THE EXTENT OF ICT INTEGRATION IN PUBLIC SECONDARY
SCHOOL MANAGEMENT AND THE STAKEHOLDERS’ PERCEPTION
ON THE USEFULNESS OF THE TECHNOLOGY IN NAIROBI COUNTY
KENYA

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OCTOBER, 2017
DECLARATION

I declare that this project is my original work and has not been presented in any
other university/institution for consideration of any certification. This research
project has been complemented by referenced sources duly acknowledged. Where
text, data (including spoken words), graphics, pictures or tables have been borrowed
from other sources, including the internet, these are specifically accredited and
references cited using current APA system in accordance with anti-plagiarism
regulations.

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Supervisor’s declaration: This project has been submitted with my approval as the
University Supervisor;

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DEDICATION

To my family for their support throughout the course.
ACKNOWLEDGEMENT

First, take this grand opportunity to thank the almighty God for the far much He has carried me in the entire course. It was not easy but with His mercies I was able to accomplish. Second, I would like to thank my supervisor, Dr. M. Ogola for his guidance and prodigious advice in the entire course. I owe you a credit sir. I also take this chance to thank my lectures from Kenyatta University for their advice. I will also not forget my family who gave me moral support as I went through the busy schedule. Mr. Antony Bojana deserves gratitude for editing the lexical setup of the final work. Special thanks to my dear wife Janet, lovely children Loreen, Laura and Levina. Thank you all and may the Almighty God bless you.
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<tr>
<td>ICT</td>
<td>Information Communication Technology</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>EFA</td>
<td>Education for All</td>
</tr>
<tr>
<td>EMIS</td>
<td>Educational Management Information Systems</td>
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<tr>
<td>MIS</td>
<td>Management Information System</td>
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<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
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<tr>
<td>TTC</td>
<td>Teacher Training College</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific, and Cultural Organization</td>
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ABSTRACT

The purpose of this study was to assess the extent of ICT integration in school management and the perceptions of teachers on its usefulness. It focused also on the level of foundation skills and training of school managers on ICT usage for management. The study also sought to study the perceptions of teachers and school principals on the usefulness of ICT to school management. The study focused on public secondary schools in Westlands sub-county, Nairobi. The total target population was 347 teachers and 7225 students while the samples size was 42 teachers, 114 teachers and 10 principals from the 10 schools. The use of Information Communication Technology (ICTs) in most setups in the contemporary society is critical. ICT has changed both technological and social interactions due to increased availability of information. The world continues to revolve around technology; teachers and school administrators need to continue incorporating these new technologies into the management of their institutions. The Government of Kenya planned to equip all secondary schools in Kenya with IT infrastructure in 2015. The huge government investments in ICT should achieve its objectives in education and school management. The objectives of this study were: to determine the extent of ICT use in management of secondary education, to identify the technology that managers access, to determine factors influencing the integration of ICT in school management, to establish the level of foundation skills and training of teachers and school managers on ICT usage, and to find out the perceptions of teachers and principals on the usefulness of ICT to school management Westlands Sub-County in Nairobi. The study focused on the Theory of Diffusion and Innovation by DeGross (2008) which has four components; Communication, time, innovation and social system. This study used a descriptive research design which incorporated both qualitative and quantitative approaches. Respondents included teachers, principals and students from public secondary schools in Westlands Sub-County, Nairobi, who were selected using stratified and purposive sampling technique. Further, this study used questionnaires, interviews and observation schedules in the collection of primary data. The resulting data analyzed using descriptive statistics with the aid of Statistical Package for Social Sciences. Quantitative data were presented in tables and figures while qualitative data were presented in form of narratives and themes. The study found that ICT was not extensively used in management of the schools. The study further established that secondary schools in Westlands mostly concentrated on using ICT in teaching and learning and not management. This shows that there is still a lot to be done on the integration of ICT in school management. The study concluded that ICT was not highly upheld in public secondary school management. The study further concluded that the principals had not been keen in implementing use of ICT in management and this has slowed down the process. The study recommends that the stakeholders in secondary schools should embrace use of ICT not only in teaching and learning but also in management. Further, the study recommends for change of attitude of the principals who are the key decision makers on the implementation of ICT. The teachers should also stand supportive to principals to enhance ICT use in secondary school management for efficiency and effective control. Further studies should be done in other parts of the country so as to enhance countrywide integration of ICT in schools.
CHAPTER ONE
INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction
The study sought to find out the extent to which ICT is used in public secondary school management and the stakeholders’ perception on the usefulness of the Technology in public secondary schools in Nairobi County, Kenya.

1.2 Background to the Study
The use of Information Communication Technology (ICTs) in most organization’s setups in the contemporary society is critical. According to Singh, Mazumdar, Sharma and Ranjan (2013), ICTs are info management tools that are used to create, pile, develop, distribute and give-and-take info. Singh et al., (2013) point out that previously, information technology (IT) meant ICT, but with time, it covered other equipment created to augment acquisition, stowage and distribution of info resources. They further note that most of these equipment were initially confined to the offices. They add that ICT comprises the use of computers, internet, telephone, cameras, typewriters, projectors, white interactive boards and other relevant software.

Similarly, United Nations Educational, Scientific, and Cultural Organization [UNESCO] (2011) define ICT to include communication technologies such as telephone and networks. This definition is derived from the ever increasing information processing combining processing and networking power of contemporary ICT (UNESCO, 2011). This capability has been enhanced by increased access and its improved capability which allows use, change and/or transformation of information in a unique way contrary to earlier technologies which
only allowed information dissemination or broadcast. Abbott (2003) holds that the use of ICT in schools is not an option but a necessity. Elston (2007) explains that computers have been in use in school since the 1980s. United Kingdom is reported to be one of the first countries to define IT curriculum with the aim of promoting knowledge, skills and understanding. Reeves (1999) traces the historical account of ICT use in schools to 1920 when radio transmissions were used. This developed via television transmissions and investments after 1976s. Reeves (1999) adds that planning towards using technology in education management in European and American nations started with a plan of development of a period of five years comprising of use of television and radios for education in 1970s. UNESCO (2011) attributes the increasing use of ICT in education to its power to enhance and transform communication. Abbott (2003) maintains that ICT has changed both technological and social landscape due to increased availability of information. Singh et al., (2013) observe that educators and school administrators should take all the measures possible to enhance proper management of their institutions. It is observed that whereas the initial computers generated simple diagrams, its outputs have grown and developed to more sophisticated and realistic animations coupled with sound and video processors (UNESCO, 2011).

Unwin (2005) observes that whereas the use of ICT in school management is advanced in the western counties, in Africa its use is in an ad hoc basis or use in small project basis. This status is attributed to the lack of infrastructure and IT illiteracy among teachers hence cannot integrate in curriculum implementation (Unwin, 2005). Visscher, Wild and Fund (2001) argue that information system is popular in schools. School management systems help school managers in all aspects of school management such as student registration, processing and outputting
students, finance and personnel and other day to activities. Menjo (2009) observes that many countries in the developing world have limited experience on effective use of Education Management Information Systems (EMIS). Moreover, Kukali (2013) maintains that most rural and informal urban settings may include; lack of electricity and internet connection, poor attitude towards its use as a result of lack of ICT skills, parental illiteracy and high cost of purchasing computers. This limits the realization of the benefits on the huge investments by the government on ICT in the education sector.

Hennessy et al., (2010) maintain that in developing countries citing the use of ICT in education management observes that in East Africa, for example, studies in educational institutions confirm the use of ICT in management activities such as finance, student data as well as assessment records. Hennessy et al., (2010) found, that schools in Dar es Salaam were harnessing ICT in such activities as making timetables, library management and low cost internet based communication such as e-mail. In Kenya, some students use internet to apply, register, pay fees, send in assignments as well as check their assessment results. Kukali, Simatwa and Indoshi (2010) explain that the national examinations body in Kenya enables candidates to check their grades by sending short messages through a dedicated website. However, in spite of these developments, Hennesy et al., (2010) still lament that ICT penetration and usage in educational management is still low in East Africa. Similarly, a study on ICT usage carried out by Lopro (2006) in Mbeya, Tanzania confirmed that there is low ICT use in managing learning institutions. The use of ICT was mainly clerical in nature due to dynamics like scanty funds, lack of IT professionals and poor ICT infrastructure (Lopro, 2006).
Several studies have been conducted on use of ICT in school management. In the previous twenty-five years, there have been research works of the commitment of ICT in schooling (Cox, Abbott, Webb, Blakeley, Beauchamp & Rhodes, 2003). Many research works have shown that in spite of instructor preparation platforms, an upsurge in ICT assets for school management and the necessities of countrywide syllabuses, there has been a lamentably sluggish acceptance of ICT in schools by the bulk of teachers and school managers. Some of the reasons for this lack of more pervasive interest of ICT are that school managers do not have a clear and articulate sagacity of the motives for educational change, what it is and how to progress. Thus there is let-down of change programme, unwarranted and misdirected resistance and misunderstood reform. The findings showed that principals who repel transformation are not rebuffing the prerequisite for transformation but they are often the people who are expected to lead advances when they lack the obligatory education in the management of change and are given scarce long-term prospects to make nouns of the new skills for themselves. Most of these studies have been carried out in developed countries where the use of ICT has come of age and where there are financial and material resources to maintain them.

Cox (2009) found that use of ICT in school management made their administration more efficient. However, MoEST (2005) maintain that the use of ICTs in schools in developing countries like Kenya had not gained popularity and researches in the field have just emerged. Lu, Tsai and Wu (2014) observe that there is an increased use of ICT in education despite the access disparity between schools in rural and urban areas. With the large number of secondary schools in Kenya, there are obvious economic benefits for integration and use of ICTs in school management. The use of ICT enables schools to demonstrate understanding of the programme milieu,
strategize, apply and manage learning and teaching in open and flexible environment (KESSP, 2006).

1.3 Statement of the Problem

Voogt and Knezek (2008) records that the government planned to equip all secondary schools in Kenya with IT infrastructure by 2015. Omwenga (2006) maintains that equipping schools with IT infrastructure was preceded by launching a multimillion information and communication trust fund. Cox (2009) argues that the larger picture in educational technology is not hardware or software, but curriculum management, achievement and technologies overall role in education. The school managers, instructional leaders and teachers are the ones with profound impact on ICT usage in schools once they rid themselves of “technophobia”. Kukali (2013) explains that at ultimate glassy, attempts to answer many of the pressing policy questions about the use of ICTs in educational management settings around the world and the impact of such use are complicated by the fact that there are still no reliable, globally comparable data in this area from Africa.

As hard as it may be to believe, especially given the large investments being made in this area and the increasing strategic importance of this topic in many countries, basic answers for many basic questions about the use of technology in school management around Africa remain largely unanswered. Such questions include: How many schools are connected to the Internet and what is the quality of that connection? How many school teachers and managers have been trained to use ICTs? How many schools have access to sufficient reliable power? How many computers are being used for learning and administration purposes in schools? Answering these questions has implications on productivity and innovation,
modernization of public services. It is noted that management issues that schools are missing by not integrating ICTs include in efficiencies in time tabling, record keeping, report writing, resource preparation and curriculum planning and supervision.

It is in this view that this study sought to assess the extent of ICT integration in school management as well as establish the level of foundation skills and training of school managers on ICT usage. The selection of Westlands Sub-County, Nairobi was due to its infrastructural access advantage different from other public schools in Kenya. All the schools have access to electricity whose absence is a key impediment in the integration and use of ICT.

### 1.4 Purpose of the Study

This study aimed at assessing the extent of ICT integration in school management and the stakeholders’ perception on the usefulness of the technology to the education in Nairobi focusing on Westlands Sub-County. The research also explored the equipment and technologies that schools have access to and the hindrances they encounter in the process of integration to management.

### 1.5 Objectives of the Study

The study focused on the following objectives:

i) To find out the technology that managers have access to schools in Westlands Sub-County, Nairobi.

ii) To determine the extent of ICT use in management of secondary education in Westlands Sub-County, Nairobi.

iii) To determine factors influencing the integration of ICT use in management secondary education in Westlands Sub-County, Nairobi.
iv) To establish the level of foundation skills and training of teachers and school managers on ICT usage in Westlands Sub-County, Nairobi.

v) To find out the perceptions of teachers and principals on the usefulness of ICT to school management in Westlands Sub-County, Nairobi.

1.6 Research Questions

For the researcher to delve into the depth and breadth of the study, the following research questions acted as a guide:

i) Which technology do the managers have access to in Westlands Sub-County schools, Nairobi?

ii) What is the extent of ICT use in management of secondary education in Westlands Sub-County, Nairobi?

iii) Which factors affect the integration of ICT management of Westlands Sub-County, school in Nairobi?

iv) What level of foundation skills and training do the school managers have on ICT usage in Westlands Sub-County, Nairobi?

v) What are the perceptions of teachers and principals on the usefulness of ICT in school management in Westlands Sub-County, Nairobi?

1.7 Significance of the Study

This research study was of great importance to all education stakeholders in the country and the region at large as specified below.

i. The school administrators will explore more amicable ways of dealing with computerization and ICT standards in general in their respective academic institutions.

ii. The study was to reveal the extent of ICT use in secondary schools in Nairobi.
iii. The research results helps Teacher Training Colleges (TTCs) produce labour-force with the necessary technical skills needed in modern emerging economies such as African nations.

iv. The media owners and information communication owners get sensitized on the need to guide students, parents and education stakeholders on modern technologies especially proper use of mobile phones, digital television and internet networks in order to minimize antisocial behavior and reinforce learning.

v. Finally it is hoped that the insight provided by the study could finally serve as a springboard for more investigations on ICT for education by the government and provide appropriate policy papers and guidelines to make ICT responsive to market demands.

1.8 Limitations of the Study

The following were the limitations of the study:

i. It was not be possible to receive the opinion of all education stakeholders because it required considerable resources and other logistics. In this case, sampling of a representative sample was done.

ii. In line with this study results generalization were limited to only Westlands Sub-County which is only one region. For conclusive report, all divisions ought to be studied but this was not possible due to financial implications, required period of time and the population of Nairobi.

iii. Another challenge was availability of respondents. Whereas it would be easy to access teachers and students, principals were hard to find due to their busy schedules. To overcome this challenge, appointments were made with the Principals observing flexibility to their schedules.
1.9 Delimitation of the Study

This study on the extent of ICT integration in secondary schools management in Nairobi covered all public school categories in Westlands Sub-County including day, boarding and co-educational schools. Public secondary schools rely on the government’s provision of ICTs and training of school managers and administrator on the use. Therefore, the selection of Westlands Sub-County as the study location which has access to electricity was ideal in the assessment of the ICT integration and use in school management.

1.10 Theoretical Framework

1.10.1 Systems Theory

Systems theory, Silvern (1968) defines the framework for deriving analogies of different areas. It seeks to provide a framework within which different disciplines are hosted. In this regard, it allows the operation of a general system with models, principles and laws without subjecting it to a particular kind or nature of elements or relations of any forces between them. This means that systems theory applies to any system.

According to Silvern (1968) and Hall and Fagen (1968) cited in Education Technology (1973), systems theory is “the structure of an organization as an orderly whole clearly showing the interrelation between parts of the other and the whole self.” Similarly, Miles (1964) cited in Education Technology (1973) defines it as that which is bounded in the collection of independent parts devoted to accomplishment of some goals and maintain a steady state of feedback flow environment. From these definitions, it is clear that a system is organized, has components whose functionality is based on the interdependence of its parts,
happens within an environment, has a goal and has a structure, function or development. Education Technology (1973) adds that for a system to be operational, there needs to be component elements that are synthesized in an environment in a manner that results in continuous, orderly, effective and efficient progress towards the desired goals. In this study, this theory seeks to explain the components of ICT, its use and the results from its use.

1.10.2 Theory of Diffusion of Innovation

Leon, Barnardos, Casar, Kauts, and DeGross (2008), theory of innovation diffusions was forwarded by Everett M Rodgers. According to Rodgers, innovation theory has four components communication, time, innovation and social system. Innovation is defined by Rodgers (2003) as an idea, practice, or project that is perceived as new by an individual or other unit of adoption” (p. 12). On the other hand, diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system.

Innovations according to Rodgers (1995) should have perceived newness which has perceived benefit to the user and compatibility with existing social and religious values, and with the needs of potential adopters to the bankers. Singhal, Cody, Rogers, and Sabido (2003) maintain that for an idea to be adopted, it should be easy to understand, available for trial, observable and have visible results. Communication channels are the media through which the potential adopters of the innovation get to know it and include institutional, interpersonal and mass communication. A social system on the other hand is a set of interrelated units that are engaged in a common problem solving to accomplish a common goal. In this study, this theory explains the extent of adoption of ICT in school management by establishing the different uses ICT in administrative function. It also explains the role of attitudes in the adoption. Principals and teachers’ attitudes are indispensable
to the innovation-decision process (Rogers, 1995). Attitudes influence the level of acceptance of ICT and use which is determined by the perceived benefit to be drawn from the use of ICT use. Further, the social systems bring out the school management and social structures that are in school that the role of ICT uses to promote education and learning.

1.1 Conceptual Framework

According to Smyth (2004), a concept is an abstract or general idea inferred or derived from specific instances. Reichel and Ramey (1987) define a conceptual framework as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation. It is a research tool intended to assist a researcher in developing an understanding of the situation under investigation. In this study, it seeks to show the relationship between the dependent variable which is the extent of ICT adoption in school processes and curriculum and the independent variables which are ICT access, type of ICT used in schools, levels of teachers’ skills and training and their perception of ICT use and benefits. Figure 1.1 gives a diagrammatic illustration of the study variables and their relationship.

**Independent variables**

- Level of skills and training among staff
- Factors affecting ICT integration

**Dependent variables**

- ICT Access and use
- Extent of ICT integration in:
  - Curriculum
  - School management

*Figure 1.1: Conceptual Framework (Author, 2013)*
1.12 Definitions of Operational Terms

Management: In this study, management refers to getting workers together in order to accomplish the set goals and objectives of schools while effectively and efficiently using available resources. In this study, the term management and institutional management was used interchangeably, where institutions refer to the schools. Management is bringing persons together to undertake anticipated aims using accessible assets resourcefully.

School Managers: In this context, school managers refer to principals and Board of Management team who run schools.

ICTs: These are info management apparatuses. In this study, ICTs refer to all material management riggings in schools.

ICT Integration in Education: In this study, this term refers to the incorporation of ICT in the provision of education services both administrative and academic delivery. It is the use of information handling tools that are used to produce, store, and process, distribute and exchange information in implementation of school programmes.

Technology: Technology in this study is used to refer to the scientific knowledge and tools which enable schools to run smoothly. Advanced computer technology aids in school management by making school functions like admission, recording, appraisal and time tabling efficiently conducted.

Perception: The way one thinks about something or the way in which something is understood. In this study, perception is used to refer to the way school administrators, teachers and managers think about ICT.

Attitudes: In this study, the word attitude is used to refer to the collection or organization several beliefs held by teachers, school managers, teachers and students around the adoption and use of ICT in schools administration.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature. The variables in the objectives of this study are derived from integration of ICT in school management and its perceptions. This chapter deals with review of related literature on use of ICT in education management. It highlights important aspects by cross-reference with earlier similar studies, works, journals and comments from reputable sources and authorities. The sources are local, regional, international, contemporary or current.

2.2 ICT Components

ICT has five components: people, data, procedures, hardware, software, and information. People play a critical role in ICT use. Singh et al., (2013) explain that people supply data to the computer and make judgments and decisions from the output supplied. Hardware refers to the physical components that make up ICT system. These include input devices such as keyboard, scanner, and mouse among others, storage processor and the output devices (Singh et al., 2013). In essence, hardware refers to computer devices while software refers to computer programmes which provide step by step instructions to get job done.

In addition, Singh et al., (2013) describes data as the raw material of any ICT system needed in the processing of output by ICT system while information as the results from processing data. Finally, procedures are the determinants of what needs to be done and when. Doyle (2008) explains that it entails the passing of information between different people. Doyle (2008) points out that administrative procedure in an ICT system help in dealing with problems.
2.3 ICT Access in Schools

Availability of IT equipment plays a role in their integration in schools. Ayere, Odera and AGak (2010) explain that setting up of centres of excellence in ICT by NEPAD e-schools was to promote the integration of ICT in schools. The findings revealed that the e-learning gives better results both in learning and teaching. It also established that there was a disparity in the use of ICT in teaching some subjects. Availability of computers in classrooms and school offices helps in successful espousal of technology for teaching and management (Khosrowpour, 2002; Larsen & Marold, 2002). Similarly, Baldauf and Stair (2010) argue that teachers and managers who are aware of computer technology and have opportunity to access computers perform better than those with no access (Reeves, 2009). According to United Nations (2012), there are various types of technologies currently used in schools mostly in Europe and America. These technologies are not common in management of schools in Africa. Among these are: computer in the classroom, class website, class blogs and wireless classroom microphones, mobile devices, interactive whiteboards, digital video-on-demand, online media, and online study tools (United Nations, 2012).

Similarly, United Nations (2012) argue that the use of ICT in education management has been a priority in most European countries during the last decade. However, progress has been uneven. There are considerable differences of e-management within and between countries, and between schools within countries. United Nations (2012) argue that a small percentage of schools in some countries have embedded ICT into their administration. UN (2012) adds that most schools in most developing countries are in the early phase of ICT adoption, characterized by patchy uncoordinated provision and use, some enhancement of the learning process, some
development of e-learning, but no profound improvements in management. Such progress has been achieved at considerable cost (United Nations, 2012). It is observed that different from other countries, countries under EU have capitalized in ICT in school management: apparatus, professional development, school administration and digital learning content. This has improved access to ICT and its integration in learning.

According to Tella (2011), computer possession and admittance to computers were the best analysts of supposed computer proficiency. A study carried out to investigate availability and use of ICT in South-Western Nigeria established that instructors with computers distillate on refining the superiority of current practice, through preparation and student testing. This was highly dependent on the extent to which the computer systems were free from other users. Free accessibility was, therefore, as a result of family and/or personal ownership of computers.

Similarly, a study by Akhtar (2008) on provision of education technology at secondary level in North West Frontier Provision in Pakistan, the following findings were reported from a sample of 600 secondary teachers; that majority of teachers are not using audio cassettes in teaching learning process, drama and documentaries as a medium of instruction. Further, the study established that most schools were deprived from computer technology. Therefore, teachers did not use over-head projectors during teaching and learning even when the infrastructure is available in schools in Pakistan. These findings bring about the effect of access to ICT in its integration in learning. It should be noted that whereas there are school administrators and teachers who can access ICT but do not integrate it in instruction. But access to ICT still remains an impediment in the integration of ICT in learning.
In line with this, Akhtar (2008) recommends provision of ICT equipment such as TV sets and computer to all schools. The study also recommended teachers utilize audiocassettes, video cassettes and overhead projector for teaching learning process. This brings to light the need for ICT access and utilization as critical aspects of ICT integration in school management.

In Kenya, a report by Computer Literacy Initiative of Kenya (2003) indicates that about 60,000 computers were needed in all 20,000 schools in Kenya. Among the mechanists adopted reinforce the use of ICT in schools, the Government of Kenya developed a project under rural electrification programme to help access electricity to all schools to facilitate wider use of ICT, developed modalities for cost reduction for ICT equipment and services, and special computers for learners with special needs (Republic of Kenya, 2005). Review of telecommunication policy to support education by providing schools with telephone links for internet connections was also carried out coupled with the provision of education sector manager and teachers access to information and tools to enable them better the delivery of educational services (Republic of Kenya, 2005). Investment in ICT should be able to improve its access in schools. This cannot be established without looking at the investment made on the same by the government. The investment on ICT investment programme launched by the government of Kenya amounted to Kshs.403.3 million, the expenditure summary is presented in Table 2.1.
Table 2.1: Summary of Yearly Costs on ICT Implementation in Schools by the Ministry

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministerial ICT capacity development</td>
<td>49.84</td>
<td>34.84</td>
<td>63.94</td>
<td>25.59</td>
<td>18.34</td>
<td>192.55</td>
</tr>
<tr>
<td>ICT advisory services to educational institution</td>
<td>6.3</td>
<td>13.3</td>
<td>19.55</td>
<td>18.3</td>
<td>5.8</td>
<td>63.3</td>
</tr>
<tr>
<td>Digital content development and delivery</td>
<td>7.26</td>
<td>8.26</td>
<td>7.26</td>
<td>6.76</td>
<td>5.76</td>
<td>35.3</td>
</tr>
<tr>
<td>ICT teacher’s development</td>
<td>17.55</td>
<td>17.55</td>
<td>17.55</td>
<td>17.55</td>
<td>17.55</td>
<td>17.55</td>
</tr>
<tr>
<td>Research and development on ICT in education</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td><strong>85.45</strong></td>
<td><strong>78.45</strong></td>
<td><strong>112.8</strong></td>
<td><strong>72.7</strong></td>
<td><strong>51.95</strong></td>
<td><strong>401.3</strong></td>
</tr>
</tbody>
</table>


It is notable that the investment on ICT is incremental, the large sums invested based on a forecast and the objective was to improve access. It would be critical to establish the ICT resources accessed in school. This forms basis for the objective on the access of ICT in public schools which are beneficiaries of the budgetary allocation as opposed to their private counterparts. This study sought to establish the ICT components that are available for use in schools by the students, teachers and school managers since it forms basis for the extent of use.
2.4 Extent of ICT Use in School Management and Education

Ismail (2010) maintains that the rapid development of ICT in the last two decades has changed society substantially as a whole. European Commission (2005) cited in Ngugi (2012) explains that the main purposes of using ICT in education are management, teaching and learning facilities. Ismail (2010) points out that for schools, the exterior force to integrate ICT in administrative courses has forced them to capitalize in resources for setup and training. In addition, Ismail (2010) adds that instructors have found that they can use technology in teaching, but have deficiency of knowledge on how to use it effectively from a didactic view. Demir (2006) adds that school managers too have found a difficulty in integrating technology for efficient management of schools.

According to Offevenger, van der Akker and Fater (2007), teachers can use ICT in three areas: subject content studies, education and tutoring/instruction studies and supervised teaching practice. It is notable that these three areas are important components of effective education programmes. However, it should be noted that balance across the three areas is essential (Offevenger et al., 2007). Leask and Pachler (2013) suggest that school managers should put in place measures that promote learning and ICT capability. In this juncture, Leask and Pachler (2013) maintain that ICT should be treated as a tool for teaching, learning, and management. This was supported by articulating ICT in school vision and mission and ensuring available support in the use of ICT. Tmison and Taylor (2001) argue that integration of ICT calls for revision of existing ICT activities, developing new opportunities for ICT use, exploring new technologies and advancement of teachers’ new and existing skills.
Demir (2005) adds that using ICT in education should not be understood as using it as a tool to transfer instructional material and rehearsal but as a medium for learning discovering sharing and creating knowledge. Similarly, Kukali (2013) explains that principals embrace use and integration of ICT since it enables them to keep themselves abreast with new techniques in decision making and problem-solving based on best management practices. Behind this, Rodrigues (2010) points out that Teachers should be involved in implementing ICT use in school management since they are the principal actors in the sector (Rodrigues, 2010).

Survey results of ICT in English schools recorded in England National Statistics (2011) carried out in 2011 was compared to similar surveys conducted in 2001, 2008, 2009 and 2010. The findings revealed there stood a sturdy intensification on the sum of computers per schools between 2008 and 2010 with the highest increase being recorded in 2011. Similarly, internet usage and external electronic communication services, teacher confidence on ICT use and expenditure on ICT steadily increased too (England National Statistics, 2011).

This study sought to examine the extent of ICT use in school management. The study examined the various uses of ICT in school management and the frequency of use of ICT. Specific emphasis was made on establishing whether there are managerial activities that are fully dependent on ICT. The implication of this would show high levels of integration of ICT use in school management by school managers.
2.5 Influence of Integration of ICT in School Management

Harvey-Woodall (2009) observes that since the incorporation of the info age, there has been an intense swing in most of the archetypes on which outmoded erudition subsists. This makes it mandatory for educators to rethink their existing educational patterns. In addition, Harvey-Woodall (2009) adds that students must be able to admit change, adapt to it and thrive on it. There must be a swing in production of standards putting in place the contemporary technology. Valdez (2005) also emphasizes the use of technology in education as a means to help teachers understand individual learning styles of the children they teach. This is premised on the argument that learning is a life-long process. Technology is going to play a vital role in encouraging all stakeholders to be knowledgeable about the latest trends both in teaching and management (Valdez, 2005).

Philiphs and Sianjina (2013) explain that technology used in schools should aim at improving and achieving the educational objectives and improve the learning process in the schools. This therefore, can be done by forming committees in charge of planning to partake the due process. Philiphs and Sianjina (2013) note that planning committee should have an acquaintance base, and get the support from the teachers and other members of staff.

According to Mobingbiye, Bankole, Ajiboye, and George (2013) and Cavas, Cavas, Karaoglan, and Kisla (2009), there are 5 motives for use of technology in educational sector: unique instructional explanations, enthusiasm, increasing teacher productivity, crucial IT skills and sustenance for new teaching techniques. Smeets and Mooij (2001), Leach and Moon (2000) and Bangert (2008) cited in Mwalongo (2011) add that the integration of ICT in education has been found to uphold
learning, syllabus variation, student-centred erudition, advanced order discerning, problem-solving, obliging learning amplification of intellectual concepts and revolution of the understanding of the matter. These benefits form basis for ICT integration in education. Ngugi (2012) also argues that the use of ICTs in schools would help reduce the challenge of qualified teachers which is estimated at 25% in Sub-Saharan Africa by accelerating teacher training. It also helps in enhancing learning achievement, reduce school drop-out rates while creating opportunities in remote areas. ICT makes learning interesting thus motivating students to learn and help reduce school drop-out rates. Use of ICT in schools also helps in opening up remote areas which lack ICT infrastructure thus creating opportunities for distance learning/e-learning (Ngugi, 2012).

Despite the benefits derived from ICT use, there are factors that sway its integration in school management. It is important to note that there is a big variation in the use of ICT in the world outside the school system. ICT is often used extensively in the daily routines. Totnall, Osorio and Visscher (2005) argue that the literature reveals a wide gap in digital sector between Africa and the developed world. Nigeria is ranked 15th, in internet host in Africa at 1998 and deprivation in ICT use persists in the country as compared with worldwide standards (Totnall et al., 2005). Globally, ICTs implementation in schools has not been smooth sailing (Howei, Muller & Paterson, 2005).

In Africa, many organizations have been undertaking the mystery of low ICT integration in school management. The Association of African University (2000) surveyed the difficult and main hitches affecting the use of ICT in African universities, and thus defined the problems to be technical, non-technical, human
and organizational and financial. Technical hitches acknowledged include the poor infrastructure, absence of national information communication infrastructure, lack of university coherent plan for ICT, problems of connectivity, lack of or limited bandwidth for ICT for learning, teaching, management and research, non-reliability of public electricity supply, thus necessitating extra cost for standby generators (Association of African University, 2000).

A study conducted by Menjo and Boit (2009) on the challenges of using ICT in school administration in Nandi district in Kenya showed that ICT as an administrative tool in secondary schools was not used effectively to address administrative issues. It was employed mainly for clerical activities and to a lesser extent on a few other administrative duties, particularly processing of examinations. They found that the major challenges faced by the schools which have contributed to the limited use of ICT in school administration included lack of adequate training on ICT for teachers and administrators, limited computer hardware dedicated to administrative work, lack of time and absence of appropriate administrative software.

Moreover, UNESCO (2011) argues that despite continuous training efforts to increase the number of ICT qualified teachers, high turnover remains a challenge. It is noted that whereas training of teachers is meant to equip them with skills to work in the education sector, most of the trained teachers move to other sectors which offer better remuneration. UNESCO (2011) points out that the use of ICT for teaching and learning purposes in schools though still very low is often curtailed by the lack of qualified ICT teachers.
One of the objectives of this study was to determine the factors that influence ICT integration in school management. This is especially important due to the quest by the government to integrate ICT in education system. This is mainly due to the efficiency benefit accrued from the ICT use. In this regard, establishing the key determinants and hindrances to ICT access led to promoting the boosters while minimizing the determinants. This is one of the benefits the different stakeholders will derive from this study.

2.6 Level of ICT Skills and Training of Teachers and School Managers in Schools

Leask (2012) maintains that policy terms of action concerning the use of ICT in schools are critical to its successful implementation. Republic of Kenya (2006) points out that there is need to change the curriculum to meet the needs of society. There is also need for teachers and school managers to record information and communication technology lessons to be conversant with the technology since most of the teachers are not computer savvy (Republic of Kenya, 2006). In line with this, Kenya Institute of Education converted mathematics and science subjects for classes five to seven into digital module before piloting it in different areas of the country. The Ministry of Education policy was aimed at preparing learners and staff for the future economy by use of ICT and empower schools and teachers to operate within an all-inclusive education so as to achieve national and international goals of education by the year 2015 (Republic of Kenya, 2005).

Voogt and Knezek (2008) maintain that utilizing technology in the classroom should consequently lead to a shift towards student-centred institution. Voogt and Knezek (2008) add that teachers use technology in ways that do not encourage
them to change their instructional practices. Teachers must understand how ICT connects with pedagogy and the curriculum content. Most of the time teacher’s technology professional development is short-lived and focuses only on computer development. That they must be presented within the context of student-centred instructional practices, to change the way they present information utilizing technology (Abbott, 2003). This can only be achieved by training teachers, principals and school managers. This is because the training equips them with the required knowledge and skills on the use of ICT both in instruction and school management.

ICT training concerns the extent to which teachers become ICT literate (Abbott, 2003). In this view, Abbott (2003) explains that training received should influence their ability to teach using ICT as a potential tool in teaching other curriculum subjects and ICT related subjects. Similarly, Totnall, Visscher and Finegan (2009) maintain that teacher literacy is developed through basic learning of computer skills and some principles of computer operations. Computer studies as a subject helps teachers to gain skills on teaching, learning, classroom management, assessment and record keeping (Abbott, 2003). This enables teachers to use computers, manage hardware and software and acquire knowledge to understand trends associated with IT and its applications. However, Totnall et al., (2009) attributes the low teacher literacy to the lack of sufficient equipment which has direct relationship with operational influence.

Okeyo (2013) recommends that principals should be trained to enable them to acquire the skills needed for effective use of ICTs. Okeyo suggests that training should include ICT use. This will equip them with skills that enable them to use and
integrated for management purposes. Capable principals, in this context, refer to those who know how to learn, are creative, have a high degree of self-efficacy, can apply competencies in novel as well as familiar situations, and work well with others (Okeyo, 2013).

Further, Bamigboye et al., (2013) explain that lack of computer skill is the single largest barrier to ICTs use in education. Initial teacher training in schools should incorporate necessary ICTs training, and staff development should be developed for serving principals (Bamigboye et al., 2013). Therefore, compulsory ICTs training should be enforced for all principals, that is, ICT components should become integral part of management of education programme. In addition, Bamigboye et al., (2013) recommends regular workshops and seminars should be organized for serving school managers to keep them abreast of developments in the field of ICT as they relate to education. These arguments are in tandem with the recommendation for refresher training for the teachers and school managers and continuous assessment of the system of curriculum revision at secondary level in accordance with the national needs, market demands, capabilities of students and ICT innovation by Akhtar (2008). This study therefore sought to determine the level of foundational skills and training teachers and school managers have on ICT use and integrations. This study also sought to establish whether there is a relationship between the foundational skills and ICT use.

2.7 Perceptions of Teachers and Principals on the Usefulness of ICT Use in School Management

Scott (1994) defines perceptions as the way one thinks about something or the way in which something is understood. Perception better describes one's ultimate
experience of the world and typically involves further processing of sensory input. In practice, sensation and perception are virtually impossible to separate, because they are part of one continuous process. Thus, perception in humans describes the process whereby sensory stimulation is translated into organized experience. That experience, or percept, is the joint product of the stimulation and of the process itself. Relations found between various types of stimulation and their associated percepts suggest inferences that can be made about the properties of the perceptual process. The perceptual process is not itself public or directly observable except to the perceiver, whose percepts are given directly in experience (Scott, 1994).

On the contrary, Shores (2008) defines attitudes as the organization of several beliefs around a particular object or situation. The relationship between attitudes and perceptions are considered to be direct. Hewstone et al., (2012) argue that strength of attitudes affect the level of attitude stability, change resistance, effects on perceptions of attitude–relevant stimuli and influence behaviour. This implies that attitudes form the basis for perceptions. Attitude strengths are linked to extremity, intensity, certainty, importance, embeddedness, direct experience, accessibility, conviction, evaluative consistency and vested interests (Maio & Haddock, 2009). These characteristics form the significant aspect of subjective certainty, personal importance and significant psychological and behavioural consequences. Carducci (2009) adds that characteristics of attitudes are interrelated. It comparability brings about the importance of attitudes to individuals and explains why they are held with conviction.

Leask argues that the attitudes of principals towards ICT play an important role in the successful implementation of ICT. They are important agents in the use of ICT.
They influence other school stakeholders. Carducci (2009) adds that teachers positive attitude towards ICTs are positively correlated with their extent of experience with computer technology. In the study, almost all Turkish teachers had shown positive attitudes towards ICT in education (Reeves, 2009). This finding is attributed to the importance placed on the use of technology in all parts of life including the classroom. Another study recorded by Reeves (2009) conducted on teacher’s attitudes towards ICT in education and the relationship between their attitudes and other variables which were related to teacher’s personal characteristics gender, age, computer ownership at home and computer experience in Turkey showed that there was a high level of access to computers in schools and their homes.

Similarly, a study by Papaioannou and Charalambous (2011) on principals’ attitudes towards ICT and their perceptions about the factors that facilitate or inhibit ICT integration in primary schools of Cyprus showed that principals had a generally positive attitude towards ICT. In addition, gender, years of service, academic qualification, computer access, and computer experience significantly influenced principal’s attitude towards ICT.

The above literature underscores the role of attitudes and perceptions on the use of ICT in school management. It plays a key role in determine whether ICT is integrated or not and where there are guidelines, it is the key determining factors on the motivation to integrate or not to integrate ICT. This study sought to determine the attitudes of the principals as the mantle holders and key people to spearhead the integration of ICT in schools. The finding of this study will also be used to determine whether there is a relationship between extent of ICT integration and the
perceptions of the Principals in order to be able to come up with more informed recommendations.

2.8 Research Gaps

Kidombo, Gakuu, and Nderitu (2013) point out that the integration of ICT in school management in schools in Kenya has largely been driven by efforts and donations of organizations through corporate social responsibility efforts. This has largely seen the donation of old refurbished computers to schools and diffusion of ICT skills in the labour market. This preceded the establishment of developed several policy and strategy documents to guide the integration of ICT in education by the Kenyan Government through its key Ministries of Education, Science and Technology and Information and Communication Technology (Republic of Kenya, 2006). Consequently, the status of ICT use in schools from the initial limited number of computers for school management purposes to use of ICT in teaching and learning.

A number of studies have identified the school principal as a critical and pivotal person for establishing and maintaining learning environments compatible with student-centred approaches to teaching and learning with ICT (Afshari et al., 2008). They are also seen as curriculum and pedagogy leaders and are considered by stakeholders as central figures in leading processes for creating the conditions to teach and learn with ICT. From these arguments, it is clear that competence of teachers, Principals and school managers is important to the effectiveness and sustainability of ICT integration programmes (Afshari et al., 2008). This is central to the use of ICT and a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education.
Odera (2011) carried out a study on the computer education policy and its implementation in Kenyan secondary schools focusing on Nyanza Province. The study sought to establish the implementation of ICT policy by school principals by formulating their own school ICT policy for the use of computers in teaching and learning. The study was carried out in schools from all setups: urban, rural and suburban areas (Odera, 2011). The study found that the ICT policy was being implemented. Note the setting was far from the cosmopolitan study location, Westlands Sub-County. Since it was in use, studying the extent of use in school management would be critical since it would act as a score sheet in the achievement by the implementation oversight authorities and the Ministry of Education. This study will act as an audit of the achievements in ICT use and consequently act as a benchmark for other schools in far flung locations.

A study by Ombui (2013) on the challenges facing principals in integrating ICT for efficient management in secondary schools was carried out in Nyamira County. The study carried out an investigation of the subjects’ ICT literacy levels and the challenges that they faced in the acquisition of hardware and software. Further, the study sought to establish the extent to which ICT was used. It is important to note that whereas this study in part addressed the objectives of this study by investigating the literacy of the school principals and use of ICT in school management, it is important to point out that there is a big infrastructural difference between Westlands Sub-County and Nyamira County. Although the study selected schools in the urban centres by and large the exposure to ICT in the two locations is different. Similarly, a study by Menjo (2011) and Menjo and Boit (n.d.) sought to investigate challenges facing ICT use in secondary school administration. It sought to determine administrative ICT use by teachers and administrators and its impact on ICT use.
The study established that ICT was mostly used for clerical use as opposed to administrative uses (Menjo, 2011; Menjo & Boit, n.d.). The challenges faced in ICT use were access to hardware and software, lack of training of teachers and administrators on ICT use, and lack of time (Menjo, 2011; Menjo & Boit, n.d.).

Based on the above argument, this study aims to assess the extent of ICT integration in school management and determine perceptions of teachers and principals in public secondary schools in Westlands Sub-County, Nairobi. This study is considered important in that, the government of Kenya has invested a lot of resources in ICT in secondary schools and will soon undertake primary education laptop programme. It would be important to assess the extent of ICT use and the attitude of teachers and principals towards ICT use. The study findings will help in determining the extent of use in order to put in place measures to ensure widespread use of ICT in secondary schools and inform policy formulation on the use of ICT and investment on ICT resources.

2.9 Summary of Related Literature

This chapter has presented literature on ICT use. The literature has discussed the components of ICT, and its use in education. It has also discussed ICT access, importance of its skills and training, and its integration in learning. This chapter has also discussed the implications of ICT use, and the hindrances to the adoption of ICT in schools. The next chapter presents research methodology.
CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction
This chapter presents the research methodology used in the study. The key areas covered include research design, location of the study, the target population, sample and sampling procedures, research instruments and data collection procedures to be employed. Finally, the methods of data analysis and ethical considerations are also presented.

3.2 Research Design
A research design according to Kerlinger (1986) is a kind of manual that contains instructions on what the researcher must do to manipulate variables in a research study. Kothari (2008) describes the research design as the arrangement of conditions and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

This study used a descriptive survey design. The survey design according to Kothari (2008) is said to be useful because it does not only secure evidence on conditions but also identifies standards or norms and traditions with which to superimpose the present conditions on the future next step. On the other hand, descriptive research designs are concerned with describing characteristics of a particular individual or group of people (Mugenda & Mugenda, 2003). Descriptive survey design was suitable since it provided evidence and answers to the research questions in a relatively simple and straightforward approach since the study involved the use of ICT and its perception which are catered for by the design. Mugenda and Mugenda
(2003) maintain that descriptive research designs gathers evidence on values, attitudes, beliefs and motives.

### 3.2.1 Variables

Leedy and Ormrod (2015) define research variables as the quantifiers in a study that are used to give direction and an index measure to the study. A researcher has to have some set variables through which he or she derives the measurement for the study findings. The study was guided by both independent and dependent variables. Creswell (2005) defines dependent variable as the variable that the research lays much interest in. On the other hand, independent variable is defined as the variable that is believed to cause effect on the dependent variable. The independent variable for the study was the integration of ICT in secondary school management. On the other hand, independent variables were; access to technology by managers, extent of ICT use in school management, factors influencing ICT integration, foundation skills and training of teachers and school managers as well as teachers and principals’ perceptions on the usefulness of ICT in school management. The study explored the relationship of these independent variables with the dependent variable by conducting a study in public secondary schools in Westlands sub-County, Nairobi. Based on the availability of the equipment in the schools and the accessibility of the schools by the researcher, the area was deemed appropriate.

### 3.2.2 Research Methodology

According to Babbie (2002), a study methodology is the framework representation that shows the procedures that were used to guide the study. It is the presentation that shows the strategies that are to be adopted in carrying out the study at hand. It contains the population that was targeted by the study and the research design to be
adopted. The study employed both qualitative and quantitative research methodology. In this case, the study used qualitative methodology in that it explained into detail the study variables based on the findings of the study. On the other hand, the study used quantitative research methodology in that it employed quantifiable data in its findings. The methodology enabled the researcher to come up with diverse and detailed information on the presentation and interpretation of the findings.

3.3 Location of the Study

The study covered public secondary schools in Westlands Sub-County, Nairobi. The location has varied levels of socio-economic status hence the findings were not skewed on any economic level of schools. Westlands Sub-County has all the categories of schools including public-national and county schools, special and mixed day boarding schools.

3.4 Target Population

Mugenda (2008) explains that all the items or subjects under consideration in any field of inquiry constitute a universe or targeted population. Mugenda and Mugenda (2003) point out that a complete enumeration of all items in the population is known as a census inquiry. Mugenda and Mugenda (2003) add that in such an inquiry no element of chance is left and highest accuracy is obtained. This study targeted all public secondary schools in Westlands Sub-County. There are ten secondary schools in Westlands. This study targeted respondents in all the ten public secondary schools in Westlands Sub-County from which students, subject teachers and all the principals were included in the study. In each of the ten schools, all the 347 teachers
and 7225 students were targeted as respondents. The distributions across schools are presented in table 3.1.

### Table 3.1: Population Distribution

<table>
<thead>
<tr>
<th>School per category</th>
<th>Teachers</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boys Schools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nairobi Millimani</td>
<td>17</td>
<td>165</td>
</tr>
<tr>
<td>Kangemi Secondary School</td>
<td>26</td>
<td>355</td>
</tr>
<tr>
<td>Nairobi School</td>
<td>61</td>
<td>1403</td>
</tr>
<tr>
<td><strong>Girls Schools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parklands Arya</td>
<td>22</td>
<td>614</td>
</tr>
<tr>
<td>Kenya High School</td>
<td>51</td>
<td>1195</td>
</tr>
<tr>
<td>St George Girls</td>
<td>41</td>
<td>1022</td>
</tr>
<tr>
<td>State House Girls</td>
<td>52</td>
<td>1099</td>
</tr>
<tr>
<td><strong>Mixed Schools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lavington Mixed</td>
<td>16</td>
<td>344</td>
</tr>
<tr>
<td>Highridge Secondary School</td>
<td>18</td>
<td>172</td>
</tr>
<tr>
<td>Hospital Hill</td>
<td>43</td>
<td>856</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>347</strong></td>
<td><strong>7225</strong></td>
</tr>
</tbody>
</table>

### 3.5 Sample and Sampling Procedures

Mugenda (2008) describes sampling as the process of selecting a number of individuals for study from a larger group in such a way that the individuals are representative of the larger group. Sampling procedure provides a valid alternative to a census where, it is impractical to survey the whole population, due to budget constraints, time constraints and when the results of the study are quickly needed (Kumar, 2010). Since the study involved a fairly wide population, a census is not appropriate and sampling was not used. In non-probability sampling, there is an assumption that there is an even distribution of characteristics within the population. This is what makes the researcher believe that any sample would be representative because the results would be accurate.
This study used stratified sampling technique and purposive sampling method. In this study purposive sampling was used in the selection of principals and subject teachers. This ensured inclusion of subject teachers and principals in the study. The study used stratified sampling in the selection of student participants. This technique ensured the inclusion of male and female students in the selected schools. Stratified sampling is the approach used to get adequate representation of a sub-sample (Wimmer & Dominick, 2006). In this study, 2% of students from each school were selected as respondents with equal number of boys and girls even though the population did not have an exact equal number of both genders.

3.6 Sample Size

Whereas the most conservative research estimate used 50% of the population (Cortrell et al., 2011; Hicks, 2004; Alkins, 1992; O’Denelle, 2001 cited in Itaityeh, 2011) point out that it was not possible in this study due to the large number of respondents. Therefore, sample size determination by Yamane (1967:886) cited in EDIS (2015) was used. The formula is as follows:

\[ n = \frac{N}{1 + N(e)^2} \]

Where:

- \( n \) is the sample size
- \( N \) is the population
- \( e \) is the level of precision assuming 5% or 0.05 for the students and 10% or 0.1 for the teachers.

The resulting samples were as follows:

Teachers sample size

\[ n = \frac{347}{1 + 347(0.13)^2} = 41.44 = 42 \]
Students’ sample size

\[ n = \frac{7225}{1 + 7225(0.094)^2} = 114.14 = 114 \]

The sampled students represented 5.26% of the population while the teachers sample size represented 22.48% of the population. Sample size per school presented in table 3.2 were calculated using the sample size percentage. Teachers sample size is considered adequate based on Mugenda and Mugenda (2003) recommendation of at least 10% sample in descriptive studies is adequate when the population is large. On the other hand, the justification for 5.26% of the students is based on the recommendation of 1% sample for large populations as recommended by Gravetter and Forzano (2012). The samples were selected proportionately. The distribution of the sample is presented in table 3.2.

<table>
<thead>
<tr>
<th>School per category</th>
<th>Teachers</th>
<th>Students</th>
<th>H/Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boys Schools</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nairobi Millimani</td>
<td>2</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Kangemi Secondary School</td>
<td>3</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Nairobi School</td>
<td>6</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td><strong>Girls Schools</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parklands Arya</td>
<td>2</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Kenya High School</td>
<td>6</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>St George Girls</td>
<td>4</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>State House Girls</td>
<td>3</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td><strong>Mixed Schools</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lavington Mixed</td>
<td>4</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Highridge Secondary School</td>
<td>5</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Hospital Hill</td>
<td>7</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>114</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>
3.7 Research Instruments

Wood and Kerr (2010) give four main primary data collection methods including observation, interviews, focus group discussion and questionnaires. In this study, the observation schedule was used in the determination of access to ICT in public secondary schools in Westlands Sub-County in Nairobi. Observation was done at the school resource centres and computer rooms to determine the ratio of functional computers and other ICT facilities to the number of students, their level of operation, sources of power and safety features. This information was then used to determine effectiveness, efficiency and adequacy.

On the other hand, questionnaires are the commonly used instruments to collect important information about the population since they provide an easy means of collecting data from a large number of people (Chandran, 2004). In this study, two types of questionnaires were developed and administered to students and teachers. Each questionnaire included both open and closed-ended questions and was used to seek data from different respondents from each school. The questionnaire for the students sought to reveal students’ knowledge and the level of enjoyment of ICT integrated lessons; the impact ICT use in the school has on their learning and flow of information from the school management. The second questionnaire sought to establish the teachers’ level of training, ICT skills and the frequency of its use in the school management in monitoring teaching.

Kothari (2008) explains that an interview is an oral administration of a questionnaire or an interview schedule. Chandran (2004) adds that interviews can provide more reliable, valid and theoretically satisfactory results than a questionnaire especially in societies where interaction is highly personalized. Through an interview, one gets
better co-operation and further answers than questionnaires (Chandran, 2004). Interviews provide information about people’s beliefs, attitudes, values and reported behaviour while observation method provides information about actual behaviours (Celsi et al., 2011). In this study, principals were interviewed. The aim of the interview was to determine the response on ICT policy for schools. It also gathered data on the information resource centres in school especially the computers.

3.8 Reliability and Validity

3.8.1 Reliability

Mugenda and Mugenda (1999) define reliability as the consistency of the research instruments in measuring whatever it measures. Mugenda (2009) argues that reliability focuses on the degree to which empirical indicators are consistent across two or more attempts to measure the theoretical concept. Bagozzi (1994) explains that reliability can be seen from two sides: reliability (the extent of accuracy) and unreliability (the extent of inaccuracy). It is a measure of the proportion of true score variability that is captured across the respondents relative to the total observed variability (Kartis & Limakopoulou, 2005).

Istaiteyeh (2011) maintains that the reliability is expressed as a coefficient between 0 and 1.00. It is arrived at by applying the following formula;

\[
\frac{k}{k-1} \left( \frac{\sum_{j=1}^{k} \text{cov}(x_j, x_j)}{\text{var}(x_0)} \right) = k - 1 \left( 1 - \frac{\sum_{j=1}^{k} \text{var}(x_j)}{\text{var}(x_0)} \right)
\]

Where variable \( x_1, \ldots, x_k \) and \( x_0 = \sum_{j=1}^{k} x_k \)

Therefore the assumption is \( x_j = t_j + e_j \) where each \( e_j \) is independent of \( t_j \) and all the \( e_j \) are independent of each other. Also let \( x_0 = \sum_{j=1}^{k} x_j \) and \( t_0 = \sum_{j=1}^{k} t_j \). Then the
reliability of $x_0 \geq \alpha$ where \( \alpha \) is Cronbach’s alpha. Here, we view the \( x_j \) as the measured values, the \( t_j \) as the true values and the \( e_j \) as the measurement error values.

Cronbach’s alpha which estimates internal consistency by determining the relation of all items in a test to each other and to the total test internal coherence of data (Bagozzi, 2011). The higher the coefficient, the more reliable the test. The interpretation of reliability findings according to Istaiteyeh (2011) were as follows: 0.9 and above were excellent while 0.7-0.9 were good. 0.6-0.7 were acceptable while 0.5-0.6 were poor. Any result below 0.5 was considered unacceptable implying that the measures used were not reliable (Istaiteyeh, 2011).

### 3.8.2 Validity

Bryman (2007) defines validity as the degree to which a test measures what it purports to be measure. The three steps in establishing construct validity were applied as recommended by Bryman (2007). First, the researcher identified variables from the research questions that had strong relationship with the assessed test. Second, the researcher established through pilot test the degree to which variables conveyed and finally interpreted the evidence about the validity of the particular variable of interest. Pilot test of the questionnaire was conducted against prospective sample population. Using a panel of “experts” familiar with the construct was a way in which this type of validity was assessed. The experts who were the school managers who examined the items and decided what that specific item was intended to be measured. Sampled students were involved in this process to obtain their feedback.
3.9 Pilot Test

A pilot test was carried out in two schools to ensure that the questions are relevant, clearly understandable and make sense. The questionnaire was piloted on six respondents; three teachers and three students drawn from the schools to enable the researcher to make amendments on the questionnaire where necessary. However, the selected respondents were not included in the actual study.

3.10 Data Collection Procedures

After the ratification and approval of the research proposal, the researcher took several pertinent stages to conduct the research. The study was conducted between February 2015 and December 2016. The researcher wrote an official letter to the Department of Educational Management, Policy and Curriculum Studies detailing the intention to go out and collect data on the topic at hand. The researcher then obtained approval from the University Graduate School and obtained research authorization from National Commission for Science, Technology and Innovation (Reference number: NACOSTI/P/16/47244/12323). The researcher reported to the County Commissioner and the County Director of Education before requesting the school principals to conduct research in their schools. The researcher contacted the teachers in the schools sampled and gave them his intentions to collect data from their schools. Based on the ability and accessibility of the schools sampled by the researcher, and on the fact that he was once a teacher at one of the schools, collection of the data didn’t require a permit which served to save on costs and time. The researcher then embarked on data collection from the sampled schools by use of questionnaires, interviews and observation forms.
3.11 Data Analysis and Presentation

The researcher utilized mixed method which includes qualitative and quantitative techniques in analyzing the data. After receiving questionnaires from the respondents, the responses were cleaned (checking for outliers), edited, classified, coded and tabulated to analyze quantitative data using Statistical Package for Social Science (SPSS) version 21 software and descriptive and inferential statistics. Descriptive statistical analysis focuses on the exhaustive measurement of sample characteristics. Inferential statistical analysis involved using information from the sample to make inferences, or estimates about the population. Descriptive statistics were used in the determination of technology accessed in schools, level of foundational skills and training of teachers and school managers on ICT usage and their perceptions on the usefulness of ICT to school managements and the extent of ICT use in school management in schools.

Correlation analysis was used to determine the magnitude and direction of relationship between ICT access and usage, foundational skills and usage, and the perception of teachers and principals and ICT use. The resulting quantitative data were presented in tables and figures for easier interpretation and understandability. Percentages, frequencies and cumulative percentages were used to present the data. On the contrary, qualitative data collected from open-ended questions and interviews were analyzed thematically and presented in form of narratives.

3.12 Logistical and Ethical Considerations

3.12.1 Logistical Consideration

The study required a letter from the department and any other evidence to show that the study was only meant for academic purpose. However, since the researcher
happened to have been teaching in one of the schools sampled in the study population, some of the letters were not mandatory and the researcher easily accessed the data from the schools without any limitation. This was an added advantage since the researcher saved on the cost for accessing some of the permits from various institutions.

3.12.2 Ethical Considerations

Ethical issues arise from the kind of problems that social scientists investigate and the methods used to obtain valid and reliable data. Ethical considerations were pertinent to this study because of the nature of the problem, the methods of data collection and the kind of persons serving as research participants. While carrying out this study, participants were informed of the nature of the study and allowed to choose whether to participate or not (consent). There is a wide consensus among social scientists that research involving human participants should be performed with the informed consent of the participants (Nachmias & Nachmias, 2006). The researcher ensured that participants know that their involvement was voluntary at all times. To safeguard the privacy of the participants, respondents were kept in a private environment away from passers-by or intruders (confidentiality). Asking participants not to write their names on the questionnaires during the research was also helpful in ensuring anonymity.
CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study on the impacts of integration of ICT in management of public schools and the perception of the stakeholders on its usefulness. The chapter also contains the analysis of the data collected through questionnaires. Descriptive statistics were used to analyze the data.

4.2 Instrument Return Rate

The project targeted 210 respondents (50 teachers, 150 students and 10 principals) out of the total target population of 7682 target population (10 principals, 347 teachers & 7225 students) from the public schools in Westlands Sub-County. The characteristics of the respondents considered were biological; gender, age, level of academics education and the period the respondent has worked for the organization. The study issued a total of 200 questionnaires to the selected sample of respondents and received back 156 questionnaires (42 teachers & 114 students) and carried out interviews for the 10 principals of the schools. The response rate was 78%. Out of the sample of 156 respondents, of the total sample size and the non-response was only 22% of the total sample size. The response rate indicates that the data collected clearly met the requirements basing on the Cooper and Schindler’s standard sample size of 30% that is generally to conclude the view of the whole area of research (Cooper & Schindler, 2003). Figure 4.1 presents details of response rate.
4.3 Reliability Analysis

To determine the degree of data reliability, Cronbach’s Alpha analysis was done in order to test for reliability of the gathered data. From the table, the collected information is reliable since the value of 0.901 to 0.929 is more than the set 0.75 and alpha value over 0.75 shows that the data are reliable to determine the best reward systems among employees.

Table 4.1: Reliability Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach’s Alpha Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of ICT use in management</td>
<td>.920</td>
</tr>
<tr>
<td>Integration of ICT in school management</td>
<td>.901</td>
</tr>
<tr>
<td>Level of foundation skills and training</td>
<td>.929</td>
</tr>
<tr>
<td>Perceptions of teachers and principals on the usefulness of ICT</td>
<td>.926</td>
</tr>
</tbody>
</table>
4.4 Respondents Biodata

This section captures the biodate of respondents such as; biological gender, age, period worked for an organization as well as the academic level attained.

4.4.1 Respondents Biodata

Table 4.2 and 4.3 show distribution of respondents by biological gender. The Tables present genders of the targeted school headmasters, students and teachers respectively. The respondents were required to tick appropriately whether male or female.

**Table 4.2: Gender of Students**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>73</td>
<td>64%</td>
<td>64</td>
</tr>
<tr>
<td>Female</td>
<td>41</td>
<td>36%</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

A close look at table 4.2 shows that out of the total 114 respondents, 73 were males, which is represented by 64% and the rest, 41 respondents were females represented by 36%. This clearly shows that males dominated the study by 32 respondents. Nonetheless the gender gap did not have any implication on the responses.

**Table 4.3: Gender of Teachers**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>19</td>
<td>45%</td>
<td>64</td>
</tr>
<tr>
<td>Female</td>
<td>23</td>
<td>55%</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

The table shows that females dominated the study as far as teacher respondents are concerned. Males were 19 with a 45% of the total respondents whereas the females were 23 with a 55% of the total respondents.
Table 4.4: Distribution by Gender (Principals)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

From Table 4.4 there were 4 male Principals in the sample, representing 40% of the total population. On the other hand, female Principals were 6 representing 60% of the total population. The gender for the Principal was distributed across different gender schools with 2 male ones heading girl’s schools while 1 female Principal heads a boy’s school.

Table 4.5: Distribution by the Students Class Level

<table>
<thead>
<tr>
<th>Class level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form 1</td>
<td>20</td>
<td>18%</td>
</tr>
<tr>
<td>Form 2</td>
<td>26</td>
<td>23%</td>
</tr>
<tr>
<td>Form 3</td>
<td>31</td>
<td>27%</td>
</tr>
<tr>
<td>Form 4</td>
<td>37</td>
<td>32%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>114</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 4.5 shows that there were 37 form four students which is 32% of the sample size. Form 3 students were 31 representing 27% of the students whereas form 2 respondents were 26 (23% of the student respondents). Form one students were 20 which is the same as 18% of the student respondents. The form four students were more than the other respondents their knowledge on the questionnaire items is higher due to the many years in the secondary school level.
4.4.2 Age Bracket of Teachers

The teacher respondents were asked to indicate their age bracket on the questionnaires given. The responses are presented in the figure 4.2.

Figure 4.2: Distribution by Respondents Age Bracket

Figure 4.2 shows that majority of the teachers were middle aged. Those aged 24 years and below were 17%, those aged between 25 and 35 years were 28% and those aged between 36 and 44 years were 31% of the total teacher respondents. The teachers aged between 45 and 55 years were 14% of the teacher respondents. The respondents aged above 55 years were 10% of the total teacher respondents. This shows that most of the teachers fall in the category of 25 to 45 years having a cumulative 59%.

4.4.3 Distribution by the Level of Education

This study aimed at finding out the highest academic levels of education attained by the respondents of the study. The respondents were required to indicate either Diploma level, Degree level, Masters Level or Doctoral academic level.
Table 4.6: Teachers’ Highest Academic Level

<table>
<thead>
<tr>
<th>Academic level</th>
<th>Occurrence</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diploma</td>
<td>13</td>
<td>31%</td>
<td>31</td>
</tr>
<tr>
<td>Degree</td>
<td>18</td>
<td>42%</td>
<td>73</td>
</tr>
<tr>
<td>Masters</td>
<td>9</td>
<td>22%</td>
<td>95</td>
</tr>
<tr>
<td>PhD</td>
<td>2</td>
<td>5%</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6 above, it is evident that there were 2 respondents with Ph.D level of education, representing 5% of the study sample. The respondents (teachers) with Masters level of education were 9 representing 22% of the total teacher respondents. The respondents with a degree level of education were 18 and those with diploma level were 13 representing 42% and 31% of the study sample respectively. This implies that teacher respondents were qualified to integrate ICT in sample secondary schools in Westlands Sub-County, Nairobi.

4.5 Technology Available For Use In Schools

The first objective of the study was to find out the availability of the technology that secondary school managers in Westlands Sub-County, Nairobi have access to. The respondents (principals) were asked to indicate the ICT facilities that are available in their schools for management purposes. The responses are presented in Figure 4.3.
Figure 4.3: ICT Resources Available in the Schools

Figure 4.3 shows that the schools had the most essential ICT resources. All the schools, as reported by the principals, had desktops for management purposes. Nine (9) principals confirmed that their schools had printers representing 90% of the study sample. The respondents (principals) further responded that their schools had laptops as ICT tools for management and these were 80% of the study sample. The figure further shows that 6 schools had internet connection representing 60% of the principal respondents.

From the findings, it is evident that most of the schools had the essential ICT tools necessary for school management and therefore implementing or enhancing use of ICT in management can be less hectic. As Tella (2011) states, with all the schools having computers, keeping and processing of school management data can be easy and safer. Internet is very essential for seeking extra knowledge and doing research on new things as well as finding out how things are done in external world (Akhtar, 2008). The study found that many schools had no internet connection and this could
limit the extent of integration of ICT in management of the schools since the users have limited access to research platforms and information available on the internet.

Table 4.7: Level of Asses of ICT in the Schools

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree Freq.</th>
<th>Agree %</th>
<th>Uncertain Freq.</th>
<th>Uncertain %</th>
<th>Disagree Freq.</th>
<th>Disagree %</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a computer and other ICT tools like internet in managing of the school</td>
<td>8</td>
<td>80%</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>The heads of departments are provided with essential ICT tools for managing the activities of their departments</td>
<td>4</td>
<td>40%</td>
<td>2</td>
<td>20%</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>The students have access to computers for checking memos sent to them by the school management</td>
<td>2</td>
<td>20%</td>
<td>1</td>
<td>10%</td>
<td>7</td>
<td>70%</td>
</tr>
<tr>
<td>All our management staff are provided with computers for the school management practices</td>
<td>3</td>
<td>30%</td>
<td>2</td>
<td>20%</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>The cost of computers and computer programs hinder computer usage in our school management</td>
<td>7</td>
<td>70%</td>
<td>3</td>
<td>30%</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4.7 shows that 8 school heads had their personal computers for the school management representing 80% of the sample of the study. Two (2) principals disagreed that they had personal computers for school management and they represented 20% of the sample of the study. Four (4) principal respondents representing 40% of the sample agreed that they provided the heads of departments with ICT tools for managing their departmental activities whereas 2 respondents...
were uncertain and 4 disagreed representing 20% and 40% of the sample of the study respectively. On students access to the computers for viewing memos and other communications from the school management, 20% of the respondents (Principals) agreed that the schools, 10% were uncertain and 70% disagreed with the statement. On provision of computers to the school management staff practices, 3 school principals representing 30% of the sample agreed, 2 (20%) were uncertain and 5 (50%) disagreed with the statement. On the cost of computers and other ICT tools hindering the accessibility of ICT in schools management, 7 school-heads representing 70% of the study sample agreed with the statement and 3 (30%) were uncertain.

The findings as presented above, shows that the schools are not fully aware of the benefits of having the ICT tools to enhance use ICT in school management. Most of the schools have not enabled the students access to computers in order to check communications and other relevant information from the school. This shows that the schools do not include students in use of ICT in managing and this eventually affected the overall effectiveness of the use of ICT use in management since some parties (students) are left out (Baldauf & Stair, 2010). The findings also concur with those of Ngugi, (2012) who found that high cost of computers and other ICT tools was the main barrier to enhancement of ICT usage in management of the schools. Principals and other stakeholders are aware of the benefits of using computers and ICT generally in managing schools but the inadequacy of enough capital to purchase and maintain the ICT tools hinders them from acquiring the tools (Ngugi, 2012).
4.6 Extent of ICT Use in Management of Secondary Education

The second objective of the study was to find out the extent to which ICT is used in management of secondary education in Westlands Sub-County. The study aimed at finding out the level to which school managers (principals) utilize ICT in their daily activities of running the school. The principals were asked to state the frequency of computer use in managerial activities of the school such as sending memos to the members of the staff, allocating duties to the staff members, keeping of students records and carrying out administrative duties. The responses are presented in Tables 4.8 and 4.9.

Table 4.8: Extent of computer use in activities in school (Students)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Very Often</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting fee balances from the school administration</td>
<td>15</td>
<td>38</td>
<td>61</td>
</tr>
<tr>
<td>Seeking permissions from the school management</td>
<td>11</td>
<td>49</td>
<td>54</td>
</tr>
<tr>
<td>Registering your presence in the school (answering the daily students’</td>
<td>6</td>
<td>28</td>
<td>80</td>
</tr>
<tr>
<td>register)</td>
<td>22</td>
<td>9</td>
<td>83</td>
</tr>
<tr>
<td>Viewing memos from the principals</td>
<td>22</td>
<td>9</td>
<td>83</td>
</tr>
</tbody>
</table>

Table 4.8 shows that students were not involved in management activities of the school through use of ICT. Fifteen (13%) of the students said that they often used computers in accessing their school fees balances and more than half of the student respondents (54%) said that they never used computers at all in checking their fees balances. The findings further show that 11 (10%) students often used computers in seeking permissions from the school management, 49 (43%) rarely used and 54
(47%) never used computers in seeking permissions from the school management. On the use of computers in answering the daily students register, 6 (5%) respondents (students) said that they frequently used, 28 (25%) said that they rarely used and 80 (70%) replied that they never used computers to answer the daily register at all. The findings show that 22 (19%) students out of the 114 students involved in the study, used computers in getting memos from the school management whereas 83 (73%) said that they never used computers in viewing memos from the school management.

From the findings, it is evident that the students are not well involved in the use of ICT in school management. The students are essential components (members) of the school fraternity and their involvement in the matters concerning the school including management is of much importance (Offe lvenger et al., 2007). Offe lvenger et al., (2007) found that if the students are not involved in implementation of any project or activity of the school, the chances of the project succeeding were very minimal. This means that in order for the schools to implement use of ICT in school management, they ought to involve students so as to make the programme effective from the top level of management, to the bottom (Leask & Pachler, 2013). When students get used to getting certain information such as the fee balances, timetables as well as the school programme and plans from the school management through computers, the students are likely to be the ones to motivate and pressure the management to continue using ICT in performing such functions (Tmison & Taylor, 2001).
Table 4.9: Extent of Computer Use in Activities in the School (Teachers)

| Statement                              | Very Often | | Rarely | | Never | |
|----------------------------------------|------------|-------|-------|-------|
| Raising school matters to the heads    | 16         | 38%   | 11    | 26%   | 15    | 36%   |
| Receiving spurs and orders from the Principal | 21         | 50%   | 19    | 45%   | 2     | 5%    |
| Monitoring the students’ class attendance | 4          | 9%    | 10    | 24%   | 28    | 67%   |
| Seeking for authorization from the school-heads | 12         | 29%   | 7     | 17%   | 23    | 54%   |
| Participating in decision making processes | 13         | 31%   | 9     | 21%   | 20    | 18%   |

Table 4.9 indicates that 16 (38%) teachers frequently used computers in raising school matters to the school management, 11 (26%) rarely used computers and 15 (36%) never used computers in raising school matters to the management (principals). The findings reveal that 21 (50%) teachers frequently used computers to receive orders and memos from the principals, 19 (45%) rarely used computers for receiving memos and 2 (5%) never used computers to receive orders from the school managers. A very minimal number of teachers (4, 9%) indicated that they frequently used computers in monitoring the students’ class attendance, 10 (24%) said they rarely used computers for this function and 28 (67%) teachers said that they never monitored students class attendance by use of computers.

From the findings, it is evident that most teachers do not use ICT in managerial functions in the school. The teachers are also concerned with the management of the school by participation in the decision-making process, monitoring the students class attendance and receiving orders from the school managers (Demir, 2005). Through
integration of ICT, the teachers are able to get involved in the management of the school and preserve time for their normal lessons (Kukali, 2013). The findings show that very few teachers use ICT in managerial functions and this concurs with the findings by Ismail (2010) who found that teachers were the ones required to embrace the use of ICT in the school management so long as the required tools are provided although most of them ignored their managerial duties.

Table 4.10: Frequency of ICT use in School management as stated by the Principals

<table>
<thead>
<tr>
<th>Function</th>
<th>Frequently Freq.</th>
<th>Frequently %</th>
<th>Rarely Freq.</th>
<th>Rarely %</th>
<th>Never use Freq.</th>
<th>Never use %</th>
</tr>
</thead>
<tbody>
<tr>
<td>General management activities</td>
<td>4</td>
<td>40%</td>
<td>5</td>
<td>50%</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td>Keeping and monitoring school records</td>
<td>6</td>
<td>60%</td>
<td>2</td>
<td>20%</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>Communicating to students and staff</td>
<td>3</td>
<td>30%</td>
<td>2</td>
<td>20%</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Monitoring the staff performance</td>
<td>1</td>
<td>10%</td>
<td>7</td>
<td>70%</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>Assigning duties to the staff</td>
<td>6</td>
<td>60%</td>
<td>1</td>
<td>10%</td>
<td>3</td>
<td>30%</td>
</tr>
</tbody>
</table>

Table 4.10 presents the responses from the principals on the frequency of use of ICT in managing functions of the school. The findings show that 4 (40%) principals frequently used ICT in general management functions, 5 (50%) rarely used and 1 (10%) never used ICT in performing the general management functions in the school. Six (6) school principals frequently used ICT in monitoring school records and 2 (20%) never used ICT in keeping and monitoring the school records. The findings show that 3 principals used ICT in communicating to students and staff on the school matters representing 30% of the study sample. There were 6 respondents (Principals) frequently using ICT in assigning duties to the staff representing 60% of the study sample.
The findings clearly show that in most of the schools, the principals were using ICT in performing some management functions in the school such as monitoring of school records, communicating to staff and assigning duties to staff. The findings go hand in hand with those of Kukali (2013) who found that principals use ICT frequently in managing the schools since they need to have high and fast access to information and database and they want to communicate fast to the school community. Rodrigues (2010), explains that through use of computers and other ICT facilities in managing the schools, the principals are able to accommodate the various managerial activities and this makes it easier for them to handle the relevant tasks at a go. The findings show that most of the principals do not use ICT in monitoring the performance of the staff. Tmison and Taylor (2001) found that effectiveness in working of the staff especially the teachers was enhanced by the monitoring carried out by the school management. This according to Ngugi (2010) can be done by use of technology whereby the teachers’ performance is rated and they are awarded marks. Through the principals can identify the poor performing teachers and the hard working ones thus identifying the rewarding methods to use (Demir, 2005).

4.7 Factors Influencing the Integration of ICT in School Management

The third objective of the study was to find out the factors influencing the integration of ICT in school management. The study aimed at identifying the factors that affect ICT use in school management as well as the benefits of ICT use in management of the schools.
Table 4.11: Factors Influencing ICT Integration as Stated by the Teachers

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeking external aides in capital for acquiring ICT facilities enhances</td>
<td>37 88%</td>
<td>3 7%</td>
<td>2 5%</td>
</tr>
<tr>
<td>the integration of ICT in school management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhanced leadership from the top school managers encourages the</td>
<td>34 81%</td>
<td>2 5%</td>
<td>6 14%</td>
</tr>
<tr>
<td>integration of ICT in management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequent training of staff on the use of ICT influences the integration of</td>
<td>31 74%</td>
<td>4 10%</td>
<td>7 16%</td>
</tr>
<tr>
<td>ICT in school management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement of the staff in decision making has an influence on the</td>
<td>39 93%</td>
<td>1 2%</td>
<td>2 5%</td>
</tr>
<tr>
<td>integration of ICT in school management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement of Students in use of ICT makes integration of ICT effective</td>
<td>40 96%</td>
<td>1 2%</td>
<td>1 2%</td>
</tr>
<tr>
<td>for the school management</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.11 shows that 37 teachers representing 88% of the study sample strongly agreed that by seeking for external aides in capital for acquiring ICT facilities enhances the integration of ICT in school management. The respondents (teachers) said that enhanced leadership from the school management could encourage the integration of ICT use in managing the schools. Thirty-one (74%) respondents (teachers) agreed that frequent training of the staff on use of ICT could highly influence the use of ICT in managing the school whereas 4 (10%) and 7 (16%) teacher-respondents were uncertain and disagreed respectively. The respondents (teachers) further confirmed that involvement of the staff in decision-making
process influences the integration of ICT in school management and this was proved by 39 teachers who agreed with the statement representing 93% of the study sample. Involvement of students in the use of ICT encourages integration of ICT in management of the school and this has been proved by the 40 teachers who agreed with the statement representing 96% of the study sample.

Inadequate capital to acquire the ICT tools is one of the key hindrances in the implementation and integration of ICT use in management of schools (Kdombo, Gakuu and Ndiritu, 2013). The study proved this literature by establishing that majority of the teachers agreed that one way of enhancing integration of ICT in school management is by seeking external aides on capital for acquiring the ICT facilities. The study found that enhanced leadership on the use of ICT by the school managers enhanced the integration of ICT in school management. The findings concur with those of Hennessy, et al., (2010) who found that when managers or school principals set the examples by using the ICT in performing their managerial functions in the school, the other staff were also be motivated to embrace the same and thus there was the overall integration of ICT use in schools management. The findings show that through engagement of the staff in decision-making process, the schools are able to integrate use of ICT in management. This concurs with the findings by (Ombui, 2013) who found that principals, who engage their staff in decision-making processes of the school on the use of ICT in management, end up getting more cooperation from the staff and this enhances the integration of ICT in school management. The findings show that the students involvement in ICT enhances the integration of ICT in school management. According to Menjo (2009), students are the key determinants of a success of a project in the school and
therefore their involvement in ICT means high integration of ICT use in management of the school.

4.8 Level of Foundation Skills and Training of School Managers on ICT Usage

The fourth objective of the study was to find out the level of foundation skills and training of teachers and school managers on ICT usage in schools in Westlands Sub-County. The respondents (principals) were required to rate their skills and knowledge in computer use, indicate their frequency in training on several areas of ICT and indicate the rate of effectiveness of the training that they receive. The responses are presented in Figures 4.4.

Figure 4.4: Level of Skills and Knowledge in Computer Use

Figure 4.4 shows that 70% (7) of the principals interviewed in the study perceived themselves as having good skills in computer implying that they were in a position to use computers for performing administration purposes. The findings further show that 10% (1) of the principals had poor skills in computer use thus they could not manage the schools using computers. A 20% (2) of the respondents said that they had average level of skills and knowledge in computer use.
The findings therefore imply that most of the Principals have the knowledge on computer use which means that they are capable of managing the schools via use of computers. Philiphs and Sianjina (2013) states that due to technological changes, the school principals should be in a position to access and use ICT facilities since this is the only way they can motivate and lead the others in embracing technology in school management. Adoption of ICT in school management requires highly concerned managers who are ready to set examples for the other workers in the school (Howei, Muller & Paterson, 2005). This therefore means that for the effective adoption and implementation of ICT in management of schools, the Principals must be on the top in using the ICT in school management.

Table 4.12: Training of School Managers on Computer Use in School Management as Stated by the Principals

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am frequently trained on use of computer in school management</td>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>The training I get is adequate for me to undertake use of computer in</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>management activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I support teachers and other staff training on use of computers in school</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We organize for tutorials to encourage and offer training of the staff</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>I include students in training activities and programs on computer use in</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>management.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

60
From Table 4.12 shows 3 (30%) principals agreed that they are frequently trained on the use of computer in management of schools, 1 (10%) were uncertain and 6 (60%) disagreed with the statement that they are frequently trained on the use of computers in school management. Two (2) principals said that the training they got was adequate for them to undertake use of computers in management activities of the school and 5 (50%) said that the training was not adequate for them to manage the schools using computers. On support of teachers and other staff members to access training on the use of computers in management practices of the school, 4 respondents (principals) agreed, 1 (10%) were uncertain and 5 principals disagreed representing 50% of the study sample. The findings further reveal that 1 principal representing 10% of the study sample organized tutorials to encourage teachers and other staff on the merits of use of ICT in school management. Eight (8) respondents (principals) indicated they did not organize tutorials for encouraging the staff on the use of computers in school management. On inclusion of students in the training activities and programmes on computer use, 2 (20%) respondents (principals) agreed that they include the students in the training programs whereas 6 (60%) respondents (principals) disagreed.

The findings show that majority of the principals do not seek frequent training on the use of computers in school management. Training of the staff especially the managers on the use of technology encourages their attitude to embrace the adoption of technology in management. Through training, the staff are able to acquire new skills on the technology use and this was make them charm for the adoption of technology in management (Voogt & Kneezek, 2008). Adequate training according to Abbott (2003), is the training that one can rely on and can feel competent and confidence with the kind of training. Inadequate training is equivalent to no training
since it even confuses the trainees more and makes them getting the real concept hard for them (Abbott, 2003). From the findings, it is evident that the staff does not get enough training on the use of computers in management practices. The findings further show that the students are not fully involved in training on the use of computers. This according to Totnall et al., (2009), limits the implementation of the use of ICT in management of the school since some of the parties in the trend are not involved in the process. When the students do not get training on what is required of them as far as use of computers in management is concerned, it therefore means that the information that the management wishes to send to the students through computers was not effectively delivered since they do not have the know-how on computer use (Okeyo, 2013).

4.9 Perceptions on the Usefulness of ICT in School Management

The fifth objective of the study was to find out the teachers’ and principals’ perception on the usefulness of ICT in school management. The respondents (teachers) were asked to rate their level of agreement on various aspects given based on the Likert’s scale of 1-3 (1= Agree, 2= Uncertain and 3= Disagree). The responses are presented in Tables 4.8.
Table 4.13: Perception on ICT use in Management as stated by the Teachers

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT is very relevant in school management</td>
<td>33</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Use of ICT has enhanced the effective management of the school</td>
<td>31</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>ICT training helped me build confidence on the use of ICT</td>
<td>34</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>ICT has integrated the managerial activities of the school thus making it Easier</td>
<td>21</td>
<td>18</td>
<td>3</td>
</tr>
</tbody>
</table>

The Table 4.13 presents the perception of the teachers on the use of ICT in management of the school. From the findings, 33 (79%) teachers agreed that ICT is very relevant in school management and 3 (7%) disagreed. Thirty-one (31) teachers agreed that use of ICT enhanced effective management of the school and 2 respondents (teachers) disagreed that ICT use enhanced effective management. On ICT training, 34 teachers representing 81% of the study sample agreed that it gave them confidence to use ICT in management activities. Twenty-one teachers representing 50% of the study sample indicated that they agreed with the statement that ICT has integrated the managerial activities of the school thus making it easier.

From the findings, it is clear that the teachers have a positive attitude towards the use of ICT in school management. Through enhanced attitude toward the use of ICT in school management, stability in the implementation of the technology is achieved and this means high sustainability of ICT in school management (Hewstone et al., 2012). Maio and Haddock, (2009) state that the increased interests of the teachers towards the use of ICT in the school management was as well increase the attitude
of the other parties in the school including the top management and this meant adoption of ICT in school management. Through training of the staff on the use of ICT, the staff are able to change their attitude towards the aspect (ICT) and this makes the implementation easy and inevitable (Maio & Haddock, 2009). Similarly, a study by Papaioannou and Charalambous (2011) on principals’ attitudes towards ICT and their perceptions about the factors that facilitate or inhibit ICT integration in primary schools of Cyprus showed that principals had a generally positive attitude towards ICT. In addition, gender, years of service, academic qualification, computer access, and computer experience significantly influenced principal’s attitude towards ICT.

The above literature underscores the role of attitudes and perceptions on the use of ICT in school management. It plays a key role in determine whether ICT is integrated or not and where there are guidelines, it is the key determining factors on the motivation to integrate or not to integrate ICT. This study sought to determine the attitudes of the principals as the mantle holders and key people to spearhead the integration of ICT in schools. The finding of this study was also to be used to determine whether there is a relationship between extent of ICT integration and the perceptions of the Principals in order to be able to come up with more informed recommendations.

4.9.1 Principals

The researcher interviewed the principals from all the sampled schools and the following was captioned from the interview: On rating ICT in the schools, the principals said that ICT use in the schools was of average level as per the time of the study. However, majority of them said that they were improving day by day by
doing whatever that is necessary to enhance ICT in the school. On availability of other ICT facilities apart from computers used in management, the principals said that in addition to computers, they had laptops designed for specific teachers; other ICT facilities such as internet, printers, UPSs, projectors as well as smart boards.

The researcher further sought to find out whether the number of computers available was adequate for use in school management. The principals argued that the computers were not adequate for use in the school. The further said that a time students were forced to share computers which was caused by the inadequacy of resources as well as poor maintenance by the parties concerned. On ICT training among the school members, the principals said that there was training and they did so severally. The principals said that they brought ICT experts to train their teachers on the use of ICT and also sponsored teachers to attend ICT trainings out of the school. On the effective used of ICT in management, the principals replied that computer use in administration in their schools was moderately effective. They said that they normally used computers to store important data regarding the students and teachers. The computers also enhanced proper follow-up of payments of school fees by the students which also is an administrative function.

The researcher further asked the school principals on the hindrances they faced in school in the use of ICT in administration and how they can be resolved. The school principals said that they encountered a lot of problems in their efforts to enhance ICT in teaching and school management. Among the hindrances that they put across was: failure to take responsibility by the students, lack of enough funds to purchase better ICT tools, technological changes across the country and the world at large.
such that after you buy a new ICT tool the next day it is outdated, unreliable sources of power such that when one wants to use ICT the power goes off.

4.9.2 Observation List

On the observation list, the researcher sought to personally observe the available ICT tools for management and their usability. In so doing, the researcher was able to evidently identify the extent to which the schools used ICT in managing their operations. One of the items in the observation list was the CPU which was found that 70% of the CPUs in the schools were functional whereas 30% were not operational. All the monitors available in the schools were found to be operational. The other item was laptops which were found to be functional at a 90% rate. On the other hand, the printers were found to be operational at a level of 38% and all the mouse were found to be functional. All the keyboards in the schools were found to be functional and only two schools had functional smartboards and projectors. From the above results, it evidently shows that most of the schools had the key essential ICT tools but they did not fully utilize them to enhance the school management. This indicates that the findings of the study go hand in hand with those of Bamigboye et al., (2013) who found that despite many schools purchasing ICT tools and equipment, they rarely used the tools in managing their educational operations.
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction
This section presents the summary of findings, conclusion and recommendations of the study based on the specific objectives that guided the entire research. Conclusions are based on the study findings and analysis conducted in the previous chapter. The recommendations are made with regard to the conclusions reached after the data were analyzed.

5.2 Summary of Findings
5.2.1 Technology that managers have access to in schools
The study found that 10(100%) of the schools had desktop computers. Further, the study found that 9(90%) of the schools had printers. Other ICT tools were scarce in the schools such as laptops and scanners which are very essential in use of ICT in teaching. The findings show that the schools have the essential ICT tools and this goes in conjunction with the literature review that the basic ICT tools such as computers are essential in integration of ICT use since they form the most part in enhancing ICT in school management (Singh et al., 2013).

5.2.2 Extent of ICT Use in Management of Secondary Education
The study sought to find out the extent to which ICT is used in management of schools in Westlands Sub-County. The study found that in majority of the schools, ICT was used in getting information from the administration. Also a good number indicated that they used ICT in communicating with various parties within and out of the school. The access to computers was perceived to be moderate as per the study results. This compares to the findings by the (Akhtar, 2008) that limited
teachers’ access to the ICT tools affects the usability of the tools in performing administrative activities and teaching in schools.

**5.2.3 Factors Influencing the Integration of ICT in School Management**

The study found that majority of the schools were influenced by the need to integrate activities in the schools and have them run by the same process. The study further found that some factors were also affecting the integration of ICT in school management such as inadequate funds to acquire ICT tools, failure to adapt changes by the relevant authorities, mismanagement of the available resources, and irresponsibility among the users of the ICT resources as well as less support from the relevant authorities. The findings go hand in hand with the literature review by Valdez (2005), who emphasizes that students should adapt to changes as well as be responsible enough to take care of the available resources.

**5.2.4 Level of Foundation Skills and Training of Teachers and School Managers on ICT Usage**

The study found that 29(69%) of the respondents had average level of computer knowledge and skills. This therefore indicates the need for enhanced training since only 5(10%) of the respondents rated their level of computer literacy as good. The literature also indicates that there is also need for teachers and school managers to enroll in information and communication technology lessons to be conversant with the technology since most of the teachers are not computer savvy (Republic of Kenya, 2006). The study also found that there were some teachers who never used computers at all. As Voogt and Kneezek (2008) contend, teachers must understand how ICT connects with pedagogy and the curriculum content.
5.2.5 Perceptions of Teachers and Principals on the Usefulness of ICT to School Management

The findings show that majority of the respondents agree that; ICT is very relevant in school management and learning, ICT has had a positive effect on school management, ICT has improved and enhanced learning, ICT training helped me build confidence on the use of ICT, I use ICT in learning because it is easy to use and adoptable, and curriculum development and implementation is made easy with the use of technology. The findings further show that the principals have the positive attitude towards enhancement of ICT despite there being a lot of challenges on the way. Scholars such as Hewstone et al., (2012), Shores (2008) and Leask, (2009) contend that the attitudes of principals towards ICT play an important role in the successful implementation of ICT.

5.3 Conclusion

ICT is very crucial as far as management of any institution is concerned. Due to the changing technology, it therefore calls for adequate attention given to the schools ICT resources by the school management. The study therefore concludes that many schools are yet to integrate ICT use in management to the required standards. The study concludes that many schools have not fully adapted ICT use in management due to various reasons such as lack of enough support from the relevant authority like governments, inadequate resources, resistance to change by the parties concerned like teachers and other employees, poor maintenance of the available ICT resources and the changes in technology. Unfavourable curriculum was also cited as one of the factors hindering the integration of ICT.
The study further concludes that the schools training that the teachers and other parties involved in school management is not adequate. Although the training is effective and bears better results for the institutions, sustainability of training is yet to be enhanced in most of the schools. Lack of enough funds as well as poor commitment by the school management have been cited as one of the reasons as to why ICT training has been poorly done.

On the perception of teachers and principals on the use of ICT in school management, the study concludes that the principals and some teachers are yet to develop a positive attitude towards the ICT adoption in teaching and management of schools. Lack of positive attitude on ICT among the leaders in the school means that the seriousness and integration of ICT was poorly done.

5.4 Recommendations

Based on the findings, the study recommends that proper technology should be put in place by purchasing of the required ICT facilities in schools so as to enhance management of schools using the current technology. Considering the strikes in most of the schools, storing some of the administrative data in the databases and other only sources prevent losing the data in case of any damage.

The study further recommends that the schools should adopt fully ICT in administration by encouraging both teachers and students on the usefulness of ICT. This will improve the extent to which ICT is used in teaching and management of schools across the country.

On the factors hindering the integration of ICT in teaching and managing schools, the study recommends that the school should find out the solutions to some of these
factors by involving the teachers and students in matters concerning ICT in the schools as well as make consultations from experts even outside the schools. The principals should also seek financial support from the government, both local and national, and other aides so as to purchase the ICT tools required in school management.

i) Further, the study concludes that principals should spearhead training of teachers and other parties in the schools so as to have the latest knowledge on the ICT use. The principals should also encourage their teachers to even seek training for themselves by rewarding the teachers who use ICT in teaching and performing other activities in the schools.

ii) Finally, the study recommends that the teachers and the heads should have a positive perception on the use of ICT in teaching and managing the school since through this they will invest more of their time and resources in integration of ICT.

5.5 Recommendations for Further Studies

The study recommends that further studies should be done on the factors that can enhance access to technology in management of schools and other public institutions.

i) The study was only carried on the secondary schools in Westlands sub-County. The study, therefore, recommends that other studies should be done in other parts of the country so as to enhance countrywide integration of ICT in schools.

ii) The study was limited to schools only and therefore, other similar studies should be carried on other public institutions which have recorded high negligence in ICT integration over the years.
REFERENCES


Hennessy, S. et al., (2010). *Developing the use of information and communication technology to enhance teaching and learning in East African Schools:* [73]


APPENDICES

APPENDIX I: INTRODUCTION LETTER

Dear Respondent,

RE: QUESTIONNAIRE ON ASSESSMENT OF THE EXTENT OF ICT INTEGRATION IN SCHOOL MANAGEMENT

My name is Tom Cheruiyot Biegon a postgraduate student at Kenyatta University pursuing a course in Master of Education (M.Ed) Administration. I am expected to undertake a research on the above topic and the same is to be submitted to the University by May 2016. Your timely assistance and co-operation are required to enable complete the exercise.

You have been chosen because; you are better placed to describe the extent of ICT integration in school management. I therefore appeal to you to fill in this questionnaire, with an assurance that all information collected was treated confidentially.

Thanking you in advance.

Yours sincerely,

TOM CHERUIYOT BIEGON
APPENDIX II: QUESTIONNAIRE FOR STUDENTS

Please indicate the option as correctly as possible by putting a tick or giving a brief explanation. Use the spaces provided.

SECTION A: BIODATA
1. Gender
   Male [ ] Female [ ]

2. Class
   Form 1 [ ] Form 2 [ ]
   Form 3 [ ] Form 4 [ ]

SECTION B: ICT
3. Are there computers in your school?
   Yes [ ] No [ ]

4. How do you rate their availability for use?
   Poor [ ] Very poor [ ] Average [ ]
   Good [ ] Very good [ ]

5. To what extent do you use computers for the following activities in your school?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very often</th>
<th>rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning during class times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doing Assignments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting information from administration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Can you freely access computers in your school?
   Yes [ ] No [ ]
7. What are the challenges that the school faces in the use of computers? 

8. Apart from computers, what other Information and Communication facilities do you have access at home?

9. Please explain your answer.

Thanks for your cooperation.
APPENDIX III: QUESTIONNAIRE FOR TEACHERS

Please indicate the correct option by putting a tick or giving a brief explanation. Use the spaces provided.

SECTION A: IDENTIFICATION PARTICULARS

1. Gender
   Male [   ]   Female [   ]

2. Age category
   Up to 24 years [   ] 25-35 years [   ] 36-44 years [   ]
   45 to 55 years [   ] Over 55 years [   ]

3. Highest level of education
   Diploma [   ] Degree [   ]
   Masters [   ] PhD [   ]
   Other (please specify) ........................................................................................................

SECTION B: INFORMATION ON ICT ACCESS IN SCHOOL

1. Please tick the ICT resources that are available for your use.
   CPU [   ]   Monitor [   ]
   Laptops [   ]   Printers [   ]
   Mouse [   ]   Internet cables [   ]
   Keyboard [   ]   Smart boards [   ]
   Projectors [   ]
   Other (please specify) ........................................................................................................
2. Please give your level of agreement on the following statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Partially agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of IT equipment plays a role in their integration into management in schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT center has adequate resources for use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My awareness of computer technology made me use ICT in school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The cost of computers and computer programs hinder computer usage in our school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most of the computers in our computer center are out of order</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers cannot be used to teach my lessons</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. How do you rate the availability of computers in your school?
   Poor [ ]
   Average [ ]
   Good [ ]

**SECTION C: INFORMATION ON ICT USE IN SCHOOL**

4. Please tick the frequency of computer use in the following activities in your schools

<table>
<thead>
<tr>
<th>Activity</th>
<th>Often</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation for lessons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students’ Revision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budgeting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication to students and parents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance appraisal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. How frequently do you use the following ICTs for school management

<table>
<thead>
<tr>
<th></th>
<th>Don’t use</th>
<th>At least once in a month</th>
<th>At least once in a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word processor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spreadsheet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION D: INFORMATION ON BENEFITS OF ICT INTEGRATION AND FACTORS THAT INFLUENCE ICT USE IN SCHOOLS

6. Please rate the extent to which the following benefits have been achieved from the use of ICT in schools

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT promotes autonomous learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Through ICT we have a differentiated curriculum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT promotes student centered learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The use of ICT promotes higher order thinking and problem-solving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT helps in cooperative learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT Improves the effectiveness and efficiency of school management</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Please rate the effect of the following factors on the use of ICT in schools

<table>
<thead>
<tr>
<th>Factor</th>
<th>Large extent</th>
<th>Average extent</th>
<th>Little extent</th>
<th>No effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of computers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge on computer use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation to use technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distinctive instructional abilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essential skills for the information age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support for new teaching techniques</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The need for curriculum differentiation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Please list the main factors that hinder the use of ICT in schools

9. How can the challenges listed above be resolved?

SECTION E: INFORMATION ON SKILLS AND TRAINING IN SCHOOL

10. How do you rate your skills and knowledge in computer use?
    Poor [ ]    Average [ ]    Good [ ]

11. Below are different computer areas of training. Indicate by ticking those that you have received.

<table>
<thead>
<tr>
<th>Area</th>
<th>Often</th>
<th>rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic computer use (typing, saving documents)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-mail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online student registration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requisition/purchase of materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication / Pupil/parent contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12. How do you rate the effectiveness of computer training received?

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ineffective</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please explain your answer above? .................................................................................................................................
......................................................................................................................................................................................
......................................................................................................................................................................................

SECTION F: PERCEPTIONS ON ICT USE IN SCHOOLS

13. If you have had any ICT training, please give your level of agreement on the following statements relating to ICT use in schools.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT is very relevant in school management and learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT has had a positive effect on school management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT has improved and enhanced learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT training helped me build confidence on the use of ICT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use ICT in learning because it is easy to use and adoptable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT can only be used in school management but not teaching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum development and implementation is made easy with the use of technology</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you for your cooperation
APPENDIX IV: PRINCIPALS INTERVIEW GUIDE

1. How do you rate ICT use in your school?

2. Apart from computers what other ICT facilities for management are present in the school? Name them.

3. Is the Information Resource Centre (computer laboratory) in the school well equipped?

4. How many computers are in the computer laboratory?

5. What are they used for?

6. Are they adequate? Why?

7. Do the students and teachers have access to the ICTs in your schools?

8. Do you have any ICT training? Who are trained?

9. How often are the ICT trainings?

10. Who trains?

11. Are the trainings effective in equipping students and teachers with adequate ICT skills?


13. How effective is the computer use in education in your school?

14. What are the administrative uses of computers in your school?

15. How effective is the computer use in administration?

16. What are the hindrances faced in your school in the use of ICT in education and administration? How can these challenges be resolved?

17. What is your opinion on the use of computer in teaching and school management?
APPENDIX V: OBSERVATION CHECKLIST

1. Is there information Resource Centre (computer lab).... How many? ..............

2. Computers and other ICT equipment available in the administration wing

3. General comments on the extent of ICT use for the school management

4. The percentage of functional hardware and software parts of the ICT equipment.

<table>
<thead>
<tr>
<th>Hardware / Software part</th>
<th>% of functional parts</th>
<th>% of non-functional parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet cables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smart boards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyboard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPS, Projectors, Blowers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX VI: APPROVAL FROM GRADUATE SCHOOL

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: grad-graduate@ku.ac.ke
Website: www.ku.ac.ke

Our Ref: E35/CE/11956/08
DATE: 15th June 2015

Director General,
National Commission for Science, Technology
& Innovation
P.O Box 36023-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR TOM CHERUIYOT BIEGON – REG. NO.
E35/CE/11956/08

I write to introduce Mr. Tom Cheruiyot Biegon who is a Postgraduate Student of this University. He is registered for M.Ed degree programme in the Department of Educational Management Policy & Curriculum Studies.

Mr. Biegon intends to conduct research for a M.Ed. Proposal entitled, “The Extent of ICT Integration in School Management and the Stakeholders’ Perception on the Usefulness of the Technology use in Nairobi County, Kenya”.

Any assistance given will be highly appreciated.

Yours faithfully,

MRS. LUCY N. NAMBA
FOR: DEAN, GRADUATE SCHOOL
APPENDIX VII: APPROVAL FROM NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

NACOSTI/P/16/47244/12323

15th July, 2016

Tom Cheruiyot Biegon
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “The extent of ICT integration in school management and the stakeholders’ perception on the usefulness of the technology use in Nairobi County, Kenya,” I am pleased to inform you that you have been authorized to undertake research in Nairobi County for the period ending 15th July, 2017.

You are advised to report to the County Commissioner and the County Director of Education, Nairobi County before embarking on the research project.

On completion of the research, you are expected to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.
APPENDIX VIII: RESEARCH PERMIT

THIS IS TO Certify that:
MR. TOM CHERUJIOY BIEGON
of KENYATTA UNIVERSITY, 0-0
NAIROBI, has been permitted to conduct
research in Nairobi County

on the topic: THE EXTENT OF ICT
INTEGRATION IN SCHOOL MANAGEMENT
AND THE STAKEHOLDERS’ PERCEPTION
ON THE USEFULNESS OF THE
TECHNOLOGY USE IN NAIROBI COUNTY,
KENYA

for the period ending:
15th July, 2017

Applicant’s
Signature

Permit No.: NACOSTI/P/16/47244/12323
Date of Issue: 15th July, 2016
Fee Received: Ksh 1000

Director General
National Commission for Science, Technology & Innovation