STATUS AND BARRIERS TO INFORMATION AND COMMUNICATION TECHNOLOGY ADOPTION IN EDUCATIONAL MANAGEMENT IN PUBLIC PRIMARY SCHOOLS IN WESTLANDS DISTRICT, NAIROBI COUNTY, KENYA

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DECLARATION

This project is my original work and has not been presented to any award in any other university or any study programme.

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DEDICATION

To the Almighty God, my dear son and daughter, my parents, brothers and sisters, as well as my friends for encouraging me and supporting me as I undertook this research.

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To all of them I say thank you

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ACRONYMS AND ABBREVIATIONS

DEO:	District Education Officer
EFA:	Education for All
GoK:	Government of Kenya
IAEE:	International Association for the Evaluation of Education
ICT:	Information and Communication Technology
IT:	Information Technology
KESSP:	Kenya Educational Sector Support Programme
MDGs:	Millennium Development Goals
MoE:	Ministry of Education
NEPAD:	New Partnership for Africa's Development
NGOs:	Non-Governmental Organizations
NSF:	National Science Foundation
OECD:	Organization for Economic Cooperation and Development
PPP:	Public Private Partnerships
PTC:	Primary Teachers College
SITES:	Second Information Technology in Educational studies
SPSS:	Statistical Package for Social Sciences
TTA:	Teacher Training Agency
UNDP:	United Nations Development Programs
UNESCO:	United Nations Educational, Scientific and Cultural Organization

ABSTRACT

ICT should be used to support and enhance the attainment of curriculum objectives and engage pupils in meaningful learning using new tools to help them master key concepts and skills embedded in science, social studies, art and other curriculum activities. ICT promotes learner-centered learning and makes easy to implement instructional methods such as simulation more feasible, improves pupils performance and skills. It also maintains the quality of teaching while minimizing teaching time and makes learning more interesting. It also enhances quick, safe and effective ways of storing and managing data by the administrators and class teachers in relation to enrolments, finances as well as other educational assets. The purpose of the study was to establish the barriers to effective use of ICT in educational management in primary schools. The key objectives of the study were to establish the teachers training levels in ICT, infrastructures and facilities available for ICT use in education, the Head teacher's and teacher's attitude towards ICT use in education and to establish whether schools have put up measures to address issues related to security and maintenance of infrastructure. The study was based on the constructivist theory which states that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. The study revealed literature in ICT use in educational management globally, in Africa, regionally and in Kenya. The study adapted a descriptive survey design to produce statistical information on status of ICT on barriers to ICT use in educational management. The study was carried out in Westland's District in Nairobi County. The study population comprised of 27 primary schools. The sample size comprised of 15 head teachers and 5 class teachers in the 15 selected schools. The researcher used purposive sampling to select five teachers in each school giving a total of 75 class teachers and 15 Head teachers who participated in the study. The questionnaires were administered to head teachers and class teachers to collect data from the sampled respondents. The data collected were analyzed using the Statistical Package for Social Science. The study established that (91.9% of the respondents sampled were computer literate, (9.4% of the respondents acquired skills in school organized training and (23%) in teacher training colleges. (87%) of the respondents reported that they had secure storage facilities for the ICT equipment, 37% reported that the broken down computers were repaired by the school technician while 35.7% indicated that they had permanent qualified technicians. The study recommended that the government provides sufficient funding for ICT facilities and teachers training, improved ICT infrastructure, proper maintenance and security be provided for the full implementation of the ICT policy.

CHAPTER ONE

INTRODUCTION

This chapter covers background of the study, ICT use in developed and developing countries globally. It also comprises the statement of the problem, purpose of the study, objectives of the study, significance, assumptions, limitations, delimitations, conceptual framework and definition of terms.

1.1 Background of the Study

UNESCO (2002) considers Information Technology (IT) as a scientific technological and engineering discipline and the management technique used in information handling and processing applications, computer interaction with man and machines and associated socio-economic and cultural matters. It is the use of hardware and software for efficient management of information i.e. storage, retrieval, processing, communication and sharing for socio-economic and cultural upliftment. ICT are sets of technological tools and resources used to communicate, create, disseminate, store and manage information (Blurton, 1999). Information and communication technology (ICT) is a force that has changed many aspects of life. ICT has impacted such fields as medicine, tourism, travel, business, and law, banking, engineering and architecture in the last two decades. But when we look at education, there seems to have been far less change than other fields have experienced. Education is the key by which the door of development can be opened. Use of Information and Communication Technology (ICT) can solve some educational problems with global challenges and opportunities keeping in view the population growth and development. (Mahapatra, 2009). ICTs can be divided into two groups, old

generation ICT (namely; Radio and TV) and new generation ICT (namely; the internet and telecommunication) in educational practice.

ICT can be classified into two parts namely:

i. Computer Technology-which is a computer-based course comprising computerized course tasks, word processors and data base programmes.

ii. Telecommunication software-offers distance courses, distributed educational resources, email and video conferencing.

ICT is an integral part in educational management (Yaffa, 2000). ICT use in education refers to the infusion of ICT in the teaching learning programme with the aim of enhancing the teaching learning process. It refers to making use of technology to transmit information and ensures communication takes place effectively. It provides meaningful support for school managers, administrators, teachers as well as the non- teaching staff to improve on their daily activities and enhance higher quality of education.

Using ICT in administration enhances school administrative efficiency and enables administrators leverage technology to make better decisions based on available data. ICT is a major component in a changing educational process. Television, Radio and films have been used in schools as sources of educational information. Computers are used in multiple tasks such as, communication as well as storage of vast quantities of information (Shelly, 1971). Teachers and learners no longer have to rely on printed books for their educational needs (Mutuma, 2005). Through the internet, education can be accessed from anywhere at any time by unlimited number of people. ICT not only stimulates young student's sensory and cognitive curiosity but also acts as a catalyst to boost their self-confidence. ICT promotes learning (Heuristic approach); ICT enables learners to explore

and discover rather than merely listen and remember. They also dig for more knowledge hence improving research skills and learning independence.ICT in education enables learners to participate in learning experiences that extend beyond their own school, e.g. virtual learning.

It also mobilizes tools for examination, calculation and analysis of information providing a platform for student inquiry, analysis and construction of new information.ICT supported learning encourages interaction and cooperation among students, teachers and experts from different places. It gives learners an opportunity to work with people from different cultures thus enhancing learner's teaming and communication skills as well as global awareness. E-learning, exchange programmes, email and chat rooms on the internet enable students to correspond across the borders. This enhances communication skills and multi-cultural awareness (Nyaga, 2011).

Kenya has made remarkable progress putting in place an ICT policy framework and implementation strategy with measurable outcomes and time frames. However, universal implementation is challenging given the inadequate resources and national ICT infrastructure (MoE, 2006). The MoE (2005) developed a Kenya Education Sector Support Programme (KESSP) that featured ICT as one of the priorities with the aim of mainstreaming ICT' into the teaching and learning process. After several years of effort, Kenya promulgated a national ICT policy in January, 2006 that aimed to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services. The government aimed at encouraging the adoption of ICT in schools, colleges, universities and other educational institutions so as to improve the

quality of education. In the Kenya's vision 2030, under the education and training flagship, Kenya will provide global quality education training and research for development. Among the education flagship, education and training projects include establishing a computer supply programme that will equip the students with modern ICT skills. Failure to use ICT in educational management may lead to time wastage in data retrieval, inappropriate recording and loss of data, incomplete recording, ineffective communication, inefficient dissemination, storage and management of information.

According to Shaffer (2000), the critics of ICT in education have raised several concerns. They have feared that heavy exposure to incredibly violent games instigate aggressive habits leading to a violent society. The proliferation of computers and online services may have unsupervised access to the internet and the World Wide Web leading to exposure to prohibited material such as pornographic sites as well as being a gate for recruitment in illegal and harmful organizations. However, computers may prove to be either positive or negative depending on how they are used. Outcome may be negative if the person's primary use is chatting about undesirable topics online, but the news may be positive for youngsters who use computers to learn, to create and to collaborate amicably with siblings and peers (Shaffer; 2000).

ICT use promotes deep systematic changes in education to meet challenges in the new era. It enhances the way we deal with key issues of access and equity, management and efficiency, pedagogy and quality as well as preparing citizens for an era of globalization that will be dominated by technologies related to knowledge and information. It plays a

great role in promoting and sustaining constructive and manageable changes in education for development.

1.2 Statement of the Problem

Despite the benefits associated with ICT use in the educational sector, very few head teachers and class teachers in Westlands District use computers in planning, record keeping, enhanced decision-making, communication as well as effective resource management. Education is a catalyst to human socio-economic development as it helps to improve the quality of labour that participates in nation building. It also equips individuals with basic education that enables their capacity to be actively involved in national development and the use of the environment for self-fulfillment. Failure to use ICT in Educational management leads to time wastage in data retrieval, inappropriate recording of data, loss of data, incomplete recording, ineffective communication, inefficient dissemination, storage and management of information. ICT has contributed greatly to educational management in school globally. However, in Kenya schools hardly use ICT to manage the output or to raise teacher productivity or to reduce costs through analyzing spending. The sought establish the status and barriers to ICT adoption in educational management in public primary schools in Westlands District in Nairobi County.

1.3 Purpose of the Study

The purpose of the study was to establish the status and barriers to ICT adoption in educational management in public primary schools in Westlands District in Nairobi County.

1.4 Objectives of the Study

The study was guided by the following objectives:

i. To establish teacher training levels in ICT.

ii. To establish the infrastructure and facilities available for ICT use in education.

iii. To establish the head teacher's and class teachers' attitudes towards the use of ICT in learning/teaching, administration and management activities.

iv. To establish measures put by schools to address issues related to security and maintenance of ICT infrastructure.

1.5 Research Questions

The following questions guided the researcher in undertaking the study:

i. What are the qualifications of the Head teachers and Class teachers in computer literacy?

ii. What facilities and infrastructure are available for ICT use in education?

iii. What is the headteacher's and class teachers' attitude towards ICT use in educational management?

iv. What measures has the government put in place in relation to security and maintenance of ICT infrastructure?

1.6 Significance of the Study

It is hoped that the findings of this study would be useful to the Ministry of Education in putting in place mechanism that enhance an effective ICT implementation process. The Kenya Institute of Curriculum Development will use it to provide the curriculum content to promote a smooth implementation process. The findings of this study will also enhance

adoption of ICT in public primary schools in Westlands District. It will also contribute to the existing body of knowledge in ICT.

1.7 Assumptions of the Study

The study made the following assumptions:

i. Primary schools included in the sample required to use ICT in their delivery of quality learning and teaching, professional development and more efficient, management, governance and administration.

ii. Respondents will be cooperative to provide honest responses.

1.8 Limitations of the Study

The study was limited to:

i. Due to financial constraints, the study was restricted to Westland's District only.

ii. The study was limited to only public primary schools within the district.

iii. ICT is a very wide subject and cannot be investigated thoroughly within the stipulated time. The researcher was not able to carry out study on competence, access, cost benefit analysis on the implementation of ICT in educational management.

iv. The study only looked at one aspect which is the status and barriers to ICT adoption in educational management.

1.9 Delimitations of the Study

The study was conducted in public primary schools which receive direct funding from the government in form of free primary education funds as well as employment of teachers. The study was to overcome the following delimitations:

i. The study was delimited to public primary schools in Westland's District.

ii. The study limited itself to Westland District in Nairobi County for a more conclusive study. The other six districts should have been included in the study but due to time and financial constraints this was not possible.

iii. The study limited itself to the public primary schools; therefore, the findings do not apply to other schools in the county which might be facing peculiar problems associated with ICT use in education.

1.10 Theoretical Framework

In this study, the researcher used the constructivism theory to teaching. Constructivism follows the path of Dewey, Piaget and Vygotsky among others. Constructivism is the study of learning about how we all make sense of our world (Brooks, 1999). It is basically a theory based on observation and scientific study about how people learn and gain knowledge. It says that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. When we encounter something new, we have to reconcile it with our behavior or maybe discarding the new information as irrelevant. In any case, we are more active creators of our own knowledge. To do this; we must ask questions, explore and assess what we know.

Piaget claimed that infants have no inborn knowledge or ideas about reality as philosophers have claimed nor are children simply handed information or taught how to think by adults. Instead, Piaget viewed them as constructivists who actively create new understanding of the world based on their own experiences. By being curious and active explorers that they are, children watch what goes on around them; they experiment with

objects they encounter, they make connection or association between events and they are puzzled when their current understanding (scheme) fails to explain what they have experienced (Shaffer,2000). According to Piaget, children are able to construct new schemes because they have inherited two intellectual functions which he calls organization and adaptation. They recognize that there is no such thing as knowledge. We construct knowledge for ourselves as we learn. Learning is not understanding the true nature of things nor is it remembering dimly perceived perfect ideas but rather a personal and social construction of meaning out of the bewildering array of sensations which have no order of structure.

Shaffer (2000), notes that constructionist teachers encourage students to constantly assess how the activity is helping them gain understanding. By questioning themselves and their strategies, students in the constructionist classroom ideally become expert learners. This gives them every broadcasting tool to keep learning. With a well-planned classroom environment, the student knows how to learn. He argues that contrary to criticism by some conservative educators, constructivism does not dismiss the active role of the teacher or the value of the expert knowledge. It modifies this role so that teachers help students to construct knowledge rather than to reproduce a series of facts.

Shaffer (2000) further argues that constructivism is often misconstrued as a learning theory that compels students to reinvent the wheel. It taps into and triggers the student's innate curiosity about the world and how things work. Students do not reinvent the wheel but rather attempt to understand, how it turns and how it functions. They become engaged

by applying their existing knowledge and real world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings.

The emergence of ICTs as learning technologies has coincided with a growing awareness and recognition of learning theories; the theories of learning that hold the greatest sway today are those based on constructionist principles. (Ham, 1990). These principles declare that learning is achieved by the active construction of knowledge supported by various responsibilities within meaningful context. In constructional theories, social interactions are seen to play a crucial role in the process of learning and cognition (Vygotsky, 1998).

In the past, conventional process of teaching has revolved around teacher's planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Typically, these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some form of interaction with content as a means to consolidate the knowledge acquisition. Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring it and their instruction is supported rather than a process of knowledge transmission (Duffy & Cunningham, 1990).

The strengths of construction lie in its emphasis on learning as a process of personal understanding and the development of meaning in ways which are active and interpretive. In this domain, learning is valued as the construction of meaning rather than as the memorization of facts (Reeves, 1996). Learning approaches using contemporary ICTs provide many opportunities for constructionist. Constructivism enables learning through their provision and support for resource-based, student-centered settings and by enabling

learning to be related to context and practice (Barron, 1998). Any use of ICT in learning setting can opt to support various aspects of knowledge, construction and as more and more students employ ICTs in their learning process, the more pronounced a greater impact.

An important aspect of socio-cultural theory is the claim that all human action is mediated by tools (Dale, 2004). Tools incorporate a wide range of artifacts (for example pen, paper, book, computer) semiotic systems, social interactions and institutional structures. The social-cultural theory foregrounds the cultural aspects of human action. The teacher and student work within a local classroom culture that is influenced by both national and global factors.

Dale (2004) states that students may bring to the classroom a history of learning experiences that relate to their previous cultures of learning both inside and outside constructionism school. This is particularly important when ICT is being used in the classroom because there is increasing evidence that the ways in which young people use ICT at school are influenced by out of school cultures use.

Facer (2003) proposes that any technological tool that has been developed within a particular socio-cultural setting carries with it the provenance of this culture. ICT tools are not static and continue to be re-designed as their use within different communities evolves.

Socio-cultural theory also emphasizes the fact that students actively construct knowledge drawing on what they already know and believe (Vygotsky, 1978). Students and teachers

bring implicit theories and perspectives to any new learning situation and this influences what they pay attention to and thus the knowledge they construct. The teacher has an important role in that appropriately arranged contrast. He/she can help people notice new features that previously escaped their attention and learn which ones are relevant or irrelevant to a new concept (Bransford et al., 1999).

When the original theory was meant for use best on observation and scientific study about how people learn and gain knowledge, the researcher adapted the various aspects of the models for use in assessing the status and barriers to ICT use in educational management. The constructivist's theory is useful in this research; teachers provide tools such as computers to enhance problem solving and inquiry based learning. Students draw conclusions, add inferences, construct and convey their knowledge in a collaborative learning environment. ICT use in the classroom transforms students from being passive recipients to being active participants in the learning process as guided by the teacher rather than just mechanically ingesting knowledge from the teacher or the textbook.

1.11 Conceptual Framework

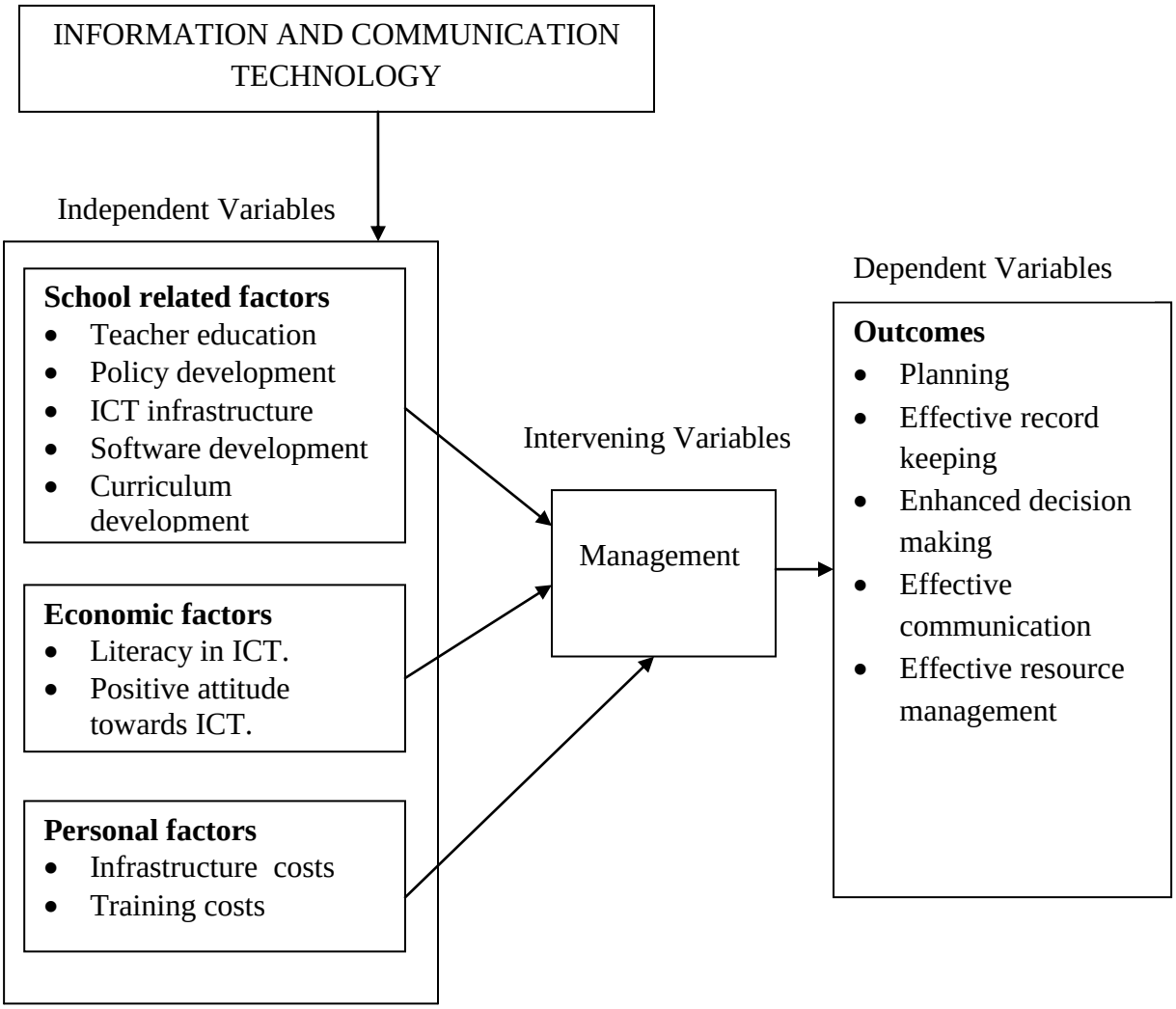

Figure 1.1: Status and Barriers to ICT Adoption in Educational Management in public primary schools.

Source: Researcher

The conceptual framework above shows the relationship between the variables of the study. The independent variables of the study are; the school related, economic and the personal factors which are barriers to ICT adoption in educational management in

primary schools. The dependent variable is the outcome as a result of the adoption of ICT the intervening variable is management of other variables. The framework is that teacher education heavily relies on changes in teachers' attitude, knowledge and behavior. The proper preparation of teachers is critical to the use of ICT in schools. The teachers' computer literacy programme should be carried out for all would be teachers or in service, as well as for continued professional development of teachers already in this field. Without head teachers and teachers being adequately prepared to use computer-based technologies, the best available computing equipment will remain unused in schools.

In curriculum development use of computers in the teaching-learning process is necessary to identify and develop different curriculum levels. All machinery will eventually break down or become unreliable. Therefore, provision adequate maintenance is required to ensure reliable performance of computers; disk drives, monitors, printers and scanners. The costs are such as to require funding from the government through the Ministry of Education to fund for the purchase of the computers; budgeting for maintenance and replacement of the equipment as well as for software and teachers training. Funds should also be allocated for preparation of room layout i.e. partitioning, furniture; security features, electrical wiring as well as air conditioning. The negative outcomes in educational management for failing to use ICT in educational management includes poor planning, inaccurate record keeping, poor decision-making, distorted communication as well as poor resource management.

1.12 Definition of Key Terms

Barriers: Things that hinder ICT adoption in public primary schools.

Data: Qualitative and quantitative information collected by a researcher.

Database: A collection of data organized for rapid research and retrieval usually by a computer often consolidation of many records previously stored separately.

Educational: About or providing education.

Effective: Having the deserved effect, producing the intended result.

Management: The process of dealing with or controlling people or things. It also comprises various functions taken to successfully accomplish a task.

Information and communication technology: A term meaning computing (hardware and software) broadcasting, telecommunication (internet, mobile and fixed telephone).

Information technology: Is the acquisition, processing and dissemination of vocal, pictorial, numerical and textual information by microelectronics.

Infrastructure: Refers to the basic organizational and physical structures required for operations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examines and presents results of similar studies in ICT use in educational management globally and regionally.

2.2 Literature Review Globally and Regionally

The use of ICT in educational management has been recognized as a way of improving learning and also enriching the educational process (UNESCO, 1986). However, its implementation is quite varied across the countries. Computers play an important function in management. The education system is a huge enterprise which deals with large numbers of students, teachers, equipment, materials and facilities. Efficient management of these resources requires an effectively organized information flow in the system, a carefully thought out plan in the short and long-term and strategies for implementation. Some functions of computers in school administration include staff and student scheduling; financial management; maintenance of staff and student records, inventory control, timetabling, students data on enrolment and performance.

2.2.1 ICT Infrastructure and Facilities Used in Educational Management in Europe

Roach (2000) carried out a research on the use of ICT in Education for research and development in the universities of Warwick and Oxford in Britain. The research sought to tackle two inter-related issues; why research and teaching are not closely linked as well as the availability of powerful ICT tools bringing with it the need to make sure that the tools are used in ways that best support student learning. This would assist academic staff

to develop research based approaches to teaching through the effective use of learning technologies.

The researcher noted that the substantial investment made in ICT in higher education and the increasing use of ICT tools in undergraduate curriculum make it vital to analyze the costs and benefits. If ICT tools are used unreflectively delivering packaged learning to passive recipients, higher education may be considerably damaged. However, if ICT can be a means of engaging more closely with the development of those capabilities and cognitive skills that have traditionally been the concern of higher education, the benefits will be immense. Hence, the researcher found it important to investigate the extent to which ICT is being used to enhance teaching and learning in public primary schools in Westland District.

Cairncross (2002) suggested that, ICT are potentially useful tools both for managing education and teaching. The researcher carried out a study on ICT for education and building human capital in Latvia. The main objectives were finding out whether ICT has been effectively used to improve the delivery of education, the cost of ICT in schools, whether ICT helps students learn better, ICT in universities, the challenges of university distance education as well as ICT in corporate training. The researcher noted that getting the best from ICT depends on several variables including the appropriate design of software and hardware, the training and attitude of the instructors and the realization that different students have different requirements. The researcher also noted that ICT are most likely to be cost-effective when used to reach very large numbers of students and when used in research and by administrators. The researcher concluded by declaring that

without skilled instructors, no electronic delivery can achieve good results. The researcher found it important to establish whether adequate infrastructure and facilities are available for ICT use to improve the delivery of education in the Westland District in Nairobi County.

According to Carnoy (2004) application of ICT in the business sector has aided access and processing of large quantities of information for employees and management with the principal aim of increasing productivity. He carried out a study in the United Kingdom on ICT in education; possibilities and challenges. He reflected on the role of ICT in education; whether ICT is suited to transmitting knowledge particularly to students who are not highly motivated to learn or well versed in the art of using and interpreting information. In education, little or no information is being used to improve student performance mainly because education managers are highly illiterate in information management tools. Despite schools having more and more access to ICT, new technologies are still scarcely used as part of the teaching methodology. It is the lack of training that creates difficulties; many teachers do not have IT skills. The researcher found it important to investigate to what extent ICT is being used in Westlands District in transmitting knowledge particularly to students who are not highly motivated to learn.

Condie (2007) observes that where the use of ICT is most effective in enhancing the learning experience, teachers have been able to integrate a number of technologies such as laptops, interactive white boards and the internet. Such combinations of hardware, software and connectivity allow them to develop innovative approaches to learning and teaching. He carried out a research on the impact of ICT on the educational sector across

the United Kingdom. His study focused on the infrastructure to support the use of ICT. Second, on the impact of learning and teaching and third on the extent to which ICT supports communication and links within and across schools and into the wider community, evidence on the impact on learning and teaching indicates that teachers' confidence and skill level have improved significantly in recent years due to the provision of more recent and appropriate staff development opportunities.

There have been considerable developments in the provision of online resources for teaching across subject areas. Mobile technologies have shown to be effective in supporting learning for disaffected and hard to get pupils where attending school is problematic due to personal, family and cultural reasons. ICT can have positive impact on the learning of pupils with special needs whether through adaptive or assistive technologies specially designed to support pupils with special needs or through the use of mainstream technologies such as digital video and photography. Improved communication within schools has led to centralized attendance, assessment and recording systems while links with the external world can support communication with parents and others within the local community as well as contact with schools and agencies in other countries.

Intranets are being used by schools to support a range of administrative activities including attendance, assessment records, reporting to parents, financial management and the sharing of information among staff. The data gathered were used strategically for self-evaluation and monitoring purposes. The researcher planned to investigate the teachers training level in ICT use in Westlands District, the extent to which ICT is being used by

schools to support a range of administrative activities including attendance, assessment records, financial management and sharing of information among staff.

2.2.2 ICT Literacy Levels in Educational Management in Asia

Ali (2003) reports that ICT offers new approaches for bridging the information gap through interaction and dialogue, building new alliances, interpersonal networks and close sectoral links between organizations. This was done in Bangladesh on information and communication technology. It focused on the challenges Bangladesh faces on how to become a learning society and how its citizens are equipped with the knowledge skills and qualifications on ICT that they will need in the next century. The challenges reduce to three broad areas, namely; participation in the information society, how ICT impacts on access, cost-effectiveness and quality of education while the third is to do with the way that ICT changes the educational process.ICT by itself cannot be an answer to all problems facing Bangladesh but it does bring new information, resources and can open new communication channel for the rural communities. The benefits include increased efficiency in allocation of resources for development work, less duplication of activities, reduced communication cost and global access to human resources.

The researcher recommended that facilities be built to promote ICT education and computer-aided education at all levels; short-term intensive training be arranged on teachers; modern and effective ICT networks be built to support traditional methods of teaching and learning and the promotion of the study of foreign languages (mainly English) to increase the understanding of different cultures and enhance mobility in a globalized ICT world. The researcher found it important to investigate on the challenges

Kenya faces as a country and particularly in Westland Districts in using ICT in the public primary schools; denying its citizens the knowledge skills and qualifications on ICT that they will need in the next century.

2.2.3 ICT Use in Educational Management in Australia

White (2008) observes that broad band access to the internet had become mainstream in Australia. He carried out a study on ICT trends in education in Australia. The purpose of the study was to develop a research report describing the trends occurring in education, roles of ICT in education, the indication of areas for research and associated services as an indication of long-term theories about use of ICT in education to inspire future research. To take up ICT in education is strongly dependent on the provision of reception infrastructure as well as the professional development of teachers (Mceetya, 2004). Results indicated that there is an average ratio of 3.3 computers per student in school; 93% have computers at home, 83% indicated are linked to the internet and 67% using educational software. The Digital Educational Revolution (DER) policy aims at provision of computers in secondary schools to support the continued development of online curriculum content, conference facilities, pre-service and in-service professional development for teachers as well as the development of web portals to enable community participation in education.

The development of the social web and its many variations such as relational networking, personal networking and social networking all has communication in common. A number of national ICT bodies between 2003-2008 reviewed the trends in ICT in education as part of monitoring of emerging technologies, personal digital devices such as mobile

phones, Mp3 players, laptop computers, Tablet PCs, game devices, scanners, interactive white boards, digital cameras and videos. These devices can be used in learning and management systems, web conferencing, plagiarism detection, virtual worlds and online collaborative work spaces. Finding and gathering information using ICT has enabled fast access to resources and cost and time saving for researchers. White (2008) finally concludes that current trends in ICT have the accelerating pace of change and diversity in the development of physical infrastructure, spread of distributed connectivity, enhanced content and network management capabilities, emerging social web as well as the continuing scientific and technological innovation. Much needs to be done to assist educators understand the profound cultural and psychological changes that are occurring and will occur in education as the take-up of ICT in the digital age progresses. The researcher found it important to establish the measures put by schools to address issues on security and maintenance of ICT infrastructure in Westland District: Nairobi County.

2.2.4 ICT Use in Educational Management in Africa

Djeneba (2009) observes that ICTs are increasingly present in African societies and have been introduced to varying degrees in all education levels from pre-school to university and in both formal and informal sectors. They are also used to offer distance education to teachers and other adult learners. However, in various education systems, ICTs are increasingly being taught as completely separate discipline, while the integration if ICTs into pedagogical practices to improve the quality of teaching and learning across disciplines remains the exception.

Research on ICT on education in Africa remain rare; a niche for acacia in support research that contribute to a better understanding of the educational uses of ICTs in the socio-cultural context of Africa, that produces evidence that can inform the main stakeholders, (policy-makers, practitioners, researcher, parents, students and that promotes the formulation and the implementation of policies and reforms supporting the introduction of ICTs in the educational systems). The purpose of the project is also to contribute on this broadening process and to participate in the access, construction and production of knowledge in the information era.

The study involved 245, 000 learners, 9000 educators, and other education stakeholders. The main research question was, how, for whom and under what circumstances can the pedagogical integration of ICTs substantially improve the quality of teaching and learning at all levels and scales of African education systems. The main research objectives was to better understand how, for whom and what circumstances, the pedagogical integration of ICTs can substantially improve the quality of teaching and learning at all levels and scales of African education systems.

Analysis of the data collected by the twelve national research team reveals a multitude of uses of ICT in the nearly 120 African schools participating in the project. The uses range from initiation of learners to the fundamentals of computing to the creation of elaborate projects involving in learner create websites, videos, field research and experimentation content.

Educators focus on initiating new users to the basic functions fully before proceeding to apply them to other learning institutions. For many, it seems especially important to

understand these functions fully. The teaching of ICT that characterizes usage in African schools is limited to demonstrating to learners how the computer functions occasionally through presentations of certain tools including world processing or spreadsheet, software popular with educators. The plan of research showed that several educators use ICTs to conduct research in mathematics, philosophy, chemistry, history, electro-mechanics industrial design, sharing and provides opportunities for those involved.

2.2.5 ICT Use in Educational Management in South Africa

Furlonger (2002) points out that urban scholars in South Africa have the access to computer centres, Internet access, information, experienced teachers, ample sporting and cultural facilities to choose from. Rural schools have no textbooks, writing paper, desks, electricity or even toilets. Research showed that many school children drop out before high school mostly in rural areas. Rural schools face many challenges when it comes to access to good quality education i.e. lack of buildings, stationery, inaccessibility and lack of experienced and skilled teachers. For rural schools to compete locally and globally, communication facilities have to be installed. To use the internet, chat rooms, bulleting boards, academic website on the internet and telephone facilities will make it possible in rural areas to keep abreast with the latest development in the educational field. He also noted that most schools lacked computer labs which are central to education. Most schools also lacked teachers with appropriate technical skills and experience in key subjects like computer literacy and internet use. This results in learners not being adequately prepared for tertiary studies where computers and internet knowledge are indispensable. The researcher found it important to establish whether Kenya and

specifically Westland's District also experience lack of teachers with appropriate skills in key subjects like computer literacy and internet usage.

Herselman (2003) proposes basic infrastructure that such as electrical reticulation and communication were essential pillars for economic growth. The researcher carried out a study on ICT in rural areas in Pretoria South Africa. The primary aim of the study was to indicate what had been done about ICT implementation in rural areas in South Africa. The researcher investigated various case studies like school net in Mpumalanga Province. This has hindered access to information and the use of internet which are vital in the promotion of learning, training and business development in developing communities. The researcher found that ICT has had a revolutionary impact on the way they do business, learn and live. This has brought the knowledge era as well as the society bringing together people from different environments. People not only learn from one another but also need basic access to ICT enabling thus, them to keep pace with the rapid changes imposed on the social structure at home, in the classroom, and in the entertainment field. ICT can be regarded both as a driver and an enabler (influencing current and future change). Broader ICT literacy is required. It is becoming a popular service delivery channel increasingly used by the government, business and financial sector.

The researcher recommended that schools be provided with facilities including solar powered computers, television sets, video machines, writing and flannel board and secure boxes. The researcher also recommended biogas projects to be installed to provide electric power. The researcher also recommended that the government provide funds to

meet costs of upgrading electrical services to schools, training of educators to understand the kind of software needed in order to integrate technology in the curriculum, create educational networks, and provide disadvantaged schools with internet access at low costs as well as organize workshops for educators in all schools to empower each other. The researcher found it important to investigate the infrastructural establishment without which access to information and internet adoption is hindered in Westland District, Nairobi County.

According to Thabani (2012) the South African education system has for a number of years faced immense challenges which range from mud schools to low pass rates at Matric level, high dropout rates, high levels of absenteeism by teachers in productivity on both teaching and learning in schools. One way to overcome the challenges of low efficiency and productivity of both teaching and learning would be through the use of ICT in S.A school.

South African schools have used traditional teaching methods for the last few decades. Educational institutions face challenge e.g. dwindling ability to collect school fees from parents and learners decline financial support from the government. Failure to use ICT as means of enhancing teaching and learning has led to SA fairly to close the digital divide.

A number of various initiative both legislative have been undertaken by various government department to support the integration of ICT into teaching and learning. The number of internet users was three million in 2002 out of 48 million estimated population. The use of computer was introduced into school during the 1980s primarily in private school and a few well resources government school. Initially, computer were used manly for administrative purposes such as keeping students records, recording

examinations marks, producing school reports and arranging timetable but with the continuous advances in ICT. This later changed.

It is estimated that 10% of South Africans 28,000 schools have access to one or more computer. The implementation of ICT in South African schools is being led by school net, which also provides staff development and ICT support to schools. One challenge faced is lack of enough funds to purchase computers and build infrastructure with regard to ICT.

2.2.6 ICT Use in Educational Management in Nigeria

Esherenana (2010) carried out research on ICT application in Nigerian secondary schools particularly the importance of ICT and the causes of low levels of ICT application in Nigerian secondary school. Development is partly determined by the ability to establish a synergistic interaction between technological innovation and human values. The rapid rate at which ICTs have evolved since, the mid 20th century, the convergence and pervasiveness of ICTs give them a strong role in development and globalization. ICTs have significant impact on all areas of human activity. ICT have potential to accelerate, enrich and deepen skills to motivate and engage students to help them relate school experience to work practice, create economic viability for tomorrow's work, as well as strengthen teaching and helping schools to change. Use ICT is no longer a luxury but a necessity for development.

ICT allows for increased industrialization of learners. Students have access to tools that adjust to their attention span and provide valuable and immediate feedback for literacy enhancement. A technologically advanced workforce will lead to ICT growth in Nigeria,

with the potential to improve military technology and telecommunication, media communication and skilled ICT professionals who will be equipped to solve IT problems in Nigeria and other parts of the world.

In 1988, the Nigerian government enacted a policy on computer education. The plan was to establish pilot schools and diffuse computer education innovation first to secondary schools, later to primary schools. The project did not take off beyond distribution and installation of personal computer. The Nigerian government has commissioned a mobile internet unit (MIU operated by Nigerian National Information Technology Development Agency. It has 10 work stations all networked and connected to the internet. It is also equipped with printers, photocopiers and a number of multi media facilities. It is also equipped with a small electric generator to ensure regular power supply.

The study revealed that, limited/poor information infrastructure, lack of adequate ICT facility inhibit deployment of ICT by teachers. Frequent electricity interruption, inadequate manpower in the schools because teaching is considered to be for poor people, high cost of ICT facilitation, poor perception of ICT among administrators.

Government should ensure that ICT policy statements are translated into reality, all secondary schools should be beneficiaries of ICT project, computer education should be made compulsory for all secondary school students not only those who elect it, efforts should be made by the ministry of education to post teachers skilled in ICT and the government should work towards stabilizing supply power.

2.2.7 ICT Use in Educational Management in Kenya

Lawler (2007) investigated the use of computers in educational institutions in Rift Valley province in Kenya. The study examined ICT projects in education in order to establish normal practice and to determine the effects of adoption ICTs at school level. There has been little evaluation of ICT projects in educational institutions in Kenya teaching staff.

Absence of educational software, internet access and use of e-mail was found. Some 35-40% of secondary school teachers had never used a computer. The research revealed tangible benefits to students from exposure to ICT, it was also found that exposure to computers in schools influenced the career choices of former students. It was concluded that reform of the telecommunications sectors is necessary to hasten the role out of computer technology in educational institution in Kenya. The key issues which arose included staff training, mainstreaming of ICT across the curriculum and provisions of adequate ICT equipment. Shortage of qualified teachers- ICT can accelerate teacher training, pre and in service training, low-learning achievement counter high pupil-teacher ratio, shortage of basic investment material, poor physical infrastructure, positive impact on pupil achievement and classroom practice. It will make learning more interesting deterring pupils from dropping out, overcome issues of geographical isolations, counteract physical distance and provide teachers with access educational content and up-to-date resources.

The government of Kenya as the natural platform for equipping their national with ICT skills in order to create dynamic and sustainable economic growth (Kenya Government 2004a p.67). Despite the slow progress with ICT development, the government in

partnership with non-governmental organizations has responded to bridge the digital divide be initiating projects like Intel technology to the future teacher programme which provides online mentor based programs that provide in-service training to teachers and how to integrate ICT.

Exposure to ICT allows leaners to develop skills that will give them an edge in an ever increasingly technology. Saturated work environment allows learners rights e.g. through conducting a school project and presenting and presenting it PowerPoint presentation, use ICT in doing assignment to cultivate culture of personal information management. Independent leaning and working without supervision, communication skills which are highly valued in today's global workforce, enhances the development of teaching instructions by teachers, teachers work faster to administer and manage their work effectively, communicate more efficiently with other teachers and colleagues. Challenges to implementation are; it is expensive to set ICT infrastructure and facilities, staff need to be trained and retrained, fear of change by the staff. The researcher recommended that the government provides more funding for ICT resources and teachers training, educators make more use of ICT resources and technology, school governing bodies to ensure adequate ICT resources and technology and equip leaners with basic computer skills and knowledge they can use in secondary school and can utilize their later stages of their lives.

Chepwogen (2011) in her extensive study on the factors affecting implementation of national ICT strategy for education and training noted that 27% of secondary school teachers had received training in ICT. She carried out her study in secondary schools in

Bomet and Narok counties. The specific objectives were to find out how the leadership and management styles of head teachers affect implementation of ICT strategy; to determine how infrastructure affects implementation of ICT strategy, examine the availability of training for staff in the implementation of ICT strategy and investigate how the availability of finances affects the implementation of the ICT strategy in secondary schools.

The researcher noted that most teachers held a bachelor's degree in education, most had diploma in computer studies, 61% had not received any training, 83% reported that the Ministry of Education rarely does monitoring and education; 10% agreed that the use of ICT in teaching enhances performance, 55% suggested that the Ministry of Education provide in-service training for teachers as well as come up with relevant curriculum for those colleges offering educational courses. The researcher found it important to investigate how the availability of finances affects the implementation of ICT strategy in primary schools.

Kiposi (2012), shows that ICT has contributed greatly to educational management in schools globally. However, in Kenya schools hardly use ICT to manage the output or to raise teacher productivity or to reduce costs through analyzing spending. This is attributed to myriad of challenges facing most school in Kenya with regard to adaption ICTs in educational management. This has resulted to a slow rate of adaption of technology despite its promise and potential for use in education management in school. The paper analyses the lethargy that has surrounded management in school with respect to acquisition of ICT. The education and training sector is a major user of ICT not only in

educational training and research but also in management of the sector. ICT policies must be dynamic, cost effective, adaptable and differentiated between the various segments of educational management in order to contribute effectively.

As Kenya lags behind in adaption, use and innovation in the use the ICT sectors, its people are missing out on a better education and well managed education systems and entities. Kenya schools hardly use ICT. This is attributed to a myriad of challenges facing most schools in Kenya with regard to adaption of ICT in education management. This has resulted to slow rate of adaption of technology despite its promise and potential for use in educational management in school. Most schools in Kenya have only adopted computers as technical subjects and not integrated its use in the teaching and learning. A more holistic approach required that school be receptive and upon to the changes ICT may make. Education managers need to have basic information on quality of teaching students in order to make the most basic resource allocation decision.

ICT can be valuably strong in analyzing data on students' assessment, educational, physical and human infrastructure, cost and finance and human infrastructure. Administrators and policy makers can construct virtual scenarios around different policy options to determined needs and analyze potential consequences. Each scenario can be analyzed and evaluation systematically over a sufficient period of time to show result, ICT can help school administrators and schools principals to streamline operations, monitor performance and improve use of physical and human resources. Computer related technologies have the potential to support the management of computer standards related instructional process in relatively simple ways. They also can promote

communication among school, parents, central decision makers and businesses thus fostering accountability, public support and connectivity with market place.

There are currently over 4000 public secondary school in Kenya, and the recent massive increase in primary school enrolment is putting pressure on the demand for and access to secondary school (RoK, 2007). There are obvious benefits for integrating computers into secondary school as students at this age needs to focus on subject-specific contents, greater critical thinking skills, scientific inquiry and mathematics, science and languages. Students will benefit greatly with the analytical creating and collaborative power of computers to map out and analyze assumptions, present ideas, participate in projects with peers from around the county and around the world. Foundation skills should be a stepping stone one using ICT to enhance teaching and learning objectives. Changes in school means changing attitude, norms beliefs and values associated with the school culture norms such as introspection, collegeability and a shared sense of purpose or vision combined to create a culture that support innovation in education management.

ICT Education in Kenya

The computer in education project in Kenya (CEPAK) was launched in April, 1983. In mid 1986, a 3 year phase II was launched. 5 more secondary schools received computers, computer software and teacher training. Majority of computers assisted learners; teachers tended to be passive, left students to do whatever they choose. Due to lack of exposure outside school female students were more disadvantage than their male counterparts.

A study conducted in Nov. 2002 revealed that 46.4% of schools sampled had computers. E-mail was not recognized as a tool for collaboration among teachers as only one school

had a website and only 2 reported to having networked all their computers to the internet. Access to internet was severely limited and when available was only for administrative purposes. Some schools made use of very equipment and heavy reliance on the donation of computers as opposed to sourcing locally reduced the capacity of the school to determine use of computer. Girls' schools were found to be having the lowest number of computers.

In order to move effectively prepare students to participate to ICT-driven education, greater commitment and willingness to share and adopt innovative solutions are needed from all aspects of society-from government and private sector, communities, donors, parents and students. Computers can have a significant impact on teaching and learning. Can compete is a global based economy because they know that their knowledge, ideas, culture and passions are and valuable as any in the world.

Policies should focus on school as starts points for rural transformation, teachers and students for rural be empowered to be active agents for change in their school and teachers must embrace vision that will prepare their youth for tomorrow's challenges.

The sessional paper Vol.1 of 2015 captures ICT in chapter VIII. The government appreciates and recognizes that an ICT literate workforce is the foundation in which Kenya can acquire the status of a knowledge economy (Rok, 2005:79). Education is seen as the natural platforms for equipping the nation with ICT skills to disseminate skills to the wider society thus create positive impacts in the economy.

The sessional paper notes a numbers challenges facing access and use of ICT, including high levels of poverty which hinders access to ICT facilitation, limited rural electrification, frequent power disruption, high costs of internet provision, costs associated with ICT equipment, inadequate infrastructure hinders the application of ICT. In order to achieve the objectives, a number of strategic on ICT that address its use in all educational institutions and neighbourhoods, incorporating access, contents, training of teaching and supplying of ICT to the institutions.

The KESSP report further ensures the development of e-learning material and e-learning content by using experiences in the region to develop digital content. There is need for a comprehensive and forward looking ICT policy which creates an enabling framework for the development of ICT in educational management in school in Kenya. The policy would guide proper deployment of ICT in education. Time and research may foreground new perspectives. A force cannot afford to exclude itself from globalization and global connectedness and has to get on board with ICTs while others experience the concern that connectivity and technology compete with the pressing promotions. Exclusion from ICT increases the fears of antagonisms between the rich and poor, young and old, urban and rural, boys and girls across and within the nation.

2.3 Summary on Literature Review

From the literature reviewed, it emerge that most institutions of learning in developed and developing countries lack ICT infrastructure, computer laboratories as well as teachers with appropriate technical skills and experience in key subjects like computer literacy and internet use. They also lack the appropriate design of software and hardware. Kenya has

not yet fully implemented the ICT strategy 2006 despite it being the backbone of industrialization. This study therefore investigated the status and barriers to ICT adoption in Westland's District, Nairobi County.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used in carrying out the study. Specifically, it describes the research design, study locale, study population, sample size and sampling techniques, research instruments, pilot study, data collection techniques, methods of data analysis and the logical and ethical considerations.

3.2 Research Design

The study adopted a descriptive survey design to investigate the status and barriers to effective adoption of ICT in educational management. This design is quite appropriate for gathering information, summarizing, presenting and interpreting it for the purpose of clarification (Orodho 2002). The descriptive survey design is one of the most commonly used methods of descriptive research to gather qualitative and quantitative data from a relatively large number of cases at a particular time. This method enabled the researcher to produce statistical information on issues of ICT status adoption in education that are currently of interest to policy-makers and educationists.

3.3 Study Locale

The study was carried out in Westland District in Nairobi County. Westland District is located northwest of the central district of Nairobi. Apart from being a commercial centre, it is one of the 8 administrative sub-counties in Nairobi. Westland contains some of the highest income areas in Nairobi such as Parklands, Kitisuru, Highridge, Kilimani,

and Lavington as well as slums like Kangemi. The entire constituency has an area of 98km^2(MoE, 2012).

The researcher chooses Westlands District as it has inhabitants from all levels of the social economic status. There are the economically able members of the society living in Lavington and Kilimani. The middle income earners living in Parklands; some live in Kangemi which is an informal settlement. This is an ideal mirror of the Kenyan society. Most of those living in the slums are small-scale traders, few in full-time employment. A large number are engaged in casual employment in the local industry around the settlement and in the transport sector. Few engage in livestock and poultry farming as well as many unemployed housewives and gardeners. The District has a variety of school types it also represents a region with diverse economic potential this enables the researcher to collect information from the target population with respect to the status and barriers to ICT adoption in educational.

3.4 Study Population

The researcher targeted to carry out the study in 27 public primary schools in Westland District, Nairobi County. The District consists of 25 public mixed day primary schools and 2 public mixed boarding schools. The total student enrolment is 22,107 while there are 510 teachers (MoE, 2012). Therefore the total target population was 510 teachers

3.5 Sample Size and Sampling Techniques

The following section covers the sample size and sampling techniques the researcher employed to collect data.

3.5.1 Sampling Techniques

The researcher used stratified and purposive sampling to select 5 teachers in each of the 15 schools. All the 15 head teachers from the 15 schools participated in the study. The total number of respondents was (90) ninety comprising fifteen head teachers and seventy five class teachers. According to Green (2006), a sample size which is too small has no ability to meet any of the objectives while a very large sample size that is adequate to meet all the objectives; but wastes monetary resources with more complex designs techniques available to efficiently allocate the sample by minimizing the standard errors level for a key estimate at a set cost or to minimize variable cost while controlling the standard error level of one or more key estimates.

Frankel (2010), states that some samples are too small to be representative and on the other hand samples are too large given the amount of time and effort the researcher must put into obtaining it. The sample should be as large as the researcher can obtain with reasonable expenditure of time and resources. This is why the researcher selected 100% of the boarding schools 50% of the day school, 42% of the males head teachers, 67% of the female head teachers, 22% of the male teachers and 13% of the female teachers have provided adequate data for research.

3.5.2 Sample Size

Westland District has a total of 27 public schools. The sample size comprised of 15 schools. Two public mixed boarding primary schools and 13 mixed public day primary schools in Westland's District were purposively sampled. The sample size for the respondents is as shown in table 3.1.

Table 3.1 Sampling Matrix

Subject	Population		Sample Size		Proportion	
Schools	Boarding	2	Boarding	2	Boarding	100%
	Day	25	Day	13	Day	50%
Headteachers	Male	12	Male	5	Male	42%
	Female	15	Female	10	Female	67%
Teachers	Male	112	Male	25	Male	22%
	Female	398	Female	50	Female	13%

3.6 Research Instruments

This study employed two sets of instruments i.e. questionnaires and an observation schedule.

3.6.1 Questionnaires

Questionnaires are important because they enable the researcher to gather large amounts of data relatively quickly. The data collected can be expressed statistically thus making it possible to make comparison with other studies (Burton, 2010). They are given simultaneously and ensure anonymity to provide time for reflection before answering the questions. The researcher gave questionnaires to the head teachers the class teachers. The research employed two sets of questionnaires as follows:

(a) Head teachers questionnaires; Barriers to ICT adoption in Educational Management questionnaire for the head teacher is attached as appendix I. It contains semi-structured, open-ended and closed items on general information of the school, availability of the ICT infrastructure, levels of ICT literacy, Head teachers' attitude towards ICT use and security and maintenance of the ICT infrastructure.

(b) Class teachers questionnaire: Barriers to ICT adoption in educational management questionnaire for the class teachers is attached as appendix II. It contains semi-

structured items that are both open and closed-ended. It is aimed at gathering information on teacher qualification, availability of ICT infrastructure, maintenance and security measures and teachers' attitude towards ICT adoption in Educational Management.

3.6.2 Observation Schedule

The researcher used an observation schedule to examine the availability and condition of ICT resources in the schools. The researcher observed the availability and condition of the ICT resources, ICT infrastructure and the security measures installed. The observation checklist is attached as appendix III.

3.7 Pilot Study

The questionnaires were piloted in 5 schools which were not included in the main study. During this time, the researcher made any necessary changes in the instruments before the research instruments were applied for the actual study. The pre-testing helped to refine the instruments before they were applied in the actual research. The pilot study helped the researcher to familiarize with the data collection techniques, ascertaining the accuracy and coverage of the questions. This exercise guided the researcher in modification of the research instruments for reliability and content coverage.

3.7.1 Validity

Validity refers to the truthfulness, correctness, or accuracy of research data (Burton, 2010). It is the degree to which the instrument collects the intended purported data. It also helps in testing the feasibility of the study, the techniques and perfects questionnaires, concept and wording. It is the qualitative procedure of pretesting or a prior attempt to

ascertain that research instruments are accurate, meaningful and correct. The researcher ensured that the set items were not ambiguous, poorly prepared or confusing to the respondent.

Validity was established through close consultation and expert judgment of the supervisors who checked on the face, construct and content validity to ascertain whether the instruments accurately represented the variables under study in line with the purpose and objectives of the study.

3.7.2 Reliability

Reliability describes the extent to which a research instrument or method is reputable. It is an assessment of the consistency of the method (Burton, 2010). The stability of the questions was assessed through test-retest method. The questionnaires were administered twice to the same number of respondents within a two weeks lapse to check the relationship between the two scores. According to Creswell (2003), qualitative data can be made reliable and valid by triangulating different data sources of information by examining evidence from the sources and using it to build justification for themes.

3.8 Data Collection Techniques

Before the actual data collection, the researcher got a letter from Kenyatta University and a research permit from the National Commission for Science Technology and Innovation. The researcher proceeded to seek permission from the DEO Westlands District to contact research in public primary school in the District. The researcher first sought for permission from each headteacher, booked appointments, collected data as well as filled in the observation schedule in the fifteen sampled schools. The researcher collected the

dully filled questionnaires from the respondents and clarified that the information collected was specifically for study purposes.

3.9 Data Analysis and Presentation

Primary data from the field edited first to eliminate the misplaced responses given. The responses were then coded for analysis. Data collected were analyzed using descriptive statistics through the use of Statistical Package for Social Science, (SPSS). Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to analyze the data which were then presented inform of tables, pie charts and bar graphs. Qualitative data was first organized and prepared for analysis, coded according to the themes and description. They have been used to explain the level of ICT use in public primary schools, teachers training in ICT, their attitude towards adoption of ICT in teaching and data management and communication as well as the availability of computers and maintenance.

3.10 Logical and Ethical Considerations

The researcher sought approval from the Kenyatta University graduate school. Being granted, the researcher also sought permit from the National Commission for Science Technology and Innovation before conducting the study. The researcher sought consent from institutions included in the study as well as the individual respondents. The researcher put into consideration the ethical and logical issues ensuring that there was no fraud or plagiarism. Confidentiality, anonymity and the informants' consent was ensured in the whole study. The data collected were presented in a way that could not be linked with the respondents except by the researcher.

According to Fraenkel (2011), it is a fundamental responsibility of every researcher to ensure that participants in a research study are protected from psychological harm, discomfort or danger that may arise due to research procedures as well as ensure confidentiality of research data. The researcher treated the information obtained during the course of investigation confidential and used it for research purposes only.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1. Introduction

This chapter presents the research findings of the study from the analysis of the primary data collected. The results have been summarized and presented in form of tables, pie charts, bar graphs and narratives. Descriptive statistics were used to analyze some of the close-ended questions in the questionnaire.

4.1.1 Response Rate

This refers to the number of people who answered the survey divided by the number of people in the sample. The questionnaires were administered to 15 public primary schools in Westland's District in Nairobi County. Each school was given 6 questionnaires making them a total of 90. One head teacher and six classroom teachers were issued with a questionnaire each. This added up to ninety questionnaires. Fourteen head teachers and sixty class teachers returned their dully filled in questionnaires.

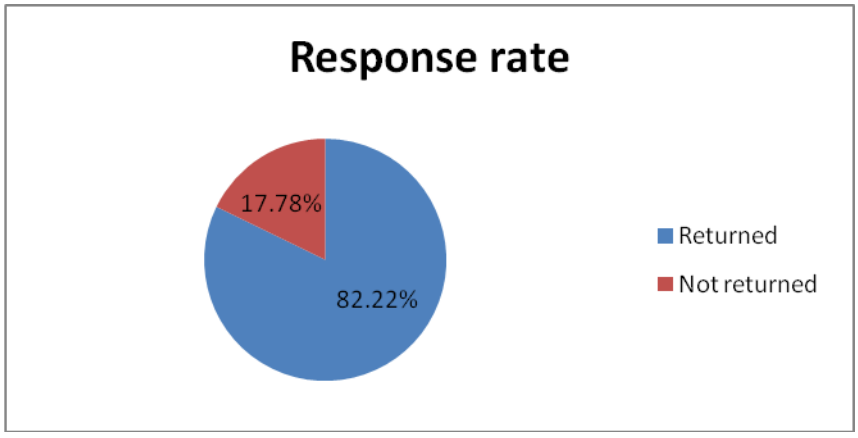

Figure 4.1: Response rate
Source: (Teachers questionnaire, 2014) **N=74**

Every attempt was made to make sure that all the questionnaires were completed and returned but it was not possible. 14 head teachers returned their questionnaires while 60 class teachers returned their questionnaires duly filled. The unreturned questionnaires did not have negative implication; Seventy-four questionnaires were computed and returned which represents a response rate of 81.1% which is considered sufficient enough for the study.

4.2 Background Information

It identifies and describes the history and nature of the well defined research problem with reference to the existing literature. It expands upon key points stated in the introduction. They are often considered to be general reference sources, meaning that they provide basic facts and knowledge that can be used as a foundation for one's research. This section included: gender of the respondents, type of schools they are teaching in, the subjects taught, the positions held and the level of training in the education course.

4.2.1 Gender of the Respondent

Gender is an important variable which is valuably affected by any social and economic phenomenon. The respondents were required to indicate their gender. The following summarizes the result.

Table 4.1: Gender of respondents

	Frequency	Percentage
Male	27	36.5
Female	47	63.5
Total	**74**	**100**

Source: (Teachers questionnaire, 2014) **N=74**

From table 4.1, it is clear that more female teachers (63.5%) took part in the sample study than male (36.5%. there was no gender disparity. Both genders were represented in the study despite the fact that more male teachers were in charge of the ICT laboratories. This does not necessarily mean that there are more female teachers than male in primary schools despite the fact that more male teachers are in charge of ICT in their schools.

4.3 Number of Streams in the Schools

This refers to the practice of placing students with others with comparable skills or needs as in classes or in groups within a class. The study aimed at establishing the number of streams in each of the schools under study. The results attained are presented in figure 4.2.

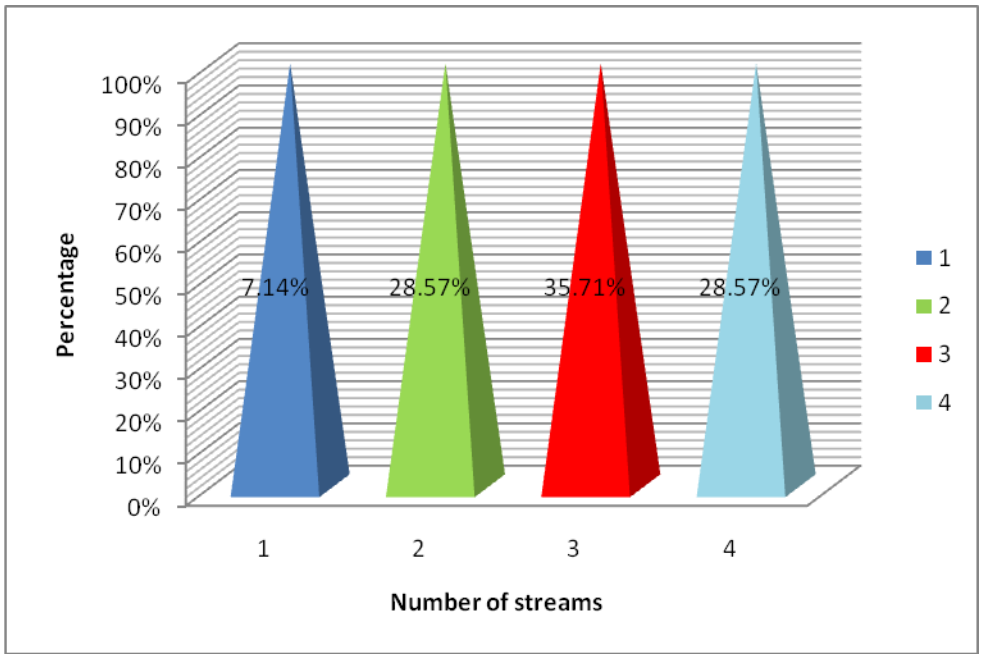

Figure 4.2: Number of streams in the school indicated in percentage N=14
Source: Head teachers questionnaire, 2014

According to the figure 4.2, (7.14%) was single streamed. Four (28.6%) were double streamed. Five (35.7%) had three streams while the remaining four schools had four streams. It can be observed that most of the schools have three streams (36%) especially in the densely populated areas such as Kangemi, Westlands and Parklands. Schools in lowly populated areas such as Lavington have low enrolments. Single streamed schools have low teachers and pupils enrollments while multiply streams schools have high population. This translates the difference personal and ICT facility requirement.

4.4 The Total Number of Students in the School

The total enrolment includes all students who attended public school within a given school year. The study sought to establish the number of students in the schools. The information in the table indicates that no school had an enrolment below 301 pupils.

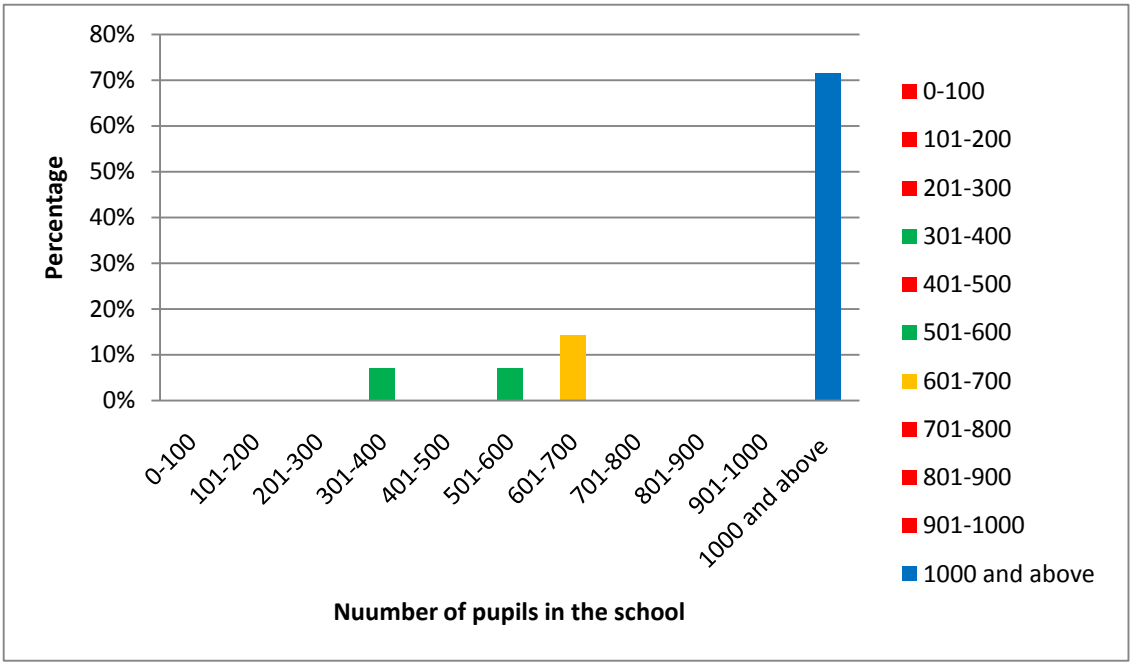

Figure 4.3: Total number of students in the school as shown in the bar graph N=14
Source: (Head teachers questionnaire, 2014)

One school (7.1%) had an enrolment ranging between 301-400 pupils. One school (7.1%) had a total number of students ranging between 501-600 pupils. Two schools had a total ten schools (71.4%) held an enrolment totaling to more than a thousand and one pupils.

The highest percentage of the total number of students in the schools is 71.43 indicating that most schools have an enrolment of more than 1001 pupils. No school has an enrolment below 301 pupils four schools have an enrolment ranging from 400-700 pupils.

4.5 Currents Academic Qualifications

The study sought to establish the current academic qualifications for head teachers and class teacher. Academic qualification requires a contribution of original academic preparation augmented by subsequent activities that maintain or establish preparation for current teaching responsibilities. The results are as shown in figure 4.4.

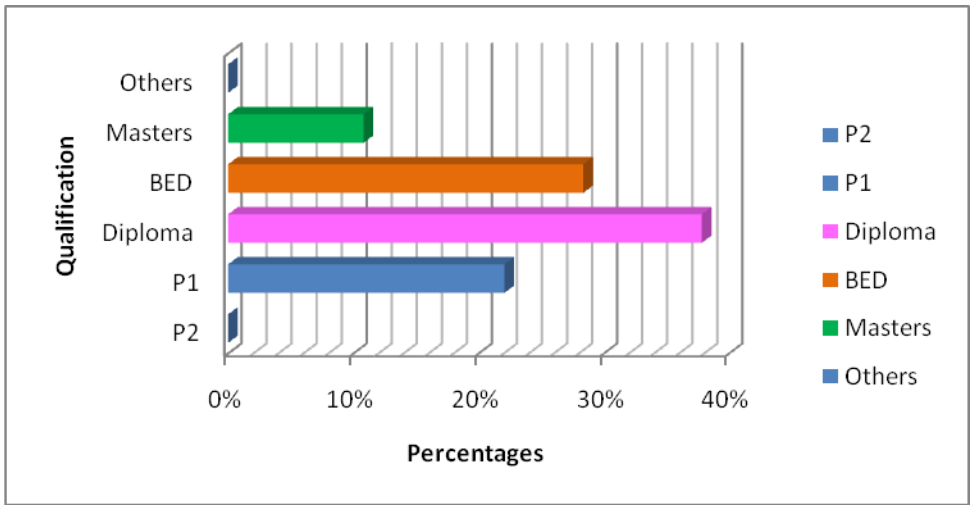

Figure 4.4: Current academic qualifications for Head teachers and Class teachers
Source: (Head teachers questionnaire, 2014) N=14

From figure 4.4, it is clear that no teacher held to p2 grade 17 teachers (23%) were in p1 grade while 28(37.8%) had Diploma in education. 21 (28.3%) had B.Ed) while 8 (10.8%) had Master degree in education. Diploma, B.Ed and Master of education holders are more proficient in the use of ICT in educational management. No teacher participating in the study held an academic qualification higher than a master degree in education. This indicates that the respondents were teachers professionally trained who understand the need to use ICT in educational management in their school.

The majority of the teachers held a diploma in education. This forms 36.98% of the total target population. It implied that no teacher participating in this study held the P2 grade and none held an academic qualification higher than the Master of Education.

4.6 Age of Respondents

The study aimed at establishing the age of the head teachers and the classroom teachers. This information is useful for understanding the context of the reproductive and health status of men and women. The results were as presented in figure 4.5.

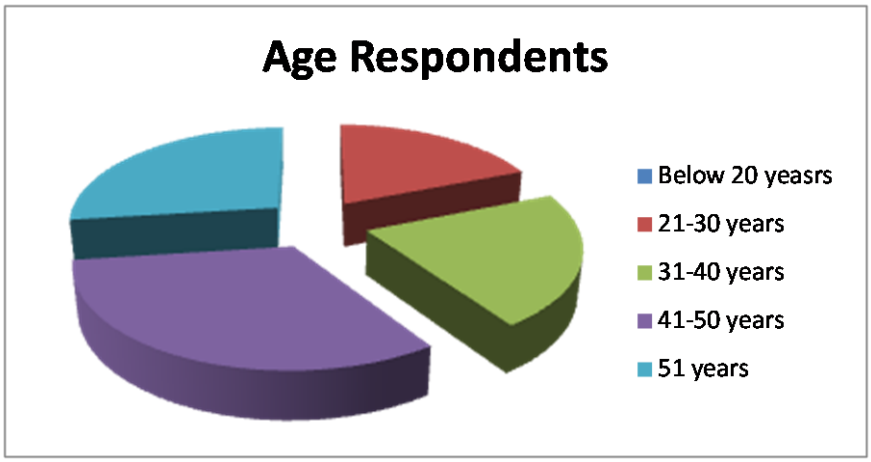

Figure 4.5: Age of the respondents
Source: (Class teachers questionnaire, 2014) **N=74**

The figure indicates that no teacher was aged below 20 years (18.9&) of the respondents belonged to the 21-30 years age bracket (21.6%) of the respondents belonged to the 31-40year age bracket (32.4%) belonged to the 41-50 years age bracket and the rest (27%) were 51 years and above. Teachers aged below 50 years are more competence in using ICT in Educational management unlike the age who find it hard to change from the

traditional methods in teaching communication and data management. It is clear from the table that most of the respondents were aged 41-50 years.

4.7 Subjects and Classes Taught

The study further sought to establish the classes as well as the subjects that the respondents taught. Teachers teach either in lower primary whereby they teach all the subjects or upper primary where they combine different subjects.

Table 4.2: Classes taught

Classes	**Frequency**	**Percentage**
Lower primary	12	16.2
Upper primary	62	83.8
Total	**74**	**100**

Source: (Class teachers questionnaire, 2014) **N= 74**

The data in table 4.2 shows that 12(16.2%) teachers taught in lower primary teaching all the subjects on the timetable. 62(83.8%) taught in upper primary where they combined different subjects. Teachers handling upper primary classes are more competent in using ICT in educational management. ICT use can improve efficiency in the instruction of all subjects and classes which emphasizes the need to use ICT for educational management in all primary schools.

4.8 Source of Power

The study aimed at establishing the source of power in the sampled schools. The primary function of a power supply is to convert one form of Electrical energy to another. Some

power suppliers are discrete. A power supply may obtain energy from various types of energy sources. The study findings are indicated in figure 4.6.

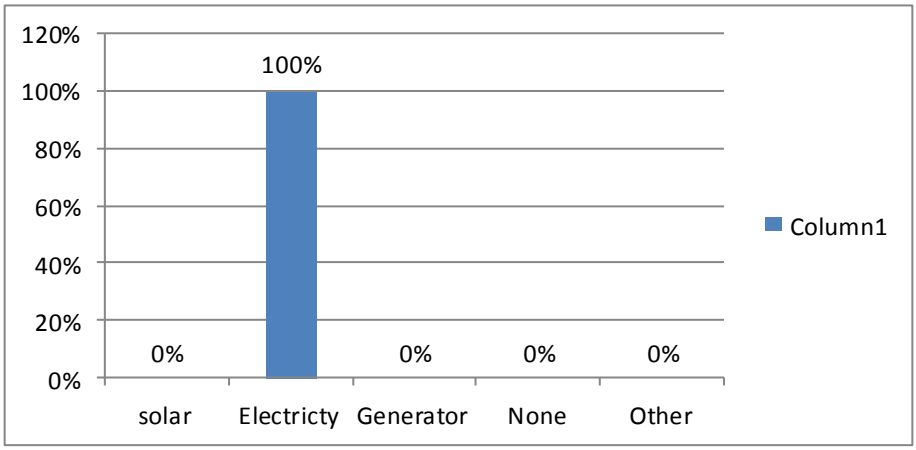

Figure 4.6: Source of power
Source: (Head teachers questionnaire, 2014) N=14

It was the findings of this study that all the 14 schools (100%) under study had electricity connected. However, from the figure, a few had back up generators but none used solar.

4.9 Mode of Communication

The study further aimed at establishing the mode of communication that the head teacher used. Communication is a purposeful activity of exchanging information and meaning across space and time using various technical or natural means. Table 4.3 represents the findings.

Table 4:3 Mode of communication

	Frequency	Percentage
Mobile (calls & messages)	8	57.1
Landline	0	0
Letters	6	42.9
Emails	0	0
Social media	0	0
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

The data in table 4.3 shows that (57.1%) mostly used the mobile phone (calls and messages) to communicate with the stakeholders (42.9%). They mostly used letters to communicate with the education officers, teachers as well as committee members. However, they used the social /media to communicate with friends and family members.

4.10. Data Management

This refers to development, execution and supervision of plans, policies, programs and practices that control, protect deliver and enhance the value of data and information assets. The study sought to establish how the head teacher managed and monitored the schools financial resources.

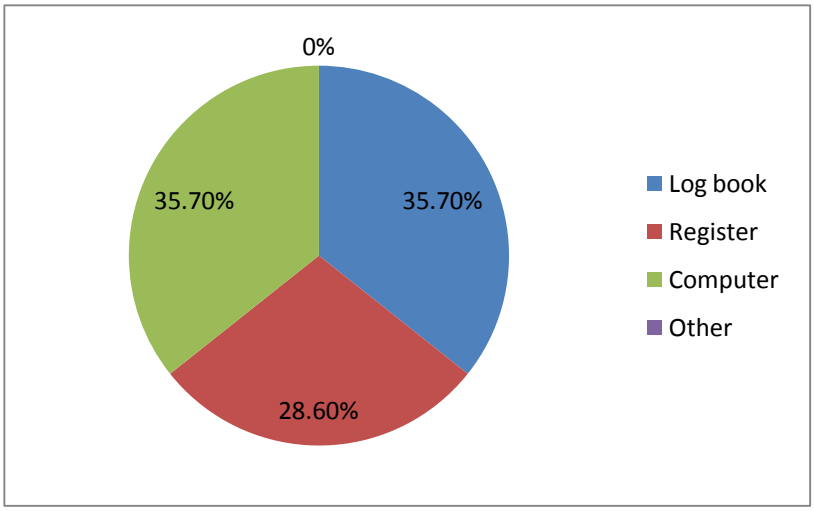

Figure: 4.7 Data Management

Source: Head teachers questionnaire, 2014 N=14

Figure 4.7 indicates that (57.2%) of the respondents used the cash book as their mode of financial management. (7.1%) used the balance sheet. Another (7.1%) used cash flow statements to manage their institutions finances, 28.6%) used the computers to manage the finances in their schools.

4.11. Resource Management

This refers to the efficient and effective deployment of the organizations resources where they are needed. The respondents were requested to indicate how they manage and monitor the school's financial resources. The following is the analysis of their mode of management.

Table 4.4: Resource management

Mode of management	Frequency	Percentage
Cash book	8	57.2
Balance sheet	1	7.1
Cash flow statement	1	7.1
Computers	4	28.6
Others	0	0
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

From the data in the table above (57.2%) used cash books to monitor and manage the school finances. (28.6%) used computers while (7.1%) used cash flow statement and balance sheets. This is largely because most head teachers are not computer literate. Those who have acquired computer skills are not confident to use in educational management.

4.12. Availability of Computers

According to the study, it refers to the ability of a user to access information or resources in a specified location and in the correct format. The study sought to establish the number of computers that were available in their schools.

Table 4.5: Availability of computers

	Frequency	Percentage
Available	10	71.4
Not available	4	28.6
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

From the table 4.4, it is clear that (71.4%) of the schools sampled had functional computers. 28.6%) of schools under this study did not have computers. However, among the schools with computers some only had a single computer which was used by the secretaries while some had many computers in their computer laboratories. These findings agree with Njiru (2012) who established that the availability of different ICT resources varies across the schools in Thika West District.

4.13. The Number of Computers

This refers to the total number of computers available in a particular time in the institution. The study sought to establish whether the computers in various schools were internet connected. The results are represented in figure 4.8.

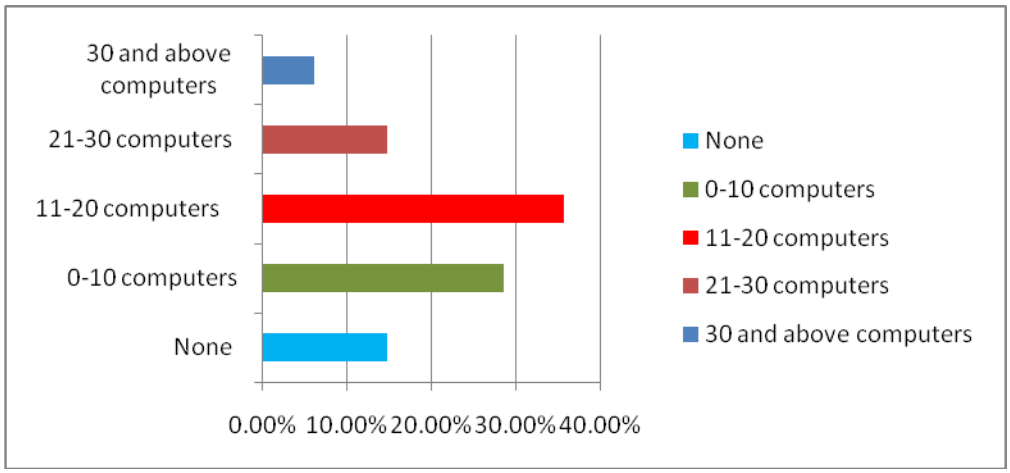

Figure 4:8: Number of computers in the school
Source: Head teachers questionnaire, 2014 **N= 14**

4.14. Internet Connectivity

The study sought to establish whether the computers in the school under study were internet connected. This connects, individual computer terminals, mobile devices and computer networks to the internet enabling users to access internet services such as emails, and the World Wide Web.

Table: 4.6: Internet connectivity

Response	Frequency	Percentage
Connected	6	42.8
Not connected	8	57.2
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N= 14**

From table 4.5, (42.8%) of the in the schools in Westland's division are internet connected. (57.2% are not connected to the internet. Similar results were obtained by Ndirangu (2012) who established that 60% of the schools in Kitui County, Kenya had internet connectivity.

4.15. The Ration of Computers to the Teachers

This is the number of computers available in the school divided by the number of the teachers in the institutions. Therefore, the study further sought to investigate the ratio of computers to the number of teachers in the schools.

Table 4.7: Shows number of computers available in the school

Ratio of teachers to computers	Frequency	Percentage
N/A	2	14.3
2:1	5	35.8
3:1	3	21.5
11:1	1	7.1
12:1	1	7.1
14:1	1	7.1
26:1	1	7.1
TOTAL	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

The study revealed that (14.3%) had no single computer in their institutions. (37.7%) shared the computer in the ratio (1:2) while (21.4%) used the computer in the ratio (1:3). Respondents from four schools revealed that they shared the computers in the ratios (1:11), (1:12), (1:14) and (1:26) respectively.

It is a major challenge to the implementation of ICT used in educational management in public primary schools. The findings perfectly agree with Migwi (2009) who noted that high ratios of computers to students indicated a low level of investment which shows limited preparedness to integrating computers to learning. This point out to the need to strengthen investments already made to maximize existing capacity in the schools that participated in the study.

4.16. Level of ICT Literacy

This refers to skills and knowledge needed by a citizen to solving and thrive in a society that is dependent on technology for handling information and solving complex problems.

This study further investigated the level of ICT literacy among the head teachers and class teachers.

Table 4.8: Level of ICT literacy

	Frequency	**Percentage**
Computer literate	68	91.9
Not literate	6	8.1
Total	**74**	**100**

Source: Teachers questionnaire, 2014 **N= 74**

Table 4.7, shows that (91.9%) were computer literate (8.1%) admitted being ICT illiterate. These findings concur with the findings of Macharia (2012) who found out that half- of the teachers who were interviewed had reported that their highest level of computer literacy was a certificate, while (80.6%0 of the students didn't value any computer knowledge.

4.17. ICT Training

This refers to the training and professional development of teachers and other facilitators for effective use of improving teaching and learning. The study aimed at establishing whether the head teachers and the class teachers had acquired their ICT training.

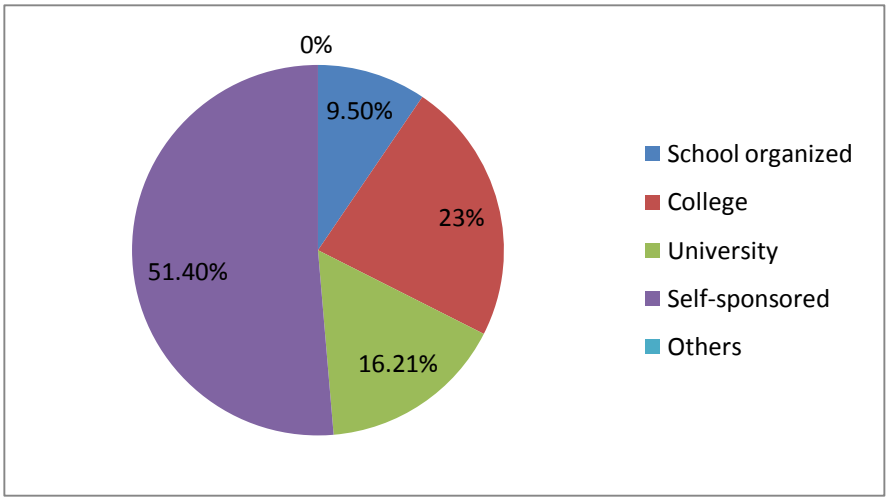

Figure 4.9: ICT Mode Training
Source: Head teachers questionnaire, 2014 N =14

The findings in figure 4.9, indicates that 9.4% attended school organized training. 23% acquired their ICT training in the colleges, (16.2%) of ICT literacy at the university as a common unit. (51.4%) acquired ICT training as self sponsored students in commercial colleges. The findings of this study are similar to what Wanjohi (2011) highlighted in his study that more than half (54.1%) of all the respondents in his study had not done any computer or ICT unit in their pre-service training in colleges and universities.

4.18. ICT Qualifications

It refers to a special skill or knowledge that makes one suitable to do a particular job or activity. The study investigated the qualification that they acquired when they enrolled for ICT training. There are a huge variety of ICT qualifications that use curriculum content.

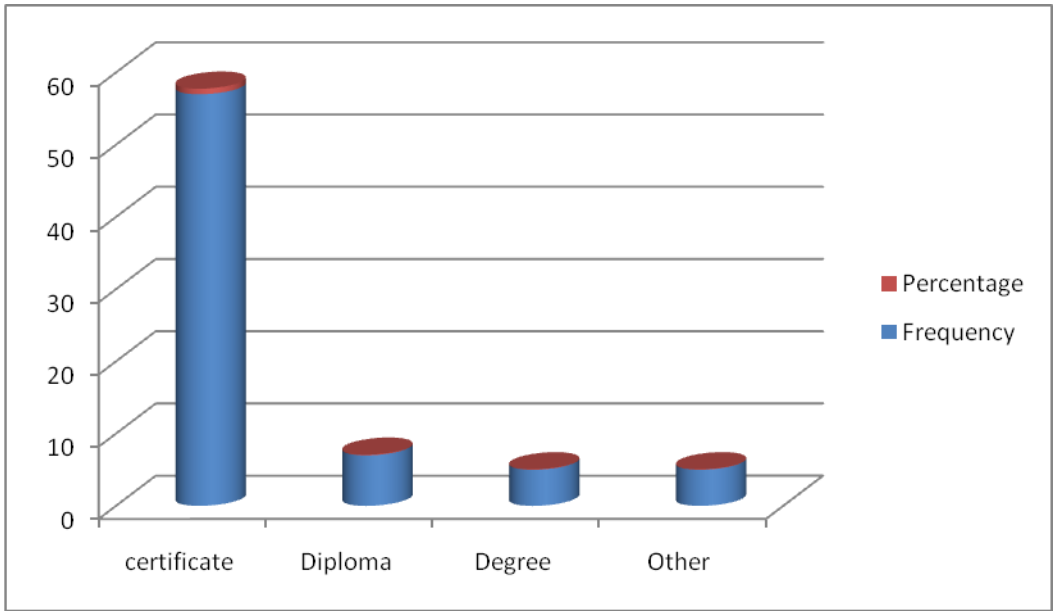

Figure 4.10: ICT Qualifications
Source: Teachers questionnaire, 2014 **N=74**

From the figure 4.10, it is clear that (77%) acquired certificates, (9.4%) got Diploma in education, (6.8%) acquired Degree in ICT and the remaining (6.8%) had acquired post graduate studies in ICT. The findings of Chepwogen (2011) indicated that the majority of teachers (30.%) did ICT just as a unit in college and most felt that the training was far much inadequate and could not enable a teacher to use it in his/her career.

4.19. Head Teacher's Attitude Towards ICT Use

Refers to the teachers favour or disfavor towards ICT. The study sought to find out whether they used computers in their day to day running of the school.

Table 4.9: Head Teacher's Attitude towards ICT use

	Frequency	Percentage
Yes	12	85.7
No	2	14.3
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

The findings presented in table 4.8 shows that (95.7%) used it while 14.3%) indicated that they did not use it daily.

4.20. Use of Computers in Educational Management

This is the application of computers in decision making on the different aspects of educational management such as office management, instructional and student welfare management, personnel management. The study investigated for what purpose the head teacher used ICT in the day to day running of the school.

Table 4.10: Use of computers in Educational Management

	Frequency	Percentage
In planning	2	14.3
Record keeping	6	42.9
In communication	2	14.3
In resource management	4	28.5
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

From the table 4.9 (14.3%) used the computer in planning lessons, (42.8%) used the computer in record keeping, (14.3%) used the computer in communication while (28.5%) used it in resource management. The findings of this study are similar to what Ngugi (2012) observed. In his study, he noted that (72%) of the principals indicated that they used computers to carry out administrative duties while only 25%) did not use computers. In carrying out administrative duties Schemelzer (2001) noted that technology can help administrators to deal with some of the challenges they face but only if they have a vision and know how to harness it and make it part of the fabric that support the teaching and learning process in schools.

4.21. Barriers to ICT Adoption in Educational Management

These are the obstacles that prevent school managers and teachers from using ICTs effectively. The study sought to investigate the degree to which teachers lack of training, teachers attitude towards ICT adaptation for instruction, lack of facilities in the schools as well as lack of infrastructure affects the adaptation of ICT use in educational management in their schools.

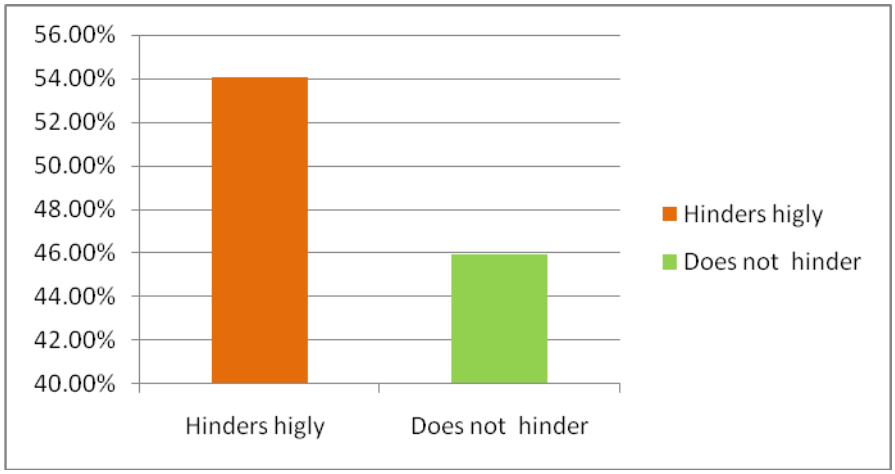

Figure 4.11: Barriers to ICT Adoption in Educational Management

Source: Teachers questionnaire, 2014 **N=74**

From figure 4.11, (54.1%) indicated that teachers' lack of training highly hinders while (45.9%) indicated that it does hinder highly, (58.1%) indicated that the teachers and head teachers' negative attitude towards ICT highly hinders ICT adaptation for instruction while (41.9%) admitted that it did not hinder highly. (82.4%) declared that lack of facilities hinders ICT adoption in their schools while (17.6%) responded by indicating that it did not hinder highly. (73%) responded by indicating that lack of the infrastructure hindered ICT adaptation to their schools while (27%) claimed that it was not a major hindrance.

Similar to these findings Migwi (2009) noted that an overwhelming (91%) reported that they were interested in learning how to use computers for instruction. (63%) of the respondent that ICT would affect learning both positively and negatively, (63%) reported that teacher's job would be affected and teachers would lose jobs if they were unable to use ICT for instruction. Relevance to engage and actively participate in the ICT initiatives was likely to be caused by a number of reasons which include lack of awareness of the specific ways in which to use computers for instruction and some have the fear that technology may replace them as well as the technology having the negative effects on the students who may be exposed to pornographic material.

4.22. Teacher Attitude Towards ICT Adoption in Educational Management

The respondents were requested to rate how the teachers attitude towards ICT adoption for instruction affects the use of ICT in educational management.

Table 4.11: Teacher attitude towards ICT Adoption in Educational Management

	Frequency	Percentage
Hinder highly	43	58.1
Doesn't hinder	31	41.9
Total	**74**	**100**

Source: Teachers questionnaire, 2014 **N=74**

4.23. Availabilities of Facilities

This refers to the availability, adequacy, quality and utilization of physical facilities. The respondents were requested to rate how the lack of facilities in the schools hinders ICT adoption in their schools the following are the outcomes.

Table 4.12: Availability of facilities

	Frequency	Percentage
Hinders highly	61	82.4
Doesn't hinder	13	17.6
Total	**74**	**100**

Source: Teachers questionnaire, 2014 **N=74**

4.24. Availability of Infrastructure

The respondents were asked to rate how lack of infrastructure affects the ICT adoption in their schools. The following are the outcomes.

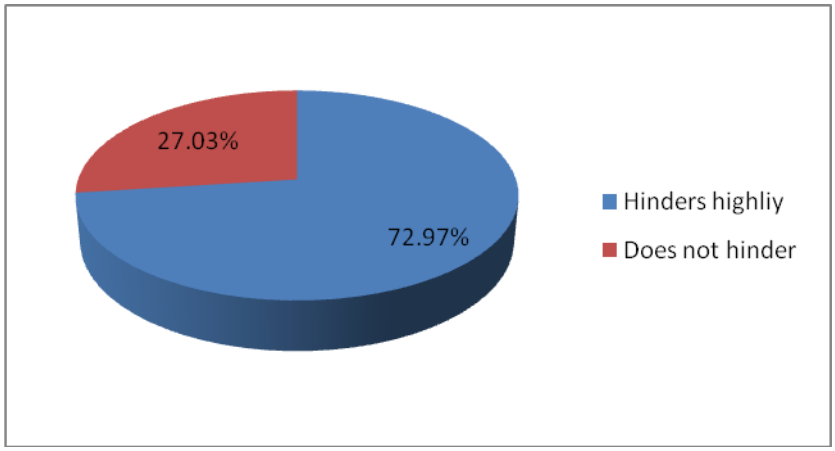

Figure 4.12: Availability of Infrastructure
Source: Head teachers questionnaire, 2014 N=14

4.25. Security and Maintenance

The study sought to understand how security was maintained in the schools under this study. Maintaining the devices is essential in keeping them running smoothly and securely.

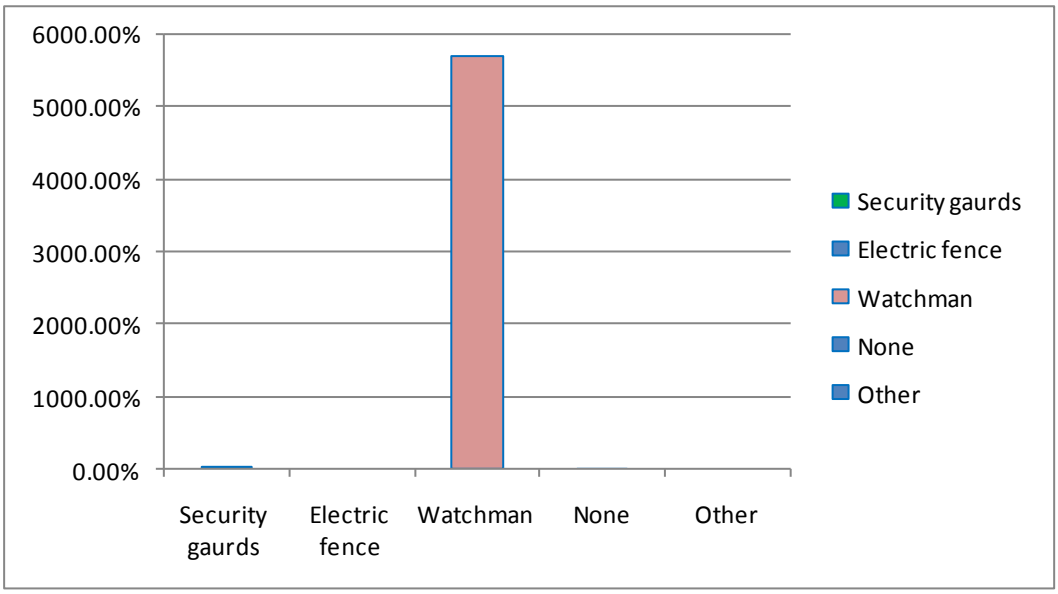

Figure: 4.13: Security and maintenance
Source: Head teachers questionnaire, 2014 N=14

Figure 4.13 shows that, (14.3%) of the respondents reported that the schools were guarded by security guards, (85.7%) of the respondents reported that their schools were guarded by watchmen. No school had an electric wire fence and no school was left unguarded. Based on the findings, all school administrators had taken measures to ensure the security of their resources.

4.26. Availability of Storage Facilities

Storage facilities are established to provide an effective professional solution for secure and confidential storage. The study further investigated the availability of storage facilities within the schools

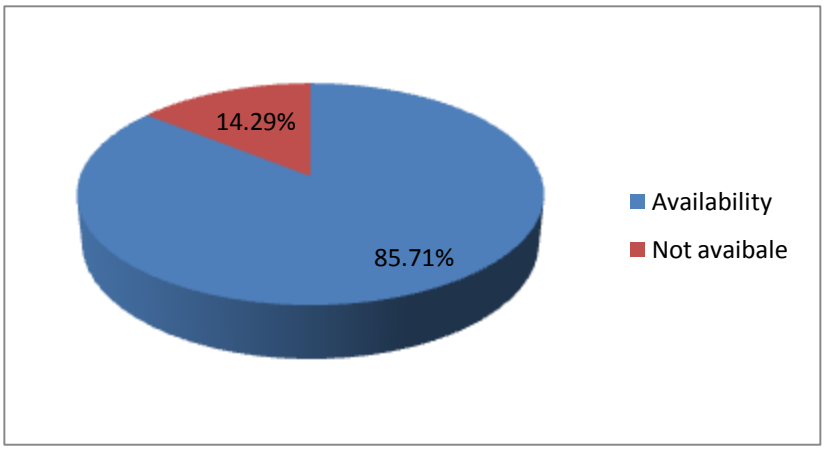

Figure 5.14: Availability of storage facilities

Source: Head teachers questionnaire, 2014 N=14

Eighty-seven percent of the respondents reported that they had secure storage facilities for the ICT equipment (14.3%) reported that they did not have strong secure storage facilities for the ICT equipment. From the findings; most school administrators have constructed strong and secure storage facilities to safeguard the security of the ICT equipment.

4.27 Maintenance of Computers

Repair and operation overhaul, involves fixing any sort of mechanical electrical device should it be out of order or broken down. The study sought to understand how the broken down computers and ICT equipment was repaired and handled.

Table: 4.13: Maintenance of computers

	Frequency	**Percentage**
Repaired by the school technician	5	35.7
Repaired out of the school compound	4	28.6
Kept in the school store	4	28.6
Others specify	1	7.1
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

From the findings, (35.7%) of the respondents reported that the broken down computers were repaired by the school technician. (28.6%) of the respondents reported that the broken down computers were repaired out of the school compound. A further (28.6%) claimed that the broken down ICT equipment was kept in the school store without being repaired while (7.1%) reported that technicians were hired to repair when need arose.

Repair and maintenance ensures continued use of the ICT resources. The findings concur with Ndirangu (2012) who reported that all the school under his study had a computer inventory managed form stored by the storekeeper. However, only one of the schools had a repair and maintenance record for their computers the teacher doubled up as the technician.

4.28. Availability and Employment of Qualified Technicians

The study further investigated on the availability and the terms of employment of the ICT technicians who repair and maintain computer and systems. The responsibilities may include building or configuring new hardware, installing and updating software packages and creating and maintaining computer networks.

Table 4.14: Availability and employment of qualified technicians

	Frequency	Percentage
Available	5	35.7
Not available	9	64.3
Total	**14**	**100**

Source: Head teachers questionnaire, 2014 **N=14**

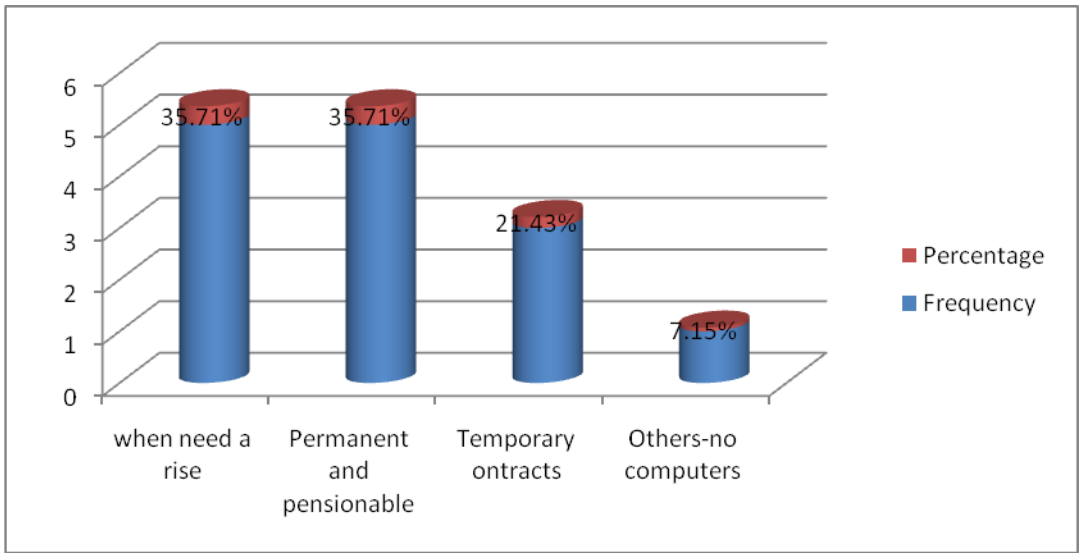

Figure 4.15: Employment of Technicians
Source: Head teachers questionnaire, 2014 **N= 14**

Table 4.14 and Figure 4.15 indicates that (35.7%) of the respondents under this study reported that their institutions had permanent school technicians while (64.3%) indicated that they did not have them in their school. (35.7%) of the respondents reported that their school administrators hired technicians when need arose. Another (35.7%) of the respondents indicated that they had technicians in their schools employed on permanent and pensionable basis. (21.4%) indicated that they got technicians in their school on temporary contracts while (7.2%) reported that they had none since they had no computers in their schools.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents a summary of the major findings of the study, conclusions of the study are given and recommendations which can be use to help in establishing the status and overcoming the barriers to ICT adoption in education management. It has also provided the areas for further research.

5.2 Summary of the key Findings

The purpose of the study was to establish the status and barriers to ICT adoption in educational management in public primary schools in Westland District, Nairobi County. In specific the study was set out to explain the teachers training levels in ICT; to determine the infrastructure and facilities available for ICT use in education; establish the head teachers and class teacher's attitude towards the use of ICT in learning, teaching administration and management activities and to investigate the measures put by schools and the maintenance of ICT infrastructure.

5.2.1 Background Information

One head teacher and six classroom teachers were each issued with a questionnaire. Fourteen out of fifteen head teachers submitted their dully filled in questionnaires, sixty out of the seventy five class teachers who were given questionnaires handed them back dully filled. The response rate was (82.2%) which was sufficient for study. More females (63.5%) took part in the study.

The study reported that (35.7%) of the school had three streams, (28.6%) had double and four streams respectively. (71.4%) of the schools had an enrolment above on thousand and more pupils, (14.3%) of the schools had an enrolment ranging between 601-700 pupils. The teachers (83.8% of the respondents taught in upper primary taking some of the subjects in timetable. The remaining (16.2%) taught in lower primary classes where they taught all the subjects on the timetable (32.4%) of the respondents fell in the (41-50) year age bracket.

5.2.2. Computer Literacy

The majority of the teachers held a diploma (37.8%) in education. No teacher who participated in this study held the p2 grade and none had acquired academic qualifications beyond the master of education. (91.9%) of the respondents indicated that they were computer literate, (51.4%) acquired their ICT literacy skills as self-sponsored students in commercial colleges. (23%) of the respondents under this study gained ICT literacy in teachers training colleges while (16.2%) accessed ICT literacy as a common unit in universities. Only (9.4%) reported that their schools had organized ICT training for them.

The study further sought to investigate the qualification that they acquired out of the IT training, (77%) of the respondents reported to have acquired certificate level in ICT training while (9.4%) indicated that they had diploma in ICT (6.8%) reported to have acquired degree level in ICT and other higher levels of training respectively.

The study sought to investigate what ICT facilities and infrastructure had been put in place in the educational institutions. the head teachers were asked to indicate the source of power in their schools, (100%) of the respondents indicated that all their schools had electricity installed, (71.4%) indicated that they had computer in their schools, (35.7%) indicated that they had between (11-20) computers, (28.6%) reported that they had between (0-10) computers, (57.1%) of the schools under this study were internet connected. (35.8%) of the respondents reported that the ratio of computer to the teachers was (1:2) (21.5%) noted (1:3) ratio while (7.1%) reported (1:11), (1:12); (1:14) an (1:21) respectively.

5.2.3 The Observation Checklist

According to the observation schedule (100%) of the schools had computer. Most use the compact, Pentium, p3 xcess and Hp brands. However, (14.3%) schools had computer which were not used at all. (63%) of the schools had Samsung and sony radios. They were all in good condition but were not used for Educational radio broadcasts. (57.1%) of the schools had Sony, Philip, JVC, LG and Sony television sets. These were however, not used for teaching. Most were kept in the school stores. (71.4%) had printers attached to their computers. The Toshiba and LaserJet machines were working properly and used regularly. Only (7.1%) of the schools had a functional scanner. (100% of all the respondents had calculators. These were mainly used to solve financial issues as well as add up examination marks, (7.1%) had functional modems (100%) of the schools were constructed using stones, had good fences and strong metallic gates. Administrators had also installed security lights around the buildings.

5.2.4 The research study purposed to investigate the headteachers and class teacher attitude towards ICT use in educational management. (85.7%) of the respondents indicated that they used computers in their day to day running of the schools (42.8%) of the respondents under this study mainly reported that they used ICT in record keeping (28.6%) reported that they used ICT in resource management while (!4.3%) indicated that they used ICT in planning as well as in communication. (54.1%) agreed that teachers' lack of training highly hinders ICT use in educational management, (58.1%) of the respondents reported that the teachers negative attitude towards ICT adoption for instructional affects the use of ICT in educational management. (73%) reported that lack of infrastructure highly hinders ICT adoption in their schools.

5.2.5 The research study aimed at establishing the security and maintenance measures that had been put in their schools from the observation schedule, (100%) of the school are built of stone, (100%) declared that they had employed watchmen to ensure security, (85.7%) noted that they had secure storage facilities, (64.3%) of the respondents reported that they did not have qualified technicians in their school. (35.7%) noted that their schools technicians repaired the broken down computers while (28.6%) reported that they either kept them in the store or had them repaired out of the school compound, (35.7%) of the respondents reported that they contacted technicians only when need arose.

5.3 Conclusion

From the research findings, the following conclusions were made:

Respondents declared that they were computer literate. However, they are not confident enough to use the knowledge and skills in educational management. Teachers should be proficient in advising and guiding pupils through more autonomous, self directed learning

process, while at the same time monitoring the curriculum standards achieved by the pupils. This can be accomplished through initial teacher education and continuing professional development. Teachers should regularly update their ICT knowledge and skills as well as exchange their views on changing curricula and pedagogical practical with the integration of technology into education. Respondents indicated that they had computers in their schools. However, the teacher computer ratio is very high, some going as high as 24 teachers sharing one computer. The government should provide schools with an enhanced ICT infrastructure that can facilitate different modes of lesson delivery and support varied learning, that is, one that can support an undisrupted delivery of powerful multimedia and full interactivity of instructional content. This will produce dependable, flexible and safe access, multipurpose multifunctional pervasive and ubiquities ICT rich environment as well as a flexible support framework.

Respondents reported that the teachers' negative attitude towards ICT adoption of instruction affects the use of ICT in educational management. Teachers should be sensitized on the importance of ICT in education. They should also be encouraged and motivated through seminars and workshops. Majority respondents indicated that they had watchmen to maintain security. However, that they did not have qualified technicians within their schools throughout the year. Most are hired when need arises.

5.4 Recommendations

Based on the research findings the following recommendations were made:

i. The government should organize ICT training for the head teachers and class teachers regularly for successful implementation of the ICT strategy. This can be

organized as a workshop, seminar or as a school based programme and ultimately issue certificates to encourage ICT literacy among the teachers.

ii. The government provides enough computers in every school in the republic. The existing ones should be repaired and the outdated modes should be replaced with modern computers. The government should also plan to be adding more computers every year due to rise in enrolment. The schools without power should have electricity installed as well as internet connectivity.

iii. The government should ensure that teachers get sensitized on the importance of adopting ICT in educational management. This will be accomplished through seminars, workshops and intensive theoretical and practical training in ICT adoption.

iv. The government should ensure that total security is maintained and the outdated ones replaced regularly. The computer laboratories should be fitted with grills. Security agents should be employed by the government to ensure continuity. The government should also employ qualified technicians on permanent basis.

5.5 Areas for Further Research

i. Further research should be carried out on the status and barriers to ICT adoption in educational management in public primary schools in other districts.

ii. A comparative study can be carried out to compare the barriers ICT use in educational management in private primary schools.

iii. Investigate the impact of ICT on the academic performance and on the administration of primary schools.

iv. Investigate the impact of ICT on the performance of the special need children in primary schools.

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APPENDICES

APPENDIX I: HEAD TEACHER QUESTIONNAIRE ON ICT ADOPTION

My name is Elizabeth Kimotho. I am Master of Education student at Kenyatta University. As a requirement of this course, I am conducting a research study on the barriers to adoption of ICT in educational management in primary schools; Westlands District in Nairobi County. Please answer all the questions in the spaces provided after each question by placing a tick (√) in the appropriate box for a given response. All the responses will be treated confidentially; please don't write your name. Thank you.

A. General Information on the School.

Instructions: Tick (√) where appropriate

(1) Number of streams in the school

Streams 1 ( ) 2 ( ) 3 ( ) 4 ( ) others specify……..

(2) Indicate the total number of students in your school

Boys		Girls	
0-100	( )	0-100	( )
101-200	( )	101-200	( )
201-300	( )	201-300	( )
301-400	( )	301-400	( )
401-500	( )	401-500	( )
Above 500 …….		Above 500……. Totals……	

(3)Indicate your gender, male ( ) female ( )

(4)Indicate your current qualifications

P2 ( ) P1 ( ) Diploma ( ) B.ED ( ) Masters ( ) others specify……

(5) How old are you?

Below 20yrs ( ); 21-30 yrs ( ); 31-40 yrs ( ); 41-50 yrs ( ) 51yrs and above ( )

(6) Which subjects do you teach and in which classes?……

(7) Indicate the number of teachers in your school.

Male…….. Female……. Total……

B. Availability of Infrastructure

1. What is the source(s) of power in your school?

Solar ( ) Electricity ( ) Generator ( ) None ( ) Other…….

2. What mode of communication do you use in your school?

(i) External -Mobile phone ( ) Landline ( ) Letters ( ) E-mails ( ) Social media ( )

(ii) Internal -Mobile phone ( ) Landline ( ) Letters ( ) E-mails ( ) Social media ( )

3. How do you store and retrieve teachers, pupils and parents records

Logbook ( ) Registers ( ) Computers ( ) others specify……

4. How do you manage and monitor the schools financial resources?

Cashbook ( ) Balance sheets ( ) Cash flow statements ( ) Computer ( ) others……

5. Does the school have computers?.....

(i) If yes how many.....

(ii) If no why.....

6. Does it have internet connectivity? Yes ( ) No ( )

7. What is the ratio of teachers to the computers?.....

C. Level of ICT Literacy

1. Are you computer literate? Yes ( ) No ( )

2. If yes where did you receive the training?

School organized ( ) College ( ) University ( ) Self-sponsored ( )

Others specify……..

3. What certificates did you acquire?

Certificate ( ) Diploma ( ) Degree ( ) others specify……

4. How many computer literate teachers does your school have?.....

D. Head teachers attitude towards ICT use

Instructions: Tick (√) where appropriate

1. Do you use computer in your day to day running of the school? Yes ( ) No ( )

If yes, for what purpose is it?

a) In Planning ( )

b) In Record keeping ( )

c) In Communication ( )

d) In Resource Management ( )

2. What hinders ICT adoption in your school? Tick appropriately.

	Hinders highly	Doesn't hinder
a) Teachers' lack of training	( )	
b) Teachers attitude towards ICT adoption for instruction.	( )	( )
c) Lack of facilities	( )	( )
d) Lack of infrastructure	( )	( )

e) Others specify……

3. What should be done to effectively incorporate ICT adoption in your school pertaining to;-

    a) Infrastructure ……

    b) Facilities……

    c) Teachers training…….....

    d) Teachers attitude……..……

    e) Infrastructure and facility maintenance?.....

E. Security and maintenance

Put a tick (√) where appropriate.

1. How is security maintained in the school?

    a. Security guards ( )

    b. Electric fence ( )

    c. Watchman ( )

    d. None ( )

    e. Others specify…….

2. Does the school have a secure storage facility for the ICT machinery?

    Yes ( ) No ( )

3. How are the broken down computers and equipment's repaired or handled?

    a. Repaired by the school technician ( )

    b. Repaired out of the school compound ( )

    c. Kept in the school store ( )

d. Others specify …….

4. Does the school have qualified technicians?

   Yes ( ) No ( )

   If no why?.....

5. On what terms do the technicians operate?

   a. When need arises

   b. Permanent and pensionable

   c. Temporary Contracts

   d. Others specify…….

6. In your view how will computer use affect the teaching and learning process

   Positively/Negatively?.....

   Explain……

   ……

Thank you

APPENDIX II:CLASS TEACHERS QUESTIONAIRE ON USE OF ICT

My name is Elizabeth Kimotho. I am Master of Education (M.E.D) student at Kenyatta University. As a requirement of this course, I am conducting a research study on the barriers to effective use of ICT in educational management in primary schools in Westland's District in Nairobi County. Please answer all the questions in the spaces provided after each question by placing a tick ( ) in the appropriate box for a given response. Responses will be treated with confidentially; please don't write your name.

Thank you.

A. General information on the school.

1. Indicate your gender. Male ( ) Female ( )
2. What is your current professional qualification?
    a) P2 ( )
    b) P1 ( )
    c) Diploma ( )
    d) BED ( )
    e) Masters ( )
    f) Others Specify…….

3. How old are you?

    Below 20yr ( ); 21-30yrs ( ); 31-40yrs ( ); 41-50yrs ( ) 51yrs and above ( )

3. For how long have you been teaching?.....

5. Which subjects do you teach?.....

    Indicate the classes you teach……..…….

6. How many lessons do you teach per week?.....

B. Availability of Infrastructure

1. Do you have a computer laboratory in your school?.....

   If yes how many computers does it have?.....

2. Are the computers internet connected?.....

3. Are the computers enough for all the teachers?.....

   What is the ratio per teacher?.....

C. Level of ICT Literacy

1. Are you computer literate? Yes ( ) No ( )

2. If yes where did you receive your training?

   a. School organized ( )

   b. At college ( )

   c. At university ( )

   d. Self-sponsored ( )

3. What qualifications did you receive?

   a. Certificate level ( )

   b. Diploma ( )

   c. Degree ( )

   d. Masters ( )

   e. Others specify……..…

4. Do you use computers in carrying out your daily activities?.....

   If yes how do you use the computers…….……

   a. To communicate ( )

   b. To search information for teaching purposes ( )

   c. To teach students ( )

   d. To record data ( )

   e. Others (specify)……

5. What hinders ICT use in your school?

	Hinders highly	doesn't hinder
a) Teachers lack of training	( )	( )
b) Teachers attitude towards ICT adoption for instruction.	( )	( )
c) Lack of facilities	( )	( )
d) Lack of infrastructure	( )	( )
e) Others specify……		

D. Class Teachers attitude towards ICT adoption

Instructions:-Tick (√) where appropriate

1. Do you use computer in your day to day school activities? Yes ( ) No ( )

   If yes, for what purpose is it?

   a. In Planning ( )

   b. In Record keeping ( )

   c. In Communication ( )

   d. In Resource Management ( )

2. What should be done to effectively incorporate ICT use in your school pertaining to:

    a. Infrastructure ……

    b. Facilities……

    c. Teachers training…….....

    d. Teachers attitude……..……

    e. Infrastructure and facility maintenance?.....

E. Security and maintenance

Instructions:-Tick (√) where appropriate

1. How is security maintained in the school?

    a. Security guards ( )

    b. Electric fence ( )

    c. Watchman ( )

    d. None ( )

    e. Others specify…….

2. Does the school have a secure storage facility for the ICT machinery?

    Yes ( ) No ( )

4. How are the broken down computers and equipment's repaired or handled?

    a. Repaired by the school technician ( )

    b. Repaired out of the school compound ( )

    c. Kept in the school store ( )

    d. Others specify …….

5. Does the school have qualified technicians?

Yes ( ) No ( )

If no why?.....

6. On what terms do the technicians operate?

a. When need arises

b. Permanent and pensionable

c. Temporary Contracts

d. Others specify…….

7. In your view how will computer use affect the teaching and learning process

Positively/Negatively?.....

Explain……

……

Thank you

APPENDIX III: OBSERVATION CHECKLIST

The researcher will observe the availability and condition of the ICT resource and fill in the spaces.

Item	Brand	Quantity	Working properly	Not working	Damaged	Not used	Regularly used
Computers							
Radios							
Television							
Printer							
Calculator							
Scanner							
Modem							

The researcher will observe the infrastructure and fill in the blank spaces

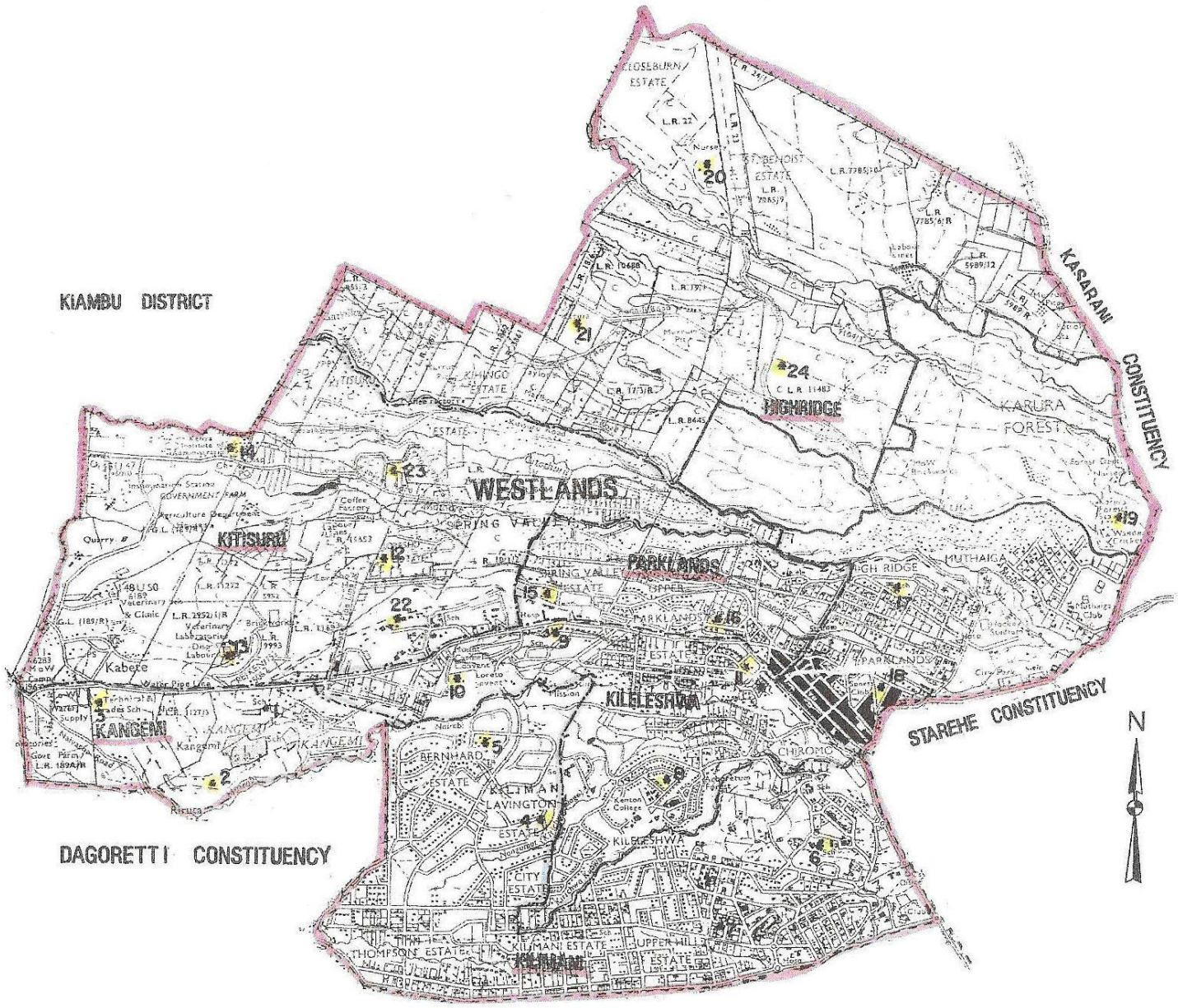
SOURCE OF POWER	AVAILABLE	NOT AVAILABLE	BEING INSTALLED
ELECTRICITY			
SOLAR POWER			
GENERATOR			
NONE AVAILABLE			

Materials used to construct the computer laboratory

Material	Stones	Iron Sheets	Wood
Quantity			

Others specify…….

APPENDIX IV: A MAP OF WESTLANDS DISTRICT



Source: (Internet Map, 2014)

APPENDIX IV: BUDGET

PARTICULARS	QUANTITY	COST IN KSHS	TOTAL COST
i. STATIONARY			
Pens	5pcs @15	75	
Pencils	3pcs @ 15	45	
Rubber	1pcs @20	20	
Flash disk	2pcs @	1000	
500		4000	
Paper	8 reams	5140	
@500			
Subtotal			
ii TRAVELLING EXPENSES			
Transports		7,000	
Questionnaire Administration		8,000	
Lunch@200 per day for 60 days		12,000	
Subtotal		27,000	
iii SECRETARIAL SERVICES			
Research proposal ,typing, printing, binding		15,000	
Research typing, printing, binding, final report		20,000	
Photocopying questionnaires		4,000	
Subtotal		39,000	
iv COMMUNICATION SERVICES			
Telephone services		7,000	
Subtotal		7,000	
a. Miscellaneous Expenses (10% of total)		7,814	
SUBTOTALS		78,140	
GRAND TOTALS			**86,554**

APPENDIX V: RESEARCH PERMIT

KENYATTA UNIVERSITY
GRADUATE SCHOOL

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

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 57530

Internal Memo

FROM: Dean, Graduate School **DATE:** 30th June, 2014

TO: **Elizabeth Wairimu kimotho** **REF:** E55/20547/2010
C/o Education Management, Policy and Curriculum Studies.

SUBJECT: **APPROVAL OF RESEARCH PROPOSAL**

This is to inform you that Graduate School Board, at its meeting of 11th June 2014, approved your Research Proposal for the M.A. Degree **Entitled, "Barriers to Effective Adoption of ICT in Educational Management in Public Primary Schools in Westlands District; Nairobi County, Kenya.**

You may now proceed with data collection, subject to clearance with the Permanent Secretary, Ministry of Higher Education, Science and Technology.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking forms per semester. The form has been developed to replace the progress report forms. The supervision Tracking Forms are available at the University's website under Graduate School webpage downloads.

Thank you.

JULIA GITU
FOR: DEAN, GRADUATE SCHOOL

c.c. Chairman, Department of Education Management, Policy and Curriculum Studies.

Supervisors:

1. Dr. Nderitu John
   C/o Department of Education Management, Policy and Curriculum Studies
   Kenyatta University

2. Dr. Murage Michael
   C/o Department of Education management, Policy and Curriculum Studies
   Kenyatta University

JG/nn

KENYATTA UNIVERSITY
GRADUATE SCHOOL

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P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: E55/20547/2010

DATE: 30th June 2014

The Permanent Secretary,
Ministry of Higher Education, Science & Technology,
P.O. Box 30040,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION ELIZABETH WAIRIMU KIMOTHO– REG. NO. E55/20547/2010

I write to introduce Ms. Elizabeth Wairimu Kimotho who is a Postgraduate Student of this University. She is registered for M.A degree programme in the **Department of Education Management, Policy and Curriculum Studies.**

Ms. Wairimu intends to conduct research for an M.A. Proposal entitled, **"Barriers to Effective Adoption of ICT in Educational Management in Public Primary Schools in Westlands District; Nairobi County, Kenya.**

Any assistance given will be highly appreciated.

Yours faithfully,

MRS. LUCY N. MBAABU
FOR:DEAN, GRADUATE SCHOOL

JG/nn

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
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When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:

23rd October, 2014

NACOSTI/P/14/7526/2640

Elizabeth Wairimu Kimotho
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Barriers to effective adoption of ICT in educational management in public primary schools in Westlands District; Nairobi County, Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for a period ending **31st December, 2014.**

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.

DR. S. K. LANGAT, OGW
FOR: SECRETARY/CEO

Copy to:

The County Commissioner
The County Director of Education
Nairobi County.

APPENDIX V: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MISS. ELIZABETH WAIRIMU KIMOTHO
of KENYATTA UNIVERSITY, 142-614
WANGIGE,has been permitted to
conduct research in *Nairobi County*

on the topic: *BARRIERS TO EFFECTIVE ADOPTION OF ICT IN EDUCATIONAL MANAGEMENT IN PUBLIC PRIMARY SCHOOLS IN WESTLANDS DISTRICT; NAIROBI COUNTY, KENYA.*

for the period ending:
31st December,2014

.....
Applicant's Signature

Permit No : NACOSTI/P/14/7526/2640
Date Of Issue : 23rd October,2014
Fee Recieved :Ksh 1,000

.....
for Secretary
National Commission for Science, Technology & Innovation