

**FACTORS HINDERING IMPLEMENTATION OF ICT SYLLABUS IN
SECONDARY SCHOOLS IN IMENTI SUB-COUNTY, KENYA**

MUGAMBI KAIMURI PURITY

E55/CE/22149/2010

**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF
EDUCATION IN PARTIAL FULFILMENT FOR THE AWARD OF
DEGREE OF MASTERS IN EDUCATION OF KENYATTA UNIVERSITY**

APRIL 2015

DECLARATION

I declare that this project is my original work and has not been presented for a degree in any other university.

PURITY K. MUGAMBI

E55/CE/22149/2010

DATE

This project has been submitted with our approval as the university supervisor(s).

PROF. GRACE BUNYI

Associate Professor

Department of Educational Management,

Policy and Curriculum

Kenyatta University

DATE

DR. KITHINJI FLORENCE

Department of Training,

Kenya School of Government, Nairobi

DATE

DEDICATION

To my late dad Gilbert Mugambi

You laid the foundation upon which I build.

To my mother Juster Gilbert

You always have a passion and is willing to pay the prize to impact on my life.

To my dear husband Phineas Riungu

You held my hand in my darkest moments,

To my sons, Sid, Kev and Bret,

You were the source of my inspiration.

ACKNOWLEDGEMENTS

During the entire period of my study and writing of this research project many people were of great help and I wish to express my gratitude to them.

First, I give thanks to God the Almighty for His endless provision, sustenance and ever sufficient grace.

I am most indebted to my supervisors, Prof. Grace Bunyi of the Department of Educational Management Policy and Curriculum of Kenyatta University and Dr. Kithinji Florence; Department of Training, Kenya School of Government, Nairobi for their dedication, enthusiasm and patience in working with me from its inception to the end.

I am particularly indebted to my loving husband Phineas Riungu, you are the pillar behind my success. To my sons Bret Mwenda, Kelvin Koome and Sidney Muthuri for sacrificing to put up with a busy mother that I am. My Mother Juster Gilbert for your prayers and wise counsel. To my sisters and brothers particularly Lydia Ruguru and Naftaly Kinyua for their inspiration during partaking of this project.

I am also indebted to Mr. Joachim Njagi, Mr. Humphrey Kirimi and all my classmates for constructive criticism, suggestions and advice on this work.

I am most sincerely indebted to my friends Mercy Muthuri and Stephen Njaki for the unwavering moral support and encouraging me to soldier on when the going got tough.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABBREVIATIONS AND ACRONYMS.....	x
ABSTRACT.....	xi
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the Study	1
1.2 Statement of the Problem.....	4
1.3 Purpose of the Study	4
1.4 Objectives of the Study.....	5
1.5 Research Questions	5
1.6 Significance of the Study	5
1.7 Assumptions.....	6
1.8 Limitations	6
1.9 Delimitations.....	6
1.10 Theoretical Framework.....	7
1.11 Conceptual Framework.....	9
1.12 Operational Definition of Terms.....	10
CHAPTER TWO: LITERATURE REVIEW.....	11
2.1 Introduction.....	11
2.2 International Trends	11
2.3 Regional Trends	13
2.4 Local Trends	15
2.5 Factors Hindering Implementation of ICT Syllabus.....	18

CHAPTER THREE: METHODOLOGY	23
3.1 Introduction.....	23
3.2 Research Design.....	23
3.3 Study Location	23
3.4 Target Population.....	24
3.5 Sample and Sampling Procedure	24
3.6 Instrumentation	25
3.7 Pilot Study.....	25
3.8 Validity and Reliability of the Instruments.....	25
3.9 Data Collection Procedure	26
3.10 Data Analysis	26
CHAPTER FOUR: FINDINGS AND DISCUSSION.....	27
4.1 Introduction.....	27
4.2 Instrument Return Rate	27
4.3 Background Information of the Respondents	27
4.3.1 Gender Distribution of the Respondents.....	28
4.3.2 Length of Service of the Respondents as Teachers	28
4.3.3 Length of Service as principals.....	29
4.3.4 Academic Qualification of the Teacher Respondents.....	30
4.4 Extent of Implementation of ICT Syllabus in Secondary School Curriculum	31
4.5 Factors Hindering Implementation of ICT Syllabus in Secondary Schools .	38
4.6 Strategies for Successful Implementation of ICT Syllabus in Secondary Schools.....	41
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	47
5.1 Introduction.....	47
5.2 Summary of the Major Findings of the Study	47
5.3 Conclusions.....	48
5.4 Recommendations.....	49
5.5 Suggestions for Further Research	49

REFERENCES.....	50
APPENDICES	55
APPENDIX A QUESTIONNAIRE FOR PRINCIPALS	55
APPENDIX B QUESTIONNAIRE FOR CURRICULUM COORDINATORS’	59
APPENDIX C QUESTIONNAIRE FOR COMPUTER TEACHERS’	63
APPENDIX D INTERVIEW GUIDE FOR QASO.....	66
APPENDIX E RESEARCH PERMIT	67

LIST OF TABLES

Table 2.1: Computer penetration ratios at schools in selected African countries	19
Table 3.1 Sample Size Distribution	24
Table 4.1: Gender Distribution of the Respondents.....	28
Table 4.2: Length of Service of the Respondents as Teachers	29
Table 4.3: Length of Service as principals.....	30
Table 4.4: Academic Qualification of the Teacher Respondents.....	30
Table 4.5: Number of computers available in the lab	33
Table 4.6: ICTs Adequacy and Access	34
Table 4.7: Factors hindering implementation of ICT Syllabus in Secondary School	38

LIST OF FIGURES

Figure 1.1: Technology Acceptance Model	8
Figure 1.2: Factors hindering implementation of ICT syllabus	9
Figure 4.1: Schools have Internet Connection	31
Figure 4.2: Computer Labs Available	32
Figure 4.3: Number of Students Enrolled for Computer Classes	35
Figure 4.4: Computer Lessons Time Tabled	36
Figure 4.5: Computer Text Books Available In Schools	37

ABBREVIATIONS AND ACRONYMS

CATs	Computer Adaptive Tests
EFA	Education for All
ICT	Information Communication Technology
ITU	International Telecommunications Union
KESSP	Kenya Education Sector Support Program
KICD	Kenya Institute of Curriculum Development
MDGs	Millennium Development Goals
MOE	Ministry of Education
NSF	National Science Foundation
OECD	Organization for Economic Cooperation and Development
PPPs	Public-Private Partnerships
TAM	Technology Acceptance Model
Qaso	Quality Assurance and Standards Officer

ABSTRACT

This study investigated factors hindering implementation of ICT syllabus in secondary schools in Imenti Sub county, Meru County. The objectives of the study were to: determine the extent to which ICT syllabus has been implemented in the secondary curriculum; identify the major factors hindering the implementation of ICT syllabus; and find out strategies that can be adopted for successful implementation of ICT syllabus in secondary schools in Kenya. The study used a survey research design and targeted all the head teachers, curriculum coordinators, computer teachers and the Imenti Sub county, Quality Assurance and Standards Officer. Stratified sampling was used to cater for both day and boarding schools. There were 38 day schools and 30 boarding schools in the sub county. A sample of 46 was selected from the target population of 155 . Questionnaires were used as the main tool for data collection. An interview guide was also used to collect data from the District Quality Assurance and Standards Officer. A pilot study was conducted in four schools in the neighbouring Maara sub county to pre-test the data collection instruments. Both qualitative and quantitative data was collected. Quantitative data was analysed using descriptive statistics, such as frequency counts and percentages. Qualitative data was analyzed thematically in line with the objectives. The results were reported using frequency tables, pie charts and bar charts. From the findings, there was a strong indication that the extent to which ICT syllabus had been implemented in most of the secondary schools curriculum in the study area, was limited. Several factors emerged as having an influence in the utilization of ICT in learning and teaching: lack of training in the usage of computers and other ICTs, teachers' low level of ICT proficiency and lack of computers and related software in the schools. It was concluded that despite the role that ICTs can play in education, secondary schools in Imenti Sub county were yet to extensively adopt ICT in teaching and learning. In view of the findings the researcher recommends that the government needs to help day secondary schools to have access to electricity from the national grid. Schools with ICT facilities to address the issue of lack trained teachers in ICT. The study further recommends that teachers should trained to acquire enough computer skills while in college. The findings of this study are expected to enable education policy makers, curriculum developers and other stakeholders to make decisions that are more practical on the implementation of ICT syllabus in secondary schools in Kenya. The research will also add to the body of knowledge in the area of ICT.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The role of Information Communication Technology (ICT) in schools is increasing dramatically, as education is key to knowledge in a growing society. Traditionally ICT, has played the role of a minor curricular subject that was at times referred to as computer literacy or informatics. On the other hand, ICT has been used as computer-assisted instruction (an instructional aid) to assist students learn other disciplines like Science and mathematics. However countries like Chile, Singapore, the United States, and Norway, are using ICT at the centre of education reforms endeavours, to bring changes in assessment, curriculum, pedagogy and teacher training. Such countries believe that integrating ICTs into teaching and curricula can improve educational systems and set learners for 21st century digital learning society. On the same note, multinational organizations such as the Organization for Economic Cooperation and Development (OECD 1999) the European Commission,(2000), and the G8 Nations,(2000) have identified the importance of preparing students for lifelong in the knowledge economy and they assign a central law in ICT in attaining this objective.

The use of ICTs in education goes beyond equipping classrooms with computers and internet connections. Currently schools and Universities have been availed to a wide variety of ICTs that can be implemented to promote students overall learning in several ways (Oliver, 2009). The schools and universities that have implemented ICTs *primarily* use these technologies to fulfill certain aims and objectives that include: to Increase Networking Opportunities (INO) to connect schools to other

schools, as well as individuals within those schools to one another. Networking ability is mostly important for students in rural areas and developing countries; to provide Distance Learning. Learning has become web based with the advent of ICTs. Consequently ICTs have started to substitute correspondent schools in order to supplement Traditional Learning. One of most common uses of ICTs in Education involves students using software programs such as Microsoft excel and word to produce otherwise traditional written assignments (Caperna, 2009).

ICT is becoming indispensable all over the world, both in the teaching-learning process and in examinations where Computer Adaptive Tests (CATs) are gaining popularity (Makau, 1988). Information and Communication Technologies (ICTs) have become ubiquitous with current and future social organizational developments. The role of this technology can not be underestimated. Its therefore critical that the developing countries of Africa embrace these technologies.

According to (Fountain, 2001), in Swaziland, 98% of school children graduate from the public school system without having seen or touched a computer in the classroom. Information and Communication Technologies (ICTs) are not included in the school curriculum and teachers are not trained in the use of computers in education. The situation is not any different in Namibia. In Africa, the use and impact of ICT is still limited. However there is potential for strong development as the use of internet grows more rapidly in Africa than in any other region in the world.

Kenya has put considerable emphasis of ICT in its Education Sector Support Programme (KESSP) and as seen in the promulgation of the National ICT Policy in January 2006 it had its aim and objectives which were: to “improve the livelihoods of all Kenyans by ensuring the availability of efficient, accessible, , reliable and affordable ICT services” (National ICT Policy, 2006).

On the other hand, the national policy has several sections which include telecommunications, information technology, postal services and broadcasting. Its objective was to ensure the government encourages the use of ICT in all academic institutions so as to adjust and improve quality of teaching and learning”.

In order to embrace the new technology, the ministry of education in Kenya (MOE) introduced ICT syllabus as a subject in the curriculum in 2003. The implementation of ICT in secondary schools in Kenya is a recommendation of the KOECH report. As a result in January 2003, the KIE (now KICD) developed a syllabus for Secondary schools education which was published in August 2004. This syllabus includes ICT as a subject of study throughout the four years course. It is also tested both formatively and summatively. Despite the overwhelming benefits of ICT, access to ICT facilities is presently one of the major challenges in Kenya and other developing countries. It is against this background that the researcher intended to investigate the factors that were hindering the implementation of ICT syllabus in secondary schools in Imenti Sub County.

1.2 Statement of the Problem

A scrutiny of the National ICT Policy, (2006) and The National ICT Strategy for Education and Training revealed cognizant of the role of ICTs in education and development.

It is emphasized that ICT is a universal tool in training and education, and its integration to promote access, learning and administration is paramount. The policies vehemently stress to launch digital equipment, policy frameworks; network infrastructure, and connectivity in education and training. Kenya Education Sector Support Programme (KESSP) (2005-2010), focuses on challenges facing education sectors and offers solution on how to overcome them. Although the ICTs syllabus in secondary schools provides basic computers knowledge, skills and attitudes, the concentration is on the study of the computer as an object. It is evident that the value of emerging technologies in the global economy cannot be overstated (Oliver, 2009). ICT syllabus was rolled out under the new curriculum by MOE way back in 2003. However, there is scanty information on factors that have hindered the implementation of the subject in secondary schools in Imenti south Sub County. Therefore the study sought to investigate the factors that were hindering the implementation of ICT in secondary schools in Imenti South Sub-county.

1.3 Purpose of the Study

The purpose of the study was to investigate factors that were hindering implementation of ICT syllabus in the secondary schools in Imenti South Sub-County, Meru County. The results of the study would be used to seek solutions to these factors and ascertain the need of the Government of Kenya to identify the constraints and means of solving them.

1.4 Objectives of the Study

The study was guided by the following objectives:

1. To determine the extent to which ICT syllabus has been implemented in the secondary curriculum in the schools in Imenti South Sub-County.
2. To identify the major factors hindering the implementation of ICT syllabus in secondary schools in Imenti South Sub-County.
3. To find out the strategies that can be adopted for successful implementation of ICT syllabus in secondary schools in Kenya.

1.5 Research Questions

1. How does government policy hinder the implementation of ICT syllabus in secondary schools?
2. How does teachers' lack of capacity hinder the implementation of ICT syllabus in secondary schools?
3. How does unavailability of ICT resources hinder the implementation of ICT syllabus in secondary schools?
4. What strategies could be adopted for the successful implementation of ICT in secondary schools?

1.6 Significance of the Study

The data and information generated from this study will hopefully enable the education policy makers and curriculum developers and other stake-holders to make decisions that are more practical on the implementation of the new technology. The education stake holders may use this information to evaluate the success of implementing the ICT syllabus in secondary schools.

This research contributes to the body of knowledge in the field of ICT by enriching the literature on the factors hindering the implementation of ICT syllabus in secondary schools. Very little had been done in Kenya on this area and thus the study was significant.

1.7 Assumptions

The researcher assumed that:

1. There would be factors that were hindering the implementation of the ICT syllabus.
2. The respondents would co-operate and give honest responses.

1.8 Limitations

This study was limited to public secondary schools. For better conclusive results all secondary schools both public and private should have been studied. However this was not possible due to time and financial resources involved in the process of data collection and analysis. Time, financial and methodological constraints led to the collection of data from randomly selected public secondary schools in Imenti South Sub-County leaving out the private schools. This means that findings of the study may not be easily generalizable to the whole country.

1.9 Delimitations

The study confined itself to secondary schools in Imenti south sub county excluding the primary schools even though they would have interesting input.

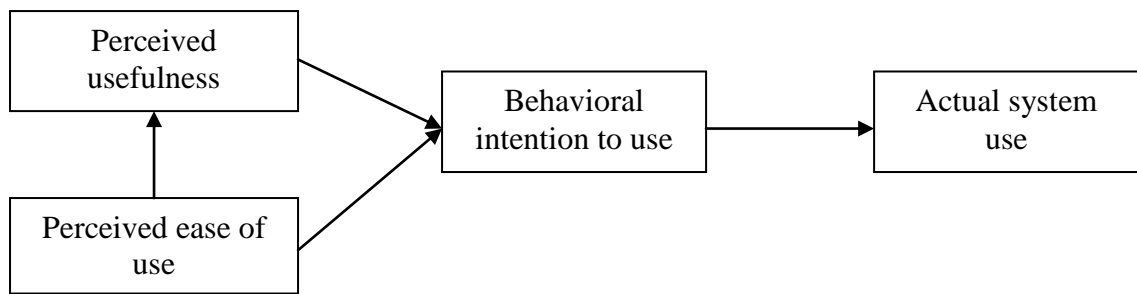
1.10 Theoretical Framework

This research was based on Technology Acceptance Theory by Davis et al. (1989); and Venkatesh et al. (2003). Since the mid 70's, quite a number of researchers have put much interest on factors that explain the use of different ICTs technologies. Technology Acceptance Model (TAM) represents one of the explanatory models having most influenced theories of human behavior (venkatesh, Morris,Davis,&Davis 2003).

The primary aim of TAM was to identify the determinants involved in computer acceptance in general ;to analyze a variety of information technology usage behaviors; and finally, to provide a penurious theoretical explanatory model (Davis, Bagozzi, & Warshaw, 1989). It is rooted in social psychology and draws on Fishbeins and Ajzen's reasoned action model (1975) which implies that the intent to produce a behavior depends on two basic determiners; Attitude towards behavior and Subjective norms.

Subjective norms refer to the reasons for producing a certain behavior or not, while attitude towards ones behavior refers to the positive or negative value the individual attaches to the facts of portraying the behavior. According to TAM, attitude would be a direct predictor of intention to use technology which in turn would predict the usual usage of technology Figure 1.1 shows the pictorial representation of TAM.

Figure 1.1: Technology Acceptance Model



Source: (Davis et al., 1989; Venkatesh et al., 2003)

Davis & Venkatesh, (1996) argued that attitude wouldn't play a big part but rather that perceived ease of use (expectation that a technology requires minimum effort) and perceived usefulness (the opinion that use of a technology can enhance performance of a task at hand) would determine intention to use a technology. Venkatesh (2000) adds that the TAM is a good model but so far it doesn't help us understand and explain the acceptance of a technology in a way that can promote the development of a strategy to have a real impact of the usability and acceptance of the technology. He therefore proposed a modified model to the TAM by adding the following four personal anchoring factors as determinants to perceived ease of use;

- 1) Computer self-efficacy
- 2) Perception of the external control
- 3) Anxiety towards computers
- 4) Computer playfulness

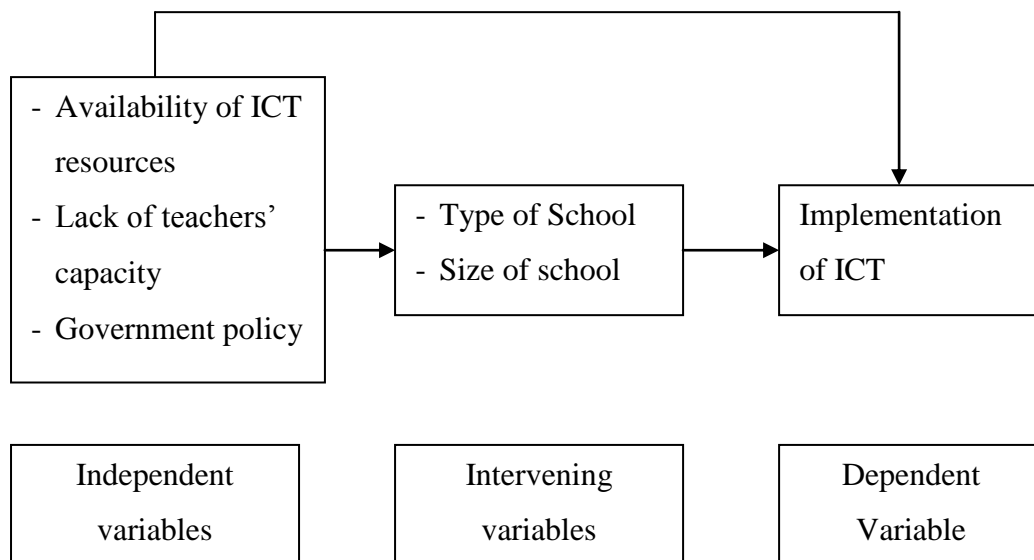
Two adjustment based factors have come up with growing experience namely;

- 1) Perceived enjoyment
- 2) Objective usefulness

These anchors represent general beliefs about computers and their use. Further more, they would seem to play an important role in forming opinion of perceived ease of use of a new system.

1.11 Conceptual Framework

Figure 1.2: Factors hindering implementation of ICT syllabus



The conceptual framework shows how ICT resources, training of teachers, attitudes of teachers and students' as well as government policy work to influence the implementation of ICT in secondary schools. However, all the above factors differ according to type and size of school, which influence the implementation of ICT. Availability of ICT resources such as computers, computer software, electricity and finances have a direct influence on the status of ICT implementation. Training of teachers' in the use of ICT as a medium for classroom instruction and school management and the attitudes of teachers and students towards ICT has an influence on ICT implementation. The government's ICT policy influences the extent to which the government channels resources to ICT infrastructure and teacher training.

1.12 Operational Definition of Terms

Factors Hindering: Refers to a circumstance causing trouble in achieving a positive result.

ICT Syllabus: Refers to the outline of subjects and course material that should be followed in teaching of Information Computer Technologies.

Information Computer Technologies: Refers to the study of use of computer processes for generating, storing retrieving and sending information.

Policy in Education: Refers to a government –issued documents which sets out the Principals, guide lines and strategies for ICT education.

Skilled Personnel: They include support personnel, School leaders, teachers whom are skilled to use ICT.

Support Policies: Schools have policies, incentive structures and Financial plans that support use of ICT

Technical Personnel: Technical support in ICTs maintenance and use of ICT, They are knowledgeable about curriculum frameworks, in relation to pedagogy, curriculum resources, the use of ICT in schools to enhance administration, teaching and learning.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Bluton (1999) interprets ICT as a device set of resources and technological tools used to create, communicate, store, disseminate and manage information. Etta & Sheilla, (2003) observes ICT includes all those instruments means and modes, both new and old, through which data and information are passed from one person to another or from one place to another. The chapter basically covers about the following: International trends; Regional trends; Local trends and factors hindering the implementation of ICT syllabus. The chapter also covers the summary of literature review, the conceptual and theoretical framework.

2.2 International Trends

For the last decade, there has been an exponential and rapid growth rate in the use of ICT, which perhaps has made great impacts to our daily lives and on our society. No wonder we find increasing interest, attention and investment directed towards use of ICT all over the world. The efforts of using ICT so as to improve education and learning have improved much in our economy. Many countries have come up with a number of master-plans on ICT in education Pelgrum & Anderson(1999). Such master plans points out that ICT in educational innovations have been increasingly embedded within a framework of education reforms that are towards developing students' capacities for problem solving, self-learning, critical thinking, analysis and information seeking, as well as the ability to collaborate, communicate, and learn.

In developed countries, the situation of computer use in education is different from that in developing countries. Cullen (2003) suggests that this is due to funds offered to the training institutions by their governments and society. In Britain for instance, by the school year 1983/84, every secondary school had personal computers for direct use by the students. In addition, every college and university provided basic education in computer technology (not mentioning mathematical and technical faculties teaching professional knowledge) (Fountain, 2001).

According to Malkin (1972), in USA, informatics had been established in secondary schools by the late 1960s. A survey by the American Institute of Research made for the National Science Foundation (NSF) in 1970 showed that 12.9% of public high schools were using computers in some way in their instructional program and 30% were using computer for administrative purposes. In 1971, the Texas University, Computer Sciences Department offered different courses and a special course specifically for teachers entitled 'computer science for teachers' to cope up with the growing population of academic schools including small colleges and secondary schools.

The US Department of Education (1998) reports that by 1996, 91% of secondary schools in USA were using computers, 62% were using advanced telecommunications and 73% had integrated technology into school curriculum. Most schools in USA have internet access and the percentage of public schools with internet access has been on the increase, with secondary schools registering the highest internet access (US Department of Education, National Centre for Education, 1998).

In Spain, Betty(1994) reports that the penetration of IT in primary and secondary schools was very close to a 100% in urban areas whereas schools situated in isolated rural areas were mostly unequipped. There is a teacher training network throughout Spain, with 113 centres in 27 provinces, geographically arranged so as to ensure that each school within reasonable distance is connected to at least one of them. IT trainers are available in all of them where they are in charge of training the teachers from the nearby schools, taking part in the Ministry of Education's intent for the introduction of new technologies.

Fountain (2001) analysis literature from Guatemala, pointed out that there is a program for institutional capacity in computer applications for Teachers Training Institutes. The program is training teachers to use the computer laboratories and the Departmental Directorate of Education staff to increase their effectiveness in using software, electronic mail and the internet. Rathore (2004) says that globally ICT can be used to promote greater access to education and information of better quality and thus help budge the digital device.

2.3 Regional Trends

Despite the much energies being directed on ICT infrastructure developments Paliwala, (2003) points out that the root cause of the global divide is the disparity in economic development van Brakel & Chisenga (2003) attribute the few personal computers to low wages and cost of computers . Van Brakel & Chisenga (2003) hold the view that the cost of computers is high in most African countries to enable public and private education institutions to afford.

Mutula(2002) notes ICT constraints as: Government policy on ICT , high cost of access to telecommunications; limited indigenous base and digital illiteracy; In addition, Jain, (2002) mentioned the following constraints: lack of skilled manpower, lack of a National IT policy, inadequate IT; ignorance of IT benefits, poor communication and infrastructure; resistance to change and expensive ICT equipment.

Jain (2002) estimated that there were 4.2 million internet users in the entire Africa by 2001, with at most a population of 850 million, showing that 99.9 per cent of population had no internet connection. However, African Internet Connectivity (2002) notes, in 2002, about 20 countries had 5 or more Internet Service Providers (ISPs) whereas 7 countries had ten or more. Jain (2006) notes that internet growth in Africa is constrained by low international bandwidth, poor telephone infrastructure, and high-dial-up tariffs levied on internet users.

In Uganda, Kawooya (2004) observes that the Government is fully committed to integrating ICT in informal and formal system but it has not yet come up with clearly detailed strategies and national ICT policy so as to achieve the same. Kawooya (2004) interprets this to mean that literacy programs in Uganda only address “traditional literacy”, with only small ICT components narrowed to some schools, where civil society endeavours, has made ICT applications available for teaching and learning.

2.4 Local Trends

Kenya shows considerable emphasis on the area of ICT in its Education Sector Support Programme (KESSP) as seen in the promulgation of National ICT Policy in January 2006 that aims to “improve the livelihoods of Kenyans by ensuring the availability of efficient, accessible, affordable ICT services that are also reliable” (National ICT Policy, 2006) The national policy has several sections, including, postal services, broadcasting, information technology and telecommunications,. The main strategies, in “E-Learning,” are to:

- Facilitate private- public partnerships to mobilize resources in order to promote e-learning initiatives
- Facilitate advancement of E learning resources.
- Boost distance education and virtual institutions especially in higher institutions of learning and training.
- Promote the development of an integrated e-learning curriculum to support ICT in education
- To facilitate dissemination of knowledge and skill through e-learning platforms by providing affordable infrastructure.
- Establish a national ICT centre of excellence.
- Create awareness offered by ICT opportunities to the education sector
- Promote content development to address the educational needs of primary, secondary and tertiary levels of education.
- share e-learning resources with other existing resources
- Enable sharing of e-learning resources among institutions
- expand e-learning chances and opportunities to promote education programmes for export

Kenya Education Sector Support Program (KESSP, 2005) points ICT as one of the priority areas with the aim of mainstreaming ICTs into the learning and teaching process. In June 2006, the ministry moved quickly to introduce National ICT Strategy for Training and Education (MOE National ICT Strategy for Education and Training ,2006). This ICT strategy for education sector comprises of following various parts each with its own objective statement and expected result.

- Digital equipment
- Connectivity and network infrastructure
- ICT in education policy
- Technical support and maintenance
- Harnessing emerging technologies
- Integration of ICT in education
- Training (professional development and capacity-building)
- Digital content
- Research and development

The Ministry of Education has the responsibility of leading the monitoring and evaluation of the strategy's implementation under the guidance of overall government policies on education and ICT, Millennium Development Goals (MDGs) and Education for All (EFA). We also have Kenya ICT Trust Fund formed in 2004, which was purposively designed with an objective of spearheading ICT in Education institutions. Membership is wide open to private and public sector organizations such as academic and educational institutions , other government institutions and ministries, civil society, donor partners, and, private sector companies. The main aim was to promote Private-Public Partnerships (PPPs) that

would in one way or the other marshal and avail ICT resources to all Kenyan public schools and community resource centres.

The ministry of Education policy framework points out that accessing and using ICT in Kenya is faced by numerous challenges such as: limited rural electrification, high levels of poverty, and frequent power disruptions among many others. (MOE National ICT Strategy for Education and Training 2006). Although several secondary schools have been equipped with computers, many of these only have one computer installed in the principals office (Farrell 2007). Its only a very small number of schools that have computers to be used by students and teachers in teaching and learning and even in such schools, the students-computer ratio is 150:1. The project of ICT infrastructure in many academic institution is initiated by parents and supported by the government, development agencies, NGOs, and private sector, such as the NEPAD (Farrell, 2007).

The presence of ICT Trained manpower in Kenya is quit crucial a resource. The Kenya government, as noted by the Ministry of Information and Communications 2005 recognizes ICT training in learning institutions and schools whereas the private sector has reacted to the demand of trained computer personnel by establishing computer training institutions in towns and in the rural areas. Estimates by the Export Processing Zones Authority, (2005) establishes that in 2001, over 150,000 Kenyans went through basic computer skills, and currently ICT specialist stands at an estimated figure of 1.1 million people.

Most of the teachers teaching computer studies in Kenya are graduates of computer science who lack teaching skills as they are not trained teachers.. Various local authorities have made recommendations to improve computer studies in Kenyan schools. For example, Kandiri (2007) further proposes that the government must be involved in in-service training programs to provide support to ICT in schools.

2.5 Factors Hindering Implementation of ICT Syllabus

ICT Application to schooling is one of the urgent tasks that developing countries tend to put into consideration to implement (Parliamentary Office of Science and Technology, 2006). On the contrary, there are several challenges which these countries are facing in one way or the other (Parliamentary Office of Science and Technology, 2006). One such challenge is the scanty data on the state of ICT infrastructure for schools in Africa, though the statistics presented below show indicators that there are efforts to use ICT in education. Table 2.1 provides an indication of the establishment of computers in selected African countries

Table 2.1: Computer penetration ratios at schools in selected African countries

Country	Number of schools	Schools with computers	Percentage schools with computers
Egypt	32 000	10 000	31.25
Ghana	35 000	500	1.43
Mozambique	7 000	20	0.29
Namibia	1 519	60	3.94
South Africa	28 798	5 000	17.36

Source: (Butcher, 2003)

Of the countries shown, Egypt has the highest percentage of computers in schools, at 31.25%. In Mozambique, only 20 schools currently have access to computers. Across the continent, radio remains the most widely accessible technology. Taking into considerations Ghana and South Africa above, the countries for which computers in schools data are available, it is clear that in Ghana, for instance, only 1.43% of schools have access to a computer, while 17.36% of schools in South Africa have access to a computer.

When discussing access to ICTs, the physical infrastructure is but one aspect to be considered. The same applies in the context of education. Physical access to computers is a fundamental starting point, but alone will not lead to computer use or enhanced learning outcomes. Teacher training is one essential requirement for successful use of ICT in education (Haddad, & Draxler, 2002). Lundell & Howell (2000) note the following factors in the South African context (which applies in other countries too) as the ones that bar schools from using computers for teaching and learning:

- Insufficient funds;
- Insufficient numbers of computers;
- Lack of computer literacy among teachers;
- Lack of subject teachers trained to integrate computers into learning areas;
- and
- The absence of properly developed curricula for teaching computer skills.

In addition, many of those schools with computers still do not have access to the Internet, which is an important requirement for supporting networking for learners and teachers, as well as for collaborative learning (Butcher, 2003). The Internet can provide a wealth of learning resources and access which at present, is very limited for many African education institutions. In Ethiopia, for instance, only nine of the 12,000 primary schools had Internet access at the end of 2001, and ten of the 424 secondary schools (Jensen & Sarroco 2002). Moreover, the costs of Internet access can be prohibitively high for many schools, both in Africa and elsewhere. In a study conducted in the US, it was shown that subsidies to schools for Internet access (which ranged from 20-90% of costs depending on school characteristics) led to 66% more classrooms with Internet (Goolsbee & Guryan, J., 2002).

According to Isaacs (2000), the main barriers faced by African schools in relation to Internet access specifically are:

- Limited infrastructure generally, and network infrastructure in particular;
- High cost of telephone and Internet ,
- Limited expertise and ICT skills levels; and
- Lack of an appropriate policy environment.

Given the constraints on widespread computer and Internet access, it is essential that other technologies and resources, such as radio, television, and print media, should never be considered less essential than computers and the Internet. These media will continue to play a fundamental role in provision of educational resources to learners (Butcher, 2003).

Most schools in Africa experience financial constraints which hinders easy purchase of ICT and other support materials for students. e.g. according to Hadebe (2000) in 1999, in the university of Zimbabwe, the government subsidy for students was reduced by 50 per cent. In Kenya Ngome(2003) argues that until the early 1970s, university education was free and the government was responsible for the full cost. Between 1991 and 1992 academic years, the Government introduced cost sharing scheme whereby students were expected to subsidise the cost for the Government. Farrell & Shafika (2007) conducted a study on ICT and Education in Africa. The study was carried out in 53 African countries. The survey showed that the process leading to adoption of ICT and diffusion in education in Africa is in transition. (Farrell & Shafika, 2007) All except a few countries surveyed in national ICT policies were either available or underway. However, while some of these national policies define implementation strategies and goals for ICT in the education sector, almost half of the countries had chosen to develop an ICT policy that is in line with the education sector.

Kakida (2003) cited some of the challenges facing ICT implementation in the classroom as: unreliable electricity, Lack of enough computers, Lack of technical skills, Fear of technology, Offensive content e.g. pornography on the internet, unreliable slow internet connectivity and Lack of national policy.

Bearing in mind that Resources in most developing world are scarce, they are mainly spent on basic needs such as food, clothing and medicine. As a result investing in ICT in education sector may be considered a long term issue. This implies that adopting ICT in Schools is definitely not an urgent issue bearing the level of poverty in African countries. As a result, this leads to a vicious circle around scarcity of funds and under-development (Oliveira, 1989). The controversy of priority of investing either on offering basic services or ICT, both might be linked in the case of education. (Parliamentary Office of Science and Technology 2006). One advantage is that the cost of IT hardware is rapidly decreasing as the price of PCs reduces by half every two years. Despite the reduced prices of the hardware, the cost of software and salary of ICT professionals, remains the biggest burden on Education budget .(Oliveira, 1989).

Electricity has also been marked as an impediment to ICT implementation. For instance, Statistics indicates that Kenya has 20,000 primary schools out of which only about 15% have power and only about 500 schools own computers but with limited internet access. In secondary schools out of the 4000 schools, almost 65% are connected to electric power. However Only about 750 schools have roughly 10 computers each though with narrow internet connectivity (Kinuthia, 2009).

According to the Kenya Pan African report ICT integration in schools is to a large extent self initiative., The self drive originates from the school Board of Management, Parents and Teachers Associations and the learners themselves. Most probably this is due to the appreciation that ICT is the way of the future if the young generation has to remain relevant and compete favorably in the labour market. Although computer studies has been introduced in a number of secondary schools , the Government seems to be lagging behind as they have not coped with the provision of necessary infrastructure both physical and human resources.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this chapter, the researcher explains the procedures used in conducting the study. Specifically, it describes the research design, study location and population, sampling procedures and sample instrumentation, data collection and analysis procedures.

3.2 Research Design

In this study, descriptive survey as a way of research design was used to investigate factors hindering the implementation of ICT syllabus in secondary school in Imenti South Sub County. By using this design the researcher was able to explain the state of affairs as it were in having had no control over the independent variables. Good (2003) observes that descriptive studies may include: present facts, current conditions concerning the nature of persons, a number of objects or class or events and may involve the procedures of induction, analysis, classification, enumeration and measurements.

3.3 Study Location

The study was conducted in public schools in Imenti South Sub County in Meru County. Singleton (1993) notes that; an ideal setting for any study should be accessibility to the researcher and one that permits instant rapport with the informants. The study location was chosen because it was easily accessible. Also, no similar research to the best knowledge of the researcher has been carried out in the sub county.

3.4 Target Population

The target population was all the 155 subjects comprising 68 principals, 68 curriculum coordinators, 18 computer teachers in the 68 public secondary schools and 1 District Quality Assurance and Standards Officer in Imenti South sub county.

3.5 Sample and Sampling Procedure

Stratified sampling was used to ensure that the research caters for both day and boarding schools. The researcher used stratified random procedure (balloting) to identify principals, curriculum teachers and computer teachers who filled in the questionnaires. Mugenda (1999) suggests that for populations that are not so vast, a sample of between 10% and 30% is adequate. A total sample of 46 was selected comprising of 20 principals, 20 curriculum coordinators and 5 computer teachers that were randomly selected while the Quality Assurance and Standards Officer was purposively identified to participate in this study.

Table 3.1 Sample Size Distribution

Category	Target population	Sample	Percentage Representation
Principals	68	20	29
Curriculum coordinators	68	20	29
Computer teachers	18	5	29
DQASO	1	1	100
Total	155	46	

3.6 Instrumentation

The study used questionnaires to collect information from principals, curriculum coordinators and computer teachers. An interview guide was used to get information from the District Quality and Standards Assurance Officer. The three questionnaires, for the principals, curriculum coordinators and computer teachers had four sections. Section one collected demographic data, while section two collected information on the extent of ICT syllabus implementation in the schools. Section three collected data on factors hindering the implementation of ICT syllabus in schools while section four sought suggestions on combating the hindrances.

3.7 Pilot Study

A pilot study was conducted in four schools in the neighbouring Maara sub county to pre-test the data collection instruments prior to visiting the schools for data collection. The respondents that were involved in pilot study were not included in the final sample. The purpose of the pilot study was to enable the researcher improve the validity and reliability of the instrument, and to familiarize with its administration.

3.8 Validity and Reliability of the Instruments

Kombo & Tromp,(2006) define validity as a measure of how well a test measures what it is supposed to measure. In other words, validity is the degree to which the results obtained from the analysis of the data actually represents the phenomena under study. Wilkinson,(1991).argued that pilot study assist to identify those items that could be misunderstood, and such items will be modified accordingly, hence increasing face validity. He continues to say that expert opinions, literature searches and pre-testing of open ended questions help to establish content validity. The

researcher prepared the instruments in close consultation with her supervisors; whose expert judgement helped improve content validity.

Reliability is defined as a measure of the degree to which a research instrument yields consistent results or data after repeated trial (Mugenda & Mugenda, 1999).

Piloting enabled the researcher to test the reliability of the instruments. Cronbach Alpha was used to compute a reliability coefficient of 0.72 with the questionnaires.

3.9 Data Collection Procedure

The researcher got introduction letter from Kenyatta University. In addition the researcher obtained a research permit from National Commission for Science and Technology and Innovation (Appendix E). The researcher booked appointments with the respondents and administered the research instruments. The respondents were given instructions and were assured of confidentiality of the information they gave. The process of data collection took one month.

3.10 Data Analysis

After data collection, the researcher cleaned and coded all the data obtained using the questionnaires and entered it in the computer for analysis. This was done using the (SPSS) Statistical Package for the Social Sciences version 21 for windows. Data obtained were analyzed using both qualitative and quantitative techniques. Quantitative data was analyzed using descriptive statistics, e.g. frequency counts and percentages. Qualitative data was analyzed thematically in line with the objectives of the study. The results were reported in summary form using frequency tables, pie charts and bar charts. Table 3.1 indicates the summary of the data analysis procedures employed for each research question and the study variables.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

In this chapter, the findings of the data analysis of the study together with the interpretations are presented. The data were processed using SPSS version 21 for windows. Statistical analysis of the findings was done using frequencies and percentages. In line with the objectives of the study, data were analyzed under the following sub-headings: questionnaire return rate, background information of the respondents, implementation of ICT syllabus in secondary school curriculum, factors hindering implementation of ICT and strategies for successful implementation of ICT syllabus in secondary schools.

4.2 Instrument Return Rate

Return rate is the proportion of the population that participated as intended in the research procedures. In this study, 20 principals, 20 curriculum teachers and 5 computer teachers were targeted and 45 questionnaires were distributed to these respondents in Imenti South Sub County. A total of 43 questionnaires were received back which brought the responses effectively to 95.5% and this was considered adequate as according to Idrus and Newman (2002) a response rate of 50% is good enough for social studies. The QASO was available for interview.

4.3 Background Information of the Respondents

This is basically the demographic characteristics of the sampled population. The research sample included the principals, curriculum teachers, computer teachers and the QASO. This section has analyzed gender issues, education and professional information and work experience for all the categories of respondents in the study. Also, information

regarding the student enrollment and school category was sought. This was meant to provide basic information about the respondents and assess their initial abilities and suitability in the study.

4.3.1 Gender Distribution of the Respondents

The population under study was stratified into males and females with the distribution as shown on Table 4.1

Table 4.1: Gender Distribution of the Respondents

Gender Distribution	Frequency	Percentage
Male	35	81.0
Female	8	19.0
Total	43	100.0

From the data obtained on the distribution of the teacher respondents by gender, it was established that 81% were male while 19% were female. These findings show a large gender disparity in the distribution of respondents in Imenti South Sub County in favor of males. This implies that most of the principals, curriculum coordinators and computer teachers as well as those in the management level in the teaching profession were males in the study locale.

4.3.2 Length of Service of the Respondents as Teachers

The study sought to know the length of service of the respondents in the capacity as teachers and the findings were as shown on the Table 4.2.

Table 4.2: Length of Service of the Respondents as Teachers

Length of Service	Frequency	Percentage
5 years and below	3	7.0
6-10 years	11	25.0
11-15 years	19	44.0
16-20 years	4	9.0
21-25 years	5	12.0
26 years and above	1	2.0
Total	43	100.0

The data showed that majority 44% had served as teachers for a period of between 11 and 15 years, 25% had been teaching for a period between 6-10 years, 12% had served for between 21 and 25 years, 9% had service years of between 16 and 20 years, 7% had between 5 years and below while 2% had 26 years or more of teaching experience. The data showed that most of the teachers had served for a considerably long time and hence expected to have useful information about implementation of ICT syllabus in the teaching and learning in secondary schools.

4.3.3 Length of Service as principals.

The study sought to know the length of service of the principals in that capacity and the findings were as shown on the Table 4.3.

Table 4.3: Length of Service as principals

Length of Service	Frequency	Percentage
5 years and below	-	-
6-10 years	3	15.0
11-15 years	7	35.0
16-20 years	4	20.0
21-25 years	5	25.0
26 years and above	1	5.0
Total	20	100.0

The results in Table 4.3 shows that majority 35% had served as principals for a period of between 11 and 15 years, 25% for a period between 21-25 years, 20% had served for between 16 and 20 years, 15% had served as principals for a period of between 6 and 10 years while 5% had been principals for 26 years and above.

4.3.4 Academic Qualification of the Teacher Respondents

The study sought to know the current academic qualification of the teachers and the findings are as shown on the Table 4.4.

Table 4.4: Academic Qualification of the Teacher Respondents

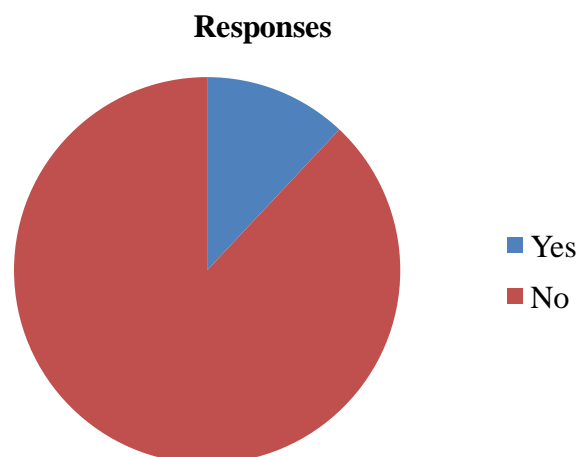
Academic Qualification	Frequency	Percentage
Master's degree	4	9.0
Bachelor's degree	30	70.0
Diploma	8	19.0
S1	1	2.0
Total	43	100.0

From the findings of the study, it was clear that most of the respondents (30) accounting for 70% had attained a bachelor degree qualification, a small proportion 9% had post graduate qualification with master's degree, 19% had diploma qualification and 2% were level of qualification. The educational levels attained by the respondents showed a notable variation in terms of the respondents' academic qualifications. These findings indicate that all of the principals, curriculum coordinators and computer teachers were qualified as teachers but it was not clear whether they could be capable of providing the expected information on implementation of ICT syllabus in secondary schools.

4.4 Extent of Implementation of ICT Syllabus in Secondary School Curriculum

First, the study sought to establish whether schools had internet connection. Figure 4.1 shows the percentage distribution of the respondents

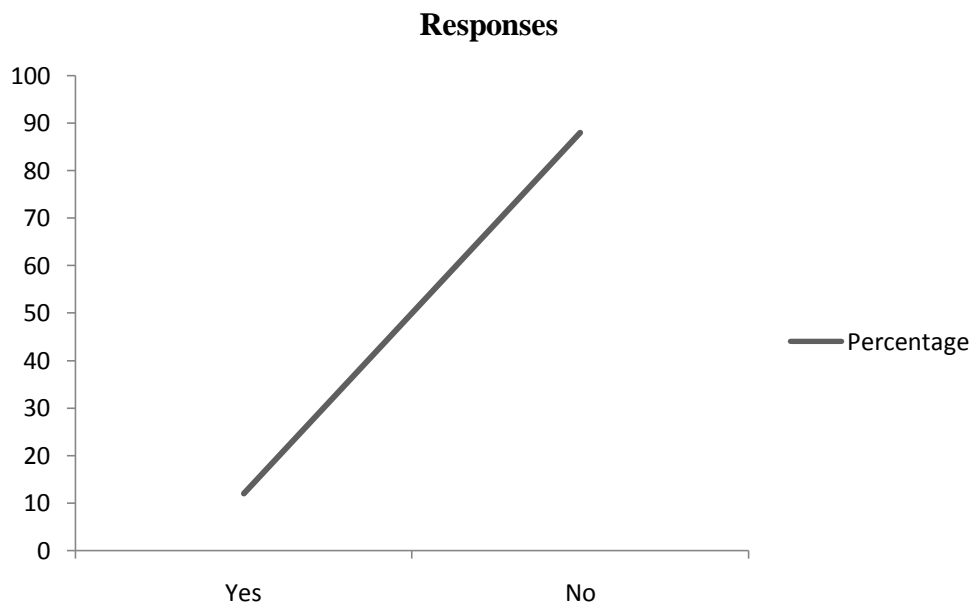
Figure 4.1: Schools have Internet Connection



From the findings, 88% of the teachers said that they did not have internet connection as compared to 12% that said they had internet connectivity in their schools. It can be deduced from the above that in most of the schools used in the study there was no platform for internet connectivity to facilitate the teachers to introduce students to the fundamentals of the internet and its application in the wider context. This outcome is in consistent to the study by McCarney and cited in Iddrisu (2009) that internet access is one of the contributing factors to the effective integration of ICT in the classroom. The secondary school ICT curriculum requires that students are introduced to different search techniques to enable them to effectively search and retrieve information from the World Wide Web for enhanced learning.

The researcher asked the respondents whether they had computer labs in their schools. Figure 4.2 shows the percentage distribution of the respondents.

Figure 4.2: Computer Labs Available



It can be seen from the results in Figure 4.2 that as many as 88% of teachers responded in the negative while the remaining 12% responded in the positive. From the results, it is evidently clear that most of the schools used in the study do not have computer labs. Abeedi (2012) notes that where the infrastructure and the platform for the application of ICT are unavailable, the implementation of ICT in teaching may be affected and this can adversely affect student motivation.

Those that said they had computer labs were further asked to state how many computers were kept in the lab for use by the teachers and learners and the responses are presented in Table 4.5.

Table 4.5: Number of computers available in the lab

Number of computers in the lab	Frequency	Percentage
1-5	3	60.0
6-10	1	20.0
11-15	1	20.0
Total	5	100.0

The results in Table 4.5 show that 60% of the teachers who took part in the study indicate having 1-5 computers available in the computer lab. The findings also show that 20% teachers indicated they have 6-10 computers and another 20% indicated they have 11-15 computers. The deduction that can be made from the findings is that the number of computers in the schools ranged from 1 to 15 which are not enough for use by the large number of students in most of the schools. The personal observation in the study schools revealed that most of the computers in the various schools laboratories were really old. It was also observed that some of the computers

had also broken down. The researcher was told by the ICT teachers and instructors that the broken down machines have been there for a while because no funds have been allocated to send them for repairs and in some cases buy some parts that have broken down.

The respondents were asked about the adequacy level of the various aspects of ICT availability/ access in respondents' schools. To answer this question respondents were asked to rate the adequacy of various aspect of ICTs availability in their schools on a five point scale. The result is presented in Table 4.6.

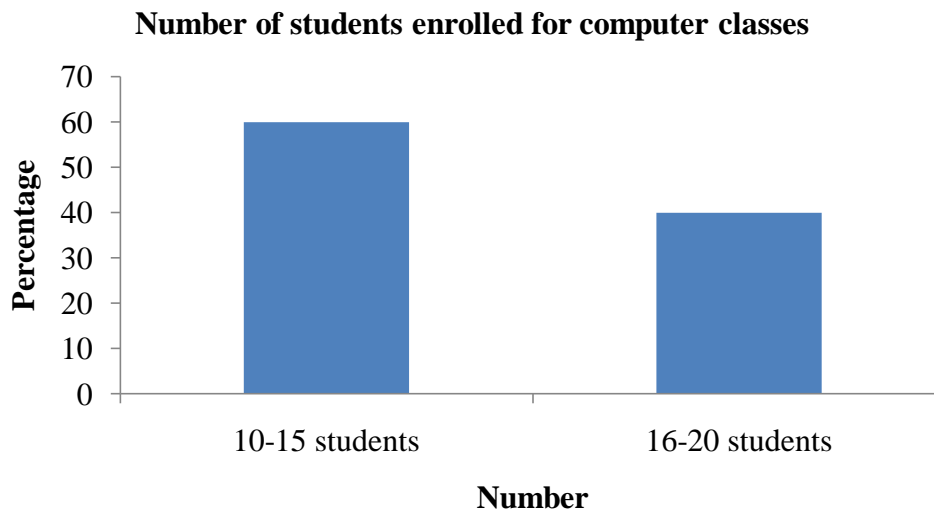
Table 4.6: ICTs Adequacy and Access

Ratings	Computer hardware	Software	Computer consumables	ICT technical support
Very good	-	-	-	-
Good	2	8	4	-
Satisfactory	12	19	8	-
Poor	21	12	28	12
Very poor	30	26	29	-
Non existence	34	35	31	88

Results in Table 4.6 show that computer hardware, software, consumable and ICT technical support received low rating of very poor, poor or these ICTs were non-existence. This indicates that computer hardware, software, consumable and ICT technical support are lacking. This may be due to non-availability of ICT equipment in the schools generally. Lack of ICT facilities has been noted by Shunguyia,(1995) to be one of the major challenges impeding the use of ICT as a teaching tool in Africa.

When respondents were asked to state the number of students enrolled for computer classes in the respective schools, the data presented in Figure 4.3 represents their response.

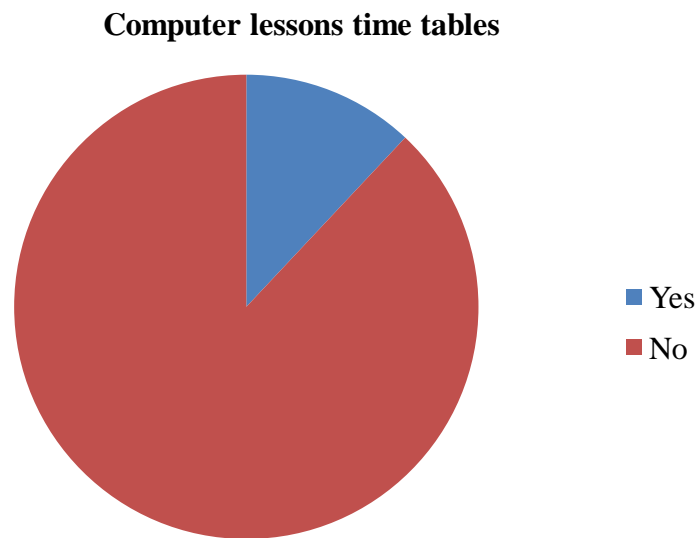
Figure 4.3: Number of Students Enrolled for Computer Classes



The findings show that the number of students enrolled for computer classes in the schools that were implementing the ICT syllabus ranged between 10 and 20. This is a clear indication that a considerable number of students are yet to access ICT learning in secondary schools despite the findings by Ndirangu, (2006) reaffirming that the use of computer based instructional programs tend to improve achievement scores of students as compared to the use of traditional or regular methods on instruction. The fewer number of students enrolled for computer lessons was confirmed by the QASO who gave the number of schools implementing ICT syllabus in Imenti South as three, implying that less number of students in the District had the opportunity to learn using computer.

Respondents were asked whether computer lessons were included in the school time table. Their response is presented in Figure 4.4.

Figure 4.4: Computer Lessons Time Tabled



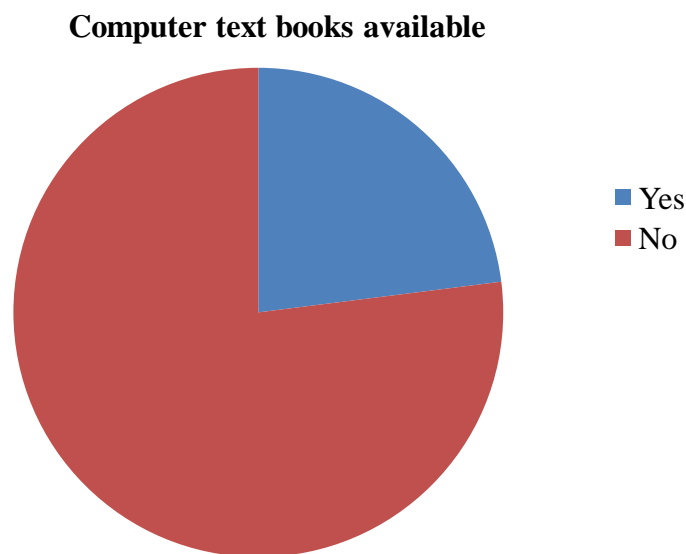
The findings show that 88% of the respondents reported that they had no time allocation for computer lessons in the school block time table as opposed to 12% that indicated on the affirmative. Those that responded on the affirmative said that students learnt computer lessons 2-3 times in a week. If effective implementation of ICT syllabus is to be achieved in secondary schools, there must be time slotted for computer lessons in the time table. Secondary schools are expected to develop an ICT strategy that incorporates the overall goals of ensuring education for all through availability of accessible, efficient, reliable and affordable ICT services.

Incorporating ICT across curriculum requires careful timetabling and corporation among department. (Sutherland-smith, Snyder, & Angus, 2002) point that in Science department; it may not be possible to move practical classes to ICT because of health and safety consideration or site computers in Science laboratory due to space

constraints. On other subjects, the time ICT suites may not suit the schemes of work planned by the teacher's. Hence much more cross-curricular and departmental planning is required than most schools do.

When the teachers were asked whether they had text books for computer in their schools to implement the ICT syllabus, the result was as in figure 4.5.

Figure 4.5: Computer Text Books Available In Schools



From figure 4.5 it can be seen that majority 77% of the teachers who participated in the study indicated that they had no computer text books in their schools while 23% indicated that they had these text books in their schools. When asked whether computer studies were an examinable subject at KCSE level, all the teachers responded on the affirmative. This was a true reflection of the information given by the teachers as the subject is examined by Kenya National Examination Council.

4.5 Factors Hindering Implementation of ICT Syllabus in Secondary Schools

The study sought to find out a number of issues hindering the implementation of ICT syllabus in secondary schools. These issues included the Government's policy on ICT integration, teacher capacity and availability of ICT resources. Table 4.7 presents the findings of the study.

Table 4.7: Factors hindering implementation of ICT Syllabus in Secondary School

Factors	Frequency	Percentage
Lack of electricity	4	9.0
Lack of computers and related software	8	19.0
Lack of training in the use of computers and other ICTs	10	23.0
Limited finances to procure computers and hire IT teachers	3	7.0
Teachers low level of ICT proficiency	11	26.0
Lack of technical support	4	9.0
Insufficient knowledge of how to use ICT equipment	3	7.0
Total	43	100.0

The findings show that lack of electricity was said to be a hindrance to the implementation of ICT curriculum by 9.0% of the respondents. This is in tandem with Gakuu & Kidombo (2010) findings in a study of Pedagogical Integration of ICT in Selected Kenyan Secondary School that lack of access to electricity especially in schools in the rural areas was among the factors restraining teachers from using ICTs to teach.

Lack of computers and related software was reported by 19.0% of the respondents as being among the factors impeding implementation of ICT curriculum in secondary schools in the study locale. A study by Lau & Sim (2008) that explored the extent of ICT adoption among Secondary Schools teachers in Malaysia generated similar findings.

Another hindrance to effective implementation of ICT curriculum in secondary schools according to 23.0% of the teachers that participated in the study was lack of training in the use of computers and other ICTs. Kandiri (2006) noted that there has been insufficient training and re-skilling of ICT end users as well as technical staff. This has tremendous influence on ICT integration. The views obtained from interview with the QASO revealed that most schools did not have TSC employed teachers to handle ICT thus leading to high turnover of those employed by the Board of Management which makes the principals to ignore sponsoring such teachers for computer training.

Limited finances to procure computers and hire IT teachers also emerged as one of the impediments to ICT integration in the teaching and learning in secondary schools as indicated by 7.0% of the teacher respondents. Victoria (2003) agrees that insufficiency of funds was the main cause of low rate of integration of ICT in schools. Victoria (2003) also posits that ICT investment is a drain of resources and schools with meager resources may not afford. Saleemi (2001) asserted that many schools do not receive any capitation from the Government to sponsor ICTs integration. The sentiments obtained from the QASO however revealed that it was not the issue of finances impeding the implementation of ICT, but lack of electricity

particularly in day secondary schools and inability of the school management to mobilize funds to procure computers and the related infrastructure. The QASO also mentioned that some principals become complacent due to their ignorance and procured substandard computers and the related accessories that ended up being obsolete within a very short duration of use, thus increasing the school recurrent expenditure which constrains schools.

Twenty six percent of the respondents indicated the level of ICT proficiency among the teachers is generally low. This was a great hindrance to ICT integration in teaching and learning. This is consistent with the studies done by So and Swatman (2006) on teacher's readiness for ICT generally, which suggest that there is a long way to go before schools can embrace modern technology. They also found out that the learning potential of ICT is deprived as many teachers are still not fully ICT literate and do not use it in the instructional process.

Lack of technical support was reported by 9.0% of the teachers.. In her study titled "Adoption and Use of ICT in Enhancing Management of Public Secondary Schools in Wareng District" Nganga (2010) noted that lack of technical support, lack of interest in ICT adoption and use, inadequate personnel and poor infrastructure to be the ones that are preventing the respondents from using or introducing the use of ICTs in their teaching and learning.

The result also reveals that 7.0% of the teachers indicated insufficient knowledge of how to use ICT equipment as factor hindering the readiness of using ICT. In a study of factors influencing integration of information communication technology in

primary school science education in Molo District, Nakuru County, Kenya Kaga (2013) found that majority of the teachers surveyed did not have the basic knowledge and skills to use ICT equipment to enable them to effectively conduct integration of ICT in the classroom. The views of the QASO interviewed collaborated with the findings of Kaga (2013) and that of the current study with regard to teachers' inadequate skills for handling ICT equipment and related software.

A deduction from the above is that the three major barriers preventing the use of ICTs in secondary school classrooms in the study area are the lack of training in the usage of computers and other ICTs, teachers' low level of ICT proficiency and lack of computers and related software.

4.6 Strategies for Successful Implementation of ICT Syllabus in Secondary Schools

Objective three sought to establish from the respondents measures that can be taken by the Government, school administration, curriculum implementers (teachers) and the community to ensure secondary schools are adequately prepared for the implementation of ICT syllabus in the curriculum. The responses obtained from the teachers and QASO are presented in a thematic narrative of the role each of the said stakeholders would play towards this endeavor.

a) Government

The measures proposed by majority of the respondents included:

- The Government should finance secondary schools to develop basic ICT infrastructure such as computer laboratories or classrooms and electricity

installation. Adequate physical and technological infrastructures are necessary conditions for effective ICT integration in schools.

- The government should make computer/ICT education compulsory for all secondary school students. At present, the National Policy on Education has made computer education an elective course in senior secondary schools. This means only those who elect to take it will have computer education at secondary school level.
- The government should fast-track enactment of the ICT policy on computer education with the view of establishing pilot schools and diffuse computer education innovation, first to all secondary schools and then to primary schools. Government should ensure that ICT policy statements for secondary education are translated into reality. An ICT policy in education that is driven by a vision which can be translated into action targeted that realistic and manageable goals will contribute to successful ICT implementation. To make ICT an integral part of the education master plan and ensure programme support, the ICT in education policy should share the same vision as other educational policies or initiatives. To ensure that ICT in education policy is integrated in the national ICT policy, Ministry of Education (MOE) should work closely with other government organizations, especially those in charge of implementing national policies on ICT and telecommunications.
- An ICT policy implementation commission should be created. This commission should be funded and given the power to provide ICT facilities in secondary schools and monitor their application and use. To ensure the site readiness of all schools, there must be adequate, initial financial investment by the government at the national level, especially on basic ICT infrastructure and resources

- Efforts should be made by the Ministry of Education to post teachers skilled in ICTs to each secondary school to impart ICT skills to the students.
- A National ICT Innovation and Integration Centre need to be fully operationalized, with the mandate to collect, test and share ICT Innovations and harness emerging technologies for integration in all aspects of education (teaching, learning and management).
- Teacher education institutions should develop ICT software in various subject areas for use in secondary schools.
- Government should provide free and compulsory training on ICT-assisted instruction for the teachers.

b) School administration

The respondents suggested that the school administration can enhance implementation of ICT syllabus in the secondary school curriculum through the following measures:

- Principals should generate funds from well-wishers and buy generators for schools.
- Principals should sponsor subject-heads in ICT training so that they in turn can train other teachers.
- Special ICT training funds should be provided to principals for in-school ICT training for teachers.
- To promote ICT uptake in schools, school leaders should initially adopt strategies that make ICT part of the daily routine or tasks of the teachers.

- ICT use in schools is more likely to be facilitated if school leaders employ strategies that provide teachers with a platform and support for the integration of ICT in the school curriculum
- Appointing an ICT coordinator or head of ICT department in each school helps to ensure administrative and pedagogical support for the teachers.
- School administration can lobby with local telephone companies and ICT industries for support to school with affordable internet connectivity and computer hardware and software.

c) Teachers

The open ended responses obtained from respondents revealed that majority were of the feeling that teachers would play their part in enhancing implementation of ICT syllabus in the following ways:

- Undergo training specifically on how to operate a computer, its devices and accessories, integration of ICT in the teaching and learning process, and the use of the internet to access teaching and learning materials. ICT use in school curriculum depends highly on the teachers who will use the ICT to teach the students. This requires that teachers have the capacity to incorporate ICT into teaching (Osadolor, 2008). Of course, having the capacity for ICT in the curriculum presupposes that it is available for students' use.
- The teachers also suggested that they needed to be equipped with enough knowledge and skills on ICT integration besides being furnished with a curriculum on how to carry out ICT integration in science education. In addition, they said there needed to be developed a clear policy on this new area

of curriculum innovation and if it was there, it had not been effectively communicated to them.

d) Community

The study respondents suggested that the community can contribute towards implementation of ICT curriculum in the following ways:

- Providing financial and resource support for the implementation of ICT. In most cases equipment of schools with ICT infrastructure has been through initiatives supported by the parents, government, development agencies and the private sector.
- Tap on the Banking sector to support ICT in schools by requesting them to donate and install ICT facilities to schools.
- County Governments should provide Internet connectivity and electricity to schools.
- Communities should refurbish/maintain buildings to provide a good platform for ICT curriculum integration in secondary schools.
- Non-government Organizations should provide training for teachers within their communities on ICT enhanced instruction.
- Enhance linkages between the school and the community around it, so as to expand and enrich the learning environment: Teachers and students can access a wealth of educational resources outside the school and collaborate with other educational institutions - local and foreign, and the community at large. With these new learning connections, students develop appropriate perspectives on working and living in an increasingly borderless and complex world.

Osadolor (2008) found that stakeholders have enormous roles to play in ICT training for teachers. The findings of his study point at the need to harness the potentialities of the private sector for enhancing ICT use in secondary schools. This is particularly important because Egboka (2007) found that corporations and banks in particular are making quite insignificant contributions to assist educational management and in the context of this study, ICT. Such stakeholder participation needs to be mobilized as is proposed by the respondents. Hopefully, such initiatives would be clearly, transparently and justifiably implemented towards stakeholder participation in enhancing ICT use in schools.

The integration and application of ICT within the learning process in the education sector in Kenya is still in its infancy. New initiatives are still dominated by technical aspects. In order to appropriately integrate ICT for an improved education quality, technology and pedagogy must go hand in hand. Gradually pedagogical considerations will become the guiding and driving force.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

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

5.2 Summary of the Major Findings of the Study

The purpose of the study was to investigate factors hindering implementation of ICT syllabus in the secondary schools in Imenti South sub county, Meru County. Three objectives were formulated to guide the study. In the first objective, the study sought to find out the extent to which ICT syllabus had been implemented in the secondary curriculum. The second objective aimed at identifying the major factors hindering the implementation of ICT syllabus in secondary schools while objective three sought to find out strategies that can be adopted for successful implementation of ICT syllabus in secondary schools in Kenya.

From the findings there was a strong indication that the extent to which ICT syllabus had been implemented in most of the secondary schools curriculum in the study area was limited. In most of the secondary schools the teachers were in agreement that the platform for enabling implementation of ICT such as Internet connection and general infrastructure was lacking.

In relation to the factors that inhibit teachers from using ICTs in their lessons in the classroom, several factors came out as having an influence in the utilization of ICT in learning and teaching. The main factors that were identified were: lack of training

in the usage of computers and other ICTs, teachers' low level of ICT proficiency and lack of computers and related software. The availability of ICT personnel was also found to be almost nonexistent and this is believed to be a big hindrance in utilization of ICT in learning and teaching even in the schools where computers are available. The availability of ICT staff is important in ensuring that ICT facilities are not vandalized by students or any other person accessing the facilities. Their availability will also ensure that the students utilize the facilities for only useful academic purposes.

5.3 Conclusions

Based on the findings, the researchers concluded that despite the roles ICTs can play in education, secondary schools in Imenti South sub county have yet to extensively adopt them for teaching and learning and efforts geared towards integration of ICTs into the secondary schools curriculum have not really taken off beyond the installation of school computers in some offices for management purposes.

From the research findings, the study also concluded that teachers lack of training in the usage of computers and other ICTs, teachers' low level of ICT proficiency and lack of computers and related software were the main hindrances to ICT syllabus integration in the teaching and learning in public secondary schools in the study area.

5.4 Recommendations

In view of the various factors that emerged from this study, the researcher made the following recommendations:

- i) The government needs to help secondary schools have access to electricity from the national grid as in some of the school this was cited as being among the factors hindering use of ICT particularly in day public secondary schools.
- ii) There is need for schools with ICT facilities to address the issue of lack of ICT staff as this will ensure that the facilities are in good working conditions and are utilized responsibly and optimally by the students and staff.
- iii) The teachers should be encouraged to acquire enough computer skills at the time they are in college. This can be achieved by the lecturers encouraging typed presentations, presentation of projects and research papers using power-point, giving assignments whose materials can only be found on the internet and encouraging the students to hand in their assignments through email.

5.5 Suggestions for Further Research

Based on the findings of the study, the following areas were suggested for further research

- i) A study to be done on utilization of ICT facilities where such facilities are well established.
- ii) A comparative study could be done between the level of integration of ICT in public and private primary schools.
- iii) Studies on factors influencing implementation of ICTs in public secondary schools in other Sub Counties can be done so as to compare the results.
- iv) A study could be done to assess the training needs of curriculum implementers in Kenya for the adoption of ICT in teaching and learning.

REFERENCES

- Betty, C. (1994). Information technologies in teacher education issues and experiences for countries in transitions. Proceedings of a European workshop. University of twente, enschede. Netherlands: UNESCO.
- Blurton, C. (1999). New directions of ICT-use in education. *Retrieved on, 24, 2012.*
- Butcher, N. (2003). Technological Infrastructure and Use of ICT in Education in Africa: an overview; Paris, Working Group on Distance Education and Open Learning. Retrieved from www.adeanet.org/publications/docs/ICT_eng.pdf
- Caperna, A. (2009). Integrating information communication technology into sustainable local policies.
- CCarney & iddrisu, s. a. (2009). *predictive validity of senior high school (shs) aggregate of students' grade-point average (gpa) at the University of Cape coast, Ghana* (doctoral dissertation, department of educational foundations of the faculty of education, university of cape coast).
- Cullen, R. (2003). The digital divide: A global and national call to actions. *The Electronic Library*, 21(3), 247 – 257.
- Davis, R. L., Thayer, M. J., Tapscott, S. J., Wright, W. E., Lassar, A. B., & Weintraub, H. (1989). Positive autoregulation of the myogenic determination gene MyoD1. *Cell*, 58(2), 241-248.
- Dutta, S., Lanvin, B., & Pua, F. (2004). *The Global Information Technology Report: Towards an Equitable Information Society*. New York: Oxford University Press.
- Egboka, P. (2007). Global initiatives and public-private partnership reform in the secondary education sector in Anambra State. Paper presented at conference of the Faculty of Education, Nnamdi Azikiwe University Awka in July, 2007.
- European Commission. (2000). Communication from the commission to the council and the European Parliament: The e-learning action plan – Designing tomorrow's education. Brussels: Commission of the European Communities.
- Farrell, G. (2007). Survey of ICT and Education in Africa: Kenya Country Report,. Washington, DC: infoDev/World Bank. Retrieved from www.infodev.org
- Farrell, G., & Shafika, I. (2007). Survey of ICT and Education in Africa: A Summary Report, Based on 53 Country Surveys. Washington, D C: infoDev/World Bank. Retrieved from <http://www.infodev.org/en/Publication.353.html>
- Fountain, M. (2001a). Teacher training with technology. Notes from the field. Retrieved from www.aed.org/publications/technologiesforeducation/techedchapter/15/pdf.

- Fountain, M. (2001b). Teacher training with technology. Notes from the field. Retrieved from www.aed.org/publications/technologiesforeducation/techedchapter/15/pdf
- G8 Nations. (2000). Okinawa Charter on the Global Information Society. Retrieved from <http://www.dotforce.org/reports/it1.html>.
- Gakuu, C. M., & Kidombo, H. J. (2010). Pedagogical Integration of ICT in Selected Kenyan Secondary School: Application of Bennetts Hierachy, *Journal of Continuing, open and Distance Education*,. University of Nairobi,Nairobi.
- Goolsbee, A., & Guryan, J. (2002). The Impact of Internet Subsidies in Public Schools. US National Bureau of Economic Research, Working Paper 9090.
- Haddad, W. D., & Draxler, A. (2002). Technologies for Education. Paris: UNESCO and the Academy for Educational Development.
- Hadebe, Z. C. (2000). The management of change: an assessment of the outcomes of change strategies at the University of Zimbabwe Library, MLIS Paper, University of Botswana, Gaborone,.
- Isaacs, S. (2000). ICTs in African Schools: A Multi-Media Approach for Enhancing Learning and Teaching. *TechKnowLogia*, January-March, 4(1), 32–34.
- Jain, P. (2006). Empowering Africa's development using ICT in a knowledge management approach; *The Electronic Library*., 24(1), 51–67.
- Jensen, M., & Sarroco, C. (2002). Internet from the horn of Africa: Ethiopia case study. *Geneva: International Telecommunications Union*.
- Chida, K., Kaga, Y., Haga, Y., Kataoka, N., Kumasaka, E., Meguro, T., & Zuguchi, M. (2013). Occupational dose in interventional radiology procedures. *American Journal of Roentgenology*, 200(1), 138-141.
- Kakida, H. (2003). A novel crystalline complex polymer composed of poly (m-phenylene isophthalamide) and ε-caprolactam. *Journal of Polymer Science: Polymer Letters Edition*, 15(9), 527-529.
- Kandiri, J. (2006). ICT policy in Kenya and Ways of Improving the Existing Policy. Kenya.: Strathmore University,.
- Kandiri, J. (2007). Pedagogies to Foster Interest In Computer Programming In Secondary Schools; Paper presented to the International Computer Science and ICT Conference, Nairobi: Strathmore University.
- Kawooya, D. (2004). Universal access to ICT and lifelong learning: Uganda's experience *New Library World*., 105(1206/1207), 423–428.
- Kinuthia, W. (2009). Educational development in Kenya and the role of ICT *International Journal of Education and Development using ICT*., 5, 2.

- Kombo, D. K., & Tromp, D. L. A. (2006). *Proposal and Thesis Writing: An Introduction*. Nairobi: Paulines Publications Africa.
- Lau, B. T., & Sim, C. H. (2008). Exploring the extent of ICT adoption among Secondary Schools teachers in Malaysia. *International Journal of Computing and ICT Research*, 2(2).
- Lelliot, A., Pendlebury, S., & Enslin, P. (2001). Online Education in Africa: promises and pitfalls. *South African Journal of Information Management*, vol 3 (1). Available online at: <http://general.rau.ac.za/infosci/raujournal/default.asp?to=>.
- Lundell, P., & Howell, C. (2000). *Computers in Schools. A national survey of information and communication technology in South African schools*. Cape Town: Education Policy Unit, University of the Western Cape.
- Makau, B. M. (1988). New IT and quality education in Kenya: the potential and problems of computer in schools working paper no. 461. Nairobi: Institute of Development Studies.
- Malkin, J. G. (1972). Computer science for teacher special interest group on computer science education, SIGCSE. Vol No 1. The Association for Computing Machinery.
- Ministry of Information and Communications. (2004). *National Information and Communications Technology (ICT) Policy* (October 2004). Nairobi: Ministry of Information & Communications, ..
- Mugenda, O. M., & Mugenda, A. G. (1999). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts Press.
- Mutula, S. (2003). The digital divide in Sub-Saharan Africa: Implications for the revitalization and preservation of indigenous knowledge systems, Paper presented at the SCECSAL – 15 Conference, 15-19 April 2002. Johannesburg.
- National ICT Policy. (2006). Ministry of Information and Communications. Retrieved from <http://www.information.go.ke/docs/ICT%20Policy.pdf>.
- Ndirangu, M. (2006). The use of Instructional Simulation to Support Classroom Teaching. *Journal of Education Multimedia and Hypermedia*. Kenya: Egerton University Njoro.
- Nganga, M. W. (2010). . Adoption and Use of ICT in Enhancing Management of Public Secondary Schools in Wareng District”. *Journal of Education Management*. Nairobi. Kenya. Kenya Education Staff Institute.
- Ngome, C. (2003). Country Higher Education Profiles. Kenya. Retrieved from www.bc.edu/bc_org/avp/soe/cihe/inhea/profiles/Kenya.htm.

- Oliveira, J. (1989). Computer education in developing countries: Facing hard choices', *Education & Computing*, 9(2), 301–311.
- Oliver, R. (2009). *The role of ICT in higher education for the 21st Century: ICT as a change agent for Education.* Western Australia: University, Perth.
- Organization for Economic Cooperation and Development. (1999). *Knowledge management in the learning society.* Paris: OECD/CERI.
- Osadolor, O. (2008). Analysis of the adoption capacity of modern information technology by senior secondary schools in Edo state. In B.G. Nworgu (Ed). *Education in the information age: Global challenges and enhancement strategies.* Nsukka: University Trust Publishers.
- Paliwala, A. (2003). Digital divide globalization and legal regulation,. Retrieved from www.austlii.edu.au/au/other/CompLRes/2003/5.html
- Pelgrum, W. J., & Anderson, R. E. (1999). *ICT and the Emerging Paradigm for Life Long Learning: A Worldwide Educational Assessment of Infrastructure, Goals and Practices,* International Association for the Evaluation of Educational Achievement,. Amsterdam.
- Republic of Kenya,. (2006). *ICT Trust Fund Strategic Plan 2006 – 2011.* Nairobi: Government Printer.
- Saleemi, A. (2001). *Entrepreneurship Education, Integration of ICTs in Schools.* Nairobi: Saleem.
- Shunguyia, N. (1995). *Factors Relevant to Teacher Training Improvement: A case Study of Instructional Technology in the Curriculum of the Teacher Education Programme of Kenyatta University.* University of Toronto, Canada.
- Singleton Jr, R. A., Straits, B. C., & Straits, M. M. (1993). *Approaches to social research* Oxford University Press.
- So, T., & Swatman, P. M. (2006, February). e-Learning readiness of Hong Kong teachers. In *Hong Kong IT in Education Conference* (pp. 6-8).
- Sutherland-smith, W., Snyder, L., & Angus, L. (2002). The digital divide: Differences in computer use between home and school in low socioeconomic households. *LI Educational studies in language and Literature*, 3(1), 5–19.
- United Nations Development Programme,. (2000). *United Nations Human Development Report 2000: Human Rights and Human Development.* New York: UNDP.
- US Department of Education, National Centre for Education. (1998). *Survey on advanced telecommunication in US public schools, fall 1998 FRSS 61.*

- Van Brakel, P. A., & Chisenga, J. (2003a). Impact of ICT Based Distance Learning: The African Story. *The Electronic Library*., 21(5), 476 – 48.
- Van Brakel, P. A., & Chisenga, J. (2003b). Impact of ICT Based Distance Learning: The African Story. *The Electronic Library*., 21(5), 476 – 486.
- Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test*. *Decision sciences*, 27(3), 451-481.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.
- Victoria, M. (2003). Storm-mediated coral colonization by an excavating Caribbean sponge. *CLIMATE RESEARCH*., 26(3), 251-256.
- Wilkinson, A. M. (1991). *The Scientist's handbook for writing papers and dissertations*. Englewood Cliffs, NJ: Prentice Hall.
- World Bank. (2002). *Information and Communication Technologies*. A World Bank.

APPENDICES

APPENDIX A

QUESTIONNAIRE FOR PRINCIPALS

Introduction

This Questionnaire is designed to gather information about the factors hindering implementation of ICT syllabus in secondary schools. Kindly respond by ticking the appropriate responses or filling the information needed. All your response will be treated with a lot of confidentiality and will be used by the researcher for the purpose of this study only. Please respond to all the items.

Section 1: Background Information

1. Gender: Male Female

2. For how long have you been serving as a teacher?

0-5 6 – 10 years 11 – 15 years

11 – 20 years 21 – 25 years 26 + years

3. For how long have you served as a principal?

0-5 years 6-10 years 11-15 years

16-20 years 21-25 years 26+ years

4. Indicate your current academic qualification

Diploma SI Bachelor Degree

Master's Degree

Others [specify]

Section 2: Implementation of ICT Syllabus in Secondary Schools Curriculum

5. Does your school have internet connection?

Yes No

6. Is there a computer lab in your school?

Yes No

If yes, how many computers are in the lab?

7. How many students have enrolled for computer classes in your school?.....

.....

8. Are computer lessons included in the school timetable?

Yes No

If yes, how many times per week do students learn computer?

9. Please indicate your rating of the adequacy of the ICTs shown in the table in your school

Ratings	Computer hardware	Software	Computer consumables	ICT technical support
Very good				
Good				
Satisfactory				
Poor				
Very poor				
Non existence				

10. Do you have text books for computers in the school library?

Yes No

11. Is computer subject examined at KCSE level in your school?.....

Section 3: Factors Hindering Implementation of ICT

12. Is your school connected to electricity?

Yes [] No []

13. Are the computers available able to meet the needs of all the students in the school?

Yes [] No []

If no, about how many extra computers are needed?.....

14. How would you rate your experience with computers?

- [] I have never used a computer and I don't intend any time soon.
- [] I have never used a computer but I am ready to learn.
- [] I have used applications like spreadsheets, word processing etc.
- [] I use the computers for instruction in the classroom.

15. If you do use computers, what type of training have you received?

- [] No training
- [] Basic Computer Literacy (on/off operations, how to run programs)
- [] Computer applications (word processing, spreadsheets)
- [] Computer integration (how to use in classroom curriculum)

16. Does your school have a computer teacher?

Yes [] No []

If yes, how many?.....

17. How many of your teachers are equipped with skills to use ICTs as a medium for classroom instruction?

18. What challenges does the school face in implementation of ICT syllabus in relation to the following?

- a) Procurement of ICT infrastructure (computers, internet connection, computer lab)?.....
.....

b) Training of teachers in the implementation of ICT syllabus
.....
.....

19. Suggest measures that can be taken by the following to ensure schools are adequately prepared for the implementation of ICT syllabus as a subject in the curriculum.

a) The government.....
.....

b) The school administration.....
.....

c) Teachers.....
.....

d) The community.....
.....

THANK YOU FOR YOUR PARTICIPATION

APPENDIX B

QUESTIONNAIRE FOR CURRICULUM COORDINATORS'

Introduction:

This Questionnaire is designed to collect information about implementation of ICT syllabus in secondary schools. Please respond by ticking the appropriate responses to the questions or filling the information needed. All your responses and information in the questionnaire will be confidential and will be used by the researcher for the purpose of this study only. Please give as truthful information as possible, and respond to all the items.

Section 1 Background Information

1. Gender: Male Female

2. For how long have you served as a teacher?
 0-5 years 6-10 years 11-15 years
 16-20 years 21-25 years 26+ years

3. How long have you been in charge of curriculum in this school?
 1 year and below 2-5 years 6-10 years
 11-15 years 15+ years

4. Indicate your current academic qualification.
 Diploma
 S1
 Bachelor Degree
 Masters Degree
 Other [specify].....

Section 2: Implementation of ICT Syllabus in Secondary Schools Curriculum

5. Does your school have internet connection?

Yes [] No []

6. Is there a computer lab in your school?

Yes [] No []

If yes, how many computers are in the lab?

7. How many students have enrolled for computer classes in your school?

8. Are computer lesson included in the school timetable?

Yes [] No []

If yes, how many times per week do students learn computers?

9. Please indicate your rating of the adequacy of the ICTs shown in the table in your school

Ratings	Computer hardware	Software	Computer consumables	ICT technical support
Very good				
Good				
Satisfactory				
Poor				
Very poor				
Non existence				

10. Do you have text books for computers in the school library?

Yes [] No []

11. Is computer subject examined at KCSE level in your school?

.....

Section 3: Factors Hindering Implementation of ICT

12. Is your school connected to electricity?

Yes [] No []

13. Are the computers available able to meet the needs of all the students?

Yes [] No []

If no, about how many extra computers are needed?.....

14. How would you rate your experience with computers? (Tick all that apply)

- I have never
- I have never used computers but am ready to learn.
- I have used word processing and spreadsheets, etc.
- I use the computers for instruction in the classroom.

15. If you do use computers, what kind of training have you received?

- No training
- Basic Computer Literacy (on/off operations, how to run programs)
- Computer Applications (word processing, spreadsheets)
- Computer Integration (using computer in classroom curriculum)

16. Are you equipped with skills to use ICTs as a medium for classroom instruction?

Yes [] No []

If yes, how do you rate the effectiveness of these skills?

- Very effective
- Effective
- Ineffective
- Very ineffective

17. What challenges does the school face in implementation of ICT syllabus in relation to the following?

- a) Procurement of ICT infrastructure (computers, internet connection, computer lab)?.....
.....

b) Training of teachers in the implementation of ICT syllabus
.....
.....

18. Suggest measures that can be taken by the following to ensure schools are adequately prepared for the implementation of ICT syllabus as a subject in the curriculum.

a) The government.....
.....
.....

b) The school administration.....
.....
.....

c) Teachers.....
.....
.....

d) The community.....
.....
.....

THANK YOU FOR YOUR PARTICIPATION

APPENDIX C
QUESTIONNAIRE FOR COMPUTER TEACHERS'

Introduction

This Questionnaire is designed to gather information about implementation of ICT syllabus in secondary schools. Kindly respond by ticking the appropriate responses to the questions or filling the information needed. All your responses are confidential and will be for research purpose.

Section 1 Background Information

1. Gender: Male Female

2. How many years have you served as a teacher?
 0-5years 6-10 years
 11-15 years 16-20 years
 21-25 years 26+ years

3. For how long have you been involved in computer studies in this school?
 1 year and below 2-5 years 6-10 years
 11-15 years 15+ years

4. Indicate your current academic qualification.
 Diploma S1 Bachelor Degree
 Masters Degree
Other [specify].....

Section 2: Implementation of ICT Syllabus in Secondary Schools Curriculum

5. How many students have enrolled for computer classes in your school?
6. Are computer lessons included in the school timetable?
Yes No

7. How many times per week do students learn computers?

8. Do you have text books for computers in the school library?

Yes [] No []

9. Please indicate your rating of the adequacy of the ICTs shown in the table in your school

Ratings	Computer hardware	Software	Computer consumables	ICT technical support
Very good				
Good				
Satisfactory				
Poor				
Very poor				
Non existence				

10. Is computer subject examined at KCSE level in your school?.....

Section 3: Factors Hindering Implementation of ICT

11. Does your school have a landline telephone?

Yes [] No []

12. Are the computers available able to meet the needs of all the students?

Yes [] No []

If no, about how many extra computers are needed?.....

13. How would you rate your experience with computers? (Tick all that apply)

[] I use applications like spreadsheets, word processing, etc.

[] I use computers for classroom instruction.

14. What type of training since using computer have you received?

[] Basic Computer Literacy (on/off operations, how to run programs)

[] Computer Applications (word processing, spreadsheet)

[] Computer Integration (how to use in classroom instruction)

15. Are you equipped with skills to use ICT as a medium for classroom instruction?

Yes [] No []

If Yes, how do you rate the effectiveness of these skills?

- [] Very effective
- [] Effective
- [] Ineffective
- [] Very ineffective

16. What challenges does the school face in implementation of ICT syllabus in relation to the following?

a) Procurement of ICT infrastructure (computers, internet connection, computer lab)?

.....

b) Training of teachers in the implementation of ICT syllabus

.....

17. Suggest measures that can be taken by the following to ensure schools are adequately prepared for the implementation of ICT syllabus as a subject in the curriculum.

a) The government

.....

b) The school administration

.....

c) Teachers

.....

d) The community

.....

THANK YOU FOR YOUR PARTICIPATION

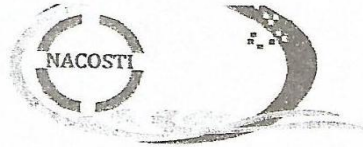
APPENDIX D

INTERVIEW GUIDE FOR QASO

1. How many public secondary schools are implementing ICT syllabus in Imenti South Sub County?.....
2. What challenges do schools in your sub county face in implementation of ICT syllabus in relation to the following?.....
 - a. Procurement of ICT infrastructure (computers, internet connection, computer lab)?.....
 - b. Training of teachers in the implementation of ICT syllabus
3. What reasons do principals have for not offering ICT?.....
4. What strategies does the sub county have to foster the implementation of ICT syllabus?
5. Suggest measures that can be taken by the following to ensure schools are adequately prepared for the implementation of ICT syllabus as a subject in the curriculum.
 - a. The government.....
 - b. The school administration.....
 - c. Teachers.....
 - d. The community.....

APPENDIX E

RESEARCH PERMIT



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

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

Ref: No.

Date:

NACOSTI/P/14/5155/2804

22nd October, 2014

Kaimuri Purity Mugambi
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Factors hindering implementation of ICT Syllabus in secondary schools in Imenti South District, Meru County Kenya,*" I am pleased to inform you that you have been authorized to undertake research in Meru County for a period ending 31st December, 2014.

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

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


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

Copy to:

The County Commissioner
The County Director of Education
Meru County.