
current study, one of the variables is technical support in relation to perceptions of using ICT in
school administration. If teachers are not assisted in dealing with technical problems associated
with ICT, the result is likely to be failure to embrace the use of ICT in carrying out
administrative tasks.
Since the time, the study was conducted many schools through rural electrification programme have been connected to electricity and a number of policies have been put in place regarding administration of secondary schools. For example, the Kenya National Examination Council has made efforts to carry out online registration of examination candidates with great success and savings in terms of time and man-hours used by head teachers to travel to Nairobi. This means the situation is not the same as it were during the period the study was done. Hence, there is need to find out perceptions on use of ICT in secondary school administration in Kimilili District in view of the technological changes that are taking place.

It is important to note that amidst the changes experienced, the MOE (2012) recognizes that in most cases the data capture systems in schools are still manual with submission made through paper work. Additionally, ICT has not been fully utilized to improve the data flows as there is lack of continuous connectivity between the districts and the ministry to facilitate data capture at the lower levels and real time transfer of the same.

2.8 Strategies of Improving ICT Use in School Administration

This section examines some of the strategies that have been proposed by various studies in the implementation and improvement of ICT use in schools. Some of the strategies include professional development for teachers. According to Tinio (2003), ICTs are swiftly evolving technologies, however, even the most ICT fluent teachers need to continuously upgrade their skills and keep abreast of the latest development and best practices. Therefore, teacher professional development becomes the cornerstone of educational ICT use. Similarly, Way and Webb cited in Neyland (2011), agree that professional development for teachers is a critical factor in the integration of ICT in schools.

Providing adequate technical support is another strategy for improving the use of ICT in schools. According to Hayes (2007), all ICT components, software and hardware, should be well
maintained and technical support should be available when teachers have difficulties operating it. Hiring special staff that has the responsibility to support ICT implementation in the schools may also be a viable strategy towards improving the use of ICT in schools.

Cartwright and Hammond (2007) also suggest that a good arranged timetable may provide teachers more time to prepare teaching material that use ICT. By reducing teachers’ workload, they will have more time for developing learning programmes with colleagues, trying new methods to teach in ICT environment, and thinking about better pedagogical practices (Hayes, 2007). The schools should also facilitate a work group which enables teachers to work together producing learning material. This effort will save teachers’ time and also increase productivity.

Adopting ICTs suited to the context is another strategy proposed by Price Waterhouse Coopers (2010). Given that internet access is a problem for most schools, especially in rural areas, educators and administrators need to consider the possibility of establishing Local Area Networks (LANs) in schools. Information could be hosted on school LANs instead of trying to make it available on the internet which is most expensive to most schools.

Although the strategies reviewed are appropriate for improving the use of ICT, it is important to understand that a number of issues are bound to limit the extent of their applicability. This is because the financial implications that come along with the strategies might be too costly for some rural schools where the current study will took place.

2.9 Summary and Knowledge Gap

The reviewed literature shows that ICT as an administrative tool has been used widely. Although its use has universal benefits, there is a difference in the rate of its application depending on the context. Literature indicates that many countries have stepped up initiatives geared towards promoting use of ICT in school administration. Nonetheless, a number of studies
have revealed that there are challenges that have slowed down the adoption and use of ICT in secondary schools. Several of the studies have focused extensively on use of ICT in teaching and administration but there is need to understand the perceptions of teachers on the use of ICT in these areas.

Conclusively, each of the studies reviewed here contributes to the knowledgebase on the perceptions of teachers in using technology in a significant way. However, there is scarcity of studies focusing exclusively on perceptions of teachers in the use of ICT in school administration. Furthermore, most up-to-date evidence is needed to give a clear picture of the current situation with regard to the perceptions of teachers in using ICT for secondary school administration. Considering that none of the reviewed studies focused on Kimilili District, the perceptions of teachers involved in the current study may have been different depending on the time and context. The current study is aimed at providing an insight to perceptions regarding the use of ICT in secondary school administration, particularly in Kimilili District.
CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the methodology that was used to address the research problem. The chapter describes the research design, context of study, target population, the sample and sampling procedures, instruments, validity and reliability of instruments, data collection and analysis procedures that were used. Finally, ethical considerations of the study are discussed.

3.2 Research Design

Research design refers to the procedures used by the researcher to select a sample, administer the instruments and analyze the data (Ogula, 2005). The mixed method design was used to answer the research questions that guided this study. According to Johnson and Onwegbuzie (2004), mixed method research is a combination of qualitative and quantitative techniques, methods, approaches and concepts or language in a single study.

The researcher adopted cross-sectional survey and phenomenology methods in the study. A cross-sectional survey is a quantitative design used when data is collected from selected individuals at a single point in time (Gay, Mills and Airasian, 2009). Cross-sectional survey design was used to collect data about levels of availability of ICT facilities and perceptions of teachers regarding the use of ICT in administration of public secondary schools in Kimilili District. Phenomenology was also used to provide an in-depth understanding of the teachers’ lived experiences with the use of ICT in administration. According to Willis (2007), phenomenology reasons that in order to arrive closer to knowing what is real, one needs to find out how humans perceive themselves and the world around them. Generally, the researcher optimized on the strengths of a mixed method research design by using both quantitative and qualitative methods specifically in data collection.
3.3 Context of Study

The study was carried out in Kimilili District of Bungoma Countyin Kenya. The district has a total human population of 96,964 (KNBS, 2009). There are twenty-five public secondary schools in Kimilili District. The teacher population in these schools is 344 while the student population is 9782. One of the schools in the district is a national school, five are county schools and nineteen are district schools. Five schools in the district offer Computer Studies as a KCSE subject (District Education Office, Kimilili, 2012). Public secondary schools in the district have benefited from the rural electrification programme. As a result, there has been substantial investment in ICT by the schools. For example, three of these schools in the district have received computers through the Economic Stimulus Programme whereas nine schools received computers through the CDF and PTA (Masinde, J., Personal communication, October 23, 2012). The recent introduction of computer in most schools prompted the researcher to propose a study in the district.

3.4 Target Population

The target population in the study was all the twenty five public secondary schools, the 344 teachers and all the twenty five head teachers of the schools. Head teachers were targeted because they bear the responsibility of carrying out administrative tasks and allocation of ICT resources in their schools. Teachers are implementers as well as users of ICT. Furthermore, teachers also execute duties related to administration as delegated to them by head teachers.

3.5 Description of Sample and Sampling Procedures

The participants for this study were teachers in public secondary schools in Kimilili District. Sampling was done through probability and non-probability sampling techniques. Probability sampling techniques permit the researcher to specify the chance that each member of a defined population will be selected for the sample (Gay, Mills & Airasian, 2009). Simple
...random and stratified sampling techniques were used. Simple random sampling means each member of the population has an equal and independent chance of being selected (Mertens, 2005). Stratified sampling is the process of strategically selecting a sample in such a way that guarantees desired representation of relevant subgroups within a sample (Gay, Mills & Airasian, 2009).

Non-probability sampling is the process of selecting a sample using a technique that does not permit the researcher to specify the chance that each member of a population has of being selected for the sample (Gay, Mills & Airasian, 2009). The non-probability technique that was used is purposive sampling. Purposive sampling allows a researcher to use the cases that have the required information with respect to the objectives of his or her study (Mugenda & Mugenda, 2003). According to Kombo and Tromp (2006), purposive sampling can be used with both qualitative and quantitative studies in addition to probability sampling.

3.5.1 Schools

Schools were sampled using stratified, purposive and simple random sampling techniques. There are twenty-five public secondary schools in Kimilili district. The sample comprised twelve public secondary schools, which is approximately 50 percent of the total schools. The twenty-five public secondary schools in Kimilili District were categorized as national, county and district schools. The only national school was purposively selected for it has extensive computer facilities. Three county schools and eight district schools were randomly selected out of five and nineteen schools respectively. Simple random sampling was done through the lottery method. After categorizing the schools, the names of the county schools were written on pieces of paper, placed in a container and thoroughly mixed to ensure randomization. Three county schools were then picked and the selected names formed the simple random
sample. This was repeated for the district schools from which eight schools were randomly selected.

3.5.2 Head teachers

The district has twenty five public secondary schools and hence twenty-five head teachers. The head teachers of twelve selected schools participated in the study. They were purposively selected because they are responsible for allocation of ICT resources and supervision of ICT use in their schools. They are therefore dimmed to have information that is vital to the study.

3.5.3 Teachers

According to the Kimilili District Education Office (2012), there are 344 teachers in the district. Stratified sampling was used where teachers were divided into two strata. The first stratum comprised of heads of departments from the selected schools. The second stratum comprised subject teachers from the twelve selected schools. Using simple random sampling, teachers from the two strata were selected through the lottery method.

A total of 172 respondents were selected to participate in the study, which was approximately 50 percent of the target population. According to Gay, Mills & Airasian (2009), for a population say, \( N=500 \) (give or take 100), 50 percent should be sampled to be adequate.

3.6 Description of Research Instruments

The research instruments that were used to collect data included questionnaires for teachers, interview guide for principals, observation guide and document analysis guide. The instruments were used to collect both quantitative and qualitative data to safeguard the purpose of triangulation and complementation.
3.6.1 Questionnaire for Teachers

Questionnaires are used to gather data over a large sample. They are advantageous since they are easy to administer and also confidentiality of respondents can be upheld (Kombo & Tromp, 2006). The questionnaires used comprised both open-ended and closed-ended questions. Closed-ended questions are easy to administer and analyze hence economical in terms of time and money whereas open-ended questions though difficult to analyze, stimulate a person to think hence respondents may give an insight into their feelings, interests and decisions (Mugenda & Mugenda, 2003).

The questionnaires for teachers comprised of six sections. Part A was used to gather demographic information of the participants, for example, sex, age, academic qualifications, experience and type of school. Part B was used to find out the ICT infrastructure available in the school for administration. Part C was used to find out the level of use of ICT for administration in secondary schools. Part D was used find out perceptions of teachers regarding the use of ICT in administration. Part E sought to find out the effect of ICT on the performance of administrative tasks while part F looked for suggestions from the teachers on what strategies can be put in place to improve the use of ICT in the administration of secondary schools.

3.6.2 Interview Guide for Head Teachers

An interview guide was used to collect in-depth information about the principals’ views on the use of ICT in secondary school administration. According to Gay, Mills & Airasian (2009), interviews can be used to explore and probe participants’ responses to gather in-depth data about their experiences and feelings. It is also a flexible tool for data collection, enabling multi-sensory channels to be used; verbal, non-verbal, spoken and heard (Cohen, Manion and Morrison, 2008).
The tool was be used to collect information from the principals of schools that were selected for the study. The interview guide consisted of six questions which sought to establish the availability and usability of ICT infrastructure in the schools as well as find out the head teacher’s perceptions regarding the use of ICT in administration. It was used to find out from the head teacher the effects of using ICT in administration, the challenges faced in using ICT and finally, the strategies that would be employed in improving ICT use in administration.

3.6.3 Observation Guide

An observation guide was used by the researcher to collect information on levels of availability and accessibility of physical ICT infrastructure and their use in administration of secondary schools. This technique is appropriate in understanding the natural environment as lived by the respondents without altering or manipulating (Gay, Mills & Airasian, 2009).

The observation guide was used to verify the adequacy of the ICT facilities, the number of computers, their location, and computer laboratory and internet/intranet connectivity.

3.6.4 Document Analysis Guide

This document was used to examine school records to enable the researcher to find out whether storage and processing of school records and students’ data is computerized or not. Document analysis in this study involved examination of school admission register, store records, school library records, newsletters, class timetables, schemes of work and progress records.

3.7 Validity and Reliability of the Instruments

3.7.1 Validity

According to Gay, Mills & Airasian (2009), validity refers to the extent to which a research instrument measures what it is designed to measure. The type of validity considered was face validity and content validity.
Face validity refers to the researcher’s subjective assessments of the presentation and relevance of the measuring instrument as to whether the items in the instrument appear to be relevant, reasonable, and unambiguous and clear (Oluwatayo, 2012).

Content validity refers to the form of validity that ensures the elements of the main issue to be covered in a research are both a fair representation of the wider issue under investigation and that the elements chosen for the research sample are addressed in depth and breadth (Cohen, Manion& Morrison, 2008).

To determine both face and content validity, the researcher gave the instruments to a panel of three experts who helped in improving them. The researcher sought her supervisors’ judgment regarding the validity of the instruments.

3.7.2 Reliability

According to Cohen, Manion& Morrison (2008), reliability is a measure of consistency over time and over similar samples. A pilot test was done using the instruments to help in improving on their clarity and comprehensiveness. The study was done in one of the schools randomly selected from the target population but from those that did not participate in the actual study.

In this study, the split-half reliability method was used. This method is appropriate when it would be difficult for a researcher to administer the same test to a group at two different times (Gay, Mills & Airasian, 2009). The method involved administering the test to a group and then dividing the test items into two halves. Each participant’s score on the two halves was computed from the two groups of items. The scores from the two groups of items for all subjects were correlated. The test returned a correlation co-efficient of 0.7 which was within the prescribed limits (0.6 and 1). This result was satisfactory and formed a basis for accepting the instrument’s internal consistency and reliability.
3.8 Data Collection Procedures

The researcher acquired an introductory letter from Catholic University of Eastern Africa and a permit from The National Council for Science and Technology (NCST). This was followed by seeking permission from the District Education Officer to carry out research in secondary schools in Kimilili District. She further asked permission from principals of the sampled schools prior to the date of data collection. The researcher then visited the sampled schools to meet the respondents and explain to them the purpose of the study and sought consent from them before administering the questionnaires. This helped to create rapport between the researcher and the participants. After administering the questionnaires, she waited for them to be filled and collected them upon completion.

The researcher booked an appointment with the principals of sampled schools for interviews. Interviews were conducted with the sampled principals as per the pre-constructed interview guide. The interviewer took short notes to capture all the important information. Immediately after each interview, the researcher reviewed the notes to ensure dependability of the data collected.

3.9 Data Analysis Procedures

Quantitative data collected from the respondents was cleaned and coded according to various variables and organized for computer analysis using SPSS Version 20.0. Analysis of quantitative data included running of descriptive statistics such as mean, frequencies and percentages and presented using tables, pie charts and bar graphs.

Qualitative data derived from open-ended questions, interviews and observations was cleaned, coded to generate categories and themes basing on the research questions. The researcher then presented the data in narrative form describing the perceptions of teachers in use of ICT for school administration.
3.10 Ethical Considerations

Informed consent is central in social research and it is up to the participants to weigh the benefits and risks associated with participating in the research and deciding whether to take part or not (Howe & Moses, 1999). The researcher informed participants about what their participation in the research entailed, the requirements of the study and its importance so as to get their consent before proceeding with data collection. By explaining to the respondents the purpose of the study, the researcher did not force them to participate in any way but allowed individuals to decide whether or not to participate in the study.

The researcher also ensured that confidentiality of the respondents was maintained. Gay, Mills & Airasian (2009) argue that researchers protect confidentiality when they know the identity of the study participants but do not disclose that information. Anonymity was used to ensure confidentiality by asking respondents not to indicate their names on the questionnaires. Finally, the researcher made sure that there was no plagiarism in her work by acknowledging other people’s work. The findings have been reported as per the respondents’ answers and not otherwise.
CHAPTER FOUR

PRESENTATION, INTERPRETATION AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the results and analysis within the framework of the set study questions, which is presented in tables and figures. It presents the rate of return and demographic characteristics of the respondents who are teachers and head teachers in the sampled schools in Kimilili District. The chapter also discusses findings of the study under the following headings:

i. Level of availability of ICT facilities for administration of public secondary schools.

ii. Extent of use of ICT facilities in administration of public secondary schools in Kimilili District.

iii. Perceptions of teachers on the use of ICT tools in secondary school administration.

iv. Effects of using ICT tools for administration in secondary schools.

v. Strategies to improve the use of ICT in the administration of secondary schools.

4.2 Rate of Return

The researcher administered a total of 160 questionnaires to the sampled teachers in 12 public secondary schools in Kimilili District. However, 140 respondents returned their questionnaires to the researcher. This gives 87.5% of the rate of return. According to Owens (2002), a return rate of 75% and above is deemed representative a study since it reduces the level of sampling bias.

4.3 Demographic Characteristics of Participants

The demographic characteristics of the participants covered in this section are gender, age, academic qualifications, working experience and school category.
Teachers

The background characteristics determined from teachers included gender, age, and academic qualifications as shown in Table 2.

Table 2

Demographic Characteristics of Teachers

<table>
<thead>
<tr>
<th>Gender</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>72</td>
<td>51.4</td>
</tr>
<tr>
<td>Female</td>
<td>68</td>
<td>48.6</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-45 Years</td>
<td>73</td>
<td>52.1</td>
</tr>
<tr>
<td>25-30 Years</td>
<td>32</td>
<td>22.9</td>
</tr>
<tr>
<td>Above 45 Years</td>
<td>25</td>
<td>17.9</td>
</tr>
<tr>
<td>20-25 Years</td>
<td>10</td>
<td>7.1</td>
</tr>
<tr>
<td>Academic Qualifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>86</td>
<td>61.4</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>34</td>
<td>24.3</td>
</tr>
<tr>
<td>Diploma</td>
<td>20</td>
<td>14.3</td>
</tr>
<tr>
<td>Working experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-15 Years</td>
<td>69</td>
<td>49.3</td>
</tr>
<tr>
<td>6-10 Years</td>
<td>34</td>
<td>24.3</td>
</tr>
<tr>
<td>16-20 Years</td>
<td>21</td>
<td>15.0</td>
</tr>
<tr>
<td>1-5 Years</td>
<td>10</td>
<td>7.1</td>
</tr>
<tr>
<td>Above 21 Years</td>
<td>6</td>
<td>4.3</td>
</tr>
</tbody>
</table>
Table 2 shows that 51.4% of the teachers in the study were male, whereas, 48.6% were female. This difference can be attributed to the response trend where more male teachers responded to the questionnaires than their female counterparts as a result of simple random sampling. It could also be due to the fact that male teachers teach in rural schools than their female counterparts.

The results in Table 2 also shows that 52.1% of the teachers were aged between 35 and 45 years, 22.9% between 25 and 30 years old, 7.9% were above 45 years whereas 7.1% were between 20 and 25 years old. This shows that most teachers were relatively mature in terms of age. Hence, they were able to provide relevant information on the use of ICT in the administration of public secondary schools in Kimilili District.

Concerning the teachers’ academic qualifications, Table 2 shows a majority of the respondents, 61.4% had a Bachelor’s degree in Education, 24.3% had a Master’s degree in Education, whereas the rest, 14.3%, had a diploma. This means that a good number of the teachers had passed through a system of education where different communication channels about the use of ICT have been employed hence they were aware of technological changes in the educational sector. According to Rogers (2003) communication channels used to spread word about an innovation determines its rate of adoption.

Regarding working experience, 49.3% of the teachers had taught in their current schools for 11 to 15 years, 24.3% had taught for 6 to 10 years, 15% had taught for 16 to 20 years, 7.1% had taught for 1 to 5 years, while 4.3% had taught for over 21 years in their current school. This shows that a good number of the teachers had taught in their respective schools for a significant period of time they were in a better position to address the items in the research instrument on use of ICT in administration of their respective schools with the understanding of the prevailing ICT infrastructural conditions.
4.3.2 Head teachers

Demographic characteristics determined from the head teachers included: gender, age, professional qualification and their school category. These characteristics are shown in Table 3.

Table 3

Demographic Characteristics of the Head Teachers

<table>
<thead>
<tr>
<th>Gender</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>7</td>
<td>58.3</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>41.7</td>
</tr>
</tbody>
</table>

Age

<table>
<thead>
<tr>
<th>Age</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 49 years</td>
<td>5</td>
<td>41.7</td>
</tr>
<tr>
<td>40-49 years</td>
<td>7</td>
<td>58.3</td>
</tr>
<tr>
<td>30-39 years</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Professional Qualification

<table>
<thead>
<tr>
<th>Qualification</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s Degree</td>
<td>7</td>
<td>58.3</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>4</td>
<td>33.3</td>
</tr>
<tr>
<td>Diploma</td>
<td>1</td>
<td>8.4</td>
</tr>
</tbody>
</table>

School Category

<table>
<thead>
<tr>
<th>Category</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>District</td>
<td>8</td>
<td>66.7</td>
</tr>
<tr>
<td>County</td>
<td>3</td>
<td>25.0</td>
</tr>
<tr>
<td>National</td>
<td>1</td>
<td>8.3</td>
</tr>
</tbody>
</table>

n=12

Table 3 shows that 7 (58.3%) head teachers, were male while 5, (41.7%) were female. The findings could be attributed to the fact that most of the schools in the district as shown in
Appendix I are mixed schools. For this reason more male teachers are likely to be appointed head teachers compared to their female counterparts.

Pertaining to age, 5 (41.7%) were above 49 years, while 7 (58.3%) were between 40 and 49 years old. None of the head teachers was aged between 30 and 39 years old. The results show that those teachers who hold the position of head teacher are advanced in age. The age of the head teachers is likely to influence their perceptions towards ICT adoption in administration. One of the head teachers interviewed said, “My predecessor, who has since retired, was not interested in implementation of ICT use in the school saying the young ones will do it and never made any initiative to introduce it.”

With regards to professional qualification, 58.3%, head teachers who took part in the study, had a Bachelors degree in Education while 33.3% had a Masters in Education, whereas 8.4% had a diploma. Findings about the head teachers’ qualifications imply that most of them were well trained to give informed views pertaining to the use of ICT in administration. It is important to note that the professional qualifications do not account for expertise in ICT use but can be important in providing guidance.

The table 3 further shows that 66.6% schools were of the district category, 3 (25) were county, and 8.3% was a national school. Since the respondents were drawn from the three categories of schools, it shows that schools with individual characteristics were represented. These characteristics according to Rogers (2003), are important because they determine who adopts the innovation and when.

4.4 Level of Availability of ICT Facilities for Administration of Public Secondary Schools

The level of availability of ICT facilities for administration of public secondary schools included finding out the availability and adequacy of ICT hardware like desktop computers,
laptops, printer, scanner, radio, DVDs/VCD players, TV, video decks and LCD projectors. In addition the section sought to find out the availability of ICT software in the schools.

### 4.4.1 Availability and adequacy of ICT Hardware

To establish the availability of ICT hardware in the schools, the teachers were provided with a list of ICT hardware, and asked to indicate whether they were available or not. Furthermore, they were required to indicate if the available facilities were adequate or not adequate. Table 4 gives a summary of the teachers’ responses.

**Table 4**

*Availability and adequacy of the ICT Hardware*

<table>
<thead>
<tr>
<th>ICT Hardware</th>
<th>Available F (%)</th>
<th>Adequate F (%)</th>
<th>Not Adequate F (%)</th>
<th>Not Available F (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop computers</td>
<td>132 (94.3)</td>
<td>31 (22.2)</td>
<td>109 (77.8)</td>
<td>8 (5.7)</td>
</tr>
<tr>
<td>TV</td>
<td>129 (92.2)</td>
<td>69 (49.3)</td>
<td>71 (50.7)</td>
<td>11 (7.8)</td>
</tr>
<tr>
<td>Radio</td>
<td>120 (85.7)</td>
<td>86 (61.4)</td>
<td>54 (38.5)</td>
<td>20 (14.3)</td>
</tr>
<tr>
<td>DVDs/ VCD players</td>
<td>109 (77.8)</td>
<td>71 (50.7)</td>
<td>69 (49.3)</td>
<td>31 (22.2)</td>
</tr>
<tr>
<td>Printer</td>
<td>71 (50.7)</td>
<td>20 (14.3)</td>
<td>120 (87.5)</td>
<td>69 (49.3)</td>
</tr>
<tr>
<td>LCD Projector</td>
<td>32 (22.9)</td>
<td>34 (24.3)</td>
<td>106 (75.7)</td>
<td>108 (77.1)</td>
</tr>
<tr>
<td>Laptops</td>
<td>20 (14.3)</td>
<td>68 (48.6)</td>
<td>72 (51.4)</td>
<td>120 (85.7)</td>
</tr>
<tr>
<td>Scanner</td>
<td>12 (8.6)</td>
<td>11 (7.8)</td>
<td>129 (92.2)</td>
<td>128 (91.4)</td>
</tr>
<tr>
<td>Video Decks</td>
<td>10 (7.1)</td>
<td>41 (29.2)</td>
<td>99 (70.8)</td>
<td>130 (92.9)</td>
</tr>
</tbody>
</table>

n=140

From Table 4, 94.3% of the teachers indicated that desktop computers are available in all schools that were sampled, whilst 92.2% had TVs, and 85.7% pointed out that radios were present in their schools. Another 77.8% of the teachers said that DVDs/ VCD players were available
whereas, 50.7% and 22.9% had printers and LCD projectors in that order. Additionally, 14.3%, 8.6%, and 7.1% had laptops, scanners, and video decks respectively.

These results show that basic ICT facilities such as desktop computers were available in most secondary schools in Kimilili District. The availability could be due to the fact that the government of Kenya has prioritized investment in ICT infrastructure in educational institutions as articulated by the MOE (2012) in the National Education Support Sector Programme.

Concerning adequacy of the hardware facilities, Table 4 shows that majority of the teachers 77.8% in secondary schools maintained that desktop computers were not adequate as 71.50.7% indicated that TVs were similarly not adequate. Another 61.4% observed that radios were adequate. Another 50.7% pointed out that DVDs/VCD players were adequate. At the same time, 14.3% indicated that printers were not adequate. A further 75.7% were of the opinion that LCD projectors were not adequate. Other respondents 51.4%, 92.2%, and 70.8% respectively, maintained that laptops, scanners, and video decks were not adequate.

The researcher also used an observation guide to verify responses elicited from the teachers. Following the observation it was confirmed that the ICT facilities that were available in most schools were desktop computers. Through observation it was confirmed that in most schools, the desktop computers, TVs, radios, DVDs/VCD players, printers, LCD projectors, laptops, scanner, and video decks available were in reasonably good working condition but still not adequate as it had been indicated by teachers. In one school for instance, there was only one computer which was mainly used by the school secretary. Also observed was that in some schools computer technicians were available to assist teachers in handling technical issues.

Arising from the findings it is apparent that adequacy of DVDs/VCD players and radios are possibly due to the fact that the technology is becoming obsolete. For that reason teachers felt that their school did require any more the DVDs /VCD players. One teacher commented that,
“The school should consider investing more in computers and other modern devices for school administration instead of radios and DVD/VCD players.”

It was further noted through interviews and observation that the distribution and availability of ICT resources largely depended on the category of the school and also the mode of acquisition. In two district schools, there was only one computer available in each of them while three other district schools had two computers each. Two others had over 20 desktop computers since they had acquired them from the government under ESP. Three county schools and one national school had over 40 desktop computers in their schools. These findings imply that the district schools were very disadvantaged in terms of ICT infrastructure.

The head teachers in the study were asked to comment on the availability of ICT facilities in their schools. Only three head teachers indicated that ICT facilities were available and adequate. Other three head teachers reported that the ICT facilities available were not adequate. They further revealed that even the few computers available were not fully utilized due to lack of appropriate software and skills. The rest of the head teachers stated that although they had acquired computers through either CDF, ESP or well-wishers, the facilities were inadequate and the head teachers felt that they needed to invest in more facilities.

Others indicated that to some extent, only computers are fairly sufficient because they had acquired them through government grants, Constituency Development Fund (CDF), Ministry of Education under the Economic Stimulus Programme and well wishers. The head teachers from most district schools reiterated that their schools had inadequate ICT facilities and hoped for county government support in acquiring more.

The inadequacy of ICT facilities in schools hinders its use in administration as revealed by Makhanu and Kamper (2010) that a relatively low percentage (42%) of principals had access
to ICT facilities in their schools. This explains the reason why many schools have not fully embraced the use of ICT in administration.

**Availability of ICT Software**

The teachers were also asked to indicate the available computer software in their schools. Their responses are shown in Figure 2.

![Available Computer Software in the Schools](image)

*Figure 2. Available Computer Software in the Schools.*

Figure 2 shows that a majority of the teachers 72.9% pointed out that the software available in their schools were Word processor, 50.7% indicated Spreadsheets while 35.8% indicated PowerPoint, and 20.2% pointed out Databases. About the availability of software, most schools acquire computers that are equipped with the standard Microsoft office suite of software packages like word, excel and power point that support basic word processing, spreadsheets and hard disk memory. This explains why teachers pointed out that they were available. Those who
failed to identify the software may not be familiar with them or were not aware of the existence of such software since they do not use them.

Other software indicated that were available in only two schools were Microsoft Publisher, Microsoft Outlook and Microsoft OneNote. The national school and two county schools had computerized their administrative processes through database management software such as School Account Management System which was used for receipting, preparing fee statements and maintaining financial records. Others were Elimu School Management System which was used for online registration, examination analysis, automatic reporting by school to parents and online form one selection. Two county schools had also computerized most of their administrative processes. District schools had not computerized most of their administrative processes.

On the subject of software, some head teachers were skeptical that their schools could afford to purchase all the required software that can facilitate efficient school administration. This finding explains why secondary schools still have got a long way to go in fully embracing ICT use in administration.

Findings in this section demonstrate that as much as basic ICT hardware and software are available in public secondary schools, they are not entirely adequate for use in the administration of the schools. This concurs with Farell (2007) who observes that access to ICT facilities is currently one of the major challenges in Africa and Kenya is no exception. The ratio is even wider in disadvantaged regions and areas. Kimilili District, demographically consisting mainly of rural population counts as one of these ICT disadvantaged regions.
4.5 Extent of ICT Use in Administration of Public Secondary Schools

To determine the extent of ICT use in administration, teachers were asked to indicate ways in which they used ICT in carrying out administrative tasks. Table 5 shows the teachers’ responses.

**Table 5**

Ways in Which Teachers Used ICT to Support their Work

<table>
<thead>
<tr>
<th>Uses</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration and confirmation of students for national exams</td>
<td>86</td>
<td>61.4</td>
</tr>
<tr>
<td>Preparation of student report forms for parents</td>
<td>73</td>
<td>52.1</td>
</tr>
<tr>
<td>Preparing schemes of work and lesson plans</td>
<td>71</td>
<td>50.7</td>
</tr>
<tr>
<td>Making exam entries and generating results</td>
<td>68</td>
<td>48.6</td>
</tr>
<tr>
<td>Preparation of school budget</td>
<td>58</td>
<td>39.4</td>
</tr>
<tr>
<td>Preparing and checking school timetable</td>
<td>54</td>
<td>38.6</td>
</tr>
<tr>
<td>Maintenance of library records</td>
<td>52</td>
<td>37.1</td>
</tr>
<tr>
<td>Keeping records of achievement</td>
<td>41</td>
<td>29.2</td>
</tr>
<tr>
<td>Communicating with parents</td>
<td>34</td>
<td>24.3</td>
</tr>
<tr>
<td>Maintaining discipline records of students</td>
<td>32</td>
<td>22.9</td>
</tr>
<tr>
<td>Registration of new students</td>
<td>28</td>
<td>18.1</td>
</tr>
<tr>
<td>Keeping teacher’s performance records</td>
<td>24</td>
<td>17.1</td>
</tr>
<tr>
<td>Keeping records of class attendance</td>
<td>20</td>
<td>14.3</td>
</tr>
<tr>
<td>Maintenance of teacher’s attendance records</td>
<td>11</td>
<td>7.8</td>
</tr>
</tbody>
</table>

n=140

Table 5 shows that 61.4% teachers indicated that the main ways in which they used ICT to support their work was registration and confirmation of students for national exams. In the same
52.1% used it in preparing students’ report forms for parents while 50.7% indicated preparing schemes of work and lesson plans. Another 48.6% indicated making exam entries and generating results whereas 39.4% indicated preparation of school budget. On the same note, 37.1% pointed out maintenance of library records while 38.6% were opined to preparing and checking school timetable. Further, 29.2% indicated keeping records of achievement and 24.3% pointed out communicating with parents while 22.9% of the teachers indicated that ICT was used to keep teacher’s performance records. More so, 14.3% pointed out keeping records of class attendance. Finally, 18.1% specified registration of new students and only 7.8% were in favour of maintenance of teacher’s attendance records.

The high response regarding registration and confirmation of students for national examinations could be due to responding to the policy of the National Council of Examination regarding management of National Examinations (KNEC, 2012). The teachers in secondary schools have no choice other than employ ICT in the registration and confirmation of candidates for national examinations. This means that strict reinforcement of policies is likely to contribute to increased use of ICT in administration.

Preparation of student report forms, preparing schemes of work and lesson plans, making exam entries and generating results are periodic tasks which can be time consuming. The results in Table 5 imply that ICT was used to perform these 5 tasks in order to save time for the teachers to carry out teaching activities and as such they are prioritized because of the advantages. These results concur with Cowie et al. (2008), who revealed that most teachers used laptops for administrative tasks associated with their obligation for teaching. In particular, teachers used laptops for recording and checking students’ grades as well as writing reports for parents.

The findings further indicated that keeping performance and attendance records were tasks that were least performed using ICT. This implied that the system of storing information
some of the schools was poor. These findings are in line with the MOE(2012) that record management in most learning institutions is weak which has led to data gaps and poor response of EMIS data submission.

Taking into consideration that only three tasks out of the fourteen listed in Table 5 fall above the 50% mark in terms ICT use, it clearly demonstrates that the use of ICT in carrying out administrative tasks in public secondary schools in Kimilili District is quite low. These findings are in agreement with Nchunge, Sakwa and Mwangi (2012) whose study revealed that secondary schools are still lagging behind in the use of ICT. Furthermore the MOE (2012) recognizes that in most cases the data capture systems in schools are still manual with submission made through paper work. This confirms that, ICT has not been fully utilized to improve the data flow in educational institutions.

The teachers were further asked whether use of ICT influenced their performance of administrative tasks. Their response is shown on figure 3.

Figure 3. Use of ICT and teachers’ performance of administrative tasks.

Figure 3 shows that 53.6% of the teachers who participated in the study indicated that use of ICT influenced their performance of administrative tasks. The rest 46.4% observed that it did not influence the performance of their work at all. Those who said that ICT did not influence their work possibly did not have access to ICT facilities due to inadequacy or inavailability.
The teachers who indicated that use of ICT influenced their performance of administrative tasks were asked to point out how use of ICT influences the way they performed administrative tasks and other processes facilitated through ICT. They stated the following:

i. Through ICT they can use the computer to store and retrieve past examination papers.

ii. Through ICT they can use the printer to print all examination analysis results and merit lists and to make copies of official documents.

iii. They use the computer to analyze the student’s academic results and to process the students report forms.

iv. They use the computer and the internet connectivity to register KCSE candidates.

v. They use the internet to access information on good administrative practices.

vi. They use computer to type, store and retrieve administrative documents.

vii. They use the computer to send E-mail to communicate with various stakeholders.

viii. They use scanners to scan official documents for administrative use.

Additionally, some teachers said that ICT enabled them to become more efficient by saving time. It is however difficult to quantify the exact amount of time saved or lost by using ICT in performing specific tasks. On the same, other teachers reported that some tasks took longer when using ICT. This is likely to be due to lack of confidence or lack of ICT skills.

All the twelve head teachers who were interviewed on extent of ICT use in administration said that the benefits associated with the use of ICT included facilitating the teaching of computer studies to staff and students, admission/registration of students, preparation of student progress reports, keeping school fees payment records. Seven head teachers opined that ICT facilitated efficient and economic storage, retrieval and dissemination of accurate information which improved the administration processes. Three head teachers, one from a national school
and two from county schools indicated that their schools had automated a good number of the administrative processes unlike their counterparts from district schools.

A head teacher reported that: “ICT facilitates preparation of student report forms, teaching time tables, communication with parents, and online registration of students for KCSE.” On line registration is a policy of the KNEC (2012). These views are an indication that if clear policies are put in place regarding the use of ICT in administration in schools then teachers will embrace ICT as a vital tool of administration.

One head teacher from a district school commenting on the extent of ICT use in his school said: “The use of ICT in my school is still in its infancy stages and efforts are being directed towards training teachers and administrative staff on the use of ICT in performing administrative tasks.” This reveals that ICT is still a novel idea to some secondary schools. As such there is need to prioritize its use as a tool in administration in all schools in order to bridge the digital divide.

With the assistance of the school authorities, the researcher examined a number of the schools’ records to ascertain the extent of ICT use. It was revealed that ICT was mainly used in keeping school admission register, storing students’ progress records, publishing newsletters, and sending emails. Findings under this research question suggest that ICT facilities are used in the public secondary schools on matters pertaining to day to day administration of both students and teachers, and occasional registration of new students in the schools, as well as annual registration of candidates in national examinations. This has consequently enhanced efficient storage and retrieval of students’ information in schools where it was used. These findings are in agreement with Maki (2008) who revealed that ICT enabled managers and administrators to update and record changes in a school environment, to produce documents regarding operational activities
of the school; to support decision and action making due to the fact that ICT systems present reality at any moment.

4.6 Perceptions of Teachers on the Use of ICT Tools in Secondary School Administration

To ascertain the perceptions of teachers on the use of ICT in secondary school administration, a five point scale was used. Teachers were provided with statements and asked to choose the level of agreement by indicating that they: Strongly Agree=5, Agree=4, Not Sure=3, Disagree=2 or Strongly Disagree=1. The findings are summarized in Table 6.

Table 6
Descriptive Statistics of Teachers’ Perceptions on the Use of ICT in Secondary School Administration

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using computers reduces time wastage</td>
<td>140</td>
<td>4.92</td>
<td>0.07</td>
</tr>
<tr>
<td>Electronic registration of students is essential in the administration</td>
<td>140</td>
<td>4.81</td>
<td>0.20</td>
</tr>
<tr>
<td>Online registration of KCSE candidates essential in administration of schools</td>
<td>137</td>
<td>4.75</td>
<td>0.26</td>
</tr>
<tr>
<td>Use of computers and internet has enhanced my job performance and satisfaction</td>
<td>139</td>
<td>4.32</td>
<td>0.62</td>
</tr>
<tr>
<td>I can perform my duties efficiently without using computers and the internet</td>
<td>140</td>
<td>3.06</td>
<td>3.28</td>
</tr>
<tr>
<td>The school has trained me and other staff well on online registration of students</td>
<td>140</td>
<td>2.61</td>
<td>2.98</td>
</tr>
<tr>
<td>Using ICT requires re-training which wastes a lot of class time and funds for other activities</td>
<td>140</td>
<td>1.79</td>
<td>1.28</td>
</tr>
</tbody>
</table>

n=140
Results from table 6 support the use of computers and internet for online registration of KCPE candidates as accounted for by the mean of 4.81. This may be because they are in support of the policy and are willing to implement it.

Additionally, teachers are certain that using computers and internet enhances job satisfaction as supported by a mean of 4.32. The certainty of the teachers shows that the use of ICT accords them some gains which drive towards adoption of ICT in administration. This can be supported by Rogers (2003) who argues that innovation must have some relative advantage for it to be adopted.

On performance of duties using computers, most teachers were not sure whether they could perform their duties efficiently without computers and internet as supported by a mean of 3.06. This result could be due to the fact that ICT facilities are not adequate or may be the teachers do not have the necessary skills hence are slowed down in using the technology.

On training, the overall opinion is that teachers have not been trained by the school on using ICT in registration of students as accounted for by the mean of 2.61. This implies that there is little effort by the management of schools to encourage and train teachers in e-administration skills.

Another mean of 1.79 accounts for teachers disagreeing that retraining them on ICT wastes time for other school activities. Most teachers seem to be enthusiastic about being retrained on ICT. Being trained on ICT will prepare them well on its application and usage in school administration.

The head teachers were asked to comment on the perceptions of teachers on the use of ICT in administration in their schools. They observed that teachers are happy and appreciate ICT considering that with it, work has been made faster and easier. They also pointed out that even though ICT facilities that were available in their respective schools were inadequate, ICT interest
among teachers was high and most of them were actually looking forward to its full implementation and use in school administration. Head teachers further indicated that, more teachers had started using ICT in their routine tasks because it was convenient and had reduced the tedious manual processes of handling information. One head teacher commented that:

“Having been taken through introductory training by the ICT champions, teachers gained interests such that even their handwritten schemes of work, lesson plans, mark sheets, and preparations were transferred to the computer. The teachers are actually positive and eager to utilize and learn more on ICT.”

The findings in this section reveal that perceptions of teachers on the use of ICT tools in secondary school administration is generally positive, with the teachers hailing it for speed and convenience. These findings concur with Hayes (2007) who argues that school administrators view ICT as godsend due to its ability to support their administrative and management duties, the level to which ICT infrastructure has reduced administration and management workload is extensive. Using ICT, the school administration can document all filed or boxed information for speedy access. With a networked system every teacher can access relevant information conveniently at the comfort of the staff room.

4.7 Effects of Using ICT Tools for Administration in Secondary Schools

Teachers were provided with a number of perceived effects of using ICT tools for administration in secondary schools and asked to indicate to what extent they felt the use of ICT in administration had effects in their work. Their responses are shown on Figure 4.
Figure 4. Effects of using ICT Tools for administration in secondary schools.

From Figure 4 pertaining to reduced time spent on routine tasks, (73.6%) of the teachers indicated that using ICT in administration had an effect to a great extent, 15.7% observed that it had an effect to some extent while 10.7% indicated that it had no effect at all.

With regards to improved communication, 64.3% of the teachers indicated that it had an effect to a great extent, 27.1% observed that it had an effect to some extent whereas 8.6% indicated that it had no effect at all. Concerning improved quality of reports, 50.7% of the teachers observed that it had an effect to a great extent, 39.4% indicated that it had an effect to some extent, whereas 7.8% were opined that it had no effect.
With reference to enhancing institutional knowledge and efficiency, 38.6% of the teachers indicated that to a great extent, use of ICT in administration had an effect. Another 40% indicated that it had an effect to some extent, whereas 21.4% pointed out that it had no an effect.

Finally, with respect to enhancement of school image and competitiveness, 35.2% of the teachers were of the opinion that it had an effect to a greater extent while 47% indicated that it had an effect, to some extent. The rest, 17.8% indicated that it had no effect at all.

When asked to comment on the effect of ICT tools on the performance of administrative tasks in the school, the teachers said that ICT enabled them to achieve speedy results, good quality work, management is simplified, safe storage of documents easy analysis of students’ results, accurate processing of report forms, enhanced registration of KCSE candidates through online method.

The head teachers who were interviewed on the same confirmed the teachers’ views. One head teacher said:

“The use of ICT has improved performance of school administrative tasks and made preparation of report saccurate and faster and also generated cleaner and neater records. Use of computers also saved time and made key school operations convenient. It also enhanced tracking of student performance as well as their financial records.”

The findings imply that the effects of using ICT tools for administration in the secondary schools are mainly in the form of efficient and quality work, reduced time wastage, and convenient record storage and retrieval. These findings concur with the Republic of Kenya (2005) in which the Ministry of Education, Science and Technology (MOEST) recognizes ICT as a useful tool in Educational Management Information System (EMIS) for its critical role in provision of timely, reliable and accurate data on educational programmes in schools.
4.8 Strategies to Improve the Use of ICT in the Administration of Secondary Schools

The study further sought to establish strategies used to improve the use of ICT in the administration of secondary schools. The teachers were asked to give suggestions on what should be done to improve on the use of ICT in their respective schools. Their suggestions are presented on Table 7.

**Table 7**

*Strategies to improve the use of ICT in administration of schools*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of cost of ICT facilities to schools</td>
<td>130</td>
<td>92.9</td>
</tr>
<tr>
<td>Workshops to equip teachers with adequate ICT skills</td>
<td>118</td>
<td>84.3</td>
</tr>
<tr>
<td>Enhancement of internet connectivity to schools</td>
<td>95</td>
<td>67.9</td>
</tr>
<tr>
<td>Acquisition of low maintenance ICT infrastructure</td>
<td>86</td>
<td>61.4</td>
</tr>
<tr>
<td>Designing comprehensive computer programmes for administrators</td>
<td>79</td>
<td>56.4</td>
</tr>
<tr>
<td>ICT should be made compulsory in schools</td>
<td>72</td>
<td>51.4</td>
</tr>
<tr>
<td>Improving basic infrastructure like electricity</td>
<td>60</td>
<td>42.9</td>
</tr>
</tbody>
</table>

n=140

From Table 7, 92.9% of teachers felt that reducing costs on ICT facilities enhances its utilization in administration of schools. Another 84.3% were of the opinion that teachers require more skills while 67.9% suggested that acquisition of low maintenance ICT infrastructure improve on the utilization of ICT in administration. Designing comprehensive computer programmes for administrators is a strategy favoured by 56.4% of the teachers whereas 51.4% suggested that making ICT to be a compulsory process will improve its application in administration. Finally, 42.9% of the teachers recommended that improving basic infrastructure like electricity would advance the use of ICT in administration.
Head teachers who were interviewed suggested training of all teachers on the use of ICT, and building of proper and secure computer labs. Another suggestion was addition of more computers to ensure accessibility by all teachers and availing internet connectivity to schools at affordable costs. Attitude change towards ICT usage was also proposed.

The findings in this section show that the use of ICT in the administration of secondary schools is coupled with a myriad of challenges the most obvious being lack of ICT skills. The suggestion provided by teachers is similar to an observation by Tinio (2003) that ICTs are swiftly evolving technologies, however, even the most ICT fluent teachers need to continuously upgrade their skills and keep abreast of the latest development and best practices. Therefore, teacher professional development becomes the cornerstone of educational ICT use. Similarly, Way and Webb cited in Neyland (2011), agree that professional development for teachers is a critical factor in the integration of ICT in schools.

High costs of ICT infrastructure calls for adequate funding of the schools for acquisition of basic ICT infrastructure such adequately equipped and consistently powered computer labs. Schools also require sufficient ICT support for instance, ensuring that there are enough curriculum-oriented computer programs and internet connection to each school.
CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings and conclusions drawn from the study. The chapter also gives recommendations and suggestions for further research.

5.2 Summary of the Study

The main purpose of this study was to ascertain the perceptions of teachers on the use of ICT in the administration of public secondary schools in Kimilili District. The study was guided by five research questions. Related literature was reviewed on ICT in education, National ICT Policy and e-Government strategy, ICT in education policy, use of ICT in school administration, perceptions, challenges and strategies of improving ICT use in school administration. However the literature review did not reveal any study on the of teachers perceptions of the use of ICT in the administration of secondary schools in Kimilili District.

The study used a mixed method research design where both cross-sectional survey and phenomenology designs were employed. Both probability and non-probability sampling procedures were adopted. Stratified and simple random sampling procedures were used to arrive at the sample of teachers, while purposive sampling was used to select the head teachers. The sample consisted of 160 teachers and 12 head teachers.

Quantitative data was analyzed using SPSS version 20.0 and summarized using descriptive statistics such as frequencies, percentages, mean and standard deviation and presented in tables, graphs and charts. Qualitative data was presented in narratives.

The study findings disclosed that the key ICT equipment available in schools was desktop computers. The ICT equipment however was inadequate, with only a few of the schools registering adequacy in desktop computers. The main computer software available in the schools
was Word processor and Spreadsheets because most schools could not afford to purchase other relevant software for administration processes.

Another finding was that the use of ICT in administration of public secondary schools was limited very few tasks. It was mainly used in preparation of student report forms for parents, registration and confirmation of students for national exams, preparing schemes of work and lesson plans in most schools. They could use the computer to store and retrieve past examination papers, print results, merit list and make copies of official documents. Most teachers in the study indicated that use of ICT had influenced their performance of administrative tasks since they were able to cut down on costs.

Teachers were very enthusiastic and positive about using ICT in administration. They perceived that using computers reduced time wastage, enhanced their job performance and job satisfaction. They perceived the registration of KCSE candidates using computers and internet as very essential in administration of secondary schools. Despite the high level of inadequacy of ICT facilities, teachers were generally happy and appreciated ICT in view of the gains such as making work faster and easier. However teachers were not well equipped with relevant ICT skills for use in administration.

Effects of using ICT tools for administration in secondary schools according to teachers were found to be reduced time spent on routine tasks, improved communication, and improved quality of reports. Head teachers indicated that accurate and faster preparation of reports, improved performance of school administrative tasks, time saving and convenience were the main effects of using ICT.

Finally the study established that the strategies that could be used to improve the use of ICT in the administration of secondary schools included: reduction of the cost of ICT facilities to schools, designing of comprehensive computer programs for assistant administrators,
enhancement of internet connectivity to schools, improvement of basic infrastructure (like electricity), change of attitude towards ICT usage among school administrators. The government should also facilitate funding towards training teachers in ICT skills.

5.3 Conclusions

The following conclusions were made based on the findings of the study which was guided by five research questions.

About the level of availability of ICT facilities, it was concluded that desktop computers were the most common hardware in schools. However the available hardware was generally not adequate to facilitate the use of ICT in the administration of schools. Also, most schools were not fully utilizing the available facilities due to absence of appropriate software.

Although ICT facilities are used in public secondary schools in day to day activities in administration and registration matters, the average use is quite low. Besides, usage largely depended on the size and category of the school. The national and county schools had computerized most of the administrative functions unlike the district schools.

Perceptions of teachers on the use of ICT tools in administration in public secondary schools in Kimilili District are generally positive, with the teachers hailing its use for speed and convenience. Despite the challenge of inadequate facilities, teachers are enthusiastic and eager to use ICT in the administration though they feel that they require further training in ICT and technical support skills.

Regarding the effects of using ICT for administration in public secondary schools in Kimilili District, it was concluded that effective use of ICT can be used to address administrative issues if it is well planned and supported since it has positive effects mainly in the form of efficiency, quality work, reduced time wastage, and convenience in storage, retrieval and dissemination of accurate information which improves administration. Additionally, ICT is also
essential in facilitating other administrative tasks such as: preparation of student report forms, teaching time tables, communication with parents, and online registration of students for KCSE.

It was also concluded that use of ICT in the administration of public secondary schools in Kimilili District can be improved by on time handling of challenges related to availability, adequacy and utilization of ICT facilities in respective schools.

5.4 Recommendations

The following recommendations were made to various relevant stakeholders concerning the use of information communications technology in the administration of public secondary schools. These stakeholders are namely: school administrators, the Ministry of Education and teachers.

Government should put in place both material and human resources to enhance application of ICT in the administrative process in schools. This could probably be done by tabling a bill in parliament to cater for the enhancement of school administration using ICT at all levels of education in the country and by asking the Teachers Service Commission to deploy computer teachers and experts to provide technical support in schools.

Another recommendation is that schools should include the purchase of ICT hardware and software facilities in their annual budgets to avoid relying on obsolete equipment and software.

The Ministry of Education and private sector should have a collective responsibility in broadening the knowledge base of application of ICT in administrative processes in schools. This can be done through formulation of sound ICT policies aimed at creating conducive environment for the implementation ICT use in schools.
School administrators should take keen interest in encouraging all members of teaching and non-teaching staff to make use ICT in administration as well as in teaching and learning process. They should ensure that they organize ICT training programmes meant to equip all members of their administrative structure with ICT related skills to be able to apply ICT dynamically in various areas of administration.

Finally, teachers should develop initiatives at personal level to improve their ICT skills by enrolling for computer classes privately.

**Suggested Areas for Further Research**

1. Availability, accessibility and use of ICT facilities for teaching and learning in rural public secondary schools in Kenya.
3. The effect of school administrators’ attitude on the use of ICT in administration of public schools in Bungoma County, Kenya.
4. The role of school community in the usage of ICT in rural secondary schools in Kenya.
REFERENCES


# APPENDICES

## APPENDIX I: SECONDARY SCHOOLS IN KIMILILI DISTRICT

<table>
<thead>
<tr>
<th>NAME OF SCHOOL</th>
<th>TYPE</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends School Kamusinga</td>
<td>Boys Boarding</td>
<td>National</td>
</tr>
<tr>
<td>Chesamisi Boys Secondary School</td>
<td>Boys Boarding</td>
<td>County</td>
</tr>
<tr>
<td>Chesamisi Girls Secondary School</td>
<td>Girls Boarding</td>
<td>County</td>
</tr>
<tr>
<td>Kamusinde Boys’ High School</td>
<td>Boys Boarding</td>
<td>County</td>
</tr>
<tr>
<td>Kimilili Boys High School</td>
<td>Boys Boarding</td>
<td>County</td>
</tr>
<tr>
<td>Moi Girls High School Kamusinga</td>
<td>Girls Boarding</td>
<td>County</td>
</tr>
<tr>
<td>Bituyu Friends School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>Chebukwabi Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>Friends Kamasielo Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>Kamkuywa Secondary School</td>
<td>Mixed</td>
<td>District</td>
</tr>
<tr>
<td>Kibingei Friends Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>Kibunde Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>Kimilili Girls Secondary School</td>
<td>Girls Day</td>
<td>District</td>
</tr>
<tr>
<td>Maeni Girls Secondary School</td>
<td>Girls Boarding</td>
<td>District</td>
</tr>
<tr>
<td>Matili Secondary School</td>
<td>Mixed</td>
<td>District</td>
</tr>
<tr>
<td>Nakalira Secondary School</td>
<td>Boys Day</td>
<td>District</td>
</tr>
<tr>
<td>Namawanga Bahai Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>Sikhendu Mixed Secondary School</td>
<td>Mixed</td>
<td>District</td>
</tr>
<tr>
<td>St. Brigid’s Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>St. Emmanuel Miruri Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>St. James Secondary School- Mapela</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>St. Jan Secondary School</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>St. Joseph’s Secondary School – Kamusinge</td>
<td>Mixed Day</td>
<td>District</td>
</tr>
<tr>
<td>St. Mary’s Secondary School- Sosio</td>
<td>Girls Boarding</td>
<td>District</td>
</tr>
<tr>
<td>St. Theresa’s Girls Secondary School</td>
<td>Girls Boarding</td>
<td>District</td>
</tr>
</tbody>
</table>

Source: Kimilili District Office, (2012)
APPENDIX II: QUESTIONNAIRE FOR TEACHERS

THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

P.O. BOX 62157-00200

NAIROBI, KENYA

My name is Alice Susan Wanjala, a postgraduate student at the Catholic University of Eastern Africa. I am conducting a research on the perceptions of teachers in the use of Information and Communication Technology in secondary schools in Kimilili District. This is part of the academic requirements for the degree of Master of Education in Education Administration and Planning.

I humbly request you to participate in the research by filling in this questionnaire. All responses provided will be strictly confidential.

Thank you in advance.

Instructions

Please indicate the appropriate response with a tick (✓) in the spaces provided and use the provided spaces for explanation where necessary.

SECTION A. Background Information

1. Sex          Male  Female

2. Age bracket  20 – 25 years  35 – 45 years

25 – 30 years  Above 45 years

3. (a) What is your highest academic qualification?

Diploma  Bachelor’s Degree  Master’s Degree

Other (specify)........................................................................................................................................
(b) How long have you been a teacher in the present school?

1-5 years 6-10 years □ 11-15 years □ □
16-20 years □ above 21 years □ □

SECTION B: Availability of ICT Facilities

4. Indicate the appropriate response on availability and adequacy of ICT equipment in your school by ticking (√).

<table>
<thead>
<tr>
<th>ICT Hardware</th>
<th>Available</th>
<th>If yes, how many?</th>
<th>Adequacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Adequate</td>
</tr>
<tr>
<td>Desktop computers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scanner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVDs/ VCD players</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Decks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCD Projector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any other (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Indicate by ticking (√) the available software (programs) in your school.

Word processor □ PowerPoint □
Spreadsheets □ Databases □
Others……………………………………………………………………………………………………………………………

6. Comment on the availability and adequacy of ICT tools in your school.

…………………………………………………………………………………………………………………………………………………………
…………………………………………………………………………………………………………………………………………………………
…………………………………………………………………………………………………………………………………………………………
…………………………………………………………………………………………………………………………………………………………
SECTION C: Use of ICT Tools in Schools Administration

7. In which of the following ways do you use ICT to support your work? (Please indicate Yes/ No where appropriate)

<table>
<thead>
<tr>
<th>Use</th>
<th>Yes/ No</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Registration of new students</td>
<td></td>
</tr>
<tr>
<td>(ii) Preparing schemes of work and lesson plans</td>
<td></td>
</tr>
<tr>
<td>(iii) Preparing records of work and teachers’ notes</td>
<td></td>
</tr>
<tr>
<td>(iv) Preparation of student report forms for parents</td>
<td></td>
</tr>
<tr>
<td>(v) Monitoring students’ academic progress</td>
<td></td>
</tr>
<tr>
<td>(vi) Maintaining discipline records of students</td>
<td></td>
</tr>
<tr>
<td>(vii) Preparing and checking school timetable</td>
<td></td>
</tr>
<tr>
<td>(viii) Keeping records of class attendance</td>
<td></td>
</tr>
<tr>
<td>(ix) Maintenance of library records (issuing books to records)</td>
<td></td>
</tr>
<tr>
<td>(x) Maintenance of teacher’s attendance records</td>
<td></td>
</tr>
<tr>
<td>(xi) Keeping teacher’s performance records</td>
<td></td>
</tr>
<tr>
<td>(xii) Registration and confirmation of students for national exams</td>
<td></td>
</tr>
<tr>
<td>(xiii) Preparation of school budget</td>
<td></td>
</tr>
<tr>
<td>(xiv) Making exam entries and generating results</td>
<td></td>
</tr>
<tr>
<td>(xv) Records of achievement</td>
<td></td>
</tr>
<tr>
<td>(xvi) Checking school notices</td>
<td></td>
</tr>
<tr>
<td>(xvii) Communicating with parents</td>
<td></td>
</tr>
</tbody>
</table>

8. In your opinion, does the use of ICT influence your performance of administrative tasks in 7 above? Yes ☐ No ☐

9. If yes, briefly explain how use of ICT influences the way you perform administrative tasks...

...............................................................................................................................
...............................................................................................................................
...............................................................................................................................
...............................................................................................................................
.............................................................................................................................
10. List other processes and functions facilitated through ICT

........................................................................................................................................
........................................................................................................................................

SECTION D: Perceptions on the Use of ICT

11. Indicate the level of agreement with the following statements on the use of ICT

Strongly Agree (SA)= 5; Agree (A)= 4; Not Sure (NS)=3; Disagree (D)=2; Strongly Disagree (SD)=1.

<table>
<thead>
<tr>
<th>Statement</th>
<th>SA</th>
<th>A</th>
<th>NS</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Electronic registration of students is essential in the administration of secondary school (in admission)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) The school has trained me and other staff well on registration of students (in admission)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Online registration of KCSE candidates using computers and internet is essential in administration of secondary schools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) I feel I can perform my duties efficiently without using computers and the internet.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) The use of computers and internet has enhanced my job performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(f) The use of computers and internet has enhanced my job Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(g) Using computers reduces time wastage in preparation of routine reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(h) Using ICT requires re-training which wastes a lot of class time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) The funds being invested in ICT can best be applied in other more beneficial activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(j) Using computers threatens my job security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION E: Effect of ICT on Performance of Administrative Tasks

12. Please indicate using a tick (√) to what extent you personally agree with the following aspects of teachers’ perceptions towards effect of ICT on performance of administrative tasks.
<table>
<thead>
<tr>
<th>Statement</th>
<th>To a greater extent</th>
<th>To some extent</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) The use of personal computers has improved the efficiency with which administrative tasks are performed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Computers have reduced time spent on routine tasks cutting down the administrative costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Use of internet for research has enhanced institutional knowledge and efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Use of Microsoft Office Suites on personal computers has improved quality of reports and other administrative communications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) ICT facilitates key activities in my school thereby enhancing its image and competitiveness</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


......................................................................................................................................................
......................................................................................................................................................
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SECTION F: Strategies to be Used For Improvement

14. In your own opinion, what should be done to improve on the use of ICT in your school?
    (Give suggestions)..........................................................................................................................
APPENDIX III: INTERVIEW GUIDE FOR PRINCIPALS

The purpose of this interview is to gather information regarding the perceptions of teachers on the use of ICT for administrative tasks in public secondary schools in Kimilili District, Bungoma County. The information you provide will be kept confidential and will be solely used for research.

Section A: Demographic Data

1. Gender
   Male
   Female

2. Age Group
   20 - 29 years
   30-39 years
   40 - 49 years
   Above 49 years

3. Professional Qualifications
   Diploma
   Bachelor’s Degree
   Master’s Degree
   PhD

4. School Category
   National
   District
   County
SECTION B: Head teachers’ Perceptions on Use of ICT for Administrative Tasks

5. Comment on the availability of ICT facilities for your school.
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

6. How does ICT facilitate the performance of administrative tasks in your school?
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

7. Comment on the perceptions of teachers on the use of ICT in administration in your school ...
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

8. What is the effect of the use of ICT in administration of your school?
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

9. What challenges does your school face in using ICT for school administration?
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

10. What do you think can be done to improve the use of computers, internet and other ICT tools in your school?
    ........................................................................................................................................
    ........................................................................................................................................
    ........................................................................................................................................

Thank you for your cooperation
## APPENDIX IV: OBSERVATION GUIDE

<table>
<thead>
<tr>
<th>Item</th>
<th>Availability Yes/ No</th>
<th>No. of facility</th>
<th>Working Condition Good/ Poor</th>
<th>Adequate (√) Not adequate (X)</th>
<th>No. of Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer laboratories</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Laptops</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Scanners</td>
<td></td>
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<td></td>
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<tr>
<td>Printers</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Source of power</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Television</td>
<td></td>
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<tr>
<td>DVD/VCD</td>
<td></td>
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<tr>
<td>Video deck</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Computer technician</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Any other facilities</td>
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</tr>
</tbody>
</table>
APPENDIX V: DOCUMENT ANALYSIS GUIDE

With the assistance of the school authorities, the researcher examined the following records to ascertain the extent of ICT use.

<table>
<thead>
<tr>
<th>Records/ Items</th>
<th>Available</th>
<th>ICT Use (√)</th>
<th>No ICT Use (X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School admission register</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stores records</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library records</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newsletters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email address</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students’ progress records</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School master timetable</td>
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APPENDIX VI: MAP OF BUNGOMA COUNTY SHOWING ADMINISTRATIVE DISTRICTS
APPENDIX VIII: RESEARCH PERMIT