

**FACTORS INFLUENCING IMPLEMENTATION OF  
INFORMATION COMMUNICATION TECHNOLOGY IN  
PUBLIC SECONDARY SCHOOLS IN KISII CENTRAL  
DISTRICT, KENYA.**

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**BY**

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## DECLARATION

This research project is my original work and has not been presented before either in part or full for an award of a degree in any university.

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The research project has been submitted for examination with my approval as a University of Nairobi Supervisor.

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## **DEDICATION**

This work is dedicated to my beloved wife Erica, my sons; Collin, Davis and Keith who have provided the moral support and patiently endured with me as I spent long hours from home during the entire period of study to come up with this study and the late Charles Otworu who was a great source of encouragement.

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Very sincere gratitude to my wife Erica who stood by my side in terms of moral support, encouragement and proofreading the research project and the tireless effort of Vane who typed and formatted this work.

## **ABSTRACT**

The study sought to establish how finances influenced implementation of ICTs in Public Secondary Schools in Kisii Central ; to examine the influence of facilities on implementation of ICTs in Public Secondary Schools in Kisii Central District; to explore the influence of ICT personnel skills on implementation of ICTs in Kisii Central District Public Schools and above all to determine the influence of government ICT policy on the implementation of ICT in Kisii Central Public Secondary Schools.

The study employed descriptive survey method. Research findings that were notable indicated that ICT implementation was not fully attained as it emerged that around 47% of schools had some forms of implementation. It emerged that finances played a major role followed by availability of ICT facilities and presence of ICT facilities and presence of personnel on ICT. Most schools were not aware of the existence of government ICT policy and therefore had not followed it. The need for school managers and administrators to follow the Government policy on ICT was of paramount importance.

The conclusion drawn from this study showed that a lot more needed to be done in provision of funds which seemed to be inadequate in most schools according to this study, training of ICT personnel who lacked in most schools and the need for schools to follow the Government ICT policy as it emerged clearly that over 30% of schools were not aware of the existence of the government policy on ICT and above all putting up ICT facilities such as laboratories, connecting of school electricity and equipping schools with computers which lacked in most schools.

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## **LIST OF ABBREVIATIONS & ACRONYMS**

<b>FPE</b>	-	<b>Free Primary Education</b>
<b>FSE</b>	-	<b>Free Secondary Education</b>
<b>B.O.G.</b>	-	<b>Board of Governors</b>
<b>PTRs</b>	-	<b>Pupil Teacher Ratios</b>
<b>TTC</b>	-	<b>Teachers Training College</b>
<b>ICT</b>	-	<b>Information Communication Technology</b>
<b>KCD</b>	-	<b>Kisii Central District</b>
<b>SBT</b>	-	<b>School Based Tele-centres</b>
<b>POP</b>	-	<b>Internet Points of Presence</b>
<b>KIE</b>	-	<b>Kenya Institute of Education</b>
<b>USAID</b>	-	<b>United States Agency for International Development</b>
<b>AD</b>	-	<b>Accelerated Development</b>
<b>GPRS</b>	-	<b>Ghana Poverty Reduction Strategy</b>
<b>GeSCI</b>	-	<b>Global Schools and Communities Initiatives</b>
<b>CD</b>	-	<b>Computer Disc</b>
<b>CCK</b>	-	<b>Communications Commission of Kenya</b>

<b>MOE</b>	-	<b>Ministry of Education</b>
<b>ACE</b>	-	<b>Accelerating 21<sup>st</sup> Century Education</b>
<b>STIC</b>	-	<b>School Technology Innovation Centre</b>
<b>PRSS</b>	-	<b>Public Rural secondary Schools</b>
<b>SPSS</b>	-	<b>Statistical Package for Social Science</b>
<b>NGO</b>	-	<b>Non-Governmental Organization</b>

## **CHAPTER ONE**

### **1.1. Background to the study**

All countries of the world have put massive resources in education. The investments are witnessed in the training of human capital and infrastructure development. The latest investment in education is now being directed to information and communication technology. This will in turn lead to the use of technology for teaching and learning. Most Governments have done this to underscore the significance of education in enhancing socio-economic and political development. The world has now become a global village because of the role of ICT. This has made the world to be so competitive especially in sharing scarce resources available and other opportunities.

Education therefore plays a critical role in preparing men and women who can be knowledgeable and skillful enough to compete for the scarce resources. Once a person has been educated, the person becomes an investment on his/her own because this will bring out a lifelong sustenance on the part of the person. True empowerment of most countries to their citizenry is through providing education. It is through provision of education that the governments tackle the issues of poverty and thus promote the standards of living of their citizens.

It therefore goes without saying that this has been the basis for most governments to introduce policies on ICT development whereby education has been singled out as a vehicle through which ICT can be entrenched in all sectors of the economy. ICT is now seen as key in promoting education standards. It has a greater effect when used for teaching and learning in schools. It is against this background that

secondary schools and other educational institutions should lay their basis for introducing ICTs in their schools to enhance teaching and learning.

Educators consider ICT as quite critical in playing a broader and wider role in lessening the cost of education and offering quality as opposed to traditional methods of teaching. In a school situation, it is used by administrators to make their administration more efficient and it has made business people to employ modern approaches in their business undertakings to be competitive enough thus leading to economic development.

ICTs continued to play a critical role in enhancing teaching and learning in schools all over the world. Countries like Britain, America, Canada, Finland, Hungary, Sweden and Korea are ICTs high intensity. This is due to the fact that ICTS are employed in every facet of their lives which included economic and social. In these countries ICTs are applied in teaching and learning intensively (Ghislain Robyn, 2001). In Africa, a general survey shows that most countries such as Nigeria, Ghana, and Uganda had fully embraced the ICTs in their secondary education.

According to Clemon and Row (1991), ICT is revolutionizing the traditional procedures involved in education delivery and many governments are enthusiastic about adopting them in their educational institutions due to the speed and efficiency in content delivery. E-learning students have 60 percent faster learning curves compared to classroom counterparts (Webster, 2001). Applications of ICTs enhance online learning that enables the student information's search through the internet. ICTs enable online teaching that makes teachers to work remotely from their students and can administer examinations online. It ensures that education stakeholders are networked through



computers and the internet (Reidlinger Andweir, 1995). ICTS are useful for entertainment and office work. Above all, ICT has become an invaluable tool for children with special education needs (Becta, 2000).

Kenya has placed considerable emphasis on the importance of ICT in its education sector support programme as evidenced in the recent promulgation of the National ICT strategy for Education and Training. The Ministry of Education has taken steps to support the implementation of the ICT strategy either by direct action or through the various institutions and agencies with which it works. In addition, there are many other organizations not involved directly with the Ministry of Education that continue to be active in implementing and supporting projects involving ICT in education one of them being computers for schools programme spearheaded by Tom Munsili. In Kenya, the schools which have successfully implemented through computers for schools programme assistance include; Secondary Schools in Central Province, Eastern Province in larger Meru, Embu, Machakos, Coast and Nairobi Provinces. (Obura, Musili and Etta, 2010).

The Ministry of Education developed Kenya Education sector support program (KESSP) in 2005 that featured ICT as one of the priority areas with the aim of mainstreaming ICTs into teaching and learning process. The National ICT policy embedded the intent as a national priority and provided the impetus for the Ministry to develop its sector policy on ICT in education. In June 2006, the Ministry introduced the National strategy for Education and Training. A document referred to as the ICT policy for the education sector was developed. It consisted components such as: ICT in education policy; Digital equipment, connectivity and network infrastructure, Access and

Equity, technical support and maintenance, Harnessing emerging technologies, Digital content, Integration of ICT in education, Capacity building and professional development, Research and development (Caruso, 2004).

A general survey on the ICTs situation in schools in Kisii Central District revealed inadequate implementation of ICTs in education (District education office ICT statistics, 2009). It was discovered that the ICT policy on education had not been exploited; funds were not adequate besides skilled ICT personnel.

Financing of ICTs implementation in schools is one of the recommendations of the government through the sessional paper No.1 of 2005. The National Information and Communication Technology (ICT) policy by the Ministry of information and communication (January, 2006), has encouraged electronic learning.. It is on the basis of this policy that a number of international organizations had developed or started developing partnerships with the MOE to facilitate the use of ICT in the government offices and education institutions, (Sessional Paper NO.1, 2005 p 68).

ICT trained personnel have a critical role to play in the implementation of ICT policy in Education. Above all, financing of ICT is instrumental in ensuring that implementation of ICT policy in education has been achieved.

## **1.2. Statement of the problem**

The use of ICT to facilitate teaching and learning in Secondary Schools in Kenya has not been done consistently, lacks uniform operationalization features and lacks proper guideline direction. These are critical challenges which require to be addressed to pave way for application of ICTs in teaching and learning. Although this is the

situation, there lacks clear cut expert information on how best this could be overcome. ICT has transformed the world into a global village and secondary schools in Kenya cannot wish away this very critical component in their day to day operations and programmes. This study therefore envisages to come up with research information upon which schools can base their ICT implementation decisions. Alongside this, ICT policy makers lack information on the impediments to ICT implementation and resolution mechanisms. Investors in ICT and other donor agencies may be brought to knowledge of the opportunities available in ICT situation in schools for purposes of putting intervention measures.

This study therefore strives to investigate and establish the ICT implementation situation in Public Secondary Schools in Kisii Central District and use the research findings to suggest the way forward on how to overcome obstacles to a comprehensive implementation and use of ICT to enhance teaching and learning.

### **1.3. Purpose of the study**

This study was aimed at investigating the factors influencing ICT implementation in Public Secondary Schools in Kisii Central District.

### **1.4. Objectives of the study**

The study was guided by the following objectives:

1. To establish how finances influenced implementation of ICTs in public secondary schools in Kisii Central District .
2. To examine the influence of facilities on implementation of ICTs in Public Secondary Schools in Kisii Central District.

3. To explore the influence of personnel on ICT implementation in Public Secondary Schools in Kisii Central District.
4. To determine how the policy on ICT influenced implementation of ICTs in Public Secondary Schools in Kisii Central District.

### **1.5. Research questions**

The following are research questions derived from the objectives;

1. In which way do finances influence implementation of ICTs in public secondary schools in Public Secondary Schools in Kisii Central District?
2. What influence do ICT facilities have towards implementation of ICTs in Public Secondary Schools in Kisii Central District?
3. How does personnel in ICT influence implementation of ICTs in public secondary schools in Kisii Central District?
4. To what extent does policy in ICT influence implementation of ICTs in public secondary schools in Kisii Central District?

### **1.6. Significance of the study**

The study was intended to benefit a number of organizations which include; the government. The government has formulated a National ICT policy through the Ministry of Information and Communication from which the MOE has derived its policy. The pitfalls and limitations of the policy would be exposed by this study and the government can improve on it alongside financing ICT; ICT skilled personnel and source of electric power. The school managers and teachers would benefit as they would receive knowledge pertaining forms of financing ICTs, role of skilled personnel in implementing

ICTs in schools, the availability of National ICT policy and its influence on implementation and the place of the source of power in ensuring implementation of ICTs in secondary schools; above all, the researchers and students can benefit. The researchers will discover the existing gaps in training, supply of source of electric power, availability of finances and the National ICT policy and suggest a further improvement to influence the implementation of ICTs in secondary schools in KCD and Kenya as a whole.

In the event that the finances influence implementation, the schools would be advised to source for finances. If the ICT skilled personnel influence implementation of ICTs in schools, the schools would be advised to source for and employ ICTs skilled personnel. Above all, if the source of power would be the ultimate factor influencing ICT implementation, then the schools would be advised to be connected to electric power. In this section, the main factors which influenced implementation of ICTs which include; availability of National ICT policy; financing of ICT; availability of source of power and ICT skilled personnel may or may not influence the implementation of ICTs in public secondary schools in Kisii Central District. With or without the knowledge of the existence of a National ICT policy, schools can undertake the implementation of ICTs. Lack of knowledge of existence of availability of National ICT policy influenced implementation of ICTs in schools.

Finances do not affect implementation of ICTs in public secondary schools in KCD. Implementation can be done without the finances. In the event that finances are unavailable, the government can provide computers and all the software to make the ICTs implementation in schools a reality. Trained ICT skilled personnel played a critical role in influencing ICTs implementation in public secondary schools. Without trained

personnel, implementation would not be possible. With or without trained personnel in schools, implementation of ICTs can be done through hired ICT skilled personnel. Electric power was one of the facilities which influenced implementation of ICTs in schools. Lack of source of electric power affected ICTs implementation in public secondary schools in KCD.

### **1.7. Basic assumptions of the study**

This study would not be affected by limited knowledge about ICTs implementation in secondary schools in KCD. Inadequate or limited ICT infrastructure will not affect this study. The current economic situation in Kenya would not affect the implementation of National ICT policy on education neither will the politics nor the set of religious beliefs prevailing in the target population going to affect the ICTs implementation in public secondary schools in Kisii Central District. Lack of adequate finances and ICT skilled personnel would not affect the ICTs implementation in public secondary schools in KCD.

### **1.8. Limitations of the study**

This study may be hindered by respondents failing to complete the questionnaire. This will be overcome by using other data collection instruments such as observations and interviews, and surplus questionnaires were administered to cater for incomplete ones. Poor road network may limit this study. This was countered by using research assistants to cover the target population faster. Inadequate finance might hinder the study but this was to be countered by the researcher sourcing for more funds by getting a credit facility. Ambiguity of some questions in the questionnaires and interview guides led to discrepancies in interpretations by both respondents and the researcher leading to

emerging of conflicting interpretations of data. Securing appointments with principals and ICT skilled teachers was cumbersome.

### **1.9. Delimitation of the study**

This study would be successful because of a number of reasons which include; ICT financing influenced implementation of ICTs in public secondary schools in KCD. The National Policy on ICT will play a critical role in the implementation of ICTs in the public secondary schools in KCD, and this explains the reason for the success of this study. The ICT skilled personnel will play a major role in successful implementation of ICTs in public secondary schools in KCD and thus enhanced teaching and learning of ICT courses in schools and the teaching and learning of other subjects using ICTs as tools of instruction. Above all, the source of power influenced the implementation of ICTs in the public secondary schools in KCD. This in turn enhanced teaching and learning of computer lessons in the schools. Availability of ICT facilities such as computers, computer labs and internet access would lead to the success of the study.

### **1.10 Definition of significant terms used in the study**

**Implementation:** Measured by actual ICT presence in schools and utilization of the same.

**ICT:** For the purpose of this study Information Communication Technology is measured by the use of both the hardware/software for networking, storage retrieving and manipulation of information

**Internet:** It is used in the context of computer science which refers computer networks to link one another and provide information resources and between computer systems and their final users. Connectivity allows computer to communicate over a network measured by utilization by teachers and learners for e-teaching and learning.

**Personnel:** Measured by teachers having enough ability, experience and knowledge to use computers for teaching and learning, technicians to maintain ICT using the computers and support staff.

**Management:** It refers to the act of running or controlling a business. In this study is measured by installing computers in schools and utilizing them for learning which includes e-teaching and student information search.



- Policy:** For the purpose of this study policy is measured by existence of government policy on ICT in education. Policy refers to Government ICT policy and whether it has been domesticated in school.
- Curriculum:** It is measured by schools offering ICT as subject course in their curriculum.
- ICT facilities:** It entails the basic facilities that facilitate ICTs utilization in schools, for example computers, computer labs, internet access and uninterrupted electricity and furniture.

### **1.11 Organization of the study**

The study is titled implementation of information communication technologies in Public Secondary schools in Kisii Central District. Chapter one deals with the background of the study. Under this chapter, the importance of education was highlighted and the usefulness of investing in ICTs to enhance teaching and learning in schools. ICT and learning has an egg- chicken relationship and therefore, for countries to survive socio-economic and political competition, ICT is a must. Significant terms in the study are also explained in chapter one.

Chapter two has dealt with literature review. The chapter concerned itself with the status of ICT in education in countries such as U.S.A , Canada, Sweden, U.K and Australia. It also examined ICT situation in Ghana, Nigeria, Uganda, Kenya and Kisii Central District. It clearly emerged that ICT in education in all these countries was a

critical component in driving teaching and learning in schools. Most countries have embraced ICTs because of its competitive advantage in all aspects of life.

Chapter three has espoused the research methodology employed in this study. Descriptive survey was employed to examine the situation of ICT implementation in Public Secondary Schools in Kisii Central District. The chapter deals with data collection instruments such as the questionnaires and interview schedule. The study has chapter four which deals with data analysis, presentation, interpretation and discussion. Chapter five of this study deals with summary of findings, conclusions and recommendations.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter deals with literature reviews touching on issues related to ICTs and education. It more specifically touches on human and technological factors that influence ICTs implementation in secondary schools. The chapter thus has an introduction which deals with the role of ICTs in education, the body of the chapter discusses the factors that influence ICTs implementation in educational institutions in various countries of the world and the final part consists of the conceptual framework. ICTs have evolved rapidly since mid of 20<sup>th</sup> century; the convergence and pervasiveness of ICTs give them a strong role in development and globalization Nwagwa, (2006). ICTs have a significant impact on all areas of human activity (Brakel and Chisenga, 2003).

##### **2.1.1 : Importance of ICT in education**

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 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). In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. 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. According to Zainol (1999), and Siegel (2003), a trained and well skilled workforce is instrumental for enhancing work and economic performance. For a country to succeed economically, it has to invest heavily in education and training (Drimbo, 2005). Therefore there should be heavy investment in education and training importance of ICT in education.

With increasing emphasis on education all over the world, educationists are researching new methods to effectively impart knowledge to students. Modern students are no longer limited to school and college grades but refresher courses, corporate training, orientation courses at government and defence, skill enhancement schools, e.t.c have found ever increasing number of students. Transfer of maximum knowledge in the minimum possible time is the ultimate aim of all the educational institutes. In the modern world of information overload, specialization and super-specialization is now driving the education industry. Therefore, the world is adapting the latest interactive learning and teaching methods that help everyone to reach the pinnacle of education. Information and Communication Technology has revolutionized almost every facet of life (Mureithi and Munywa, 2006).

### **2.1.2 ICT Policy in U.K schools.**

According to (Becta, 2005) computer literacy and studies in United Kingdom (U.K) schools was introduced as a pilot project in (1984 – 1985). During 8<sup>th</sup> five year plan, the project was adopted as centrally sponsored scheme and government aided secondary schools which were given BBC micro computers. In July 1998, National talk force on information Technology and software development made recommendations that

ICT be introduced in education sector including schools. Since then, ICT has benefited U.K schools in several ways as follows:

Students have access to the internet and consequently information search; rate of school drop out has declined; it has promoted student centred learning; it has created interest and motivation among learners and it has linked schools to libraries and other ICT centres.

### **2.1.3 Implementation of ICT in education in U.K, U.S.A, Canada, Denmark, Sweden, India, Ghana, Nigeria and Uganda.**

The ICT learning strategies on National and institutional levels has been a focus in European countries such as United Kingdom (UK), Australia, Sweden, and other countries like United States (US) and Canada. All these are English speaking countries (Holmberg, and Hansson, 2002). ICTs in education have been influenced majorly by ICT policies in individual governments and the financing of the ICTs in education by the same governments.

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The existing ICT policies have led to globalization of education. In Sweden, it is also clear that technological knowledge in ICT has assisted in the promotion of ICTs in education. In Denmark, the public finances ICT to the tune of 50%. Also ICTs are tailored in most European countries to meet the pedagogical objectives in education. ICTs implementation has been a continual process. It has not only supported the key curricular process, it has facilitated a wide range of teaching and learning styles connecting all schools, colleges, libraries universities and as many community centres as possible. The significance of ICTs in schools include; Ensuring that serving teachers

feel confident and are competent to teach ICT within the curriculum and that librarians are similarly trained and enabling school learners to have a good understanding of ICT, with measures in place to assess the competence in it (Bates, 2001).

Some of the factors that have made ICTs in schools possible include; accessibility by school to an adequate, sustainable and manageable ICT infrastructure; connection of schools to each other to their communities and to the internet; teachers have easy access to a diverse range of educational online content; teachers are confident enough with their practice to know when and how to use ICT and when not to use it. In UK, policy makers realized that the key measures of successful infrastructure provision must go beyond simple computer: pupil ratios and look to the issue of manageability and sustainability. Every school in UK has been connected to the “information superhighway”.

The Netherlands and Denmark have also implanted ICTs in their schools with funds being given by the state. Their diverse provision of ICTs give choice to parents and encourages innovation and customer focus, and bids up standards as schools strive to win the support of more parents and so increase their share of the state’s funding. In America, more than three decades ago, ICTs were introduced to educators as educational tools. Koisakowak- author of the Benefits of Information Technology notes that Today there is computers of various descriptions in U.S.A. Teachers, school administrators, government officials and others faced with the costs involved in technology implementation must constantly escalate the education benefits technology (Becta, 2005).

Today, there are computers of various descriptions in nearly all schools in the United States. Teachers, school administrators, government officials and others faced

with the costs involved in technology implementation must constantly evaluate the education technology. In the Commonwealth of Dominica, the MOEYA & HRD has considered ICT to be one of the pillars upon which quality education for all can indeed become a reality, because of its unique capacity for bringing the world to even the most remote and disadvantaged of communities (Abraham, Durand, Cert, Ed. 2004).

The Ministry of Education recognizes that: Accessibility and utilization of knowledge are fundamental to the development of the country's citizenry; In light of growing impact of advanced ICTs on the economy of the country, each student must be provided with access to up-to-date computer based tools so as to make valid contribution to society. The integration of ICT in the education system can eventually boost the economic engine of the country because the courses are developed by local educators and can be exported; Curriculum reform is necessary for ICT to be introduced and utilized effectively in the classroom. ICT must be exploited to allow students greater control over their learning and thus develop skills and speed at their own level; ICT is innovative vehicle by which student can more readily explore broader world views and their own self actualization.

The potential of all individuals (including those with special needs) can be enhanced by the use of ICT learning tools. Equity of access must be the overriding consideration in any ICT programme being implemented. The availability of authority packages for use by teachers in the development of their own instructional material can have positive impact on the teaching learning process. National and international copyright laws must be respected by all individuals involved in the incorporation of ICT into the education system. The introduction of ICT in the Education sector necessitates

the training of all personnel of the MOEYA & HRD and familiarity with the process involved.

According (Becta, 2000), there is a wide applicability of ICT in the area of social science and humanities, which include geography, history, citizenship and in Scotland, modern studies. In all of these areas, ICT increases opportunities for communication and collaboration and makes the subject of study more authentic and relevant. The internet in particular, provides access to a comprehensive range of communities and events as well as access to information and views about global issues.

In geography, as well as engaging and motivating students about important concepts, ICT has been found to enhance geographic knowledge through access to resource materials, improve presentation of reports and written assignments, and facilitate communications which broaden experience of people, places and environments Becta, (2004). Becta also concluded that use of ICT makes geography more authentic and relevant, increases opportunities for communication and collaboration and can, by taking away or reducing mechanical processing, offer more time for observation, discussion and analysis. In virtually every country which has embraced ICTs in the world today, the commonest features appearing as factors affecting the implementation include government policy, funding by government, trained technicians and teachers and above all availability of power.

#### **2.1.4 Implementation of ICTs in Ghanaian schools**

According to Mangesi, (2007), in Ghana, the government has placed a strong emphasis on the role of ICT in contributing to the country's economy. The country's



medium-term development plan captured in the Ghana poverty reduction strategy paper (GPRS i & ii) and the Education strategic plan 2003 – 2015 all suggest the use of ICT as a means of reaching out to the poor in Ghana. In 2004, parliament passed into law Ghana's ICT for Accelerated development (ICT 4AD) policy which is currently at various stages of implementation. This policy represents the vision of Ghana in the information age and addresses 14 priority focus areas or pillars. The ICT education policy in Ghana had a long gestation period. An attempt at policy development for the sector predates the National ICT policy.

A committee set up by the ministry of education, youth and sports outlined an ICT in education policy framework and produced a document that remained untouched for a long time. The objectives of the policy include: Ensure that students have ICT literacy skills before coming out of each level of education; Provide guidelines for integrating ICT resources for all schools; Facilitate training of Teachers and students in ICT; Determine the type and level of ICT needed by schools for teaching and administration purposes; Promote ICT as a learning tool in the school curriculum at all levels.

Through the help of various agencies, including Global-schools and communities initiative (GeSCI), final ICTs in education policy document has been finalized and released. As one of the first African countries to liberalize its telecommunication sector, Ghana has made tremendous progress in ICT infrastructure development. But like many parts of Africa, the ICT has left behind the Internet and computing. There are also significant differences in urban and rural access to ICTs. In secondary education sector, a

project to set up computer laboratories in all science schools in the country has led to a significant number of computers being installed across the country.

There is, however, a great disparity between public and private schools as well as between urban and rural areas in access to ICTs. In schools where ICTs exist, a number of teachers use the Internet for research. Smart boards and projectors are also available in such schools. The school curriculum however is not yet on CD, even though it has been a policy issue for many years.

#### **2.1.5 Implementation of ICTs in Nigerian schools**

Views aired by Evoh (2007), are that Nigeria is another success story country in effective ICTs implementations in schools. Improved secondary education is essential to the creation of effective human capital in any country. The need for ICT in Nigerian secondary schools cannot be overemphasized. In this technology – driven age, everyone requires ICT.

The Federal Government of Nigeria, in the National policy on Education Federal Republic of Nigeria, (2004), recognizes the prominent role of ICTs in the modern world, and has integrated ICTs in education in Nigeria. To actualize this goal, the document states that government will provide basic infrastructure. At junior secondary school, computer education has been made a pre-vocational elective and is a vocational elective at senior secondary school. It is also the intention of government to provide necessary infrastructure and training for the integration of ICTs in the secondary school system.

In 1998, the Nigerian government enacted a policy computer education, although computer education was officially introduced in 2004, the plan was to establish pilot

schools and diffuse computer education innovation first to all secondary schools, and then to primary schools. Okebukola (1997), cited by Ogiegbaen and Iyamu (2005), Concludes that the computer is not part of the classroom technology in more than 90 percent of Nigerian public schools. This implies that chalkboard and text book continues to dominate classroom activities in most Nigerian secondary schools.

It is worthy to note however that of late, the Federal Ministry of Education has launched an ICT-driven project known as school Net ([www.snnng.org](http://www.snnng.org)). Federal Republic of Nigeria, (2006); (2005); Okebukola, (2004), which is intended to equip all schools in Nigeria with computers and communication technologies.

In June 2003, at the African summit of the world economic forum held in Durban, South Africa, the New partnership for African Development (NEPAD) launched the e-schools initiative, intended to equip all Africa high schools with ICT equipment, including computers, radio and television sets, phones and fax machines, communication equipments, scanners, digital cameras and copiers among other things. Effective implementation has not however been realized due to factors such as: unavailability of some ICT components in schools which hampers teachers' use of ICTs; lack of adequate search skills and of access points in the schools are reported as factors inhibiting the use of internet by the secondary school teachers (Kaku, 2005); the absence of ICT equipment in most Nigerian secondary schools makes students to resort to cybercafés for internet access. Most Cybercafés clients in Nigeria are students (Adomi, Okiy and Ruteyan, 2003).

### **2.1.6 Implementation of ICTs in Ugandan schools**

According to Matovu, R. (2009), Uganda is another case of African countries which have done well in the effective implementation and use of ICTs in rural secondary schools. Uganda has an established training centre for Teacher professional development in ICTs which perform the following tasks: helping schools to enhance the teaching and learning process using Information Communication Technology through provision of affordable computers; ICT for Education advise and sensitization, technical capacity and building support; teacher pedagogical professional development and support; local education content development, school networking and school international linkages for project based learning. School Net Uganda with the support of the world bank institute, world links organization, schools online, Bill and Melinda gates foundation and the Ministry of Education and sports implemented a 2-year pilot project (2002 – 2003) for rural school connectivity in Uganda. This was the first school based VSAT connectivity in Africa.

The project involved 15 schools located in different parts of the country. The VSAT installation and commissioning was done by Wilken AFSAT and Verester, a Global communication solution provider provided a satellite band width. The participating schools acted as school-based tele-centres (SBTs). For a school based tele-centre, the ICT resources which are based at school are open to the community after school hours, over the weekend and during the holidays.

The effective implementation of VSAT project in Uganda has led to the following impact: Uganda has become advanced beyond many other developing countries in terms of rural connectivity and in particular in the dissemination of VSAT technologies; Teachers and students in rural schools move rapidly toward the use of ICT resources to support learning across the curriculum, and to the development of high value skills for globalizing economies as a result of access to computers and the internet and access to teacher professional development; the project catalyzed setting up of ICT resources in rural areas by business entrepreneurs and setting up internet points of presences (POP) in rural towns.

#### **2.1.7 Implementation of ICTs in Kenyan schools**

ICT skills play a key role in promoting economic development of a country. Many of the productivity gains in the developed world economies over the past two decades can to a great extent be attributed to the impact of ICT (Sessional paper No. 1 of 2005). The Government has therefore formulated a National information and communication technology Policy. Education and training sector has a major role to play in the implementation of the proposed ICT policy.

Information and communication technology have a direct role to play in education and if appropriately as, ICT can bring many benefits to the classroom and the education and training in general. It will promote student centred teaching, opportunity to reach more learners, greater opportunity for teacher-to-teacher, and student-to-student communication and collaboration. It will also create greater enthusiasm for learning in line with the Government of Kenya (Sessional Paper No. 1 of 2005).

According to the Kenya report which presented research findings of the Pan African Research Agenda on the Pedagogical integration of ICT in education in Kenya, it concluded that a National ICT policy exists in Kenya. Further, among factors which were discovered to hinder or encourage ICTs implementation include: the ICT skills of the school managers, for example at Uthiru ICTs have been effectively implemented because the principal has higher Diploma in ICT; inadequate computers and inadequate ICT skilled teachers especially in schools where principals are not ICT skilled, teachers are not trained and vice versa. Lack of a unified ICT curriculum in primary, frequent power blackouts and the problem of viruses have hindered ICT implementation in schools.

According to a document webmaster, the business daily (January 14, 2010), In Kenya, several initiatives to computerize public schools by government and private sector are paving the way to electronic learning in Kenya which may not only change how students access learning materials but also boost the quality of education especially in remote areas where there are no libraries. Current statistics from the Ministry of Education indicates that less than 2 percent of public primary schools have access to basic computer studies and only 800 out of the 4,000 public secondary schools have computers. However, through the public private partnership programmes, the Ministry of Education has plans to boost this number over the next three years. Some of these initiatives include the digitization of school syllabus by the Kenya institute of education; computer donations and networking by telecommunication regulator, Communications Commission of Kenya (CCK), and partnership programme by the Clinton Global initiative, Cisco, Intel, Microsoft and USAID aimed at improving education in Kenya.

In 2009, the Kenya Institute of Education (KIE) launched the first phase of a curriculum digitization project that will enable both public secondary and primary schools to start offering e-learning. Curriculum review efforts making Kenya the ICT hub of Africa will from now be geared towards modernization, including intensification of the integration of ICTs to cover all sub-sectors. The initiative started in 2005 and KIE has been working through other partners and stakeholders who are currently involved in developing the e-curriculum besides being involved in computer education pilot studies in 19 schools across the country.

The Ministry of Education objective is to have digitized content act as teaching aids to compliment the work of teachers not to replace them. Some of the challenges facing implementation of e-learning include: lack of electricity connection to most public schools and low ICT knowledge among teachers. To address this, the government through the Ministry of Energy has prioritized provision of electricity to learning institutions through the rural electrification program and the use of solar power. KIE has also developed an online course for orientation of primary teachers on the curriculum interpretation and implementation.

The Clinton global initiative last year (2009) September launched in collaboration with Kenya's MOE, the Accelerating 21<sup>st</sup> Century Education (ACE) project aimed at improving the quality of primary and secondary education through the effective use of information and communications technology. The various bodies are developing a best-in-ta class model for deploying ICT in education. Reflecting a combined commitment valued at more than 9 million, ACE will create "one-to-one e-learning" classrooms in 60 focus schools across Kenya.

One-to-one e-learning, a model in which every student has access to a computer helps to foster an environment where young people can develop skills such as problem solving, critical thinking and individual learning. ACE has plans to distribute more than 6,000 networked computers for student and teacher use and train approximately 7,000 teachers to effectively integrate ICT in the classroom.

In addition, Cisco, Intel and Microsoft will work together to establish a School Technology Innovation Centre (STIC) in Nairobi – a model that has been promoted in other countries through the Microsoft partners in learning programme. The centre will be dedicated to research on innovative emerging technology solutions and serve as a repository and show case for best known methods of teaching, learning and educational technology

In KCD where the study will be based, investigation will be whether implementation of ICTs in public secondary schools has been done. A general survey has indicated that, out of 50 public rural secondary schools, only 12 schools have launched use of ICTs. The study will therefore concern itself with establishing factors that will influence the implementation of ICTs in these schools and whether the computers are fully under use and the benefits accrued out of the ICTs in these schools.

The researcher will endeavour to establish why some schools have not effectively implemented the ICTs and what the obstacles are and suggest the way forward.

#### **2.1.8 Rationale for ICT**

According to Obura, Musili and Etta, (2010), the whole world has embraced ICT as a major player in socio-economic development. It has become a major industry out to



economically empower populations technologically in these countries as it plays a key role in human capital development, creation of employment thus raising standards of living, foreign exchange through export led ICT services and products and the improvement of general security. ICTs is the way to go in the modern world. In Developed Countries like Greece, Luxembourg, Mexico, Poland and Spain, employment in ICT sector is estimated to be 12.8 million persons (35%, thereof in the USA, 16% in Japan, 9% in the UK 8% in Germany, 3.5% in South Korea). ICT use by households is on the increase.

The Winning Formula of Computers for schools Kenya: International De..page 1 of 13, over and above fairly common national goals for education, there exists clear need and rationale for the incorporation of ICTs into the educational system and process in Kenya. Three of the reasons for integrating ICTs into education are: The risk of being marginalized in the new development dispensation due to information and knowledge poverty: In order to be part of the international economic processes that would benefit local people, it is imperative to be part of the international information exchange. To remain a part from it will mean poor prices for national, agricultural and non-agricultural produce, unfavorable economic relationships and an inability to influence or be involved to the best advantage in international events.

The risk of producing redundant human capacity in a globalized job market that envisions unfettered movement of knowledge; labour and skills: Globalization has brought new opportunities as well as demands on educational systems the world over. The competition is not restricted to learners seeking the best schools and training; it is also between countries seeking to offer the best training and opportunities to woo

students along with their money in fees on one hand, and among locations and localities as better managers or sources of knowledge and information, on the other. Winning countries, localities, and locations using ICTs get higher numbers of students as well as the money these students bring and offer superior knowledge and information products.

In the worst case scenario, Kenyan graduates could be unemployable outside or possibly even inside the country on account of poor training. Limited resources as an ever-present risk in most education systems, including Kenya: Human resources for the education system, in the main, teachers, are hugely insufficient especially when the decimating influence of HIV/AIDS in Africa is factored into the teacher supplying equation. Non-human resources such as teaching and learning materials are evidently insufficient to support the growing needs of the educational system in Kenya. ICTs can come to the rescue as they can tremendously expand the reach.

#### **2.1.9 Role of ICT in teaching and learning .**

According to Rae Condie and Bob Munro (January, 2007), ICTs play a significant role in teaching and learning. ICT has a number of roles in enhancing teaching and learning which include; learning and attainment. According to Passey et al, (2004), where ICT is clearly embedded, in classroom activity, there is positive impact on pupil attainment. Valentine et al, (2005), found that parents and students believed that ICT improved motivation and confidence, made school work enjoyable and improved achievement. ICTs play an important role on student's motivation and engagement.

Increased motivation and improved engagement is exhibited by students when ICT is used in learning and teaching, both overall and in relation to specific technologies

such as digital video (Pittard et al, 2003; Passey, 2005; Passey et al, 2004; Becta, 2003a). Learning outcomes, behaviour, school attendance, truancy, anti-social behaviour, and uses of digital content has been significantly improved. ICTs have enhanced creativity among learners. Creativity is the generation of new ideas and concepts.

Loveless (2002, identified ICT as a set of tools that could be selected and developed as and when appropriate in the creative process. Creativity is regarded as central to children's abilities to work imaginatively and with a purpose, to judge the value of contributions and to fashion responses to problems posed across the curriculum (Facer and Williamson, 2004). With some of these roles put into play, the teaching learning impact will be felt in specific areas such as: English language; literacy and English languages, science; Social Sciences and humanities (Becta: 2003c; 2003d; and 2003e). ICTs equally will play an important role in enhancement of school administration and Board of governors to perform their functions more effectively.

## **2.2 Variables likely to influence implementation of ICT**

According to Christopher Gakuu and Harriet Kidombo (2006), several factors hinder or encourage the use of ICTs; the ICT skills of the school manager are a major success factor. An ICT compliant manager will influence school to effectively implement ICTs in his/her school; Adomi and Kpangban (2010), have cited poor information infrastructures; inadequate ICT facilities in schools; absence of electric power connections to schools and frequent electricity interruptions; non integration of ICTs into the school curriculum; poor ICT policy and ICT project implementation strategy; inadequate ICT manpower in the schools; limited ICT skills among teachers;

shortage of funds and inadequate ICT facilities in schools such as ICT software and hardware. All the above cited variables will affect effective implementation of ICTs in KCD Secondary Schools.

### **2.2.1 Theoretical framework of the study**

The study applied a number of learning theories and other relevant theories. The theories include:- constructivism theory and multimedia learning theory. Constructivism views learning as a process in which the learner actively construct builds new ideas of concepts based upon current and past knowledge or experience.

Learning involves constructing one's own knowledge from one's own experiences. This is also known as social constructivism. Social constructivism has it that knowledge is constructed when individuals engage socially in talk and activity about shared tasks. This study has employed this theory on the basis of careful and systematic survey of ICT situation in PSS in KCD. Indeed the study has borrowed heavily from the theory's key aspects such as experiential learning and transformational learning. In order to transform the state of ICTs in KCD, something ought to be done based on the state of ICTs in order to transform the ICT situation in PSS in KCD.

On the other hand, multimedia theory focuses on principles for the effective use of multimedia in learning. Considering the relevance of this study with the theory of multimedia learning, the researcher will greatly drew ideas which led to the success of the study (Wikipedia, free encyclopedia). According to Kombo and Tromp (2006), a theory is a reasoned statement or groups of statements, which are supported by evidence, meant to explain a phenomenon. They are a systematic explanation of the relationship

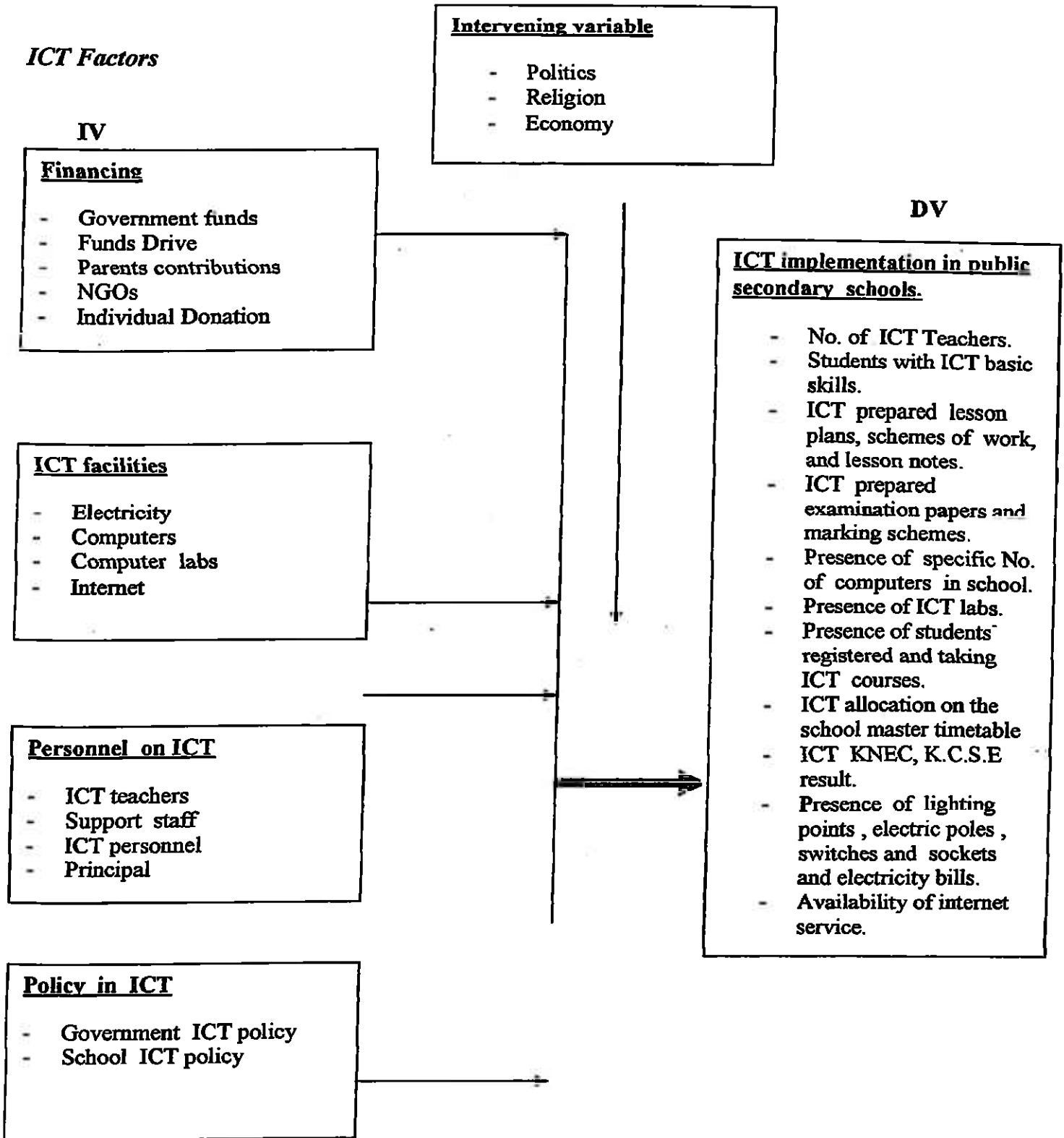
among the phenomenon. Theories provide a generalized explanation to an occurrence. The research employed structural functionalism theory (Durkheim; 1858-1917). According to this theory, a human society is like an organism and is made up of structure called social institutions. According to the theory, human society will function if various institutions will play their roles effectively. In this study, as a result of being interrelated and independent, one variable will affect others and ultimately the whole. The theory will be used to point out why and how some schools have effectively implemented ICTs and others have not done so.

### **2.2.2 Conceptual framework of the study.**

The conceptual framework of the study entails the case study of PSS in KCD. For purposes of this study, ICTs implementation in PSS in KCD will be measured using Dependent variables (Dvs) which include; personnel in ICT in the schools, availability of ICT curriculum, availability of ICT prepared lesson plans, schemes of work and analyzed exams, number of computers in schools, number of students taking computer courses and availability of E-mails and internet services. For purposes of this research, factors influencing implementation of ICTs will be characterized by independent variable which include; availability of ICT policy, financing ICTs, availability of source of power and availability of ICT skilled personnel.

### 2.2.3 Conceptual framework

Figure 1



#### **2.2.4 Summary of the Literature review**

According to the Literature review, ICT will not only support key curricular processes; it will facilitate a wide range of teaching and learning styles connecting all schools, colleges, libraries, universities and as many community centers as possible to the grid. This will ensure that; serving teachers feel confident and are competent to teach ICT within the curriculum, and that librarians are similarly trained and enabling school leavers to have a good understanding of ICT, with measures in place for assessing their competence in it. Further it was clear that most countries which had embraced and implemented ICTs had structured their approach. For instance, most governments have developed ICT policies in education. Besides that, these countries have literary funded the implementation of ICTs in schools. The finances provided by governments are used for procurement of ICT facilities such as computers, connecting schools with internet. Alongside that, the governments have used the finances to purchase the ICT software. On training, the governments have developed programmes on training personnel on ICT. The countries that have implemented ICTs in schools have also ensured development of training programmes for ICT personnel and the relevant ICT skills have been imparted to these personnel.

Although some governments have implemented ICTs in schools, it was also clear that internet was not adequately used in schools. It was clear that the governments of the world have taken ICTs very seriously and have taken deliberate steps to invest in ICTs. In Kenya, the Ministry of Education has developed a policy on ICT whereby the Kenya Education Sector Support Programme (KESSP) is the vehicle through which ICTs are implemented in schools. In Kenya, the MOE has underscored the need to

manage school programmes through the use of ICTs by school administration, teaching students basic ICT skills, processing examinations, information search and research. Above all to promote e-learning by linking libraries, other schools, universities and community centres.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter discussed the methodology used in conducting this study which included: Research design; population of study, sample size and sampling procedures, data collection instruments and its validity and reliability; data collection procedures, data analysis time frame and budget.

#### **3.2 Research design**

The research design used in this study was descriptive survey. The study was aimed at collecting information from respondents on which factors influenced ICTs implementation in PSS in KCD. The descriptive survey was chosen because of its appropriateness in dealing with data which would be easily quantified. The research sought to establish the no. of computers in schools, no. of schools with computers, number of ICT personnel in schools, no. of schools with internet access, no. of schools connected with electricity and the total no. of computer labs in school.

The study sought to establish the existing situation of factors that influenced ICTS implementation in PSS in KCD. A questionnaire was administered and interviews were conducted on respondents to establish key factors that influenced ICTs implementation in public secondary schools in KCD (Orodho, 2003). The research sought to survey PSS in KCD by use of questionnaires and conducting interview guides on students, the principals and the ICT skilled teachers.

The researcher used purposive sampling and simple random sampling in coming up with sample size. This was necessary to cater for all the characteristics of the target population for proper generalization of results.

### **3.3 Target population**

The study was carried out in Kisii Central District, Nyanza Province, Kenya. The study population involved 50 public secondary schools in KCD whereby the researcher sought to establish the factors that influenced ICTs implementation in these schools. The total student population was 15,500, a teaching force of 960 teachers and six divisional education officers that represented six educational divisions in the district.

Target population consisted of 50 Public Secondary schools from KCD. This study targeted principals of schools, ICT skilled teachers and students who constituted the population that was directly concerned with the utilization of ICTs in schools. The principals represented ICT policy and financing of ICTs implementation in schools. The ICT skilled teachers represented implementation of ICT curriculum course to the learners and the students represented the use of ICT services such as internet and e-mail. They therefore could give information related to their areas of concern.

### **3.4 Sample and sampling techniques**

The study selected 17 public secondary schools in KCD as a sample of study which was at least 1/3 of the total target population (Mugenda & Mugenda 1999). The method used to arrive at this sample was purposive sampling because a general survey of ICTs situation in PSS of KCD assisted in identifying the specific characteristics that the

researcher was interested in. There are thirteen Districts in the larger Kisii region representing the universe namely: Nyamira North, Borabu, Kisii South, Gucha South, Gucha District, Kenyena, Nyamache, Masaba South, Masaba North, Nyamira, Marani, Manga and Kisii central itself. Public secondary schools were stratified as District day, mixed provincial boarding, girls and boys boarding schools. This was done to ensure equitable representation. Kisii Central District was chosen purposively from among the districts as a sample of the study. KCD was chosen due to varied reasons which included: high number of students' population that is, 15,500; high number of teachers that was 960, and many public schools which add up to 50. The case of Kisii Central district ICTs implementation would be replicated elsewhere within the region and outside. Thus, the benefits which will be accrued from selecting KCD rural secondary schools will have been ignored if random sampling technique was adopted to select public rural secondary schools (PSS) in any district from among 13 districts. Purposive selecting of KCD covers all PSS in KCD whether they are or not under ICTs implementation programme. KCD has a total number of 50 public rural secondary schools.

The district has different categories of schools ranging from district day schools most of which are Mixed , Provincial Mixed Boarding schools, Provincial Girls' Boarding Schools and Provincial Boys' Boarding Schools.

**Table 1: Nature of public secondary schools in KCD**

<b>SCHOOLS</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
District mixed day	40	80%
Provincial mixed day and boarding	4	8%
Provincial girls boarding	3	6%
Provincial boys boarding	3	6%
<b>Total</b>	<b>50</b>	<b>100%</b>

The table above provided a list of schools in the district and it indicates the nature of schools that exist in the district in terms of various categories. Over 80% of schools in the district are district mixed day schools with enrolment ranging from 100 to 300 students.

### **3.5 Research instruments**

The study employed the following methods and data collection instruments; questionnaires and interview guides.

A questionnaire was used as the main tool for data collection. The questionnaire method was considered most appropriate since data to be collected was majorly quantitative. A questionnaire also collected data within a short period of time (Oso and Onen 2005). The questionnaire had three features consisting demographic information, factors influencing ICTs implementation in KCD. Personal interview guides and

observation schedules were also conducted as they were more realistic. Three sets of questionnaires were administered on the respondents and interview guides on interviewees who consisted of principals of schools, students and ICT skilled teachers. Interview guides were important because they captured the words of the informants, data was accessed at the convenience of the researcher and it saved time and expenses. 68 questionnaires were administered to and targeted the following sample population for information:

17 to principals of schools ; 17 to teachers handling ICT courses in schools and 34 to students from the sampled schools. The questionnaires for principals endeavoured to bring out the demographic population and the factors influencing ICT implementation. The questionnaires for ICT teachers addressed the extent of implementation of ICT in schools and above all the questionnaire for students sought to find out the various services and benefits obtained from using ICT in teaching and learning.

The questionnaires contained both closed and open ended questions for purposes of clarity and detailed information on ICT implementation.

### **3.5.1 Piloting of questionnaires**

Five questionnaires were piloted prior to actual data collection. The questionnaires were administered to competent trained ICT knowledgeable personnel for purposes of acting as a safeguard against any errors during actual data collection. This was also aimed at testing the effectiveness of the questionnaires to aid collecting the targeted data without much deviation. It would also provide a basis for

comparison after actual data collection to ensure realistic and relevant data was obtained.

**Table 2: Data analysis instrument table**

<b>INSTRUMENT</b>	<b>TARGET RESPONDENTS</b>	<b>DATA TYPE</b>	<b>OBJECTIVE ADDRESSED</b>
Questionnaire	Principals	Primary	Availability of ICT school policy
Document analysis	Management	Secondary	Human resource availability and finances
Observation	Students	Secondary	Availability of electric power and policy

### **3.6 Reliability and validity of instruments**

According to Kombo and Delno (2006), reliability is a measure of how consistent the results from a test are. The reliability of the research instruments were measured using split half according to Roscoe (1993), which involved splitting the instruments into halves (Odds and evens) then calculating the object's correlation coefficient between the scores divided into two categories, then the items were divided into two comparable halves and coefficient of correlation calculated for the two halves. The split halves were transformed into an appropriate reliability estimate for the entire test and spearman-Brown-prophecy formula was applied.

$$R_{xx} = 2r_{\frac{1}{2} \frac{1}{2}}$$

$$\frac{1+r_{\frac{1}{2} \frac{1}{2}}}{1+r_{\frac{1}{2} \frac{1}{2}}}$$

Where  $R_{xx}$  was the estimated reliability of the entire test.  $r^{1/2}$  was the Pearson's (r) correlation between the two halves. Views aired by *Roscoe J. (1983)*, *fundamental Research statistics for behavioural sciences New York: (KOH P102)* by using the above, reliability of items were determined. According to *Fraenkel and Wallen (2000)*, an alpha value of 0.7 and above is considered suitable to make inferences that are accurate enough. To ensure internal consistency, questionnaires with two sets of similar questions that measured the same variables were issued out and after completion, comparisons were made. Thereafter causal relationship between what was to be and what was not be measured were assessed. Study instrument were tested for both reliability and validity by piloting it in a sample of highly knowledgeable and qualified personnel on issues related to ICTs.

### **3.7 Data collection procedures**

The researcher applied for a permit from the Ministry of Higher Education, Science and Technology (MOHEST) and then from the University of Nairobi (UoN) that enabled him to proceed to the provincial administration for an introduction letter before proceeding to collect data. The researcher had a schedule of dates when the questionnaire was to be administered. Research instruments were pre-tested and the research piloted the questionnaire with a representative sample. The data in this study was collected by use of three questionnaires which were administered to sixty eight respondents who included 17 principals of sampled schools, 17 ICT skilled teachers from sampled schools and 34 students drawn from sampled schools. On the appointed day the researcher personally went out to meet respondents who were to be drawn from 17 public secondary schools. Alongside this, extra questionnaires were administered to carefully

ICT knowledgeable personnel in these schools which would be used for purposes of comparisons to ascertain the validity and reliability. This was also to be a representative sample outside the selected sample.

### **3.8 Data analysis techniques**

The study applied quantitative research methods which included both descriptive and inferential methods. After collection of data, the researcher used statistical tools such as measures of central tendency and descriptive statistics which included, ratios, percentages and frequencies to analyze data. Friedman's test was applied to help evaluate the relative importance of variables and to enable the researcher to measure the extent of ICT implementation in public secondary schools in KCD. Factor analysis was also applicable for data analyzes. Factor analysis is systematic statistical procedure used to uncover relationships among several variables and also reduces responses to manageable factors.



### 3.9: Operationalization table

**Table 3: Operationalization Table**

RESEARCH OBJECTIVE	TYPE OF VARIABLE	INDICATOR	MEASURE	LEVEL OF SCALE	DATA COLLECTION METHOD	DATA ANALYSIS METHOD
Policy interventions	I.V. School policy	Minutes of the B.O.G.	Number of Computer labs and ICT personnel.	Ratio	Survey	Qualitative/Quantitative
	D.V. effective implementation	Presence of computer rooms and computer teachers.	ICT teachers, KCSE ICT results and active Computer classes.	Ratio	Survey	Qualitative/Quantitative
Financing	I.V. Availability of money	Computer budget	Payroll and purchased documents.	Ratio	Survey	Qualitative/Quantitative
	D.V. effective implementation	Presence of computers and internet	Total amount of money spent on ICT.	Ratio	Survey	Qualitative/Quantitative
Availability of power	I.V. electricity	Presence of electric power	Electricity bills and electricity poles and cables	Ratio	Survey	Qualitative/Quantitative
	D.V. effective implementation	Functioning power supply	Power connected to Computer labs, sockets and lighting system.	Ratio	Survey	Qualitative/Quantitative
Human capital	I.V. Human resource	Presence of ICT teachers	Number of ICT teachers.	Ratio	Survey	Qualitative/Quantitative
	D.V. effective implementation	Availability of facilities and training	Number of Computers.	Ratio	Survey	Qualitative/Quantitative

## **CHAPTER FOUR**

### **4.0 DATA ANALYSIS, PRESENTATION AND INTERPRETATION.**

#### **4.1 Introduction.**

This study investigated the factors influencing implementation of ICT in Kisii Central District public secondary schools. The data collected was analysed mainly using descriptive statistics particularly measures of central tendency, inference and factor analysis.

#### **4.2 Questionnaire Return Rate (QRR)**

The findings from the 17 sampled schools whereby a total of 68 questionnaires were administered to 17 principals of secondary schools, 17 ICT skilled teachers and 34 students are shown in the tables below. All 68 questionnaires were responded to by the respondents, of which two questionnaires were incomplete.

#### **4.3 Demographic information about the respondents**

The sample size was 17 principals of schools, 17 ICT skilled teachers and 34 students. The statistical tool which was used in the study was mainly tables which captured the data which were collected and interpretations made appropriately.

#### **4.4 Categories of secondary schools**

Most schools surveyed were District day schools at the rate of 58.8%, followed by Provincial Boys and Girls boarding schools at 17.7% respectively and least were the Provincial Mixed Boarding Schools at 5.8%.

**Table 4.1. The Category of Schools**

<b>CATEGORY</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
District mixed day	10	58.8%
Provincial mixed boarding	1	5.8%
Provincial Girls boarding	3	17.7%
Provincial Boys boarding	3	17.7%
<b>Total</b>	<b>17</b>	<b>100%</b>

From the table presented above, it was very clear that majority of schools were day schools. The ratio of boys' to girls' schools was 1:1 and mixed boarding schools came last in the category of schools.

#### **4.5 : Age of schools.**

Out of the schools surveyed, 35.3% of schools had existed for more than 25 years; schools between 21-25 years and those between 11-15 years tied at 23.5% respectively. The schools which had existed for a long period had implemented ICTs at the rate of 47% compared to the recently established schools.

**Table 4.2**

<b>YEARS</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
Less than 5 years	0	0
06 -10	01	5.9
11 -15	4	23.5
16 -20	2	11.8
21 -25	4	23.5
Over 25	6	35.3
<b>TOTAL</b>	<b>17</b>	<b>100</b>

Most schools in the district had existed for over 25 years since they were established. According to the research, those which started in the last 10 years were the least. It was expected that most of the 35% schools that had existed for more than 25 years were to be fully compliant in the area of ICT, yet it emerged clearly that even those schools had not comprehensively implemented ICTs like schools founded in the recent past. Either they lacked awareness on the government ICT policy that required all schools to implement ICTs or they did not attach any significance to ICTs.

#### 4.6 : How ICT courses are executed in schools.

It emerged that 47% of the schools in the district offered computer as an optional course and that there was no school in the District which offered ICT as a compulsory subject.

**Table 4.3: How ICT course is executed in schools.**

<b>SCHOOLS</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
Compulsory	0	0
Optional	9	47
Not offering	8	53
<b>Total</b>	<b>17</b>	<b>100</b>

#### **Discussion**

There was no school in the district which offered ICT as a compulsory subject. 47% of the schools offered it as an optional subject while 53% did not offer it at all. This therefore clearly shows that schools did not have arrangements to equip students with basic ICT skills. The major stakeholders have a role to play to bring to eminence in their schools the usefulness of computer courses and the need to integrate ICT in teaching and learning.

#### 4.7 Ratio of computers to students

In terms of computer student ratio, the study showed that Provincial Boarding schools had a ratio of 1:51 while District schools had 1: 100. The state of implementation of ICTs in boarding schools was better than the District schools. Boarding schools had more access to computers as opposed to their day school counterparts. It also emerged that Provincial Girls' and boys' boarding schools had the highest number of student enrollments as opposed to District mixed days.

**Table 4.4. Computer Student ratio**

<b>MODE OF OPERATION</b>	<b>NO OF STUDENTS</b>	<b>NO OF COMPUTERS</b>	<b>STUDENT COMPUTER RATIO</b>
		sum	
Boarding	7300	21	1:51
Day	2100	142	1:100
<b>Total</b>	<b>9400</b>	<b>163</b>	

Most students in boarding schools had easy access to computers as compared to their day school counterparts. It also emerged those provincial girls' and boys' boarding schools had the highest number of student enrollment as opposed to district mixed day schools. It is evident from the table above that most schools were experiencing the problem of inadequate computers. This was demonstrated by a very large ratio of 1 computer being shared by 51 students in a boarding school and 100 students sharing a computer in day schools. To reverse this situation, there was need for equipping schools with more computers to satisfy the large

student enrolments. The school management and the government are duty bound to equip schools with computers by increasing their budget allocations to ICT programmes

#### 4.8: Classification of schools by gender in relation to computer accessibility

Most boys' schools had more access to computers compared to girls' schools at a ratio of 1:40 and 1:68 respectively.

**Table 4.5: Accessibility of student to computers on the basis of gender**

<b>SCHOOL CATEGORY</b>	<b>NO. OF STUDENTS</b>	<b>NO. OF COMPUTERS</b>	<b>STUDENT COMPUTER RATIO</b>
Girls	2930	43	1:68
Boys	3070	77	1:40
Mixed	2100	47	1:45

#### Discussion

For purposes of equity, the ICT policy should insist that both sexes have equal access to ICTs. This will be made possible if the government would distribute ICT resources in accordance with the ICT policy to ensure implementation of the same. This would address the disparity witnessed in terms of access. The effect of marginalization in terms of a coding both boys and girls equal opportunities in learning would be eliminated. This would remove the vulnerability of the girl child and create a spirit of equal competition among boys and girls. Managers of schools and the government should follow up the ICT policy to ensure equity in access for both boys and girls.

#### 4.9: Extent of ICT implementation in schools

Most schools in the District which had implemented ICTs applied ICTs in various service areas as follows; 58% utilized the ICTs in the office work which included 17.6% for e-learning for teaching and 17.6% for administering exams online. 17.6% was applied for mailing and chatting with peers and 5.9 percent leisure and entertainment.

**Table 4. 6: The extent of ICT implementation**

<b>ICT APPLICATION</b>	<b>APPLICATION</b>	<b>PERCENTAGE</b>
mailing and chatting with peers	1	17.6
Leisure and entertainment	1	5.9
Office work	2	58.8
Student information search	1	17.6
staff records and payroll management	3	58.8
E learning for teaching	4	17.6
Administration of on –line exams.	2	17.6
<b>Total</b>	<b>14</b>	<b>100</b>

#### **Discussion**

Although most schools had computers, the computers were not engaged in activities that directly promoted teaching and learning in schools. Instead, the computers were used for office work mostly as opposed to aiding teaching and learning. The schools will benefit the students more if the ICT, will be utilized in enhancing teaching and learning activities as they



directly affected the quality of education offered and therefore promote high standards in turn leisure and entertainment came last as far as utilization of ICTs in schools was concerned. The need to minimize stress levels in schools was important as it was capable of making students relax and disciplined. Student information search was directly linked to teaching and learning but was not being properly utilized by students and teachers.

#### 4.10: Qualification of ICT Skilled teachers

Qualification of teachers in ICT skills is critical in ensuring that ICTs are implemented in schools. Most schools in KCD had teachers with Diploma level qualification. This showed that ICT training programmes for ICT personnel which include teachers had not been adequately addressed.

**Table 4.7: Qualification of computer teachers in secondary schools**

QUALIFICATION	FREQUENCY	PERCENT
Certificate	0	0
Diploma	8	88.9
Degree	1	9.1
Total	9	100

#### Discussion

Most ICT teachers in the district were diploma holders covering 88.9% whereas those with degrees taking 9.1% which meant that the personnel was still wanting. It emerged that part of the reason for non implementation of ICT in most schools in the district was due to inadequate

ICT skilled teachers. There was need for the MOE to come up with clear ways of training adequate ICT personnel like teachers and other technicians to ensure smooth implementation of ICTs in secondary schools. It will be difficult to implement ICTs without trained personnel who had relevant skills and knowledge.

#### 4.11: Schools offering Computer Courses

Most school which offered Computer Courses used computers for training students on computer basic skills while others used the computers to teach KNEC curriculum. There was no school that offered Computer Course as an application package only 47% had various forms of ICT courses.

Table 4.8: Schools offering ICT curriculum;

CATEGORY	TOTAL NO. OF COMPUTERS	FREQUENCY	PERCENT
Boys	77	3	17.6%
Girls	43	3	17.6%
Mixed day and boarding	47	5	29.4%
Total no. of school without ICT curriculum	6	6	35.4%

#### Discussion

From the findings, there was need for schools to diversify the computer courses. This would open greater opportunities for students to have basic ICT skills. Due to

inadequate ICT teachers who can train for KNEC certification, the schools should endeavour to offer packages and basic ICT skill courses besides teaching ICTs as KNEC examinable course.

#### 4.12: Computer Integration in learning and teaching

Only schools using e-learning and teachers trained on integration of computers and learning were reported as using computers for teaching and learning.

Table 4.9.

<b>INTEGRATION OF COMPUTERS WITH TEACHING</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
Yes	2	11.76%
No	15	88.24%
<b>Total</b>	<b>17</b>	<b>100%</b>

In the district it emerged that 11% of the schools had teachers integrating computers with teaching. Perhaps it should dawn on the government and school board of management that students get highly disadvantaged in an atmosphere of learning where teaching and learning has not been integrated with ICT. Plans should be therefore put in place to implement this.

#### 4.13: Schools planning to introduce ICT

Most schools in Kisii Central District had no plans to introduce ICTs . Only 17.6% of the schools plan to introduce ICTs whereas 29.4% did not have such plans.

Table 4.10.

SCHOOLS	FREQUENCY	PERCENT
Planning	3	17.6
Not planning	5	29.4
<b>Total</b>	<b>8</b>	<b>47</b>

#### Discussion

In KCD, 17.6% planned to introduce ICTs in schools. This means that at this rate, it might take many years before ICTs are fully implemented in Secondary schools in KCD. It is incumbent upon the stakeholders to move with speed and promote ICTs implementation in schools by creating awareness on those factors which will enable the implementation to be effected. These included: construction of computer labs, buying computers, connecting schools with electricity and training enough ICT personnel to boost implementation of ICTs. The fact that most schools were complacent with their current ICT status indicated that the policy was not being followed. It would be safe to conclude that 29.4% who had no plans to introduce ICTs were indifferent to the government policy on ICT or were not aware of it. This behooved the government to put measures in place and a

time frame to compel all the schools to implement the ICTs for the benefit of quality in teaching and learning.

#### 4.14 . Computer maintenance status

Computer maintenance was a major challenge. 17.64% of schools outsourced their maintenance service while the Ministry of Education through KESSP Programme 11.76% of the maintenance work.

**Table 4.11**

<b>WHO MAINTAINS COMPUTERS IN SCHOOL</b>	<b>FREQUENCY(NO. OF SCHOOLS)</b>	<b>PERCENT</b>
Computer teachers	1	5.88%
Support staff	1	5.88%
Employed technician	1	5.88%
Ministry of education	2	11.76%
Outsourced services	3	17.64%
<b>Total</b>	<b>9</b>	<b>53%</b>

It did clearly emerge that maintenance service which are core to ICTs in schools was a challenge in most schools. The fact that most schools outsourced this service is a clear indication that skilled personnel in schools were inadequately trained to carry out maintenance work or

were lacking completely. The government has a responsibility to diversify training of ICT personnel and probably launch in service programmes for school ICT personnel to guarantee success in implementing ICT school programmes.

#### 4.15: Sources of financing ICTs in schools

Most schools in the District which had implemented ICTs received most of their ICTs finances from the government at 23.52% then P.T.A and NGOs at 11.56% respectively and last from churches at 5.88%.

**Table 4.12**

<b>SOURCES OF FINANCING ICT IN SCHOOL</b>	<b>FREQUENCY (NO. OF SCHOOLS)</b>	<b>PERCENT</b>
Government	4	23.52%
P.T.A	2	11.56%
Churches	1	5.88%
NGOs	2	11.56%
<b>Total</b>	<b>9</b>	<b>53</b>

It was clear that the government fund which was also school fund through the F.S.E programme played a critical role in ensuring implementation of ICTs in schools. The role of P.T.A was critical in ensuring the success of implementation of ICTs and therefore parents have a responsibility to mobilize and take a more active role to ensure greater

success. The Government should increase her budget allocation also to enable schools finance ICT programmes.

#### 4.16: Factor analysis on internet accessibility to school

**Table 4.13: Internet connectivity in the schools**

<b>REASON</b>	<b>FREQUENCY (NO. OF INSTITUTIONS)</b>	<b>PERCENTAGE</b>
High cost of connection	3	11.8
inadequate computers	1	5.9
Lack of technical support	3	17.6
High electricity cost	2	11.8
Lack of telecom lines	6	35.3
No Clear ICT Policy	5	29.4
Lack of ICT software vendors	1	5.9
Lack of ICT Equipment vendors	3	17.6
Lack of Internet know How	4	23.5

Internet connectivity in schools was majorly influenced by communication service providers such as telecom lines and the wireless communication systems reflecting 35.3%. This had a direct implication on the rate at which the internet services could be provided. It emerged clearly that the high costs involved in linking the schools with telecom lines had direct bearing

to lack of internet connectivity. To unlock this, the government had a duty to partner with development partners and commit more allocation of their budget in education to ICTs to enable the schools to implement the policy. ICT policy had not been clearly emphasized by the ministry of education as it was envisaged. This made almost 70% of schools reluctant to issues related to ICT as the management did not see the tangible significance of impressing the technology.

The cost of implementation had the tremendous implication on the rate at which ICT was impressed since it included the cost of purchasing computers, cost of connection, electricity cost and cost of purchasing and installation of software. Internet know how was another factor that had a bearing on the rate at which internet is connected since most people had not yet understood the importance of ICT.

#### **4.17: Adequacy of ICT labs**

One of the basic facilities that influenced implementation of ICTs in schools was availability of labs. There was inadequacy of computer labs in secondary schools in Kisii Central District.



**Table 4.14**

<b>SCHOOLS</b>	<b>NO. OF LABS</b>	<b>FREQUENCY</b>	<b>DEFICIENCY</b>	<b>PERCENTAGE DEFICIT</b>
District Mixed day	3	3	6	26%
Provincial mixed boarding	0	0	6	26%
Provincial girls school	4	3	5	22%
Provincial boys school	4	3	6	26%
<b>Total</b>	<b>11</b>	<b>9</b>	<b>23</b>	<b>100</b>

### **Discussion**

In order to elevate the ratio of computer to students, more computers were necessary and that more laboratories were required where computers would be placed. The MOE in collaboration with other stakeholders have a responsibility to develop more laboratories in schools to commensurate with the enrolment in schools. This would be possible only if the government commits more funds to develop ICT infrastructure and specifically computer laboratories.

## **CHAPTER FIVE**

### **5.0. CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter consists of concluding remarks and recommendations emanating from this study are presented in this chapter.

#### **5.2 Conclusion**

The general objective of this study was to investigate the factors influencing implementation of ICTs in public secondary schools in Kisii Central District. Specific objectives included : how finances determined implementation of ICTs , the influence of ICT facilities on the implementation of ICTs in Public Secondary Schools , the role of personnel on ICT implementation in KCD Secondary schools and the significance of government ICT policy on the implementation of ICT in Public Secondary Schools in KCD. The ICT situation in education in European countries , America , Asia and Africa where Kenya is inclusive was apparently significant and visible. It clearly emerged that ICT had become the driver in social-economic and political programmes of most governments of the world. As a result of this , most governments are putting great emphasis on investing in ICT in education to facilitate their citizenry with relevant knowledge and skills which will enhance exploitation of ICT for economic and social development.

However, it was noted with a lot of concern that the ICT situation in most Kenyan Schools and more specifically Kisii Central District Secondary Schools had not measured to the expected standards. Perhaps this would explain the reason for lack of good competition and poor performance in the K.C.S.E National Examinations. Lack of comprehensive

implementation of ICTs has denied students the benefits of using ICT in teaching and learning which include; rampant cases of school drop outs , lack of interest among students to pursue their knowledge , low levels of confidence among teachers and students in pursuit of knowledge , lack of motivation, poor performance and failure to attain good grades in various subjects, lack of creativity among learners and teachers because learning without ICTs becomes teacher centred instead of being student centred. Students are denied opportunity to access internet for information search thus acquiring learning materials from linked ICT centres and libraries and also inability to access leisure and entertainment for purposes of varying learning activities.

Data in this study was collected from 17 principals of schools, 17 ICT skilled teachers and 34 students of the sample. Out of the 17 secondary schools 9 had implemented ICTs in their schools, 7 did not have even one computer and one had computers used in office for document typing purposes. The principals' questionnaires sought to establish whether the following existed in the school in line with ICT skilled personnel, ICT policy, funds availability to implement ICTs, uninterrupted electricity supply and adequate laboratories for ICTs.

### **5.3 Recommendations**

The research findings have revealed that the various factors which influence ICTs implementation have relative importance as shown in table 4.15. The government being the initiator of ICTs policy in education should ensure that the core factors that influence ICTs implementation such as; financing of ICTs, availability of ICT skilled teachers and sources of power are properly put into place because of their critical role in achieving this. Above all, the ministry of education should create more awareness on the significance of ICTs in enhancing

quality teaching and learning. The ministry should revise the policy to include certain aspects which will make it mandatory for schools to adopt the ICTs in schools considering the enormous benefits it has in assuring quality teaching and learning.

### **Recommendations for future Research**

ICT has become one of the world's most recent and the fastest growing economic activity. The research having been conducted in secondary schools within Kisii Central District, there was need for other studies to be conducted in other districts in Kenya, not necessarily to repeat this study but most significantly to establish the effectiveness of ICTs in promoting education standards in the country.

**APPENDICES**

**APPENDIX 1**

LETTER OF TRANSMITTAL:

OBOSO TIMOTHY ATUTI

UNIVERSITY OF NAIROBI

FACULTY OF

BOX 30197

**NAIROBI**

**tatuti2001@yahoo.com.**

TEL: 0723-901 433

JANUARY, 2010

Dear Sir/Madam,

RE: **FACTORS INFLUENCING EFFECTIVE ICT IMPLEMENTATION IN  
PUBLIC RURAL SECONDARY SCHOOLS IN KISHI CENTRAL DISTRICT.**

**KENYA**

I am a Master of project planning and management student at the University of Nairobi carrying out research on the above topic. I would like to request your participation in filling out the questionnaire correctly and to the best of your knowledge. Be assured that your identity and respondents will be treated with utmost confidentiality and for this reason do not write your name or institution on the questionnaire. Thank you.

Yours faithfully,

**OBOSO TIMOTHY ATUTI**

## APPENDIX II

### QUESTIONNAIRE FOR PRINCIPALS

(a) Please answer all the questions exhaustively and the best of your knowledge . all the information you will provide will be utilized for the purpose of this study and will be treated as confidential.

(b) Schools where there are no computers, indicate not applicable as responses to questions which require explanations and other information .

1. Name of he school.....

2. state which of the following describes the category of your school.

(a) District Mixed Day

(b) Provincial Mixed Day

(c) Provincial Boys Boarding

(d) Provincial Girls Boarding

(e) Provincial Mixed Boarding

3. How old is your school in terms of years?

0<5

06-10

11-20

20-25

>25

4. What is the total student population in your school?.....

5. Indicate the number of streams per form in your school.

Form	<u>Streams</u>				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Over 4</u>
Form 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Form 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Form 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Form 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If the streams are more, please state the number in the space provided

.....

.....

.....

**SECTION B: FACTORS INFLUENCING ICTS IMPLEMENTATION**

6. (a) Does your school offer ICT curriculum?

Yes  No

(b) If yes, how many students are enrolled in ICT course?.....

(c) If no, how do your school implement policies on ICTs in education?

.....

.....  
.....

7. What is the number of your skilled ICT teachers and their qualifications?

Qualification		Number
Certificate	<input type="checkbox"/>	<input type="checkbox"/>
Diploma	<input type="checkbox"/>	<input type="checkbox"/>
Degree	<input type="checkbox"/>	<input type="checkbox"/>

Others,

Specify.....

.....

Tick inside the box against the statements Numbers 8-20 in scale 5-1 where scale 5- Strongly agree, 4- Agree, 3 – Not sure, 2 –Disagree, 1 – Strongly disagree. 3- Not sure , 2- Disagree, 1- Strongly disagree

- 8. Your school has an ICT policy.
- 9. The school policy influence ICT implementation in your school.
- 10. Your school has adequate ICT laboratory space.
- 11. There is an elaborate ICT curriculum in your school.
- 12. Your school has skilled ICT personnel.
-



13. There is availability of uninterrupted electricity supply.
14. The funds availability affect ICT implementation in your school.
15. The government funds ICT programmes in your school.
16. Parents provide funds towards ICT implementation
17. Individuals, churches and NGOs fund ICT programmes in your school

18. Is your school connected to the internet.

Yes  No

19. How reliable is internet service provider?

- (a) Very reliable  (b) Reliable  (v) Not sure
- (d) Not reliable  (e) Very unreliable

### SECTION C: FUNCTIONS OF ICT

20. How far do you agree about ICT functions in your school with the following statements

on a scale of 5-1,, where 5 – Strongly agree, 4 – Agree, 3 – Not sure, 2-Disagree,

Strongly disagree

- a) ICT facilitates administration online examinations
- b) ICT facilitates office work – typing memos, and e-mail services
- c) ICT-e teaching is conducted
- d) ICT enables students to access online learning materials
- e) ICT facilitates daily administration of the school

**SECTIONS D: POLICY ON ICT**

**21. Is there a policy in place for ICT staff development programme in your school?**

**If yes, state what is entailed in the policy and important steps you will take to achieve this?**

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

**If no. how will your staff be ICT skilled?**

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

**22. What measures do you intend to adopt to improve ICT implementation in your school?**

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

**Thank you for your time and effort in answering these questions.**

**APPENDIX III**

**QUESTIONNAIRE FOR ICT SKILLED TEACHERS**

**(c) Please answer all the questions exhaustively and the best of your knowledge . all the information you will provide will be utilized for the purpose of this study and will be treated as confidential.**

**(d) Schools where there are no computers, indicate not applicable as responses to questions which require explanations and other information .\**

1. Name of the school.....

2. What are your ICT qualifications?

(a) Degree  (b) Diploma  (c) Certificate

(d) Other Specify.....

.....

3. How many students are you teaching (ICT ) in school?

Specify the number .....

4. How is the space of your computer lab?

(a) Very spacious  (b) Spacious  (c) Not very spacious

(d) Not spacious

5. How many computers does your ICT class have?

Please specify the number.....

6. Do you teach ICT subject as:

(a) Compulsory? (b) Optional? (c) others specify .....

7. What type of power (energy) supply is our ICT class connected to?

(a) Generator

(b) Electricity

(c) Solar

(d) None

If none, how is your ICT class learning effected?

Please specify.....

8. How reliable is the availability of power supply in your ICT class?

(a) Very reliable

(b) Reliable

(c) Not reliable

(d) Not very reliable

9. During the breakdown of computers in your ICT class, how is maintenance made?

(a) School ICT Technicians

(b) Outside school ICT Technicians

(c) School ICT Teachers

(d) None

10. Does the school have an elaborate ICT curriculum?

Yes  No

If yes, do you follow the school ICT curriculum in teaching your ICT class?.....

.....

If no, how do you get ICT content?

Please

Specify.....

.....

.....

11. Do you use ICT to prepare schemes of work , lesson plans and lesson notes in teaching your ICT class?

Yes  No

If yes, how often?

(a) Very often  (b) Often  (c) Not sure  Not very often  
(d) Not at all

If no, explain how you prepare lessons plans and notes

.....  
.....  
12. How often do you use ICT as a mode of teaching in your class?

- (a) Very often  (b) Often  (c) Not sure  (d) Not often  
(e) Not very often

13. How often do you use ICT to prepare exams of your class?

- (a) Very often  (b) Often  (c) Not often  (d) Not sure  
(e) Not very often

14. Is the school connected to the internet?

- Yes  No

If yes, does your ICT class have internet services?.....

If no, how do you access internet services? Please specify

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

15. Do you use the internet services in your school?

- Yes   No

If yes, what are you accessing?

(a) Teaching materials

(b) Personal use

16. How reliable is internet services in the school?

(a) Very reliable  (b) Reliable  (d) Not sure

(d) Very unreliable  (c) Not reliable

17. How frequently do you use the internet services?

(a) Daily  (b) Weekly  (c) Monthly  (d) Not at all

18. If yes, how is ICT taught in the classroom as a separate subject

(a) Compulsory  (b) Elective  (c) Integrated in other

subjects

(d) Other  (Please specify)

19. Is there a separate body to monitor and evaluate implementation on ICT curriculum in your school?

Yes  No

If yes, please indicate name and describe its function

.....  
.....

If no, how is implementation on ICT curriculum in your school monitored and evaluated?

**Please explain how**

.....

.....

.....

**20. What do you think can the school do to improve ICT learning?**

.....

.....

**Thank you for your time and effort in answering these questions.**



**APPENDIX IV**

**QUESTIONNAIRE FOR STUDENTS**

**(e) Please answer all the questions exhaustively and the best of your knowledge . all the information you will provide will be utilized for the purpose of this study and will be treated as confidential.**

**(f) Schools where there are no computers, indicate not applicable as responses to questions which require explanations and other information .**

1. Name of the school: .....

2. Form: .....

3. Is ICT curriculum taught in your class:

Yes  No

If yes, are you taking the ICT as :

A Compulsory subject

An optional subject

4. How are ICTs Examination evaluated in your school?

(a) Externally  (b) Internally  (c) Both

5. Is your school connected with internet?

Yes  No

If yes, are you allowed to access the internet services and how often

.....  
.....

If no, give reasons

why.....

.....

6. On a scale of 5-1. where 5 – very good reason, 4 – good reason, 3 – not sure, 2 – not good reasons , 1 – not a reason at all, please rank the reasons indicated below if they contribute to the lack of internet connectivity in your school.

Lack of:

Adequate computers

Cost of connection

Technical support

Telecom line

Internet – know-how

ICT hardware

ICT software

Clear ICT policy

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Electricity

Others (please specify)

Others (please

specify).....

.....

7. Do you contribute as a student through your parent or guardian any resources to the ICT implementation in your school

Yes  No

If yes, how much do you contribute per year?.....

If no, how are ICT programmes funded?

.....  
.....

8. What is the enrolment in your ICT class? Specify the number.....

9. How many computers are there in your class? Specify the number.....

Use scale 5-1 to answer the questions where scale 5 – strongly agree, 4 – Agree,

3 Not sure, 2 – Disagree, 1- Strongly disagree to answer question 10

10. There is enough space in the computer lab to accommodate all the ICT students

Yes  No

11. Are your computer classes interrupted during learning?

Yes

No

Others specify

If yes, mention the factors that cause interruption

.....

.....

.....

12. Is ICT used as mode of learning instruction in your class in all subjects?

Yes

No

If yes, state which subjects

.....

.....

13. Do you use internet services for accessing learning materials?

Yes

No

If yes, state the materials you access

.....

.....

If no, state the kind of information you access

.....  
.....

14. What type of energy is used in your classroom? Tick on.

- (a) Electricity      (b) Solar energy      (c) Generator      (d) None

15. How reliable is the source of power (energy) in your class?

- (a) Very reliable      (b) Reliable      (c) Not very reliable      (d) Not reliable

(e) Other specify.....

16. In your opinion, is ICT implementation useful to you?

Yes       No

If yes, state areas.

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

If no, explain how it is not.

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

17. What do you think will be done to improve effective ICT implementation in your school?

.....

.....

.....

.....

18. Indicate the extent to which you agree about which factors below affect ICT implementation in your school. On the scale of 5-1 where 5- strongly agree, 4- agree, 3- not sure, 2-disagree, 1- strongly disagree.

**Factors influencing ICT implementation**

Reliable Telecommunication links	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquisition of computer hardware	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquisition of computer software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subscription to relevant sites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of an elaborate ICT curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formulation of appropriate ICT policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of adequate computer laboratory space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government funding to acquire ICT equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Involving of NGOs in ICT implementation**

**Staff participation in planning and implementation**

**ICT skilled Technicians availability**

**Security around and within the school**

**Competent ICT skilled staff (teacher & support staff)**

**Funds availability for ICT implementing**

**Availability of uninterrupted electricity supply**

**Alternative power supply**

**The ministry of education support**

**The school administration support**

**Students interest and motivation**

**Thank you for your time and effort in answering these question**

**APPENDIX V**

**TIME FRAME**

This study will be carried out as shown in the bar below:

<b>Activity</b>	<b>May 09</b>	<b>Aug 09</b>	<b>Oct 09</b>	<b>Dec 09</b>	<b>Jan 10</b>	<b>Feb 10</b>	<b>Apr 10</b>
	<b>Aug 09</b>	<b>Oct 10</b>	<b>Nov 10</b>	<b>Jan 10</b>	<b>Feb 10</b>	<b>Apr 10</b>	<b>May 10</b>
Literature Search and Review							
Proposal Writing and preparation							
Defence Department Faculty							
Pilot testing study							
Revision and design of data collection instruments							
Data collection							



Analysis and interpretation of data									
Compiling report, binding and handing over to supervisor									
Defense of report in graduate school									

The bar chart above shows the time schedule for research activities to be carried out by the researcher who therefore hopes to submit completed research report to the Department of Education. Project planning and management – Faculty of Education – University of Nairobi.

By July 30<sup>th</sup> 2010.

**APPENDIX VI**

**BUDGET**

No.	Category	Amount
1	Proposal writing – traveling within Kisii Central District and subsistence between May 2009 to May 2010	14,000.00
2	Secretarial services <ul style="list-style-type: none"> <li>❖ Typing of proposal (1<sup>st</sup> copy)</li> <li>❖ Expected corrections made on proposal</li> <li>❖ Typing of final proposal</li> <li>❖ Photocopying questionnaires</li> </ul>	2,220.00 14,000.00 3,500.00 3,500.00
3	Stationary <ul style="list-style-type: none"> <li>❖ Duplicating papers</li> <li>❖ Pen, pencils, erasers</li> <li>❖ Writing materials</li> </ul>	900.00 500.00 2,200.00
4	Traveling expenses <ul style="list-style-type: none"> <li>❖ Pre-testing questionnaire</li> <li>❖ Administering questionnaire @ 1,000x10 .days</li> <li>❖ Subsistence during administration of supervisors</li> </ul>	10,000.00 6,000.00

	expenses @2,000.x3 days ❖ Traveling to interview respondents and make observation @ 600 per day for 20 days using public transport.	10,000.00 60,000.00 12,000.00
5	Research clearance	1,000.00
6	Binding ❖ Binding proposals ❖ Binding final report 8 copies	1,000.00 3,000.00
7	Computer expenses ❖ Analysis of pre-test data ❖ Analysis of final research data	3,000.00 25,000.00
8	Miscellaneous	25,000.00
	<b>Total</b>	<b>182,820.00</b>

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# NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

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Website: www.ncst.go.ke

Our Ref:

NCST/RR1/12/1/SS/789/3

Date:

1<sup>st</sup> September 2010

Mr. Timothy Atuti Oboso  
University of Nairobi  
P. O. Box 2461  
KISII

UNIVERSITY OF NAIROBI  
EAST AFRICANA COLLECTION

Dear Sir,

## **RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on "*Factors influencing implementation of Information Communication Technology in public secondary schools in Kisii Central District, Kenya*" I am pleased to inform you that you have been authorized to undertake research in Kisii Central District for a period ending *31<sup>st</sup> December 2010*.

You are advised to report to the **District Commissioner and the District Education Officer Kisii Central District** before embarking on the research project.

On completion of the research, you are expected to submit **two copies** of the research report/thesis to our office.

A handwritten signature in black ink, appearing to read 'P. N. Nyakundi'.

**P. N. NYAKUNDI**  
**FOR: SECRETARY/CEO**

Copy to:

The District Commissioner  
Kisii Central District