CHALLENGES FACING EFFECTIVE INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) IMPLEMENTATION IN SELECTED PUBLIC SECONDARY SCHOOLS IN NAKURU NORTH DISTRICT NAKURU COUNTY

BY:

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DECLARATION

This researchproject is my original work and has not been presented for a degree in any other university

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DEDICATION

This study is dedicated to my parents John and Damaris, my sisters Sylvia and Rosefor the moral support they accorded me during the study period.

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ABBREVIATIONS AND ACRONYMS

ICT - Information and Communications Technology

IT – Information Technology

OECD- Organization for Economic Cooperation and Development

ABSTRACT

ICT in education has the potential to enhance the quality of teaching and learning. However opportunities for realizing the benefits of using ICT in education face a number of challenges in developing countries. This study thus set out to investigate challenges facing effective ICT implementation in selected Public Secondary Schools in Nakuru North District Nakuru County. The main objective of the study was to explore factors that challenge effective ICT implementation which can play a significant role in equalizing opportunities for marginalized groups and communities. Head teachers, Deputy Head teachers and teachers in Public Secondary Schools in Nakuru North District formed the target population. Systematic sampling technique was used to select ten schools from a list organized in order of performance of Mock exams (2012) by public secondary schools in Nakuru North District. Eight (8) teachers were randomly selected from each school for the study giving a total of 80 teachers. Head teachers and deputy head teachers were purposively selected from the ten selected schools to have a total of ten head teachers and ten deputy head teachers. The total sample size for the study was 100 respondents. The research design used was a descriptive survey design. Research instruments employed were questionnaires with open-ended and structured questions. Data collected was both quantitative and qualitative. Percentages and frequency distributions were used to analyze the collected data with the aid of Microsoft excel and statisticalpackage for social sciences (SPSS Version 16.0). The data was presented using tables, bar charts and pie-charts.Based on the findings of the research it was concluded that there were a number of challenges facing effective implementation of ICT in schools in Nakuru North District. These challenges included: few computers and computer labs, insufficient internet connectivity, power unreliability and lack of sufficient equipment such as LCD projectors, speakers among others to enhance effective implementation. The study also concluded that efforts by the ministry to sustain ICT implementation projects in schools are very minimal especially in the rural districts. In addition the study also concluded that even though there are few ICT specialists the specialists are there as there a number of people who are computer literate. From the findings the following recommendations were made:The government should put measures to assess how ICT programs are being integrated and implemented in rural district secondary schools and reliable power supply, sufficient equipment and free internet preferably WI-FI (a facility allowing computers, smartphones, or other devices to connect to the internet or communicate with one another wirelessly within a particular area) should also be set in the rural areas by the government to enhance effective implementation of ICT in the schools within that area.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

Information and communication technology (ICT) is a force that has changed many aspects of the way we live. If one was to compare such fields as medicine, tourism, travel business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous. The way these fields operate today is vastly different from the ways they operated in the past. But when one looks at education, there seems to have been an uncanny lack of influence and far less change than other fields have experienced. A number of people have attempted to explore this lack of activity and influence (Soloway and Prior, 1996; Collis,2002).

The word, Information and communication technology (ICT) broadly refers to all forms of technology used to create, store, process and use information in its various forms (data, voice, image, multimedia presentations and other forms including those not yet conceived) and which enable, facilitate and support communication. More specifically ICT refers to the convergence of micro-electronics, computers and telecommunications which make it possible for data, including text, video and video signals to be transmitted anywhere in the word where digital signals can be received. They include networks such as fixed, wireless and satellite telecommunications, broadcasting networks and applications such as the internet, database management systems and multi-medium tools. (Howell and Lundall, 2000)

Torero and Braun (2006) offer a much broader definition of ICT which encompasses equipment and services. For them, ICT "includes the computing industry(hardware, software, networks, the Internet, and related services); electronic data processing anddisplay (such as photocopiers, cash registers, calculators, and scanners, as well as a myriad of less well known machines specifically tailored to production and manufacturing);telecommunications and related services (such as fixed and cellular telephones, facsimile machines, instant messaging, teleconferencing, and so on.); and audiovisual equipment and services (including television, radio, video, DVDs, digital cameras, compact discs, MP3 players, and so on"

Increasingly ICT is becoming a more and more powerful tool for education and economic development. Unwin (2009) contends that "ICT can be a catalyst by providing tools which teachers use to improve teaching and by giving learners access to electronic media that make concepts clearer and more accessible". Thus, ICT is used for capacity development and citizen empowerment. Ultimately, ICT can enhance educational opportunities and outcomes for students, including students with intellectual disabilities (Anderson, 2009). According to Gwang-Jo Kim (2009), ICT in Education can serve the following purposes:

Restructuring education system,

Diversifying teaching-learning methods and practices,

Engaging all stakeholders of education and adapt rapidly to changes in society and the environment,

Enhancing education efficiency, effectiveness, and productivity.

In additiona great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).

Furthermore Esque (2009) sees three key investment components in long term economic growth. She believes that: Investment in knowledge leads to sustained economic growth, Knowledge economy framework, and Educational reforms to build relevant skills. Song et al (2009) think that ICT in Education has three main goals: Individual development, Education reform, and Social and Economic growth.

Despite the benefits of ICT there have been a number of factors impeding the wholesale uptake of ICT in education acrossall sectors. These have included such factors as a lack of funding to support the purchase of thetechnology, a lack of training among established teaching practitioners, a lack of motivation andneed among teachers to adopt ICT as teaching tools (Starr, 2001). But in recent times, factorshave emerged which have strengthened and encouraged moves to adopt ICTs into classrooms andlearning settings.

These have included a growing need to explore efficiencies in terms ofprogram delivery, the opportunities for flexible delivery provided by ICTs (Oliver & Short,1997); the capacity of technology to provide support for customized educational programs tomeet the needs of individual learners (Kennedy &McNaught, 1997); and the growing use ofthe Internet and WWW as tools for information access and communication (Oliver & Towers, 1999).

As we move into the 21st century, these factors and many others are bringing strong forces to bearon the adoption of ICTs in education and contemporary trends suggest we will soon see large scale changes in the way education is planned and delivered as a consequence of theopportunities and affordances of ICT.

1.2ICT AND EDUCATION GLOBALLY

Information and communication technology (ICT) has become an important part of most organizations and businesses these days (Zhang & Aikman, 2007). Computers began to be placed in schools in the early 1980s, and several researchers suggest that ICT will be an important part of education for the next generation too (Bransford, Brown, &Cocking, 2000; Grimus, 2000; Yelland, 2001). Modern technology offers many means of improving teaching and learning in the classroom (Lefebvre, Deaudelin&Loiselle, 2006). Dawes (2001) is of the view that new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have not been possible before. ICT in education has the potential to be influential in bringing about changes in ways of teaching. However, this potential may not easily be realized, as Dawes (2001) underlined when he stated that "problems arise when teachers are expected to implement changes in what may well be adverse circumstances" (p. 61). Due to ICT's importance in society and possibly in the future of education, identifying the possible obstacles to the integration of these technologies in schools would be an important step in improving the quality of teaching and learning. Balanskat, Blamire, and Kefala (2006) argue that although educators appear to acknowledge the value of ICT in schools, difficulties continue to be encountered during the processes of adopting these technologies.

Education is of course, at the core of the knowledge economy and learning society. Correspondingly, the role of ICT in schools is shifting dramatically. The traditional role

of ICT has been that of a minor curricular subject, sometimes called informatics, computer literacy, or keyboarding. Alternatively, it has been used as an instructional aid (i.e., computer- assisted instruction) to help students learn other subjects, such as math or science. However in some countries, ICT is now at the center of education reform efforts that involve its use in coordination with changes in curriculum, teacher training, pedagogy, and assessment. Countries from Singapore (Ministry of Education, Singapore, 2000) to Chile (Ministerio de Educacion, Republica de Chile, 1998) to The United States (U.S Department of Education, 1996) to Norway (Ministry of Education, Reasearch and Church Affairs, Norway, 2000) have taken the position that the integration of ICT into classrooms and curricula can improve educational systems and prepare students for the 21st century learning society. Similarly multinational organizations, such as the Organization for Economic Cooperation and Development (OECD 1998, 1999) The European Commission (1995, 2000) and the G8 nations (2000) have identified the need to prepare students for lifelong learning in the knowledge economy and they assign a central role to ICT in accomplishing this goal.

According to Kaul and Odera (1991) governments around the world have been engaged in the process of implementing a wide range of ICT Applications. Countries have been classified by the United Nations according to their Computer Industry Development Potential (CIPD) as advanced or less developed Mgaya (1999). Advanced include, for example: the United States, Canada, West European countries and Japan; less developed include: Argentina, Brazil, India, Mexico, Kenya and Bulgaria.Developed nations are using ICT in their education systems. For instance, in the United Kingdom, 'rising of standards' of teaching and learning has become intertwined with the use of ICTs (Watson, 2001).

According to the U.S. State department (Larson, 2000), of the approximately 275 million people online at the end of the twentieth century, less than a quarter resided outside North America and Europe. According to an UNESCO REPORT (Blurton, 1999), while over 26% of the U.S. population were internet users, only 0.8% of the Latin American population were internet users. The figure for SouthEast Asia is 0.5% for Eastern Europe, 0.4%, for Sub-Saharan Africa, 0.1% and for South Asia, 0.04%.

The use of computers at an early age helps students learn ICT skills that help as tools in the education process. For example, 77% of Swiss students reported using a computer

several times a week to prepare their courses and assignments. Only 3% reported never using a computer for course preparation. As indicated in the OECD (2002) document, the average number of students per computer is an indicator of students' access to new technologies. As some data from OECD (2002) shows, the percentage of students with access to computer varies from 25% in Italy to 90% or more in Canada, Finland and New Zealand.

In Watson's (2001) description, ICTs have revolutionized the way people work today and are now transforming education systems. As a result, if schools train children in yesterday's skills and technologies they may not be effective and fit in tomorrows' world.

1.3ICT AND EDUCATION IN DEVELOPING COUNTRIES

In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability includes ICTs in the global village. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing counties, especially in Africa, are still low in ICT application and use (Aduwa -Ogiegbean and Iyamu, 2005).

ICT success or failure in developing countries can be categorized into three depending on the degree of success (Heeks, 2002), first is the total failure of an initiative never implemented or in which a new system was implemented but immediately abandoned. Second is partial failure of an initiative, in which major goals are unattained or in which there are significant undesirable outcomes. Associated with partial failure is the sustainability failure where an initiative first succeeds but is then abandoned after a year or so. The last is success of an initiative where most stakeholders attain their major goals and do not experience undesirable outcomes.

Although ICT is now at the center of education reform efforts, not all countries are currently able to benefit from the developments and advances that technology can offer (Kozma. Anderson, 2002).Significant barriers that are often referred to as "the Digital Divide" limit the ability of some countries to take advantage of technological developments(Kozma.Anderson, 2002). Thus, developing countries are faced with challenges related toaccess, pedagogy or assessment when using ICT to improve and

reform education (Kozma,Anderson., 2002). Due to the fact that much research in the area of technology integration ineducation has been conducted in technologically advanced countries, but little in the developingCountries, few statistics are available from developing countries (Jhurree. 2005).According to Jhurree (2005), this might imply that the former countries now possess awealth of knowledge, skills, expertise, and the competitive edge that most of the latter countries do not possess. On the other hand, as Jhurree (2005) suggests, the latter countries can gain a lot from the expertise of their advanced counterparts. According to a study undertaken by Kozma and Anderson (2002), both developed anddeveloping countries are beginning to use their investment in ICTs to reform education.Moreover, Hepp, Hinostroza, Laval and Rehbein (2004) claim that developing countries have become anxious about the widening gap between their reality and the aggressive ICT policies of some developed countries. Consequently, there is a more urgent need to improve the quality andequity of education to bridge the gap between developed and developing nations, and ICTs are perceived as necessary tools for this purpose (Hepp, K., Hinostroza, S., Laval, M.,Rehbein, F., 2004).

Wagner et al (2005) note that "ICTsarecurrently being used widely to aid education in many developing countries, and it appears that there is increasing demand for their use in education by policymakers and parents in developing countries…" This is evident in Kenya where parents both in private and public schools work hard to ensure that they provide computers to their schools. Further ICT in education has the potential to be influential in bringing about changes in ways of teaching. Many studies have been conducted to investigate the role of ICT in educational reforms (Yusuf & Yusuf, 2009).

Indeed, Information and Communication Technology plays a key role in enhancing the quality of education. However, successful implementation of ICT requires strategic planning. As Wagner et al (2005) observes, "Research suggests that simply putting computers into schoolsis not enough to impact student learning. That said specific applications of ICTcan positively impact student knowledge, skills and attitudes, as well as teaching practices, school innovation, and community services".This has been a trend in most schools in Kenya particularly those in the rural areas where computer labs have been built and computers procured but hardly do they use them. This is attributed to the fact that teachers lack skills to integrate ICT into classroom teaching.

1.4 Statement of the problem

The demands of the 21st century dictate that learners should be equipped with requisite skills to competently engage and perform in the new information age. These skills commonly referred to as 21st century skills include inter-alia; critical thinking, problem solving, collaboration, creativity and communication (Voogt&Pareja, 2012). When the learning opportunities presented by Information Communication Technology (ICT) are well utilized, they have a great potential to develop 21st century skills (Selwyn, 2007). In view of the above, the Kenyan Ministry of Education expects ICT to be widely deployed for teaching and learning in primary and secondary schools across Kenya (Quality Education and Training for Vision 2030). However, a simple placement of hardware and/or software will not make ICT integration naturally follow (Earle, 2002). One of the key failures of many past programs in Africa – and the rest of the world - was that schools were provided with equipment but with little or no support for teachers' professional development, national and local ICT policies, and/or community involvement (Agyei&Voogt, 2011).

While ICT continues to advance in western and Asian countries, African countries still experience a lag in its implementation, and that continues to widen the digital and knowledge divides. In a recent study by Kiptalam et.al (2010), observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries.

Whereas results indicate that ICT has penetrated many sectors including banking, transportation, communications, and medical services, the Kenyan educational system seems to lag behind. Further, recent report by the National Council for Science and Technology (2010) indicated that computer use in Kenyan classrooms is still in its early phases, and concluded that the perceptions and experiences of teachers and administrators do play an important role in the use of computers in Kenyan classrooms. In Nakuru County the case is not different as ICT has not been effectively implemented especially in Public Secondary Schools. Efforts especially by the Computer for schools Kenya (CFSK) have not reached the intended goal as most schools have not fully integrated ICT in their institutions.

Owing to the impact of technological developments, our society is in a transition towards information or knowledge- based society. From this, challenges have arisen in education (Voogt&Kneezek, 2008) leading to new tasks for schools and a duty to provide all children and young people with equitable opportunities to participate in our society. However the implementation of information and communication technology (ICT) has proved more challenging than was initially assumed when it first appeared in the educational agenda in the 1960's (Tearle, 2004). Even today the regular use of ICT by the majority of teachers and students within public schools is still not common place.

Attempts to enhance and reform education through ICTs require clear and specific objectives, guidelines and time-bound targets, the mobilization of required resources, and the political commitment at all levels to see the initiative through. With the emergence of information and communication technologies (ICT) it is possible to improve efficiency and effectiveness in the education curriculum, by providing e-learning therefore improving the education sector immensely. While benefits of ICT in the education sector cannot be disputed, there are several concerns about its successes as well as the strategies to be adopted in implementation of systems. This study therefore tried to address the challenges facing effective ICT implementation in selected Public secondary schools.

1.5 Objectives of the study

1.5.1 General Objective

The general objective of the study was:

To explore factors that challenge effective ICT implementation inPublicsecondary schools in Nakuru North District

1.5.2 Specific Objectives

The specific objectives of the study were:

i. To evaluate how administrative support affects effective ICT implementation in Nakuru North Distict.

ii. To determine how much the political, economic, socio-cultural and technologicalfactors affect effective ICT implementation in Nakuru North District.
iii. To find outhow scarcity of resources challenges effective ICT implementation in Nakuru North District.

1.6 Research Questions

The following research questions guided the study:

i. To what degree does administrative support affect effective ICT implementation in Nakuru North District?
ii. To what extent do political, economic, socio-cultural and technological factors affect effective ICT implementation in Nakuru North District?
iii. To what degree is scarcity of resources a challenge to effective ICT implementation in Nakuru North District?

1.7 Significance of the study

Findings of this study on ICT may play a significant role in equalizing opportunities for marginalized groups and communities. This is by: providing faster access to necessary information required by secondary schools; acting as a database of information related to educational issues. In general the expected outcome is: to facilitate sharing of resources, expertise and advice; provide access to up-to date pupil and school data anytime anywhere; facilitate focused teaching tailored to students' strengths and weaknesses through better analysis of attainment data; enhance greater efficiency throughout the school; provide higher quality lesson through greater collaboration between teachers in planning and preparing resources and easier planning and preparation of lessons and the designing of materials.In conclusion the study findings may elicit information to the responsible parties and identify the drivers and barriers to ICT including those related to curriculum and pedagogy, infrastructure, capacity – building, language and content and financing.

1.8 Scope of the study

Selected Public secondary schools in Nakuru North District formed the target population as: the area is easily accessible; it is a rural district; the area is challenged by high school drop-out because of lack of school fees as a result of poverty; main economic activity is small scale farming; the area is demographically populated but school enrolment is low as compared to student population.

1.9Limitations of the study

The limitation faced by the study is that it generalizes the findings to other areas while not all areas face the same problems related to ICT implementation. However a study survey was used to describe the large population. Furthermore it assumed that the large samplewould make the results statistically significant.

1.10Organization of the study

This project reportis structured as follows: the foregoing chapter one provides the research background, statement of the problem, research objectives and questions, significance of the study, scope and limitations encountered in the course of the study. Chapter two presents the literature review on the integration and implementation of ICT by schools as well as a conceptual framework. Chapter three looks at the methodology employed in the study. Chapter four presents data analysis, presentation and discussions of the findings. The final chapter, chapter five provides the summary, conclusions and recommendations as well as suggestions for further suggest.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter contains current trends in ICT implementation in schools, challenges facing ICT implementation, ICT and education, the empirical studies, the theoretical framework, summary and gaps to be filled by the study and the conceptual framework.

2.2 Trends in ICT implementation in schools

According to Daniels (2002) ICTs have become within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. However, there appears to be a misconception that ICTs generally refers to 'computers and computing related activities'. This is fortunately not the case, although computers and their application play a significant role in modern information management, other technologies and/or systems also comprise of the phenomenon that is commonly regarded as ICTs.Pelgrum and Law (2003) state that near the end of the 1980s, the term 'computers' was replaced by 'IT' (information technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term 'ICT' (information and communication technology) around 1992, when e-mail started to become available to the general public (Pelgrum, W.J., Law, N., 2003). According to a United Nations report (1999) ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centers, commercial information providers, network-based information services,and other related information and communication activities. According to UNESCO (2002) information and communication technology (ICT) may be regarded as the combination of 'Informatics technology' with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice

response system, audiocassettes and CD ROMs etc have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007).

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).As Jhurree (2005) states, much has been said and reported about the impact of technology, especially computers, in education. Initially computers were used to teach computer programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into schools at a rapid rate. Computers and applications of technology became more pervasive in society which led to a concern about the need for computing skills in everyday life. Hepp, Hinostroza, Laval and Rehbein (2004) claim in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICTs have been utilized in education ever since their inception, but they have not always been massively present.

Although at that time computers were not fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to preparecitizens for lifelong learning in an information society boosted interest in ICTs (Pelgrum, W.J.,Law, N., 2003).The 1990s was the decade of computer communications and information access, particularly with the popularity and accessibility of internet-based services such as electronic mail and the World Wide Web (WWW). At the same time the CD-ROM became the standard for distributing packaged software (replacing the floppy disk). As a result educators became more focused on the use of the technology to improve student learning as a rationale for investment.

Any discussion about the use of computer systems in schools is built upon an understanding of the link between schools, learning and computer technology. When the potential use of computers in schools was first mooted, the predominant conception was that students would be 'taught' by computers (Mevarech& Light, 1992).In a sense it was considered that the computer would 'take over' the teacher's job in much the same way as

a robot computer may take over awelder's job. Collis (1989) refers to this as "a rather grim image" where "a small child sits alone with a computer". However, the use of information and communication technologies in the educative process has been divided into two broad categories: ICTs for Education and ICTs in Education. ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process.

People in this modern society are becoming more and more familiar with Information and Communication Technology (ICT). ICT refers to 'the technology that enables communication and the electronic capture, processing, and transmission of Information' (Parliamentary Office of Science and Technology 2006). Some scholars (Oliveira 1989) argue that ICT is a formidable tool for developing countries to leap up to the economic level of developed nations. This leapfrogging might be accomplished by skipping a few steps that developed countries have gone through, so that developing countries close the economic gap more easily.

Technology enhanced education is generally perceived as a way to relieve poverty, social division and improve living standards due to the fact that technologies can deliver educational programs at a lower cost than traditional education systems. This technology-supported education system is cost-efficient, which is especially meaningful in countries with poor infrastructure (Oliveira 1989).

However, compared with developed countries, the use of ICT in education programs in developing nations is relatively limited, because underdeveloped countries face shortages of financial resources, limited internet access, a lack of trained teachers and the lack of proper policies (Gulati 2008; Kozma 1999; Oliveira 1989; Parliamentary Office of Science and Technology 2006).In addition, many African countries have not been able to employ teachers, and provide resources to keep up with this demand. This brings about compromised quality of education. Further, many African governments face the predicament of educational expansion that corresponds with economic development. Despite the setbacks, access to education is a strong focus of most governments. ICT can play a significant role in equalizing opportunities for marginalized groups and communities. But the paradox is that for those groups that are unable to cross the

technology divide, ICT is yet another means to further marginalize them. Education has a major role to play in resolving this problem. Thus, unless ICT becomes part of both the delivery and content of education, the disadvantage will deepen and development will suffer. But the failure to use ICT is itself a result of the digital and knowledge divides that exist, and their causes are deeply embedded in the complex historical and socio-cultural context of the country.

2.3 Challenges facing ICT implementation

ICT is perceived as a prerequisite for development. However, when it comes to comparing the developing world with the developed world, there is also a huge gap in the usage of ICT between these two groups. This gap is referred to as 'the Digital Divide' (Parliamentary Office of Science and Technology 2006) and can be seen within a country and between countries. The ICT environment surrounding education in developed countries is relatively abundant. According to the research done by the Second Information Technology in Education Study (SITES), which is the project of the International Association for the Evaluation of Educational Achievement (IEA), the number of PCs (Personal computers) in schools is increasing and access to the internet is easy in developed countries. Moreover, ICT is actively adapted in schooling to the extent that ICT changes pedagogical practice innovatively (Kozma 1999). In contrast, in underdeveloped countries, ICT infrastructure is weak and the internet access is limited. Supply of PC (Personal computer) in school is much less than needed and trained person who can resolve computer literacy is also in serious shortage (Gulati 2008; Kozma 1999; Oliveira 1989).

The digital divide is mainly related to such factors as appropriate products, cost, education, literacy, human resources, and government regulations. To tackle the digital divide, carefully selected technology can be used. Open source software, which is basically free because its source code is open to the public, might be a good choice for the countries under financial pressure. Governments have a significant role in reducing the digital divide. They can cut the tax imposed on ICT related imports or liberalize the market for PCs, telecommunication and the internet business. These actions will result in a lower price of ICT related products and an increase in affordability. Industries also have a role in closing this division. Normally, industry works for profit, but corporations have a social responsibility to spend their resources on unprofitable but highly required areas

and some of them are actively involved in addressing the digital divide (Parliamentary Office of Science and Technology 2006). The main challenges for implementing ICT in the education sector in underdeveloped world include:

The first issue, which almost all developing countries face, is how to deal with the scarcity of financial resources (Oliveira 1989). Resources in the developing world are always scarce so that they have to be spent mostly on basic supplies such as food, housing and roads. In a sense, investing in ICT for schooling might be regarded as a long term issue which means adopting ICT in the education system is relatively not an urgent issue considering the serious poverty in many African countries. This results in a vicious circle between scarcity of funds and underdevelopment. When it comes to the controversy of priority of investment between basic services and ICT, both might be linked in the case of education (Parliamentary Office of Science and Technology 2006). One piece of good news about cost is the cost of hardware is decreasing rapidly. The price of PCs and peripherals is reduced to half of the original price every two years. Because of this, the salary of the IT professionals who can teach the new technology is the biggest burden on education budgets and it is followed by software related costs (Oliveira 1989).

Secondly, access to the internet is highly limited in remote areas, and relatively poor infrastructure in developing nations such as supply of electricity makes this worse (Gulati 2008). Low infrastructure is the fundamental problem for developing countries to deal with and it might take a long time and huge funding to improve. Low literacy rates also hinder locals in remote areas from accessing information through the internet and due to the dominance of English on the internet; non-English speaking local people are isolated from the benefits of using internet (Parliamentary Office of Science and Technology 2006).

Another challenge of developing nations to adopt ICT in education systems is a lack of trained teachers (Gulati 2008; Kozma 1999). When it comes to practically applying ICT, which is new to traditional teachers, many may not know how to deal with it and sometimes they are reluctant to accept new technologies in their classrooms. Thus, tutors who can train these teachers about new technology and IT professionals who can technically install and maintain the system are needed.

Whereas results indicate that ICT has penetrated many sectors including banking, transportation, communications, and medical services, the Kenyan educational system seems to lag behind. Further, recent report by the National Council for Science and Technology (2010) indicated that computer use in Kenyan classrooms is still in its early phases, and concluded that the perceptions and experiences of teachers and administrators do play an important role in the use of computers in Kenyan classrooms. Challenges facing implementation of computer education in Kenya include:

Lack of qualified teachers to teach ICT in schools;The demand for ICT learning has been tremendous and the number of teachers who are trained to teach ICT cannot meet the demand. There are more students willing to be taught computing skills than there are teaches to transfer the skills.

Lack of computers; Computers are still very expensive and despite spirited efforts by the government agencies, NGO, corporate organizations and individuals to donate computers to as many schools as possible, there still remains a big percentage of the schools unable to purchase computers for use by their pupils.

Lack of electricity;Many schools are still not yet connected to electricity; Kenya being a developing country, the government has not been able to connect all parts of the country to the national electricity grid. Consequently those schools that fall under such areas are left handicapped and may not be able to offer computer studies.

Computers are still expensive in Kenya, in a country with a GDP of $1600 (128,000 kshs), majority of the individuals and schools cannot afford to buy a computer and consider it as a luxury item, more expensive than a TV. While second hand computers cost as little as $150 (12,000 kshs) and branded new computers being sold at $500(40,000 kshs) or higher.

Broken down computers; while a good number of schools have benefited from donated used computers, they have not been adequately equipped with the same on maintenance and repair, hence its very common to see a schools computer lab full of broken down computers, some repairable and some not. This has actually been a major problem, and the government has now put strict measures on any person, NGO or corporate bodies

willing to donate second hand computers. (It is seen as a dumping ground); e-waste management.

Burglary; the fact that computers are still very expensive in Kenya, makes them a target for thieves who usually have ready markets to another party at a much less figure. This has made many schools to incur extra expenses trying to burglar proof the computer rooms. This extra expense makes some schools shy away from purchasing computers for their students.

Fear by the administration; there is still a strong perception especially by the older generation that computers require highly skilled personnel to operate them, while this may not be the case, some school administrators also fear that their students will be exposed to adult sites and other undesired sites, through the use of the internet. Some also fear the infection of viruses to their computers leading to data loss, while this may be true to some extent, proper education on the safe use of computers and help alleviate some of these fears.

Fear by the teacher, the teacher may fear being rendered irrelevant by the introduction of computers in his/her class. The 'feel' that the teacher still remains an authority and a 'know it all' in class is something that most teachers cherish, and anything that makes them otherwise is deemed an enemy of the classroom.

Lack of internet or slow connectivity; most schools are not able to connect to the World Wide Web, due to the high costs involved in the connectivity. On average, it may cost approximately $120 (9,600 kshs) per month to connect to about 15 computers on a bandwidth of 128/64kbps. This is considered as very expensive for a very slow speed.

Lack of initiative by the community leaders; the community leaders who are charged with looking at the interests of a given community do not see the need to purchase and subsequent installations of computers to their schools as a priority. They consider health care, provision of water and other amenities as more important than buying computers for their schools.

Obsolete computers lower the morale of both the teacher and the student; it is very common to find some schools using very old computers running on windows98 or windows95.

Increased moral degradation – internet pornography, cyber bullying and other anti-social behaviors is a worrying emerging problem.

2.4 ICT and education

Attempts to measure or assess the utilization of ICT in Africa have been hampered by insufficient empirical data to indicate any impact of ICT on sector productivity and lack of cross-county evidence. In some cases the evidence has been non-existent due to recent development. The rapid revolution of ICTs and methodological challenges that include a deficiency of assessment of variables and models of causality. Most of the studies undertaken have focused on information infrastructure issues, while few have been undertaken to measure the extent of ICTs in Africa, particularly in education (Kenya schoolNet 2003).

The use of ICT in education has the potential to enhance the quality of teaching and learning, the research productivity of teachers and students and the management and effectiveness of institutions (Kashorda et al. 2007). However opportunities for realizing the benefits of using ICT in education face a number of challenges in the developing countries. Assess to ICT facilities is a major challenge facing most African countries with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries.(EMIS, 2005).

In Kenya, the ratio for universities and colleges is 1:45 while access at the primary school level is much more limited at 1:250 (Ministry of Education, Kenya, 2006).According to the Communications Commission of Kenya 2011-2012 report released in October, internet usage via traditional computers grew by 19.2% to 7.7 million users, while mobile phone internet usage grew by 1.7% to 29.7 million users. The Education Management Information System (EMIS) survey of 2003/2004 indicated that over 70 per cent of the secondary schools in Kenya required functional telephones. Furthermore, 90 per cent of such schools needed to establish Local Area Network (LANS) in order to improve sharing of learning resources. As at 31st DEC, 2008 there were 6,566 secondary schools

in Kenya of which 4,261 were publicly funded and the rest 2,305 privately funded with a total student enrolment of 1,382, 211 and total teaching staff of 43,016 (Kenya National Bureau of Statistics 2009).

2.5Empirical studies

Technology involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities. In other words, technology can change or alter how people access gather, analyze, present, transmit and simulate information. The impact of technology is one of the most critical issues in education (Webber 2003). Moreover, the use of information and communication technology ICT creates a powerful learning environment and it transforms the learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way. It is thus an important instrument to support new ways of teaching and learning which should be used to develop students skills for cooperation, communication, problemsolving and lifelong learning (Plompet.,al 1996; Voogt, 2003).

Research studies in the past decade have shown that computer technology is an effective means for widening educational opportunities, but most teachers neither use technology as an instructional delivery system nor integrate technology into the curriculum. Studies reveal a number of factors influencing teachers' decision to use ICT in the classroom: non-manipulative and manipulative school and teacher focus. These factors are interrelated. The success for the implementation of ICT is not dependent on the availability or absence of one individual factor, but is determined through a dynamic process involving a set of interrelated factors. It is suggested that ongoing professional development must be provided for teachers' to model the new pedagogies and tools for learning with the aim of enhancing the teaching-learning process. However it is important for teacher trainers and policy makers to understand the factors affecting effectiveness and cost-effectiveness of different approaches to ICT use in teacher training so training strategies can be appropriately explored to make such changes viable to all.

Research conducted found that e-mail was yet to be recognized as a tool for collaboration among students and teachers (Kenya schoolnet 2003). In Schools surveyed, access to the internet was severely limited and when available was only for administrative use. The study found that almost 40 per cent of these schools had less than 10 computers and were

therefore inadequate for teaching and learning. More than 20 per cent had less than 5 computers, indicating that the computers mostly for administrative use.

Another study by Padraig Wims and Mark Hawler(2007) looked at the implementation of ICT projects in selected educational institutions with a view to making recommendations on how such projects can be deployed and supported. The findings were from two secondary schools- St. Patrick's High school and Singore Girl's Secondary school, an agricultural training college, Baraka Agricultural College. The ratios of students to computers in the institution surveyed were: St. Patrick's, 25:1; Singore, 32:1 and Baraka, 4:1. In St. Patrick's, the computer laboratory had 16 working computers, with an average of 1:5 students per computer. Singore had a laboratory of 10 computers and an average class size of 15 or a ratio of 1:5 students per computer. In Baraka Agricultural College, students had access to a computer laboratory of 12 computers. Only 12 students attended classes at any given time, allowing for a ratio of 1:1.

Malaysia, Lau and Sim (2008) made the following observations: use of ICT for teaching and instructional support was reported at 75 per cent and classroom management at 49 per cent with least use for communication with peers at 26 per cent. For teachers ICT competency, respondents considered themselves to be excellent or good.

2.6Theoretical framework

The use of ICT in education has the potential to enhance the quality of teaching and learning, the research productivity of teachers and students and the management and effectiveness of institutions (Kashorda et al. 2007). This implies that the study on ICT implementation in schools could not be exhausted without considering administrative support, environmental factors and the availability of resources.As a guide to this study the Open System Systems, Technology Acceptance Model and the Model of IT implementation process theories was used.

In the open system systems theory, the school being a typical example of an organization is viewed as a socio-technical system composed of four sub-systems: human, technical,structural and task (Owens & Steinhoff, 1976). The human subsystem is composed of teachers, administrators and support staff who deliver instructions, develop curriculum and evaluate student progress. If they are going to perform these tasks they

require structure. Finally the organization must also have technological resources in order to complete tasks.

The schools subsystem interact with the external environment in such a manner that bringing change in one would necessarily lead to changes in all the others. Therefore when considering the introduction of innovations in schools, it is prudent to take cognizance of the inter-dependencies and interactive first between the four subsystems and secondly with the external environment. The subsystems are thus critical elements to be dealt with when attempting to initiate change or implement an innovation in an organization. This guide was thus used to study the challenges facing effective ICT implementation in secondary schools.

The Technology Acceptance Model theory was also used to guide the study as it aimed to predict and explain ICT usage behavior that is, what causes potential adopters to accept or reject the use of information technology. The theory predicts attitudes toward the use of the system that is the user's willingness to use the system (Davis, 1989). It looks at the perceived usefulness which refers to the degree to which a person believes that using a particular system would enhance performance and the perceived ease of use which concentrates on the degree to which a person believes that using a particular system would be free from effort.

The other guide, the Model of IT Implementation process is based on organizational change, innovation and technological diffusion. The purpose of the model is to offer a directing and organizing framework for ICT implementation. The model comprises six stages, namely: initiation, organizational adoption, adaptation, acceptance and adoption, routinization and infusion. Thus, the model covers an implementation process from scanning the organizational needs to a full and effective use of the technology in daily practice. The model also identifies five contextual factors which impact on processes and products in each implementation stage: the characteristics of the user community, the organization, the technology being adopted, the task and the organizational environment (Cooper &Zmud, 1990).

2.7Summary and gaps to be filled by the study

The use of ICT in the classroom is very important for providing opportunities for students to learn to operate in an information age. Findings indicate that teachers have strong desires to integrate ICT into education; but they encounter many barriers. The major barriers are lack of confidence, lack of competence and lack of access to resources. Confidence, competence and accessibility are considered to be the critical components of technology integration in schools, ICT resources including software and hardware, effective professional development, sufficient time, and technical support.

Over the past five years, the Kenyan government has initiated some capital investment towards set up and installation of ICT infrastructure. Funding for these investments is achieved through partnerships between the government and development partners. The government contribution is usually in the form of technical support staff facilities including buildings. Despite of all this various challenges affect the successful implementation of ICT projects.

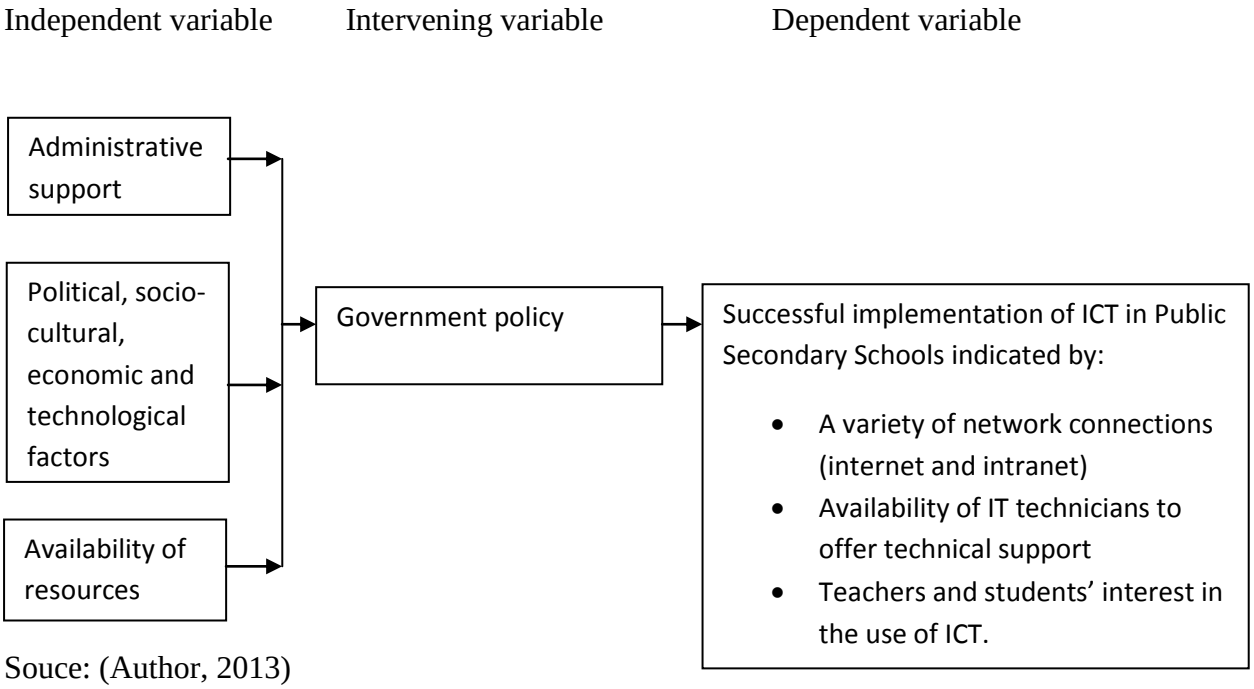
Most developing countries Kenya included are characterized by limited computer applications in the public sector, inadequate infrastructure and shortage of skilled man power (Odedra 1993). This situation exists not merely due to lack of financial resources, but largely due to lack of coordination at different levels in making effective use of the technology. This uncoordinated effort can only result in duplication if ICT is properly implemented.

Studying the obstacles to the use of ICT in education (learning and teaching) is very important as it may assist educators to overcome these barriers and become successful technology adopters in the future. Understanding this environment is crucial because this knowledge could provide guidance for ways to enhance technology integration and encourage greater use of ICT in the education sector.

2.8 Conceptual framework

Onen and Oso (2009) note that a conceptual framework is a diagrammatic presentation of a theory and that it's presented as a model when research variables and the relationship between them are translated into a visual picture to illustrate the interconnections between the independent, intervening and dependent variables. The conceptual framework was therefore a scheme of concepts which the study used in order to achieve the set objective.

The conceptual framework depicted below aimed at identifying challenges facingeffective implementation of ICT in Public Secondary Schools. The study tried to find problems which challengeeffective implementation of ICT in Public Secondary Schools. From the conceptual framework the independent variables were: administrative support. This is the typical hierarchical arrangement of lines of authority, communications, rights and duties of an organization and how they work hand in hand. Administrative support determines how the roles, power and responsibilities are to be assigned, controlled and coordinated. The second independent variable wasthe: technological, socio-cultural, political and economic environmental factors and these are some ofthe external factors that impact organizations in an economy. The third independent variable was the availability of resources. These resources are: human, machine and financial resources. In order to achieve effective implementation of ICT in Public Secondary Schools these independent variables weregoverned by the government policy which is a plan or course of action intended to influence and determine decisions andactions.Effective implementation was then measured by: Avariety of network connections (internet and intranet), availability of IT technicians to offer technical support,and teachers and students' interest in the use of ICT.



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CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This section highlighted the methodology and procedures that were employed to carry out the study. It showed the study design, location, study population, sampling procedures, data collection and instruments used and finally data analysis.

3.2 Research design

This research was a descriptive research as it involved gathering data that describes events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 1984). The research adopted a survey approach to establish challenges facing effective ICT implementation in public Secondary Schools.Descriptive studies are aimed at finding out "what is," so survey methods are frequently used to collect descriptive data (Borg & Gall, 1989).The survey design involves asking a large group of respondents' questions about a particular issue (Mugenda and Mugenda, 1999). It also seeks to obtain information that describes existing phenomenon by asking individuals about their perceptions, attitudes and values (Mugenda and Mugenda, 2003). According to Creswell (2003) a survey design provides a quantitative or numeric description of trends, attitudes or opinions of a population by studying a sample of that population. The design was preferred since it is easy to apply research instruments such as questionnaires and which allow for the collection of data from a large number of respondents in a relatively short period.

3.3 Location

The study was conducted in Nakuru County, Nakuru North District as the area is: easily accessible; it is a rural district; the area is challenged by high school drop-out because of lack of school fees as a result of poverty; main economic activity is small scale farming; the area is demographically populated but school enrolment is low as compared to student population.

3.4 Target population

According to Mugenda and Mugenda (2003), target population is the members of a real or hypothetical set of people, events or objects the researcher wishes to generalize the results of the research. Head teachers, deputy head teachers and teachers in tenPublic Secondary Schools in Nakuru County, Nakuru North District formed the target population.

3.5 Sampling procedures

Nakuru North District has twenty nine (29) public Secondary Schools. Systematic sampling techniques were used to select ten (10) schools out of the twenty nine. The ten schools will be selected from a list organized in order of performance of Nakuru North District mock (2012) by public secondary schools. The minimum sample size being 30% representative of the population which according to Mugenda and Mugenda (2003) observe that the 30% of the target population is a good representation of the study.Eight(8) teachers were randomly selected from each school for the study giving a total of 80 teachers. Head teachers and deputy head teacherswerepurposively selected from the ten selected schools to have a total of ten head teachers and ten deputy head teachers. The total sample size for the study was targeted to a100 respondents.

Sampling Frame

County	Schools	Population frequency (y)	Ratio (x/y)	Sample size (x)
Nakuru	Bahati Girls Sec School	30	0.3	10
	Bahati P.C.E.A Girls High School	30	0.3	10
	Jomo Kenyatta High School	30	0.3	10
	J.M KariukiMem Sec School	30	0.3	10
	St. John's Sec	30	0.3	10

	School			
	Rigogo Sec School	30	0.3	10
	St. Joseph Kirima Sec School	30	0.3	10
	St.MarksEldonyo Sec School	30	0.3	10
	Kiamaina Sec Sch	30	0.3	10
	Heshima Sec Sch	30	0.3	10
Total	10	300	3	100

3.6 Data collectionand techniques

Research instruments used were questionnaires with both open-ended and structured questions. (Kombo and Tromp, 2006 and Mugenda and Mugenda 2003). They were used because: there is low cost in administering them, it is free from bias of the interviewer; answers are in respondents' own words, respondents have adequate time to give well thought answers and large samples can be made use of and thus the results can be made more dependable and reliable (Kothari, 2004). The method used by the researcher was self-administration to distribute the questionnaires.

3.7 Piloting of research instruments

The researcher conducted a pilot study to determine the validity and reliability of the instruments. In piloting, four secondary schools were selected which were not involved in the main study. The researcher administered the research questionnaires to these respondents randomly. The pilot study helped to improve face validity and content of the instruments.

3.7.1 Validity of the instruments

Validity is defined as the accuracy and meaningfulness of inferences which are based on the research result (Mugenda and Mugenda, 1999). It is also the qualitative procedure of pre-testing or a prior attempt to ascertain that research instruments are accurate, correct, true, meaningful and right in eliciting the intended data for the study (Kasomo, 2006). To validate the research instruments the researcher checked whether there were any ambiguous or confusing terms so as to improve the content validity of the instruments.

3.7.2 Reliability of the instruments

Reliability is a measure of degree to which a research instrument yields consistent results or data after repeated tests when administered a number of times (Mugenda and Mugenda, 1999). The test- retest technique of the research instruments was used to gauge the clarity and relevance of the instruments. The instruments were tested in four schools and then re-tested after one week in the same schools which were not involved in the study. Ten responses from each of the four head teachers, four deputy head teachers and eight teachers were used as raw data points to calculate the correlation coefficient between the corresponding data points for the two times the instruments were administered. The formula given below was used to calculate the correlation coefficient.

$$R = \frac{\sum xy - (\sum x)(\sum y)}{n \sqrt{\sum x^2 - (\sum x)^2 \, (\sum y2 - (\sum y)^2}}$$

nn

Where:

$\sum xy$- sum of the gross products of the values of variable x and y

$(\sum x)(\sum y)$-product of the sum of x and the sum of y

$\sum x^2$- sum of squared values of x

$\sum y^2$- sum of squared values of y

$\sum$- sigma (sum) of values obtained in piloting

n- number of the responses

X	Y	XY	X^2	Y^2
4	3	12	16	9
3	4	12	9	16
5	4	20	25	16
3	2	6	9	4
1	1	1	1	1
2	3	6	4	9
2	2	4	4	4
5	5	25	25	25
3	2	6	9	4
4	3	12	16	9
∑32	∑29	∑104	∑118	∑97

$$R = \frac{104-\frac{(32)(29)}{10}}{\sqrt{118-\frac{(32)^2}{10}\left(97-\frac{(29)^2}{10}\right)}}$$

$$= \frac{11.2}{\sqrt{(15.6)\,(12.9)}}$$

$$\frac{11.2}{14.19}$$

$$= +0.79$$

From the table above x values were the data points that is, number of respondents of corresponding questions for the first trial and y values were the data points obtained in the second trial. Upon calculations the coefficient obtained was +0.79. According to Kasomo (2006) a coefficient of 0.6 to 0.79 is high hence the instrument deemed reliable for data collection.

3.8 Data collection procedure

The researcher first got an authorization letter from Kenyatta University and the Teachers Service Commission through the County Directors office. The selected schools were then

visited and the questionnaires administered to teachers, head teachers and deputy head teachers by the researcher in person.

3.9 Data analysis

Descriptive statistics were used in the analysis of both quantitative and qualitative data. Data analysis was done by editing, coding and tabulation of data according to the research questions.Achola (2007) points out that analysis means ordering, categorizing, manipulating and summarizing of data to obtain answers to research questions. The data was entered into the computer and analyzed with the aid of Microsoft excel andStatistical Package for Social Sciences (SPSS Version 16.0).The data was presented using tables, bar charts and pie-charts.

CHAPTER FOUR

4.0 DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter contains results and presentations of the findings. The study targeted three categories of respondents namely: Head teachers, deputy head teachers and teachers. Questionnaires were administered to collect data in the sampled schools. The study aimed at establishing challenges facing effective ICT implementation in selected public secondary schools in Nakuru North District Nakuru County.Simple pie charts, bar graphs and frequency distribution tables were used in presenting data where interpretations and conclusions were made.

4.2 Background information of schools

The researcher sought to establish the type of schools in the area. The illustration in figure 1.1 shows the information of the schools.

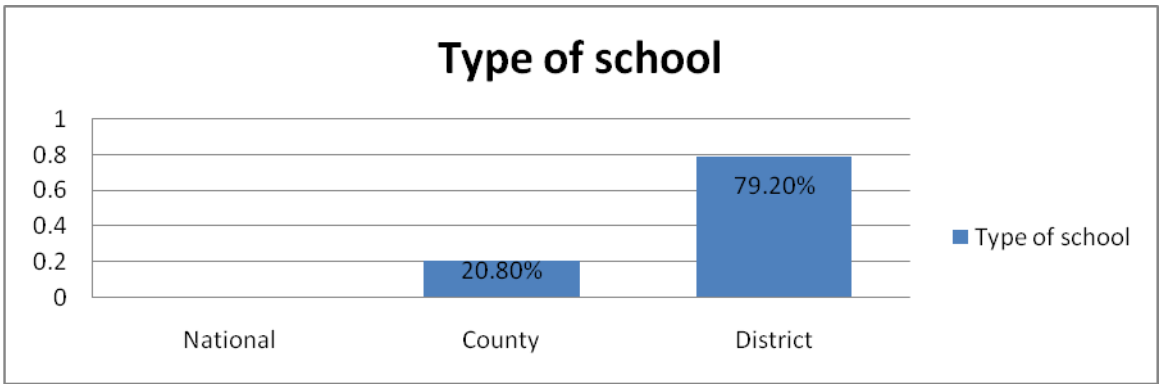

Figure: 1.1

The findings presented shows that district schools are many in the area with a percentage of 79.2% and a few county schools of 20.8% with no national schools in the area.

4.3 Background information of head teachers, deputy head teachers and teachers

The findings presented in table 1.1 below illustrate the number of respondents who participated in the research study.

Table 1.1:Background information of head teachers, deputy head teachers and teachers

Designation	frequency	percent
Head teacher	4	5.6
Deputy Head teacher	6	8.3
Teacher	62	86.1
Total	72	100
Missing	28	

Teachers who participated in the study stood at 86.1% followed by the deputy head teachers at 8.3% and head teachers comprising of 5.6%. The study targeted 100 respondents but only 72 participated.

4.4 Background information on sustenance of ICT implementation

4.4.1 Perceptions on financial assistance to sustain ICT projects

Table 1.2 below shows perceptions of financial assistance to sustain ICT projects.

Table1.2:Financial assistance to sustain the ICT project

scale	frequency	percent
A great deal	4	5.6
Much	7	9.7
Somehow	22	30.6
A little	24	33.3
Never	15	20.8
Total	72	100
Missing	28	

A percentage of 33.3% had the view that there was a little financial assistance, 30.6% somehow, 20.8% never, 9.7% much and 6.9% a great deal. This shows that financial assistance to sustain the ICT projects is minimal.

4.4.2 Information on infrastructure

Table 1.3 below tabulates information on the availability sufficient infrastructure.

Table 1.3:Sufficientinfrastructures (computers, computer labs and power supply)

scale	frequency	percent
A great deal	5	6.9
Much	7	9.7
Somehow	25	34.7
A little	21	29.2
Never	14	19.4
Total	72	100
Missing	28	

A percentage of 34.7% stated that there is somehow sufficient infrastructure in terms of computers, computer labs and power supply whereas 29.2% were for a little, 19.4% never, 9.7% much and 6.9% a great deal. The findings indicate that there are a few infrastructures in most schools.

4.4.3 Demographic of skilled people to run the ICT projects

The perception of skilled people to run ICT projects in schools is clearly illustrated in table 1.4 below.

Table1.4:Skilled people to run the ICT project

scale	frequency	percent
A great deal	8	11.1
Much	24	33.3
Somehow	26	36.1
A little	10	13.9
Never	4	5.6
Total	72	100
Missing	28	

The findings indicate that the demographic of skilled people to run the ICT projects are at 36.1% for somehow. 33.3% much, 13.9% a little, 11.1% a great deal and 5.6% stated that they were no skilled people in their schools. This implies that skilled people to run the ICT projects are not that many.

4.4.4 Availability of reliable sources of energy

The findings indicated that availability of reliable sources of energy (electricity, standing generators or uninterruptible power supply-UPS is never available. This is clearly shown in table 1.5 below.

Table 1.5:Availability of reliable sources of energy (electricity, standing generators or uninterruptible power supply-UPS)

scale	frequency	percent
A great deal	9	12.5
Much	10	13.9
Somehow	19	26.4
A little	14	19.4
Never	20	27.8
Total	72	100
Missing	28	

Results from the table show 27.8% were for never, 26.4% somehow, 19.4% a little, 13.9% much and 12.5% for a great deal. The findings indicate that there are problems with the availability of reliable sources of energy which may hinder ICT implementation.

4.4.5 Availability of network connections (internet and intranet)

Respondents were asked if their schools had network connections either the internet or the intranet. The results are tabulated in the table below.

Table1.6: Availability of network connections (internet and intranet)

scale	frequency	percent
A great deal	1	1.4

Much	4	5.6
Somehow	17	23.6
A little	24	33.3
Never	26	36.1
Total	72	100
Missing	28	

Findings indicated that 36.1% stated that there are never network connections, 33.3% a little, 23.6% somehow, 5.6% much and 1.4% were for a great deal. The results above show that there is neitherinternet nor intranet services in this area.

4.4.6 Information on sufficient internet connectivity

The findings on sufficient internet connectivity showed that both internet and intranet are not sufficient as illustrated in table 1.7 below.

Table 1.7: Information on sufficient internet connectivity

scale	frequency	percent
A great deal	0	0
Much	2	2.8
Somehow	8	11.1
A little	29	40.3
Never	33	45.8
Total	72	100
Missing	28	

The results show that sufficient internet is never available and this is shown by 45.8% for never, 40.3% a little, 11.1% somehow, 2.8% much and none were for a great deal on sufficient internet connectivity implying that internet is not utilized as required.

4.4.7 Information on sensitization of the benefits of ICT

Respondents were asked if there were any strategies put into place to sensitize the school stakeholders on the benefits of ICT in school. The results are shown in table 1.8.

Table 1.8: Information on sensitization of the benefits of ICT

scale	frequency	percent
A great deal	2	2.8
Much	4	5.6
Somehow	26	36.1
A little	19	26.4
Never	21	29.2
Total	72	100
Missing	28	

Respondents stated that sensitization on the benefits of ICT was somehow done**.** This is shown by 36.1% who were for somehow, 29.2% never, 26.4% a little, 5.6% much and 2.8% a great deal which shows that the community to a certain extent is aware of the benefits of ICT.

4.4.8 Findings on easy access to ICT facilities

Information on access to ICT facilities is shown in table 1.9. Results reveal that that there is somehow an access to ICT facilities.

Table 1.9: Easy access to ICT facilities in school

scale	frequency	Percent
A great deal	3	4.2
Much	3	4.2
Somehow	26	36.1
A little	22	30.6
Never	18	25
Total	72	100
Missing	28	

The table shows that 36.1% somehow have access to ICT facilities, 30.6% have a little access, 25% never have any access and 4.2% for both much and a great deal have no

problem with accessing ICT facilities. This indicates that most are disadvantaged when it comes to ICT facilities.

4.4.9 Perception of teachers and students' interest in the use of ICT

Teachers and students interest in the use of ICT was seen to be positive. This is shown in table 1.10.

Table 1.10: Perception of teachers and students' interest in the use of ICT

scale	frequency	Percent
A great deal	15	20.8
Much	25	34.7
Somehow	20	27.8
A little	9	12.5
Never	3	4.2
Total	72	100
Missing	28	

The results show that teachers and students' interest is much thus been positive in the use of ICT with 34.7%, somehow 27.8%, 20.5% a great deal, 12.5% a little and 4.2% never.

4.4.10 Information on sufficient equipment

Table 1.11 below provides information on sufficiency of equipment (computers, hardware, LCD projectors, software, flash disks, CD-ROMS and equipment stores).

Table 1.11: Sufficient equipment for ICT implementation (computers, hardware, LCD projectors, software, flash disks, CD-ROMS and equipment stores

scale	frequency	Percent
A great deal	3	4.2
Much	3	4.2
Somehow	18	25
A little	25	34.7
Never	23	31.9

Total	72	100
Missing	28	

The table shows that there are no sufficient equipment for ICT implementation where 34.7% were for a little, 31.9% never, 25% somehow and both 4.2% for a great deal and much.The findings hence indicate that equipment to sustain ICT implementation is in lack.

4.4.11 Background information on ICT assessment

Respondents were asked if the ministry conducts an ICT assessment in their school and the responses were as shown in the table.

Table 1.12: Background information on ICT assessment

scale	frequency	percent
A great deal	6	8.3
Much	3	4.2
Somehow	9	12.5
A little	17	23.6
Never	37	51.4
Total	72	100
Missing	28	

Information provided shows that 51.4% stated that there is never an assessment carried out, 23.6% were for a little, 12.5% somehow, 8.3% a great deal and a few by 4.2% much have assessments carried out by the ministry. This is an indication that rarely is there crucial assessment carried out.

4.4.12 Perception on the encouragement of the public-private partnership to create sustainable ICT programs in school

The research aimed at finding out the perception on the encouragement of the public-private partnership to create sustainable ICT programs and the results are as shown in table 1.13 below.

Table 1.13: Perception on the encouragement of the public-private partnership to create sustainable ICT programs in school

scale	frequency	percent
A great deal	1	1.4
Much	3	4.2
Somehow	21	29.2
A little	25	34.7
Never	22	30.6
Total	72	100
Missing	28	

A percentage of 34.7% stated that there is little encouragement to sustain ICT programs in school. 30.6% were for never, 29.2% somehow, 4.2% much and 1.4% a great deal where there is great encouragement in sustaining the ICT programs showing that encouragement to sustain the ICT programs is very minimal.

4.4.13 Information on strategies and policies

Questionnaires distributed sought to find out if the ministry declares the strategies and policies by stating goals and objectives involved in the implementation of ICT in schools.

Table 1.14: Information on strategies and policies by the ministry stating goals and objectives involved in the implementation of ICT

scale	frequency	percent
Much	3	4.2
Somehow	16	22.2
A little	29	40.3
Never	24	33.3
Total	72	100
Missing	28	

The results indicated that 40.3% stated a little, 33.3% never, 22.2% somehow, and none for a great deal. The findings imply that no strategies have been put in to place to enhance effective ICT implementation.

4.5 Background information on computer exams

Respondents were asked how many computer exams they had in their schools. The findings are as shown in figure 1.2.

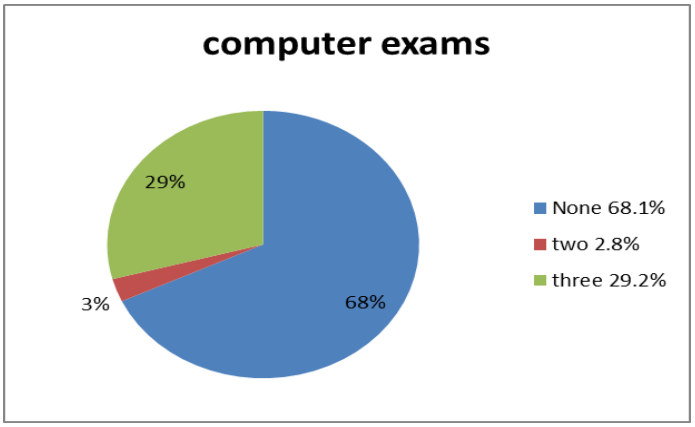

Figure 1.2:

The figure shows that most schools at 68% have no computer exams, 29.2% have three and only 2.8% have two exams indicating that most schools do not examine their students in this area.

4.6 Number of computers in schools

As shown in figure 1.3 below the number of computers in most school ranges from 1-20 while others have 21-40 computers.

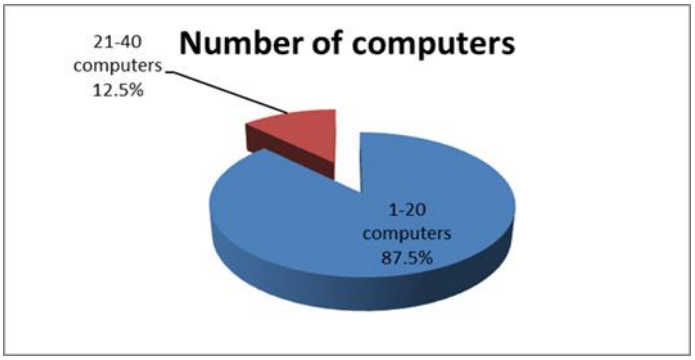

Figure 1.3:

The figure shows that 87.5% have 1-20 computers while other schools with more that is 21-40 computers lay at 12.5% implying that a majority of schools have very few computers.

4.7 Information on computer literate people

The figure below provides information on the number of computer literate people in schools.

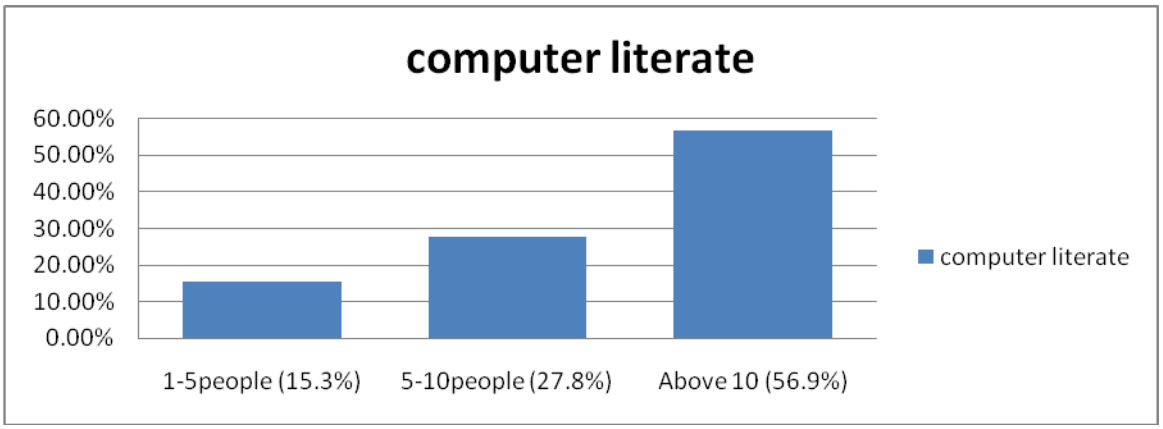

Figure 1.4: Number of computer literate people

Findings on computer literate people in schools indicated that 56.9% had above 10 computer literate people, 27.8% 5-10 people and 15.3% for 1-5 people. This is shown in figure 1.4 above showing that there are a number of computer literate personnel in schools.

4.8 Availability of a computer board or committee

Based on the findings of the availability of a board or committee, most schools proved to have no committees or boards for the ICT project. This is as depicted in table 15 below.

Table 1.15: Availability of a board or committee

Scale	Frequency	Percent
No idea	14	19.4%

Yes	23	31.9%
No	35	48.65%
Total	72	100

Those with no board or committee stood at 48.65%, having a board or committee at 31.9% and those with no idea at 19.4%.

4.9 Appointment of the board or committee members

The respondents were also asked how the board or committee members are chosen and the results are as illustrated in figure 1.5 below.

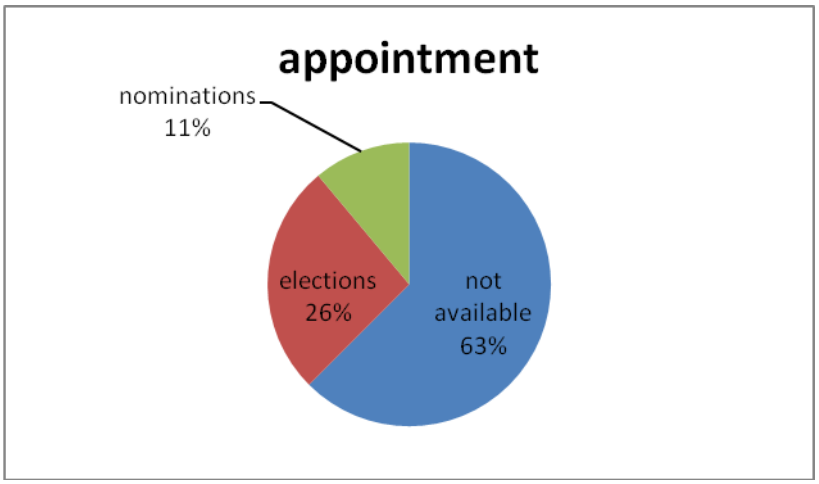

Figure 1.5:

The results were 63% stating that the board or committee members were appointed directly, 26% was through elections and 11% through nominations indicating that most schools have an ICT committee.

4.10 Information on the qualification requirements

Background information on the qualification requirements for the board as shown in figure 1.6 shows that most schools had no qualification requirements of the members in the board or committee.

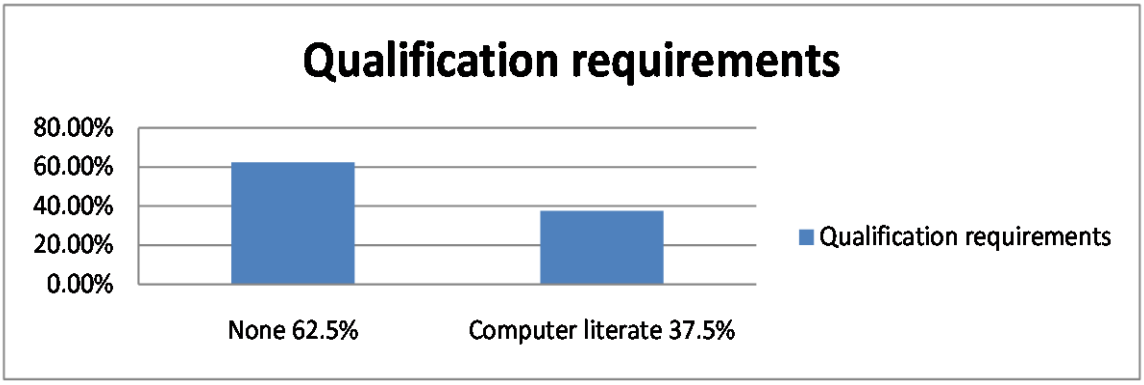

Figure 1.6:

The figure shows that the qualification requirements of computer literate people stood at 37.5% while those who were for none stood at 62.5%.

4.11 Problems faced in ICT implementation

Respondents were asked what problems they face in implementing ICT in teaching and learning. Results are as shown in figure 1.7 below.

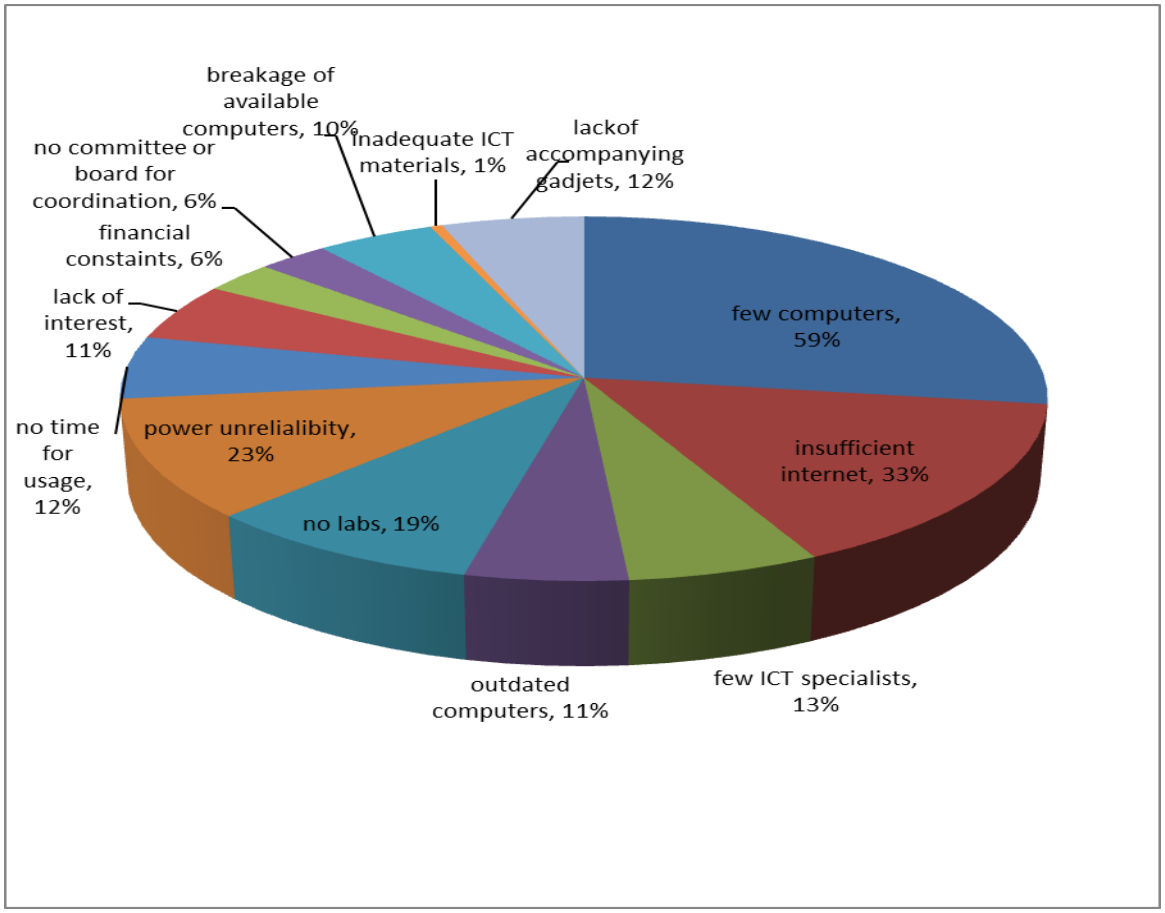

Figure 1.7: Problems in implementing ICT in teaching and learning

Fifty nine (59%) percent said there were few computers, 33% insufficient internet, 23% power unreliability, 19% had no labs, 13% stated that there were few ICT specialists, no time for usage and lack of accompanying gadgets such as LDC projectors, speakers etc. were both at 12%, 11% stated that most computers were obsolete or outdated and the same percentage stated that there was a lack of interest in the use of ICT both in teaching and learning, breakage of the available computers was at 10%, lack of an ICT board or committee and problems related to financial constraints both were at 6%. Finally 1% stated that there were inadequate ICT materials.

4.12 Information on the benefits of ICT

Benefits of implementing ICT in teaching and learning are as shown in figure 1.8 below.

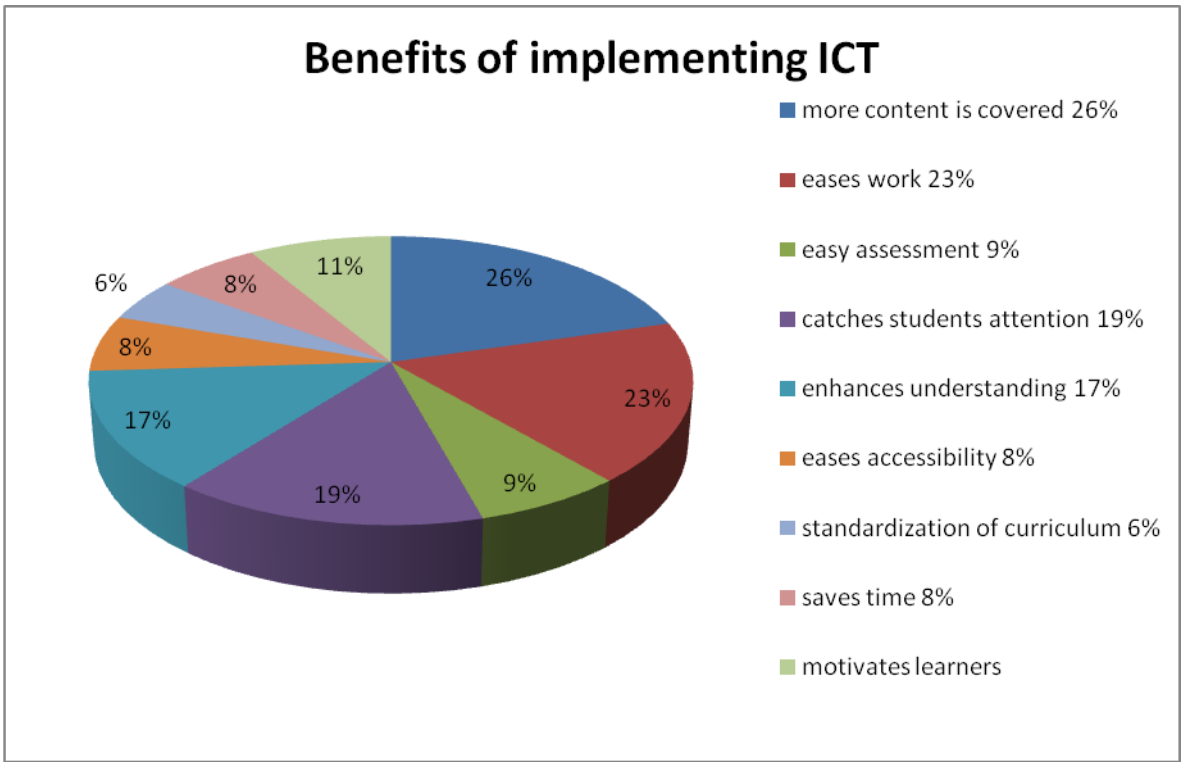

Figure 1.8: Benefits of implementing ICT

Twenty six percent (26%) stated that one of the benefits was that more content is covered, 23% stated that it eases work, 19% stated it catches students attention, 17% stated that it enhances understanding, motivation of learners was at 11%, 9% were for the idea that it

made assessment easy, those who stated it enhanced easy accessibility and saved time were at 8% and standardization of the curriculum were at 6%.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, conclusions, recommendations and suggestions for further research.

5.2 Summary of the findings

The purpose of this study was to investigate challenges facing effective ICTimplementation in selected public secondary schools in Nakuru North District Nakuru County. Three specific objectives were formulated to guide the study. Research objective one sought to evaluate how administrative support affects effective ICT implementation; research objective two sought to determine how much political, economic, socio-cultural and technological factors affect effective ICT implementation and the third objective was to find out how scarcity of resources challenge effective ICT implementation. The study employed descriptive survey design and was conducted among head teachers, deputy head teachers and teachers. The study relied on self-administered questionnaires. Data was analyzed by the use of percentages and frequencies.

Findings indicated that Nakuru North District has many District schools which comprises of 79.2%. The other types of schools were the county schools which ranged at 20.8%. the area does not have any national schools.

The study established that ICT implementation in schools is faced by a number of challenges thus hindering full and effective implementation. One of the challenges established is that administrative support in terms of financial assistance to sustain ICT projects is very little. This is shown by the research results which are indicated by many respondents at 33.3%.

It is either due to financial constraints that most schools lack sufficient infrastructure to fully implement ICT in their schools. The findings (34.7%) reveal that there is somehow

sufficient infrastructure in terms of computers, computer labs and power supply. As a result of this effective and efficient implementation of ICT cannot be achieved.

Thirdly, from the findings skilled people to run the ICT projects are somehow available and this is shown by the 36.1% however this is very low. As a result few people cannot enhance effective implementation of ICT.

In addition, availability of reliable sources of energy that is electricity, standing generators or uninterruptible power supply in most schools is never available. The response percentage is higher at 27.8% stating there are never reliable sources of energy. As a result if power is not available to run the computers to facilitate ICT implementation then its effectiveness will not be achieved.

Lack of network connections (internet and intranet) as indicated by the research shows that there is never any network connections. This is shown by 36.1% for lack of network connections. The lack of network connections preventsthe downloading and sharing of important files thus, this is a great hindrance to enhance effective implementation of ICT as shown by the 45.8% who stated that internet sufficiency is never available.

Despite having sensitization measures on the benefits of ICT no effective strategies have been put into place to fully sensitize people on the benefits of ICT. Findings clearly show that sensitization is not done to a great deal (2.8%) but it is somehow done (36.1%). The results indicate that with no effective sensitization people will not know the benefits of ICT. If at all it is integrated it may not be fully implemented as people do not know of its benefits.

Findings also indicate that most people somehow have access to ICT facilities in school (36.1%). This indicates that access to the ICT facilities is not 100% thus making effective implementation difficult.

Having a positive attitude and interest in the use of ICT by both teachers and students (34.7%) clearly indicates that if effective measures are to be put into place in terms of finances, machinery and effective personnel then effective implementation will be enhanced.

The results (51.4%) also indicated that assessment on ICT is never carried out as there is little encouragement to sustain the ICT programs especially by the ministry. Probably this is the reason why 68.1% have no computer exams, 87.5% have very few computers despite having computer literate people in schools with 56.9%. Measures to also have a board are not put into consideration thus hindering effective implementation.

5.3 Conclusion

Based on the findings of the research it was concluded that there were a number of challenges facing effective implementation of ICT in schools in Nakuru North District. These challenges included: few computers and computer labs, insufficient internet connectivity, power unreliability and lack of sufficient equipment such as LCD projectors, speakers among others to enhance effective implementation. The study also concluded that efforts by the ministry to sustain ICT implementation projects in schools are very minimal especially in the rural districts. In addition the study also concluded that even though there are few ICT specialists the specialists are there as there a number of people who are computer literate.

5.4 Recommendations

According to the findings, the researcher made the following recommendations:

The government should put measures to assess how ICT programs are being integrated and implemented in rural district secondary schools.

The government should also allocate funds for the effective and efficient running of the ICT programs especially in the rural secondary schools.

Reinforcement in terms of awards by the stakeholders should also be used to motivate the use of ICT in rural secondary schools which in turn will strengthen the implementation process.

Reliable power supply, sufficient equipment and free internet preferably WI-FI (a facility allowing computers, smartphones, or other devices to connect to the internet or communicate with one another wirelessly within a particular area) should also be set in

the rural areas by the government to enhance effective implementation of ICT in the schools within that area.

5.4.1 Suggestions for further research

The researcher focused on challenges facing effective ICT implementation in public secondary schools in rural districts. Further studies need to focus on challenges facing ICT implementation in rural primary schools. It is also imperative to carry out further research on the effectiveness of ICT implementation in public schools in urban areas.

REFERENCES

Anderson, N. (2009). *Equity and Information Communication Technology (ICT) in Education.*Peter Lang Publishers, New York.

Al-Ansari, H. (2006). Internet use by the faculty members of Kuwait University.*The Electronic Library* Vol.24. No.(6).

Collis, B. (1989). Using information technology to create new educational situations. Paris:*UNESCO International Congress on Education Informatics*

Cooper, R.B. and R.W. Zmud (1990) "Information Technology Implementation Research: A Technological Diffusion Approach," *Management Science* (36)2.

Creswell, J. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2nded.). Thousand Oaks: Sage.

Daniels, J.S. (2002) "Foreward" in information and communication Technology in Education- *A Curriculum for Schools and Programme for Teacher Development.* Paris: UNESCO

Davis, F.D. (1989) "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly* (13)3.

Esque, S. (2009). Technology in education: transforming teaching & learning. IntelCorporation.Global Symposium on ICT in Education.Co-organized by theWorld Bank, the Korean Ministry of Education, Science, and Technology (MEST) and Korea Education & Research Information Service (KERIS), November 9-11, 2009. Seoul, South Korea.

Federal Republic of Nigeria (2004).National Policy on Education 4th edition. Lagos: National Educational Research and Development Council.

G8 countries (2000). Okinawa charter on the Global Information Society http://www.dotforce.org/reports/itl.html

Gulati, S. (2008). Technology-enhanced learning in developing nations: a review. International Review of Research in Open and Distance Learning, 9(1), 1–16.

Gwang-Jo, K. (2009). ICT in education: issues & questions. Global Symposium on ICT in Education. Co-organized by the World Bank, the Korean Ministry of

Education,Science, and Technology (MEST) and Korea Education & Research InformationService (KERIS), November 9-11, 2009. Seoul, South Korea.

Heek, R., (2002). *Information systems and Developing Countries: Failure, success and local improvisations.*Philadelphia.

Howell, C. &Lundall, P. (2000).*Computers in schools: A National Survey of Information Communication and Technology in South African Schools.* Education Policy Unit: university of the Western Cape: Cape Town.

Jhrurreev, V. (2005). "Technology Intergration in Education in Developing Countries: Guidelines to Policy Makers". *International Education Journal.*Available: http://ehlt.flinders.edu.au/education/iej/articles/v6n4/jhrurree/paper.pdf

Kashorda, M. (2007): *Emerging Trends in information and communication Technology Education in Kenyan Universities.* Strathmore University Press, Nairobi.

Kasomo, D. (2006). *Research methods in humanities and education.*Eldoret , Kenya: Zapf.

Kaul, M. and Odedra, M., (1991). Government initiatives in information technology application: A commonwealth perspective. Report on the information Technology Policy Workshop 12-16 November 1990. Marlborough House, Pall Mall, London UK.

Kennedy, D. &Mcnaught, C. (1997). Design elements for interactive multimedia Australian *Journal of Educational Technology,* (13)(1).

Kenya SchoolNet, (2003). Preparing a Workforce for the Evolving Information Economy: A survey on ICT Access and use in Kenya Secondary Schools, Nairobi.

Kombo, D.A. &Tromp, D.L.A. (2006). *Proposal and Thesis Writing.An Introduction.* Panlives Publications Africa.

Kothari, C.R. (2004). *Research Methodology* (2nd Edition): New Age International, New Delhi.

Larson, A. (2000). *Remarks delivered at the sovereignty in the Digital Age Series.* Washington, D.C: Woodrow Wilson Center.

Lau, B. T; Sim, C. H. (2008). *School of Computing and Design, Swinburne University of Technology, Sarawak Campus.* Malaysia.

Lemke, C., & Coughlin, E.C. (1998).Technology in American Schools. Available: www.mff.org/pnbs/MEI58.pdf

Mgaya, R.J., (1999). Adoption and diffusion of group support systems in Tanzania, Delft University of Technology.

Ministerio de Educacion, Republica de Chile (1998). *Reform in progress: Quality of Education for all.* Santiago, Chile: Ministerio de Educacion.

Ministry of Education, Singapore (2000).*Mission with a passion: Making a difference.* Singapore: Ministry of Education.

Mugenda, M.O. &Mugenda, G.A. (1999). *Research Methods; Quantitative &Qualitative approaches.* Nairobi, Kenya: Acts press.

Mugenda, O.M. &Mugenda, A.G. (2003). *Research Methods; Quantitative and Qualitative Approaches*.Nairobi : Acts Press.

OECD. (2002). ICT: Policy Challenges for Education. Planning Meeting, Agenda and Issue Paper. Retrieved from: http://www.oecd.org/LongAbstract

Pelgrum, W. J. & Law, N. (2003). ICT in education around the world: trends, problems and prospects. *In U.I. Planning, Fundamentals of Education planning.* Paris:UNESCO.

Tearle, P. (2004). *The Implementation of information and communications technology UK secondary schools: Final report.*Exeter: University of Exeter.

Torero, M. & Braun, J.V. (2006). Information and communication technologies for development and poverty reduction: *The potential of telecommunications.* International Food Policy Research Institute. Washington, DC.

Unwin, T. (ed.). (2009). *ICT4D.Information and communication technology for development.* Cambridge: Cambridge University Press.

Voogt, J.&Knezek, G. (2008). *International handbook of information technology in primary & secondary education:Part 1*. New York: Springer.

Wagner, D.A., Day, B., James, T., Kozma, R.B., Miller, J. & Unwin, T. (2005).*Monitoring and Evaluation of ICT in Education Projects.A Handbook for Developing Countries.* Washington DC: Information for Development Program (InfoDev).

Appendix I: Letter of introduction

Dear respondent,

I am a postgraduate student at Kenyatta University pursuing a Masters in Business Administration Strategic Management option. As a partial fulfillment of the course, I am conducting a study on "Challenges facing effective ICT implementation in selected public secondary schools in Nakuru North District Nakuru County. For this reason I would kindly appreciate if you would spare a few minutes of your time to fill in the questionnaire to the best of your knowledge.

Kindly respond to the questionnaire by ticking (√) in the appropriate box or by filling the spaces provided. The information provided will be highly appreciated and treated with utmost confidentiality and only used for the sole purpose of this study which is academic.

Thank you in advance.

Yours faithfully,

NyagaSerah

D53/NKU/PT/21745/2010

Kenyatta University

APPENDIX II: STUDY TIME LINE

ACTIVITY	OCT-DEC 2013	FEB 2014	MARCH 2014	APRIL 2014	MAY 2014
Proposal development					
Proposal defence					
Corrections of presentation of the proposal					
Presentation					
Data collection					
Data analysis					
Presentation of the final report					

APPENDIX III: BUDGET

ITEM	ESTIMATED COST
Proposed development	
Questionnaire development (400@ 30 ksh)	12,000/=
Transport	1000
Stationery, accessing literature and internet time.	3000
Data collection	
Questionnaires (500@ 20)	10,000
Transport	1000
Stationery	100
Data Analysis	
Report preparation	4000
10% contingencies	3110
Total	34,210

APPENDIX IV: RESEARCH QUESTIONNAIRE

Dear respondent,

I am a postgraduate student atKenyatta Universitypursuing a Masters in Business Administration Strategic Management option. As a partial fulfillment of the course, I am conducting a study on "Challenges facing effective ICT implementation in selected public secondary schools in NakuruNorth District NakuruCounty. For this reason I would kindly appreciate if you would spare a few minutes of your time to fill in the questionnaire to the best of your knowledge.

Kindly respond to the questionnaire by ticking (√) in the appropriate box or by filling the spaces provided. The information provided will be highly appreciated and treated with utmost confidentiality and only used for the sole purpose of thisstudy which is academic.

Thank you in advance.

SECTION A

PLEASE TICK (√) IN THE APPROPRIATE BOX.

Type of School ☐ National school

County school ☐

District school ☐

Designation ☐ Head teacher

Deputy Head teacher ☐

Teacher ☐

SECTION B

The following scale has been provided; kindly use it to fill the table below by ticking in the appropriate box using the Likert scale.

KEY:

1. A great deal
2. Much
3. Somehow
4. A little
5. Never

	A great	Much	Somehow	A little	Never

	deal				
The school provides financial assistance to sustain the ICT project?					
There is sufficient infrastructure (computers, computer labs and power supply)?					
There are skilled people in my school to run the ICT project?					
Reliable sources of energy (electricity, standing generators or uninterruptible power supply- UPS) are readily available in school?					
There are a variety of network connections (internet and intranet connectivity) in school?					
Internet connectivity is sufficient?					
Strategies have been put into place to sensitize the school stakeholders on the benefits of ICT in school?					
Do you have easy access to ICT facilities in school?					
Teachers and students' interest in the use of ICT is positive?					
There is sufficient equipment for ICT implementation (computers, hardware, LCD projectors, software, flash disks, CD-ROMS and equipment stores?					
Does the ministry conduct an ICT assessment in your school?					
There is encouragement of the public-private partnership to create sustainable ICT programs in school?					
Does the ministry declare the strategies and policies by stating goals and objectives involved in the implementation of ICT in your school?					

SECTION C

1. Do you have computer exams in your school? If YES, how many exams in a term

   _____

   _____

   _____

2. How many computers do you have in your school?Do you think the number of computers determines effective implementation of ICT? Elaborate your answer.

   _____

   _____

3. How many are computer literate?

1-5 peop☐

5-10 peop☐

Above 1☐ple

4. Do you have a board or committee appointed for coordinating ICT implementation? How is the board or committee appointed? (What are the requirements for one to be appointed)?

5. W hat are the problems faced by teachers in implementing ICT in teaching and learning?

6. What are the benefits of implementing ICT in teaching and learning?