

**ISSUES AND CHALLENGES IN THE
IMPLEMENTATION OF COMPUTER STUDIES
CURRICULUM IN PUBLIC SECONDARY SCHOOLS IN
KAHURO DISTRICT, MURANG'A COUNTY, KENYA**

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E55/CE/10096/2008

**A RESEARCH PROJECT SUBMITTED TO THE
SCHOOL OF EDUCATION IN PARTIAL FULFILLMENT
FOR THE AWARD OF DEGREE OF MASTER OF
EDUCATION (ADMINISTRATION) OF KENYATTA
UNIVERSITY**

JUNE 2013

DECLARATION

This research project is my original work and has not been presented for award of a degree in any other university.

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DEDICATION

To my dear wife Emmah and our lovely sons Onesmus and Lukas.

ACKNOWLEDGEMENTS

The researcher would like to acknowledge the following for their selfless contributions toward making this work a success:

Dr. John Aluko Orodho; a senior Research Fellow, Department of Education policy and curriculum studies Kenyatta university who introduced me to Research methods in Education and techniques of writing a Research proposal and report.

My supervisors, Dr. F. Itegi and Dr. G. A. Onyango, Lecturers Department of Education Management, policy and curriculum studies for their scholarly advices in writing the research proposal and project report.

My close friends, Peter, Peterson and Florence for their great inspiration and contributions which lend to successful accomplishment of this work.

My dear wife Emmah, my lovely sons Onesmus and Lukas for their moral and material support and perseverance during the time I have been away from them doing this work.

My colleague, Eunice Irungu who typed this work with a very high degree of accuracy within a limited time.

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ABBREVIATIONS AND ACRONYMS

B. O. G.	–	Board of Governors
COMESA	–	Common Market for Central, Eastern and Southern Africa
CDE	–	County Director of Officer
DEO	–	District Education Officer
D. N.	–	Daily Nation
G. O. K.	–	Government of Kenya
HELB	–	Higher Education Loan Board
ICT	–	Information Communication and Technology
K. C. S. E.	–	Kenya Certificate of Secondary Education
K.E.S.S.P.	–	Kenya Education Sector Support Programme
K.I.C.D.	–	Kenya Institute of Curriculum Development
K. N. E. C.	–	Kenya National Examination Council
K.P.L.C	–	Kenya Power & Lighting Company
K. S. T. C.	–	Kenya Science Teachers’ College
K. T. T. C.	–	Kenya Technical Teachers College
MOE	–	Ministry Of Education
M.O.E.S.T.	–	Ministry Of Education, Science and Technology
M.S.S.	–	Mean Standard Score
NGO	–	Non Governmental Organisations
P. T. A.	–	Parents Teachers Association
R.D & D	–	Research, Development and Diffusion
T. S. C.	–	Teachers Service Commission

ABSTRACT

The technological advancement all over the world has placed societies on a complex automated status where information and data flow freely in websites and other electronic mediums. In order to move in pace with the rest of the world in field of ICT, the Kenyan government through MOE introduced computer studies curriculum in secondary schools in 1996. Its implementation has faced a number of challenges all over the country. The objective and purpose of this study was to investigate the issues and challenges in the implementation of computer studies curriculum in public secondary schools in Kahuro District, Murang'a county, Kenya. The target population was 36 public secondary schools in the District. A descriptive survey design was used in this study. Stratified sampling techniques, purposive sampling techniques and simple random sampling techniques were used to select a study sample of eight schools. In this study, 30 respondents were reached which included eight principals, two computer teachers and 20 computer studies students. Purposive sampling technique was used to select the eight principals and the two computer studies teachers. Purposive sampling technique and simple random sampling technique were used to select 20 computer studies students who included; 6 students in form two, 7 students in form three and 7 students in form four. Interview schedules were used to obtain information from the Principals while Questionnaires were administered to teachers and the students. Observation Checklists were also be used. The researcher administered the questionnaires personally. The degree of reliability of the research instruments was tested through test-retest technique which gave a Spearman rank order coefficient of 0.78. The validity of the research instruments was determined by a several judges competent in area being investigated. Their feedback was incorporated in the final research instruments. The data collected was analyzed using descriptive statistics and presented in tables, charts and graphs. This study established that only 12.5% of the schools in study sample had implemented computer studies curriculum. Inadequate funds to procure computers, their accessories and set up infrastructures such as computer laboratories, Lack of trained computer teachers and inadequate revision materials were found to be the major challenges in the implementation process. The major issues are the examination performance in the subject and the levels of the teachers' exposure to computers as this affected the enrollment in the subject. The findings of this study will be useful to the policy makers at the MOE, KICD and the schools managers such as BOGs, PTA as it revealed the underlying issues and challenges in implementation of computer studies curriculum in secondary schools. It will aid in formulation of appropriate strategies to address the issues and challenges affecting the implementation of computer studies curriculum in Kenya. Based on the research findings, the researcher recommended that the government should provide grants to schools to procure more computers, their accessories and set up infrastructures such as computer laboratories, enhance the interconnection of the secondary schools with fibre optic cables to enhance easier internet access. The MOE through TSC should also recruit computer teachers in all public secondary schools, organize regular seminars and workshops to sensitize school managers on the importance of the implementing computer studies curriculum in secondary schools, regularly review the computer studies curriculum and make the subject part of the core curriculum in secondary schools.

CHAPTER ONE

INTRODUCTION

1.1 Background to the problem

Computers play a major role in the technological development all over the world. Countries which had successfully integrated computers in their educational system are in very advanced level of development in their economies (Mwaniki, 2007). Nowadays computers which are a common form of ICTs, plays an important role education sector, especially in the process of empowering the technology into the educational activities. Education sector is the most effective sector to anticipate and eliminate the negative impact of ICT. According to Muhammad (2009) ICT plays the following roles in education:

- (i) It promotes the principle of life-long learning / education.
- (ii) It increases a variety of educational services and medium / method.
- (iii) It promotes equal opportunities to obtain education and information.
- (iv) It develops a system of collecting and disseminating educational information.
- (v) It promotes technology literacy of all citizens, especially for students.
- (vi) It develops distance education with national contents.
- (vii) It promotes the culture of learning at school.
- (viii) It supports schools in sharing experience and information with others.

Mwaniki (2007) described the Rostow's (1972) theory of economic development and income per head of population. The Rostow's theory distinguished five stages of development from traditional to modern industrial and heavily automated (information-

based) society. Stage 1 of the Rostow's model is traditional society when main activity was subsistence agriculture supplemented by hunting and gathering. Stage 2 is precondition for take off achieved when necessary infrastructure for a wealthier economy is laid down such as transport network. According him, stage 3 is the take off stage where society experience rapid expansion of manufacturing industry. At this stage there is an attempt to introduce IT skills to the educational system so as to produce necessary labour forces required. Stage 4 is drive to maturity where there is continued expansion in manufacturing industry and development of service industry. At this stage the society fully embrace the aspect of IT. Workers are also well equipped with IT skills. The fifth stage is the maturity and the highest. At this stage the society in complex primary, secondary and tertiary industries. This stage is also characterised with very complex information driven system based on society where data flows through websites and e-mails.

In the wake of the new millennium, developed countries had completely integrated ICT in their education systems. The developed countries such as USA, Japan, German, Britain, Canada, France, Russia and Italy oftenly referred to as G8 countries are in very advanced level in ICT which corresponds to stage 5 of Rostow's model (Mwaniki 2007).

According to Kwok-Wing and Pratt (2004), ICT is an integral part of the existing curriculum in primary and secondary schools curriculum In Scotland. Computer studies is a core curriculum in this country. Teachers in Scotland are adequately trained in handling the subject. The training of teachers in this country was funded by UK-wide development organizations. A study carried out in New Zealand in 2002 aimed at evaluating the use of

ICT in 21 secondary schools established that there was an increased and satisfactory access of computers in all 21 secondary schools. The computer to students' ratio in that country was established to be at 1:6 in secondary schools and 1:9 in primary schools. In US the computer to student ratio in secondary schools improved from 1:9 in 1996 to 1:4 in 2001 (Kwok-Wing and Pratt, 2004).

Norway instituted a national ICT policy (called eNorway) in 2000 with aim of creating a knowledge based economy (CIA, 2011). Norway had established a comprehensive plan and committed substantial resources in the pursuit of establishing ICT leadership. Norway's ICT efforts were divided into five basic sectors namely; Individual, culture and the environment, Norwegian Industries, Norway's Workforce, the government and Education. Although Norway national ICT policy was formally launched in 2000, much of the work began in the 1990s with the computer to student ratio in secondary schools level being at 1:4 by the time of its launch. Most of the US countries and other developed world nations had by year 2000 achieved a computer to student ratio of 1:4.

This is a deep contrast to Kenya in which computer to student ratio in some secondary schools was 1:30 in year 2007 (Waiharo, 2007).

ICT plays a large part in learning in German. Schools have regular scheduled access to a multimedia learning facilities, where pupils are able to access German websites and videos, practise their listening, speaking, reading and writing skills and produce their own presentations and movies. In schools, there are several subscriptions to language learning websites which make lessons in the multimedia suite and in the classroom with the interactive whiteboards more stimulating. Pupils can also access these websites from

home, which can add an element of fun to homework activities. Although not all German schools and state universities have classrooms equipped with a computer for every student, all schools usually have at least one or two computer. The German federal government plans to reach at least three quarters of all its households with super-fast broadband networks by 2014, (Telecom Paper, 2009).

Most African countries risk being left behind in technological advancement due to their slow pace at which they are integrating ICT in their education systems. For instance in Sudan, the education authorities had embarked on building and capitalizing on ICT policy as a gateway for sustainable development seen as a tool for integrating economy onto the global market. However the full potential of ICT in Sudan is hampered by lack of capacity of communities to make the best use of the service. It was further established that less than 50% of public secondary had computers in their schools in Egypt by 2007 (Hamdy, 2007). According to Broadcasting Council secretariat (2006), Uganda ICT policy recognizes ICT as an important medium for communication as well as a tool for development including at community levels. However this potential in Uganda is yet to be effectively leveraged despite the government will and mandate as the ICT in the country education is hampered by funding, investment and affordability.

In Kenya, the policy framework on ICT can be traced from the recommendations of Commission on Total Integrated Quality Education and Training (Republic of Kenya, 1999) which proposed that, in the view of the current trends in market globalization and explosion of information technology, the human resource development must take an international outlook. The Kenya National ICT policy was formulated and officially

launched in 2005. The policy recognizes that the countries that have harnessed the potential of Information Communication and Technology (ICT) have attained a significant social and economic development. The policy seek to facilitate sustained economic growth and poverty reduction, promote social justice and equity, maintain gender in nation development, empower youth and disadvantaged groups, stimulate investment and innovation in ICT and achieve universal access. The policy is based on internationally best practices particularly COMESA model adopted by the council of COMESA ministers in 2002, (Ministry of Information and Communication, 2006). The overall objective is aimed at utilizing ICT toward technological and economic development. The policy paper commits the government to promote ICT in education at primary, secondary, tertiary and community levels through:

- Developing ICT curricula and ensuring that teachers and trainers posses the perquisite skills
- Setting up a frame work for evaluating and certifying ICT training programmes
- Developing a mechanism for attracting and retaining skilled resources
- Establishing networks for sharing training resources
- Developing strategies to support research and innovations

The MOE had been in forefront in the process the integration of ICT in education. It introduced computer studies curriculum in secondary schools in 1996 and requested schools to build computer laboratories with adequate number of computers to teach the subject (Kinyanjui, 2003). The Kenya National Development plan 2002-2006 made specific commitments to exploit ICT by making 2,500 primary and secondary schools

ICT ready every year and training 43,000 teachers in ICT through in-service training (Kinyanjui, 2003). This was an ambitious plan that would have seen 17.2% of teachers in Kenya become ICT compliant and be in position drive the Kenya education sector forward in bridging the digital divide. Kenya Vision 2030 aim at making the country a medium income country with better lives for its citizens. Innovations in information communication and technology could act as valuable catalyst toward achievement of this vision.

According to KIE (2002), the curriculum revision of 2002 aimed that learners would be equipped with competencies to operate effectively in knowledge based economy. The computer studies subject is aimed for the learners to achieve the following general objective among others:

- Appreciate the role of computer applications in carrying out day-to-day business and organizational tasks,
- Understand the role of information and communication technology in mental, moral social and spiritual development,
- Develop abilities to interact more efficiently with the wider community,
- Appreciate the use of programming as a tool for problem solving,
- Appreciate the impact of computer technology on society,
- Acquire basic knowledge, skills and attitudes necessary for adapting to a fast changing technological world as well as developing a firm base for further education.

These objectives risk not be achieved as the implementation of computer studies curriculum in secondary schools in Kenya had been a slow process with most of form four graduates leaving schools with no background of computer .(MOE 2008). The achievement of these objectives was hampered by lack of effective ICT integration in education (KIE, 2010). According to the World Bank Report (2008) on internet users as a percentage of population in Kenya, only 8.7% of the country population was using internet by 2008, a very low percentage compared with 77% for the developed countries. This is a clear indication that the level of computer literacy among Kenyans is very low. This is further confirmed by the low number of candidates in form four sitting the computer studies examination at KCSE level. For instance, in 2007, only 4,835 form 4 candidates (1.75%) sat for computer studies in KCSE examinations in the whole country (MOE 2008)

According to Murang'a East District Education Office (2011), only two schools out of 36 schools in Kahuro district were registered as examination centers offering computer studies in 2010 KCSE examinations. More surprising is the fact that only 17 out 2,168 candidates (0.78%) were examined in computer studies subject in the district.

This enrollment in computer studies is very poor which is a clear reflection of some underlying issues and challenges in its implementation. The performances of computer studies subject in the two schools in the district which registered students in the subject in 2010 KCSE examinations was poor. One of the schools posted an M.S.S. of 5.000 in computer studies with the subject being the most poorly performed subject in the school and ranked position 15 out of 15 in subjects' analysis. The second school had the

computer studies subject having an M.S.S. of 6.111 where the subject was ranked position 13th out of 15 subjects in school. This is a clear reflection of existence of issues and challenges in schools on the implementation process.

According to MOE (2008), the percentage of KCSE candidates sitting computer studies examinations has been very low. For instance only 4,835 of candidates (1.75 %) were examined in the subject in year 2007 in the whole country. Though this was a slight improvement from the 2,962 candidates (1.42 %) in 2003 national examinations, this pace of improvement is unsatisfactory considering the current state of technological advancement and innovations all over the world. This study aimed at investigating the issues and challenges in the implementation of computer studies curriculum in secondary schools in Kahuro district.

1.2 Statement of problem

In 2005 the Kenyan government through KESSP planned to spend Kshs 689,295 millions in ICT advisory services to education institutions, digital content development delivery, ICT teacher development, research and development in ICT in education and capacity building. This was in pursuit of achievement of secondary objectives of education in computer studies which was launched in 1996. To teach this subject, the ministry of Education requested secondary schools to build and equip the laboratories with adequate computers (Kinyanjui, 2003). Despite the Kenyan government effort to bridge the digital divide, most public secondary schools have not heeded to this call as there is low number of candidates taking computer studies KCSE examinations (Kinyanjui, 2003). Despite the government's effort to bridge the digital device, public secondary school in Kahuro district have not implemented computer studies curriculum completely.

1.3 Purpose of the study

The purpose of study was to investigate the issues and challenges affecting the implementation of computer studies curriculum in public secondary schools in Kahuro district.

1.4 Objectives of the study

This study was guided by the following objectives:

- i. To establish the types of resources and infrastructures available for the implementation of computer studies curriculum in secondary schools in Kahuro district
- ii. To establish the effects of teacher training and exposure to ICT on the implementation of computer studies curriculum in secondary schools in Kahuro district
- iii. To establish the effects of the teaching methodologies and evaluation on the implementation of computer studies curriculum in secondary schools in Kahuro district
- iv. To explore the measures which can be put in place to enhance the implementation of computer studies curriculum in secondary schools in Kahuro district

1.5 Research questions

This study was guided by the following questions:

- i) To what extent have computer studies curriculum been implemented in public secondary schools in Kahuro district?

- ii) Which types of resources and infrastructures are available for the implementation of computer studies curriculum in secondary schools in Kahuro district?
- iii) Are the resources and infrastructures available for the implementation of computer studies curriculum in secondary schools in Kahuro district adequate or not?
- iv) Does the level of the teachers training and exposure in ICT influence the implementation of computer studies curriculum in secondary schools in Kahuro district?
- v) What are the effects of the teaching methodologies and mode of evaluation on the implementation of computer studies curriculum in secondary schools in Kahuro district?
- vi) Which measures can be put in place to enhance the implementation of computer studies curriculum in public secondary schools in Kahuro district?

1.6 Significance of the study

This study unearthed the underlying issues and challenges which have affected the effective implementation of computer studies curriculum in public secondary school. The findings of the study will be significant to the following stakeholders in the following ways:

1.6.1 Ministry of education

The findings of the study may be used by policy makers in the ministry of Education to address the issues and challenges identified in this study. These could be policy issues in

which the ministry will be in a position to put mechanisms in place that enhance effective implementation process.

1.6.2 Kenya institute of education

The findings of the study may be used by curriculum developers at KIE in addressing the curriculum issues raised in this study. If the issues raised are curriculum in nature KIE will effect any necessary changes which could promote smooth implementation process.

1.6.3 Secondary schools

The research finding will also be useful to education managers at a school levels (Principals, P.T.A and BOG) to develop strategies to address the issues and challenges raised in this study at school level. If the issues raised point on resources and finances, the school managers will find a way of addressing the challenges. The research findings will also be useful to teachers and students in realizing their role in implementation of computer studies curriculum in secondary schools.

1.7 Basic Assumptions

Three basic assumptions were made in this study as follow:-

- (i) That the respondents contacted in this study provided freely and honestly the information on implementation of computer studies curriculum in secondary schools in Kahuro district.
- (ii) That there were issues and challenges affecting the implementation of computer studies curriculum in public secondary schools in Kahuro district.

- (iii) That the schools and respondents selected in the study sample gave a fair and unbiased representation of study population

1.8 Scope of the study

The study covered Kahuro district only due to limitation of time and financial resources. The study sample will constitute eight public secondary school in the district which constitute 22.22% of the total population.

1.9 Limitation of the study

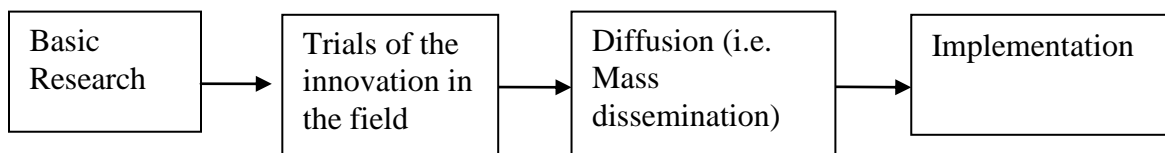
The study focused on public secondary schools leaving out private schools in the district. The research findings obtained from schools in the sample were generalized for the whole population while different schools in the district could be having different issues and challenges pertaining computer studies curriculum.

The respondents in the study sample constituted the Principals, teachers and students only leaving out other stakeholders such as Ministry of Education officials at; Ministry headquarters , KICD, CDE and DEO offices, QUASO's, members of BOG and PTA and parents who could be having valuable information.

1.10 Theoretical framework

This study was based on the Research, Development and Diffusion (R, D and D) model of educational innovation whose proponent is Havelock (1969) as expounded by Bishop G. (1986). According to Bishop (1986), R, D and D model is an effective strategy where innovation has to be introduced in a large, macro scale where ideas have to reach

geographically dispersed and isolated users (usually the teachers). The people implementing the change are assumed to be often lacking in knowledge and expertise as it is the case in many developing countries. The Research, Development and Diffusion approach is highly organized, systematic and rational approach to innovation founded on logical sequence of activities (Bishop, 1986). The four major sequences of activities are illustrated in the following Figure.



Source: Developed from Bishop, G (1986, 17): Innovation in Education

Figure 1.1: Research, Development and Diffusion model of educational innovation model

The Basic Research is carried out by a central team which in Kenya may include K.I.E., QUASO, Education commissions or any other government or Non-governmental organization. In Education sector, the basic Research may be done as a way of needs assessment to a certain educational program, curriculum or Education system in general. The commission on Total Integrated Quality Education and Training (1999) commonly referred as Koech Commission was mandated to look into the system of Education system in Kenya. Its recommendation was adopted by the Government and incorporated in the new secondary curriculum (2002) where computer studies was incorporated as one of the examinable subject at KCSE level.

After the Basic Research the next step in R, D and D model is the Trial of the innovation in the field. This is a piloting process where the curriculum is implemented in small scale in few selected schools to assess on its practicality. Any problem noted in this stage is addressed and the necessary re-adjustment made before the curriculum is implemented in large scale. This is a very important stage in implementation of any education initiative as it point out complexity in the initiative which can haunt the implementation process. Many education innovations in third world countries fail or are implemented poorly due to lack of proper piloting.

The third stage in R, D and D model is planned dissemination or diffusion of the innovation through conferences, workshops courses and seminars about the educational initiative. The implementation agents are educated about the initiative to impart them with necessary skills and attitudes which are of paramount importance if the implementation has to be successful. The implementation agents such as DEO, School principal and the teacher determine the success of any innovation in education making this stage to play a key role in the implementation process. The last stage is R, D and D model is the implementation of Education initiative. The success of this stage depends on how well the first three stages were carried out. If any of the previous stages was undermined, the implementation process will face problems.

1.11 Conceptual framework

The conceptual framework adopted in this research was based on assumption that there are certain composite factors that affect the implementation of computer studies in the secondary school curriculum in Kenya. The following figure illustrates the correlation of factors that determine the level of success of implementation of computer studies in secondary school's curriculum:

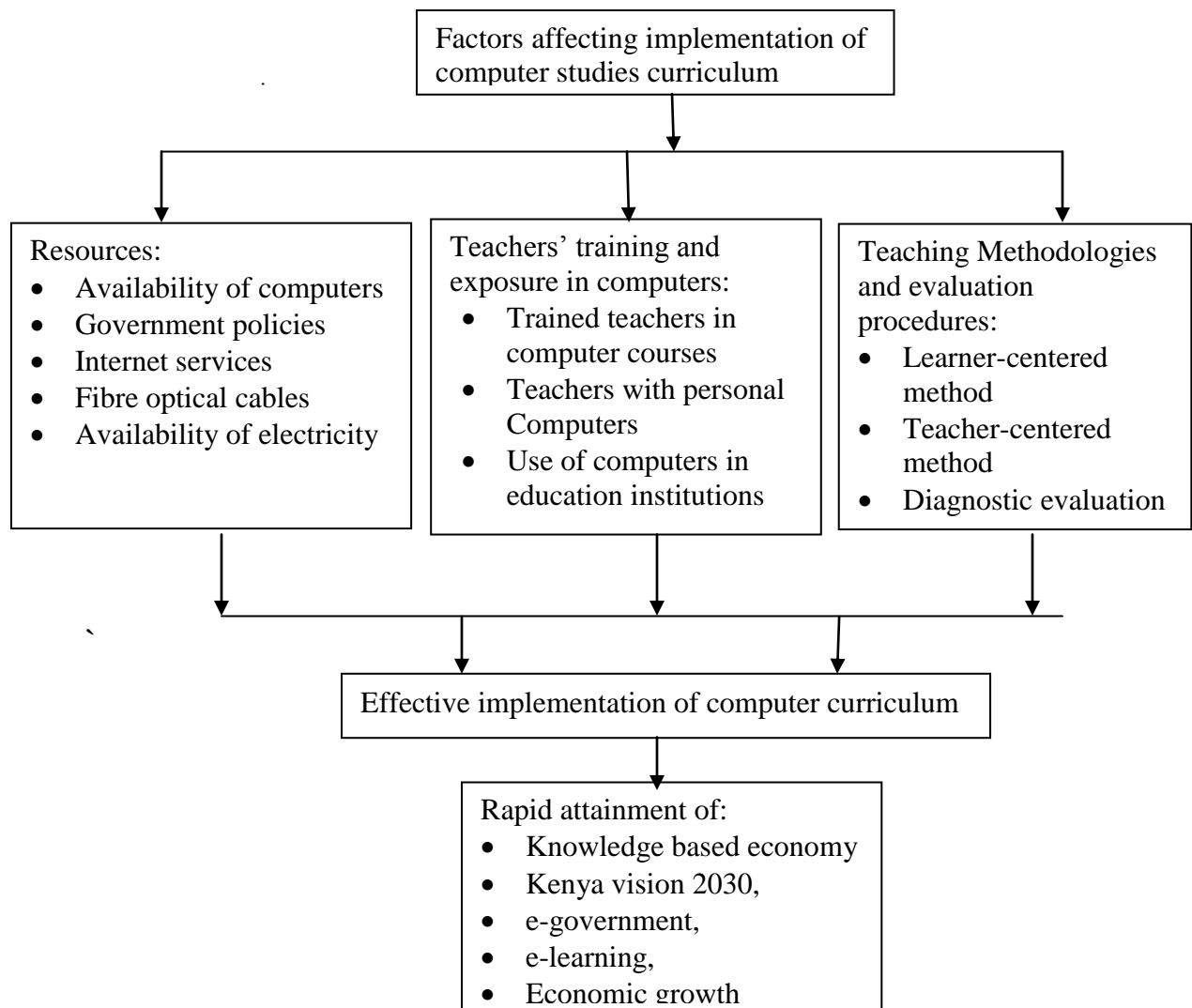


Figure 1.2: Factors that affect implementation of computer studies curriculum in Secondary school curriculum

Figure 1.2 is a diagrammatic representation of conceptual framework which shows the correlations of factors in the implementation of computer studies curriculum in secondary schools in Kahuro district. The independent variables considered in this conceptual framework were the resources, infrastructures, the level of teachers training and exposure to computers. The dependent variable was the effective implementation of computer studies curriculum in secondary schools which is directly or indirectly affected by the above independent factors. When resources are available such as funds for buying computers, schools will implement computer studies curriculum. Availability of funds can be influenced positively when government give grants to schools through KESSEP and CDF funds or negatively by the government policies such as FSE and school fees guidelines which discourage schools from charging extra levies to parents. Availability of infrastructures such as internet and electricity in a school will enhance implementation process. Fibre optic cables when available make the internet network fast and efficient. When teachers have basic knowledge in computers or use computers more frequently, such teachers are likely to implement computer studies curriculum in their schools. The teaching methodologies used and the mode of evaluation have an effect on the implementation process. Effective implementation will lead to attainment of e-learning, e-government, economic growth, Kenya Vision 2030 and knowledge based economy.

1.12 Operational Definition of central terms

For the purpose of this study, the following terms will be taken to have the following meaning

- Computers:** An electronic machine which is used in storing, organizing and analyzing data
- Curriculum:** Group of subjects studied in a school
- Digital divide:** The difference between the countries that have advanced in computers technology and those which have not
- E-government:** State of governance in which citizens get information online
- E-learning:** Process of getting information of learning purpose through internet
- Implementation:** To put a plan into operation such as teaching the teaching of computer Studies in secondary schools
- Internet:** The large system of many interconnected computers around the world which people use to communicate with each other.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

The literature review focused on the extense of the implementation of computer studies curriculum in various countries of the world, the types and adequacy of the resources, the teachers training and exposure to computers and influence of teaching methodology and evaluation on the implementation of computer studies curriculum.

2.2 The extent of implementation computer studies curriculum

The advent of the new millennium has made people around the world to realise that the world is undergoing a transformation often known as the digital revolution (Mburu 2005). These technological changes affect people in almost every aspect of life. To keep in pace with technological advancement taking place all over the world, its inevitable to incorporate these technological changes in the education system of the country.

Mwaniki (2007) described the Rostow's (1972) theory of economic development and income per head of population. The Rostow's theory distinguished five stages of development from traditional to modern industrial and heavily automated (information-based) society. Stage 1 of the Rostow's model is traditional society when main activity was subsistence agriculture supplemented by hunting and gathering. Stage 2 is precondition for take off achieved when necessary infrastructure for a wealthier economy is laid down such as transport network. According him, stage 3 is the take off stage where society experience rapid expansion of manufacturing industry. At this stage there

is an attempt to introduce IT skills to the educational system so as to produce necessary labour forces required. Stage 4 is drive to maturity where there is continued expansion in manufacturing industry and development of service industry. At this stage the society fully embrace the aspect of IT. Workers are also well equipped with IT skills. The final stage is the maturity and the highest. At this stage the society in complex primary, secondary and tertiary industries. This stage is also characterized with very complex information driven system based on society where data flows through websites and e-mails. Most of the countries in the world are either in stage 2, 3 or 4 of Rostow's model. The developed countries such as USA, Japan, German, Britain, Canada, France, Russia and Italy commonly referred to as G8 countries are in very advanced level in ICT which corresponds to stage 5 of Rostow's model. These countries have completely integrated ICT into their education systems (Mwaniki 2007). Kenya can be placed in stage 3 of Rostow's model as it is currently attempting to introduce the ICT skills to the educational system and this shows there are problems in its ICT integration in education.

According to Kwok-Wing and Pratt (2004), ICT is an integral part of the existing curriculum in primary and secondary schools curriculum in Scotland. Computer studies is a core curriculum in at this country. Teachers in Scotland are adequately trained in handling the subject. The training of teachers in this country was funded by UK-wide development organizations. In Kenya, the situation different as computer studies is an optional subject. On training of teachers, there are no any development organizations or NGOs to sponsor teachers for on handling the computer studies subject. Teachers in Kenya train either through self sponsored programs or through loan from HELB. In 2002, a study carried out in New Zealand aimed at evaluating the use of ICT in 21 secondary

schools established that there was an increased and satisfactory access of computers in all 21 secondary schools. The computer to students ratio in that country was established to be at 1:6 in secondary schools and 1:9 in primary schools. In US the computer to student ratio in secondary schools improved from 1:9 in 1996 to 1:4 in 2001 (Kwok-Wing and Pratt (2004). Contrally, the computer to students ratio in Kenya was established to be 1:30 in 2007 Waiharo (2007).

The data available on internet usage in North America is in agreement with the above findings as more than 77% of the population use and access internet as illustrated in Table 2.1.

Table 2.1 internet usage in North America

Region/country	Population	Internet user	Percentage (%)
Canada	68,265	54,000	79.1%
Bermuda (UK)	33,559,742	26,224,900	77.7%
USA	310,232,863	239,893,600	77.3%
Greenland	57,566,961	52,000,000	90.2%
Total	344,124,450	266,224,500	77,4%

Source: Miniwatts marketing group (2010)

Table 2.1 shows that over 77% of population in North American countries use internet, which is a clear indication that the computer literacy level has been achieved due to effective integration of ICT in education system in developed countries.

According to Hawkrige (2010), most African countries are turning to computers in their efforts to build stronger economies and more efficient public service. Benzie (1995) is of the same point of view as he said that many developing countries have responded to the challenge of initiating national programs to introduce computers into schools. According to him, their efforts have been of limited success not only because the programs were formulated in non-educational realms but also because they were not based on research.

Vota (2009) is of view that despite the rapid growth, Africa ICT penetration levels in 2009 are still very far behind the rest of the world. He further argues that, very few African countries reach ICT levels comparable to global averages as very small percentage of Africans use internet. A study carried out by Miniwatts (2010) confirmed this as it established that the level of internet usage in Africa is very low compared to the rest of the world as shown in Table 2.2:

Table 2.2: Comparison of internet usage in Africa with the rest of the world

Region	Population % in the World	Penetration % of population	User growth (2000-2010)	% of Ushers the world
Total of	14.8%	10.9%	2.357 %	5.6 %
Rest of world	85.2%	31.8%	420.5%	94.4 %

Source; Miniwatts (2010)

According to figures in Table 2.2, the percentage of Africans who use internet in the world is 5.6% as compared to 94.4 % in the rest of the world. This percentage is very low considering that the population of people in Africa amount to 14.8% of the world population. The level of internet penetration in Africa is also very low (10.9%) compared to 31.8% in the rest of the world.

According to Dzidomu (2002), the slow pace of embracing ICT could seriously undermine the capacities of these developing countries to embark on sustainable socio-economic development. He further argues that African countries are at risk of being marginalised if they fail to embrace technology to transform their economies. According to World Bank Report (2008) on internet user as percentage of population in Kenya, only 8.7% of the country population was using internet by 2008. This is a very low percentage which implies that the level of computer literacy among the Kenyan population is very low due to its poor integration in the education system. This is in agreement with Miniwatts (2010) findings in internet use in African country as illustrated in Table 2.3:

Table 2.3: Comparison of internet usage in Kenya with other selected African countries

Country	Population User 2010	Internet estimate 2010	% of user in Africa
Nigeria	152,217,341	143,987,000	39.6
Egypt	80,871,865	17,060,000	15.4
Morocco	31,627,451	10,442,500	9.4
South Africa	49,109,107	5,300,000	4.8
Algeria	34,586,184	4,700,000	4.3
Sudan	41,980,182	4,200,000	3.8
Kenya	40,046,566	3,995,500	3.6
Uganda	33,398,682	3,200,000	2.9
Zimbabwe	11,651,858	1,422,000	1.3
Ghana	24,339,838	1,297,000	1.2

Source: Miniwatts (2010)

The data in Table 2.3 shows that only 3,995,500 of Kenyans (9.98% of the population) were using internet by 2010. This is 3.6% of Africans who use internet which is a very low percentage compared to a percentage of Nigeria which stood at 39.6%. This emphasizes the importance of hastening implementation of computer studies curriculum in secondary schools to make the population ICT compliant which is supported by Mwaniki (2007) who said that no country can afford to be left behind in the technological revolution because by so doing, she risks underdevelopment, isolation and backwardness. Computer studies curriculum was introduced in secondary schools in 1996 (MOEST 2003). Consequently, it was also introduced in Teacher Training colleges so as to prepare teachers trainees to handle the subject in secondary school. Ben-zion et.al (1995) stresses that, proper employee preparation programs are a pre-requisites for successful IT assimilation. After launching the computer studies curriculum in Kenya, the ministry of education requested Secondary schools to build computer laboratories with adequate number of computers (Kinyanjui, 2003). According to MOEST (2005) an ideal computer laboratory should be equipped with 20-40 computers, printer, copier, scanner, overhead projector, digital video camcorder, digital camera, webcams, microphones, special needs peripherals among other software requirements such as antivirus, keyboard software, web browse and productivity tools such as word processing, spreadsheets, presentation, database (open office or Microsoft office suit).

In Kenya, most studies carried out reveals unsatisfactory level of integration of ICT in education. Karuru (2005) established that, though computer studies curriculum existed at secondary school and tertiary levels, its implementation has either been only partial or not there at all in most of these institutions. Mburu (2008) carried a research aimed at

establishing the attitude of secondary school teachers and students towards e-learning in Thika Municipality and found out that most of the secondary schools have inadequate number of computers. Out of eight schools sampled in his study, none had the set number of computers 20-40 recommended by MOEST (2005) for an ideal computer laboratory. The findings of his research was replicated in Waiharo (2007) findings who established that more than 50% of the secondary schools in North Eastern province had no computers or have computers which were defective or absolute. A study carried by ICT federation and University of Nairobi department of computing and informatics revealed that Kenya had 20,000 – 30,000 computers in schools against a national requirement of 132, 000 computers in public high schools alone, Kanyeki (2006). These make Kenya to be ranked as 135th country out of 179 countries by United Nations international union digital access index.

Table 2.4: Number of computers available in secondary schools

No. of computers	Frequency	Percentage (%)
None	2	25.0
One	2	25.0
Two	2	25.0
Ten	1	12.5
Sixteen	1	12.5
Total	8	100.0

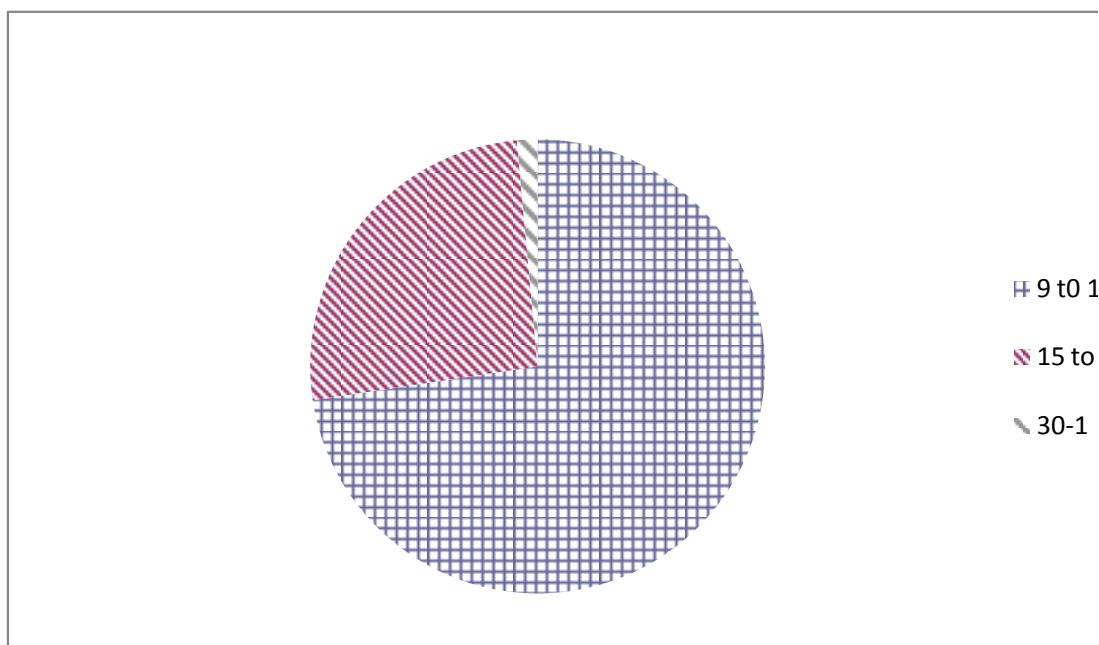
Source: Mburu (2008)

The research findings in Table 2.4 show that two schools did not have even a single

computer which is a major setback in implementation of computer studies curriculum.

Though one of the schools had 16 computers, these are still not enough for an ideal class of 40 students for the recommended student to computer ratio of 2:1. This research findings are similar to that of Waiharo (2007) who established that 85.4% of secondary schools in North Eastern province had unreliable and absolute computers. His findings established further that most of secondary schools in the province which have computers had computer to student ratio as low as 1: 30. This computer to student ratio is very low hence adversely affects the smooth implementation of computer studies curriculum.

The information is illustrated in Figure 2.1.

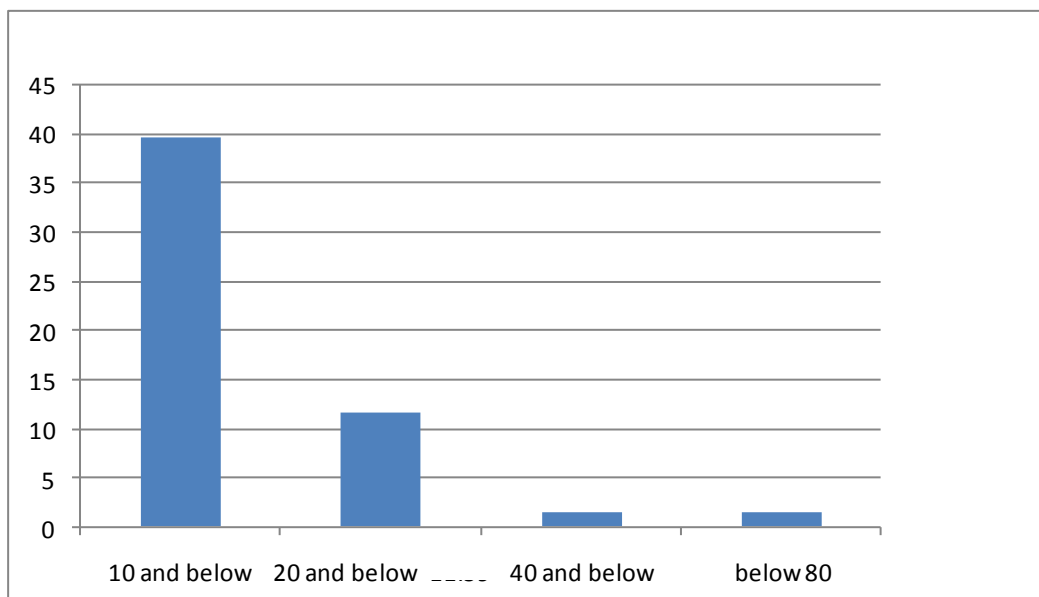


Source: Waiharo (2007)

Figure 2.1: The ratio of No. of students to computer in North Eastern Province

None of the school represented in the pie chart in Figure 2.1 have the recommended number of students to computer ratio of 2:1. Some schools had a ratio as big as 30

students to 1 computer which can seriously affect the quality of education in computer studies curriculum in secondary schools in Kenya. Kinyanjui (2003) findings further amplify the level of inadequacy in number of computers in secondary schools in Kenya as she established that more than 50% of secondary school in the study sample had less than 20 computers. This is a sympathetic situation considering that this study was carried out across all eight provinces in Kenya. The research findings are represented in the following Figure 2.2:



Source: Kinyanjui (2003)

Figure 2.2: Quantity of computers in secondary schools in Kenya

It is clear from the research findings in Figure 2.2 that computer studies curriculum is poorly implemented in secondary schools in Kenya. This could explain why the candidates sitting for computer studies examinations at KCSE level are also very low.

Table 2.5 shows that very few candidates register for computer studies at KCSE examinations.

Table 2.5: Computer studies candidates in K.C.S.E in Kenya 2003-2007

Year	2003	2004	2005	2006	2007
No. of computer studies candidates in Kenya	2,962	3,142	3,419	4,192	4,835
Total No. of candidates in Kenya	207,730	222,676	260,643	243,319	276,093
Percentage candidature	1.43	1.41	1.31	1.73	1.75

Sources: MOE (2008)

The data represented in the table 2.5 show that very small percentage of candidates in Kenya take computer studies examinations at national level. For instant in year 2007 only 4,835 candidates out of a total of 276,093 candidatures in Kenya sat for computer examination. This is a very small percentage of 1.75% which graduated with computer skills at form 4 level. In 2010, only 17 out of 2168 candidates sat for computer studies examinations at KCSE level. This reveals that there is poor enrollment in the subject which points out to some underlying problem in the implementation process.

2.3 Resources available for the implementation of computer studies curriculum

According to Padraig and Lawler (2007), the incorporation of ICT in Kenya education curriculum was aimed at promoting a major step in bridging the digital divide. Further commitment by the Kenyan government in bridging the digital divide through

empowering ICT in education is seen in its development of ICT policy (KESSP, 2005). The Sessional Paper No. 1 of 2005 underlines the government's recognition of the role of ICT in technological development. The summary of the government investment is shown in Table 2.6:

Table 2.6: Summary of yearly Cost: 2005/06-2009/10 (Kshs millions)

DESCRIPTION	2005/06	06/07	07/08	08/09	09/10	TOTAL AMOUNT
Ministerial ICT capacity development	49.84	34.84	63.94	25.59	18.34	192.55
ICT advisory services to Education Institutions	6.3	13.3	19.55	18.3	5.8	63.3
Digital content developmental delivery	7.26	8.26	7.26	6.76	5.76	35.5
ICT teachers development	17.55	17.55	17.55	17.55	17.55	87.75
Research and development of ICT in education	4.5	4.5	4.5	4.5	4.5	22.5
Capacity building	102.53	5.52	35.52	35.52	35.53	287.995
TOTAL	187.95	113.97	148.32	108.22	87.47	689.295

Source: KESSP (2005, 157)

The summary of budget in Table 2.6 show the government planned spending in Education in the five year period in its commitment in making education the avenue for equipping the nation with ICT skills in order to create a vibrant and sustainable economic growth (KESSP, 2005). Contrary to the governments plan to invest in ICT in Education,

the secondary schools have done very little with some having taken no initiative to implement the computer studies curriculum. The high cost of computers makes it hard for the schools to procure the computers for effective curriculum implementation. Kenya has a liberalized economy where price of goods are determined by forces of demand and supply which makes the prices of computers to be highly prohibitive for most secondary schools, Waiharo (2007). Another policy which slows down the implementation of computer studies curriculum is FSE fees guidelines. According to MOE (2007), schools are supposed to stick to Government fees guidelines. As a result schools cannot charge extra money to buy schools computers. Kanyeki (2006) established that the percentages of schools with computers in Africa are very low as illustrated in Table 2.7;

Table 2.7: Number of school with computers in selected African countries

Country	No. of schools	No. of schools with computers	% of schools with computers
Egypt	32,000	10,000	31.2
Ghana	35,000	500	1.4
Mozambique	7,000	20	0.3
Namibia	1,519	60	3.9
South Africa	28,798	5000	17.4

Source; Kanyeki (2006)

The data in Table 2.7 show that Egypt is among the African countries having high number of schools with computers (31.2%). The situation is worst in Mozambique where only 0.3% of its schools have computers. The inadequacy in number of computers in

schools could be attributed to huge capital required to purchase and install computers in school. Most secondary schools operate on limited resources to implement competing curriculum projects. In Sudan, the education authorities had embarked on building and capitalizing on ICT policy as a gateway for sustainable development seen as a tool for integrating economy onto the global market (Hamdy, 2007).

However the full potential of ICT in Sudan is hampered by lack of capacity of communities to make the best use of the service. Less than 50% of public secondary schools have computers as shown in Table 2.8.

Table 2.8: No of schools with computer in Sudan

School category	Total number in the country	Schools with computers	Percentage
Public	11,752	4,363	37.1
Private	1,035	647	62.5
Technical Schools	81	20	24.7
Public Universities / Colleges	27	27	100.0
Private Universities / Colleges	47	47	100.0

Source: Hamdy (2007)

From the Table 2.8, it's evident that only 37.1 percent of public schools have computers. This is incomparable with 62.5 percent for private schools. The infrastructure systems in a school affect the implementation of computer studies curriculum. Ndwiga (2005) also highlighted availability internet as one of the setbacks in the implementation of computer

studies curriculum in diploma Teachers Training colleges. According to him, there is inadequate computer internet connectivity in two of the three diploma teachers colleges as illustrated in Table 2.9:

Table 2.9: Availability of internet services

Institution	Internet service	Adequacy
K.T.T.C	Yes	Adequate
K.S.T.C	No	Inadequate
Kagumo	No	Inadequate

Source: Ndwiga (2005)

According to the research findings in Table 2.9, only K.T.T.C. had adequate internet services. The internet services were rated inadequate in K.S.T.C. and Kagumo College which imply that the Teacher graduating from those colleges could not be well prepared to handle computer studies effectively in secondary schools. He further established that in one of the diploma teachers college the computers were not adequate which could affect teachers' training on computer courses.

2.4 Secondary school teachers' training and exposure to computers

Koech Commission (1999) emphasized the importance of having highly qualified and motivated teaching force capable of understanding the needs of the learner and curriculum in order to implement it effectively. The introduction of Computer studies curriculum in secondary schools in Kenya in 1996 was consequently followed by its introduction in Teacher Training colleges (MOEST 2003). However implementation of

ICT courses in teacher training colleges has been hampered by a number of factors. Mwaniki (2007) identified five factors that had adversely affected the implementation of computer courses in Primary Teacher Training colleges as:

- i. Low connectivity to the internet which lead to poor signals
- ii. Very low numbers of qualified tutors
- iii. High students to computer ratio
- iv. Inadequate and expensive textbooks
- v. Old slow outdated computer

Oduda (2004) holds similar views as he argues that although computer studies are an examinable subject at Form 4, few teachers are trained on the subject. He further stressed that schools depend on hired personnel to teach the subject most of whom are not professional in classroom delivery. The problem of trained teachers in both secondary and tertiary institution is compounded by the high level of brain wash in teaching career as the IT trained graduates often quit teaching profession to join private sectors where there is a lucrative opportunity.

Quite good number of teachers in secondary schools does not have any skills in use of computers. Mburu (2008) established that 41.7% of teachers in the secondary schools in Thika municipality had never used computers. Such teachers may be slow in implementing computer studies curriculum in their schools. The level of ICT usage in educational institutions can influence the implementation of computer curriculum in the institution. ICT Services include among others, computers, Television and radio (Karuru 2005). The services of the above gadgets can be used in an educational institution as

either an instructional tool or in administrative duties. Karuru (2005) established that the use of ICT in educational Institutions was high in print, radio and Television and low in computers and internet as shown in the table below.

Table 2.10: Availability of internet services

ICTs	Mean	Comment
Print	4.0120	High
Radio	3.7867	High
Television	3.5667	High
Computer	2.0521	Low
Internet	0.9772	Very low

Source: Karuru (2005)

The research findings in table 2.10 shows that most school does not use computer and internet services which can adversely affect the implementation of computer studies curriculum. She established that the adequacy of computer facilities in Kenyan schools is low. This could affect the implementation of computer curriculum in secondary schools.

2.5 The teaching methodologies and assessment of computer studies subject

According to Billie (2009), Teaching-Learning activities can be categorized as either student-centered pedagogy or teacher-centered pedagogy. The use of these strategies can positively or negatively affect student learning and the consequent achievement in particular subject. Many variables come into play when we try to determine which teaching style to be used. The variables include:

- Discipline
- Class size
- Subject within the discipline
- Room layout
- Environmental factors in the room (temperature, for example)
- Teacher personality
- Classroom dynamic (between students)

Teaching strategies can become a complicated issue, and teaching effectiveness can affect student learning, teaching evaluations, and consequently the success of the implementation of a given curriculum. Courses where the instructor shows a technique or calculation or problem and then has his students repeat similar tasks are described as student-centric. But this depends on certain disciplines or situations. According to Science now (2011), assessment provides an effective tool for communicating educational expectations and progress toward accomplishing those expectations. Assessment involves the ongoing process of collecting and interpreting data for the purpose of improving understanding and adjusting teaching. In essence, assessment and learning are two sides of the same coin. The challenge is for teachers to shift the assessment process to embrace the concept of assessment as more than a terminal event. There are three types of assessment. These are diagnostic, formative, and summative:

Diagnostic assessment provides a way for teachers to chart a course of action, or map out a route, using existing knowledge to build upon. It also allows for identification of

gaps or misconceptions in prior learning. These assessments are used to gather information about what students already know and are able to do.

Formative assessments occur throughout the learning process. They provide multiple opportunities for students to demonstrate attainment of identified targeted goals without concerns about grading. Formative assessments should vary to accommodate students' abilities to demonstrate knowledge. Formative assessment provides ongoing direction for improvement and/or adjustment in learning and instruction. It is non-graded and considered low-stakes. An important element of formative assessment is feedback. Feedback makes the biggest impact when it occurs during the learning process.

Summative assessment is a high-stakes type of assessment for the purpose of making final judgments about student achievement and instructional effectiveness. By the time summative assessment occurs, students have typically exited the learning mode. Summative assessment forms an end point that sums up the performance or learning level of achievement. The evaluation of summative assessments provides a look at student performance as well as an opportunity to evaluate instructional practices. The effectiveness of the teaching methodology and the assessment process influence the success of the implementation process.

2.6 Summary of related literature

From the review of the related literature the following has been established. The level of implementation of computer studies in Kenya is very low. There is poor enrollment for students taking the computer studies subject in Kenya. This is evidenced by very low candidature in the subject at KCSE level. For instance the total candidature in the whole

country was 1.75% in 2007 (MOE, 2008) and 0.78% in Kahuro district, Murang'a county, Kenya, Murang'a East Education Office (2011).

Some of the resources and infrastructures which are available in a number of schools for the implementation of computer studies curriculum in public secondary schools in Kenya are inadequate. There are inadequate numbers of computers in secondary schools in Kenya which make it to be ranked 135th country out of 179 countries by United Nations International Union digital access index (MOEST (2005), The previous studies carried out in some parts of Kenya especially in former North Eastern province (Waiharo, 2007) revealed that 85.4% of schools in that province did not have computers and those had them, the computers were absolute. Most public secondary schools in Kenya do not have MOE recommends standard number of computers in school computer laboratory which is 20-40 computers. This is revealed by Mburu (2008) study which established that 0% of the schools in his study sample had the set number of computers. For those schools that have some computers, the computer to student ratio is also very low with it being 1:30 (Waiharo, 2007). Secondary schools and Teacher training colleges have not completely implemented the computer studies curriculum. It's also clear that the level of I.C.T. usage in secondary schools is low. The state of internet connectivity in Teachers Training Colleges is also inadequate.

The level of the teachers training and exposure in ICT have is low in the country. For instance, many teachers do not use computer as established by Mburu (2008). He established that 41.7% of teachers had not have computers. On other hand, Performance in computer studies subject is poor. In Kahuro District, two schools had registered

candidates in 2009. One of the schools posted an M.S.S. of 5.000 in computer studies with the subject being the most poorly performed subject in the school and ranked position 15 out of 15 in subjects' analysis. The second school had the computer studies subject having an M.S.S. of 6.111 where the subject was ranked position 13th out of 15 subjects in school.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research design and procedures used in the study. This includes; the research design the locale, the target population, research sample and sampling procedures, research instruments, piloting, data collection procedures and methods of data analysis.

3.2 Research design

The study adopted a descriptive survey design. The researcher considered this type of research design appropriate as it would help to obtain a cross section of information touching on issues and challenges affecting implementation of computer studies curriculum in public secondary school in Kahuro district. This design was chosen as it is an important tool which is used in gathering facts and obtaining precise information concerning the current status of phenomenon and making conclusion from the facts discovered whenever possible, (Orodho, 2009).

3.3 The research locale

The study was conducted in Kahuro district, Murang'a County of Republic of Kenya.

Kahuro district is 18 kilometres west of Murang'a town and about 88 kilometres north-west of Nairobi city. The district is on average altitude of 6000 metres above sea level and experience diverse weather conditions with two rainy seasons in months of March and October every year. The average temperature in the district is 18-27^oC.

The locale was considered appropriate as there is availability of schools of diverse categories ranging from National, Extra-County, County and District schools. The locale also presented regions with diverse economic potentials with Murarandia division been high income zone resulting from tea farming while Mugoiri and Wangu divisions are low income coffee growing zones. This according to Mugenda and Mugenda (1999) would enable the researcher to collect information from target population with respect to one or more variables.

3.4 The target population

3.4.1 Schools

The target population consisted of 36 public secondary schools in Kahuro district, Murang'a County, Republic of Kenya. These schools belong to different categories which comprises; one provincial boys boarding, two provincial girls boarding, three district boys boarding, two district girls boarding, six mixed day and boarding, and 22 district mixed day schools.

3.4.2 Respondents

The study targeted 36 Principals, 4 computer teachers and 266 computer studies students in public secondary schools in Kahuro district.

3.5 The sample and sampling design

3.5.1 Schools

The study sample in this study constituted of eight public secondary schools in Kahuro district. This constituted of 22.22% of the target population. According to Gay (1992),

the sample size for the study with a small population should be at least 20% of the target population. The selection of the schools in the study sample was done using three sampling techniques namely; stratified sampling techniques, purposive sampling techniques and simple random sampling techniques. The schools in the study population were first divided into seven strata depending on the type and the status of the schools present in the study locale. These included; National Girls' Boarding School, Extra-County Boys' Boarding School, Extra-County Girls' Boarding School, County Boys' Boarding School, County Girls' Boarding School, District Mixed Day And Boarding School, District Mixed Day Schools.

Stratified sampling technique was used and it ensured that the schools were selected across six strata depending on the type and the status of the schools. Orodho (2009) emphasizes the use of stratified sampling technique when the population is a composite of sub-groups with different characteristics as it ensure that all the sub-groups are represented in the study sample. One school was selected from each stratum which existed by the time this research was carried out. The study sample consisted of eight secondary schools making up of 22.22% of the study sample. Gay (1992), proposed that the sample size for the study with a small population should be at least 20% of the target population.

Purposive sampling technique was used select one Provincial Girls boarding secondary school which registered candidates for computer studies KCSE examinations in 2010. This is justified by Patton (1990) who perceives the purposive sampling as a sampling technique that allows a researcher to use cases that have the required information with

respect to meet the objectives of the study. Simple random sampling technique was used to select schools in other strata which did not schools register candidates for computer studies KCSE examinations in 2010. These according to Kathuri and Pals (1993) gave each school in each stratum an equal and independent chance of being selected.

Table 3.1: Schools in the sample

Type and status of the School	Population Size (N)	No of Schools in the Sample (n)
National Girls' Boarding School	1	1
Extra-County Boys' Boarding School	1	1
Extra-County Girls' Boarding School	1	0
County Boys' Boarding School	3	1
County Girls' Boarding School	2	1
District Mixed Day And Boarding School	6	1
District Mixed Day School	22	3
Total	36	8

The table shows that there was no school selected from Extra-County Girls' Boarding School. This is because by the time this research was carried out, there was different way of classifying schools. The school selected as National Girls' Boarding School and the Extra- Girls' Boarding School were by that time in same category of Provincial Girls' Boarding School and one of the school selected from that category. The school was later uplifted to National status. The study sample consisted of eight secondary schools

making up of 22.22% of the study sample. Gay (1992), proposed that the sample size for the study with a small population should be at least 20% of the target population

3.5.2 Respondents

In this study, 30 respondents were reached which included eight principals two computer teachers and 20 computer studies students. The target population was small hence the study sample of 22.22% met the Gay (1992) minimum threshold, as he proposed that the sample size for the study with a small population should be at least 20% of the target population. There were five men principals, three women principals, one male computer teacher, one female computer teacher and 20 computer studies students. Purposive sampling technique was used to select the eight principals and the two computer studies teachers. Purposive sampling technique and simple random sampling technique were used to select 20 computer studies students who included; 6 students in form two, 7 students in form three and 7 students in form four. Purposive sampling technique ensured that the respondents selected are those who had valuable information with respect to meet the objectives of this study as emphasized by Patton (1990). Simple random sampling technique ensured that each computer studies' student in form 2, 3 and 4 had an equal chance of being included in the study sample (Orodho, 2009).

3.6 Research instruments

The researcher used three research instruments in this study. These included; Principals' interview Schedules, teachers' and students' questionnaires and observation checklists.

3.6.1 Interview Schedules

These research instruments were used to seek information from the schools' Principals. Interview schedule was found to be very appropriate as it made it possible to obtain the data required to meet the specific objectives of the study. This was possible as this instrument gives room for probing, (Orodho, 2009). The interview schedule contained three major sections; section A which sought the demographic information, section B which sought the information on the issues and the challenge on the implementation of computer studies curriculum in secondary school in Kahuro district. Section B had five parts with each part seeking information as per each research question. Section C sought to find out the proposals for strategies for the effective implementation of computer studies curriculum.

3.6.2 Questionnaires

Questionnaires were used to seek information from teachers and students. A questionnaire is an important research instruments as the respondents fill in answers in a written form which could be distributed to the respondents by the researcher or a research assistant. The respondents are given time to complete the form which can then be collected later on a date agreed upon.

Kombo and Dolno (2006). These research instruments contained three major sections; section A which sought demographic information, section B which sought the information on the issues and the challenge on the implementation of computer studies curriculum in secondary school in Kahuro district. Section B had five parts with each part

seeking information as per each research question. Section C sought to find out the proposals for effective implementation of computer studies curriculum.

3.6.3 Observation checklist

This instrument was used to record observable information during the researcher's visit to the sample schools. Kathuri and Pals (1993) recommend the use of observation checklist as an important instrument which minimizes or eliminates the bias that may result from people offering information about themselves. Mugenda and Mugenda (1999) agree with this as they view it as an important instrument which a researcher utilizes to record what he or she observes during data collection. Observation checklist used had guidelines seeking information such as availability of computers, availability of electricity and computer laboratories.

3.7 Piloting of the research instruments

After the research instruments were constructed, they were piloted in two schools not included in the study sample. Kombo and Dolno (2006) are of opinion that the pilot study helps in testing the feasibility of the study. Some of the questions which were found to be ambiguous were reconstructed after the pilot study to ensure that the research instruments were ready for the actual study.

3.8 Validity and Reliability of the research instruments

The validity of the research instruments was determined by a panel of several judges competent in the area of study. The researcher first sought the input of some of his fellow students who were also preparing to undertake research. He then sought for insights from

two scholars (Florence W. Mwangi and Peterson K. Mwangi) who had earlier carried out a similar research. The two university supervisors also made their own individual assessment on the instruments and give their feedback which was incorporated in the final instruments used in the actual research. Mugenda and Mugenda (1999) view this as an important process as it ensure that the research instruments measures what they are purported to measure. The degree of reliability of the research instruments was tested through test-retest techniques which gave a Spearman rank order coefficient of 0.78 which is good enough as Orodho (2009) proposed that any coefficient above 0.75 is good to judge the reliability of the research instruments.

3.9 Data collection procedures

The researcher first obtained an introduction letter from the school of education, Kenyatta University. This was followed by seeking of Research approval from the Secretary; National Council for Science and Technology. The researcher then proceeded to seek permission from the District Commissioner and DEO Kahuro district to conduct research in public secondary schools in that district. The researcher then proceeded to carry out the research in public secondary schools in the study sample. He first sought the permission from each school principal in the sample schools to conduct research in the school. He then interviewed the Principals and administered the questionnaires to teachers and students personally. Consequently, there was 100% return rate for all the research instruments.

3.10 Data analysis

After the data has been collected it was analysed using the descriptive statistics analysis procedures. The data was first organised as per the thematic areas covered in the research instruments. The descriptive statistics analysis was then used to tabulate the data and report the research findings as percentages, in frequencies tables, bar graphs and pie charts.

3.11 Ethical and logical considerations

The researcher put into consideration the ethical and logical issues throughout the research process. Orodho (2009) outlined the following ethical principles to be considered during the whole research process; informed consent, confidentiality of the respondents and anonymity. The researcher ensured that these principles were adhered to from the time the research instruments were prepared, during the collection and analysis of data. The logical considerations made in this research were; pre-field work logistics, field work logistics and post-field work logistics. The pre-fieldwork logistics in this research included; Construction of research instruments on time, obtaining the research permit from the concerned authorities, preparation of work plan and research budget. The field work logistic considered was geographical location of the schools where schools in same geographical regions were visited on a same day. The post-field work logistics was collecting and editing the research instruments. This ensured the research was carried out in a smooth way.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS OF FINDINGS

4.1 Introduction

This chapter gives a systematic presentation, analysis and interpretation of the data collected during the research. The data is presented in forms of frequency distribution tables, pie charts and bar graphs. The purpose of this study was to investigate the issues and challenges affecting the implementation of computer studies curriculum in public secondary schools in Kahuro district, Murang'a County, Kenya. The analysis of the data, presentation and discussions of the findings are organized under the following themes:

- i) Analysis of the demographic information.
- ii) Type of the resources and infrastructures available.
- iii) The level of teachers' exposure and training in ICTs.
- iv) Teaching methodologies and evaluation process.
- v) Strategies for effective implementation of computer studies curriculum.

4.2 Analysis of the demographic information

This study aimed at establishing the gender of the respondents. Thirty respondents were reached in this study. These comprised five male principals, three female principals, one male computer teacher and one female computer teacher. All the twenty computer studies students were females. This is because there was only one girls' school in the study sample that had implemented computer studies curriculum. The information is represented in Table 4.1:

Table 4.1: Gender distribution of the respondents

Gender	Computer teachers		Principals	
	n	%	n	%
Male	1	50.0	5	62.5
Female	1	50.0	3	37.5
Total	2	100.0	8	100.0

From Table 4.1, it is clear that there was no gender disparity with computer teachers. However 62.5% of the principals were male while 37.5% were female.

This study further established the age of the computer teachers and principals. The results were as presented in Table 4.2:

Table 4.2: Age distribution of the computer teachers and principals

Age (Years)	Computer teachers		School Principals	
	n	%	n	%
Below 30	2	100.0	0	0.0
31-40	0	0.0	1	12.5
41-50	0	0.0	6	75.0
Above 50	0	0.0	1	12.5
Total	2	100.0	8	100.0

Table 4.2 indicates that the two computer teachers were below 30 years of age while 75% of the Principals were between 41-50 years. It is also clear that 12.5% of principals were

at the age of 31-40 and 12.5 % were above 50 years of age. Age of the teachers was found to have no effect in the implementation of computer studies curriculum. This is because in this study, the two computer teachers were below 30 years of age while the principal of the school that had implemented computer studies curriculum was above 50 years of age.

This study also aimed at establishing the academic and professional qualifications of the computer teachers and the schools principals. The results were obtained are presented in Table 4.3

Table 4.3: Academic qualification of the computer teachers and principals

Professional qualification	Computer teachers		School Principals	
	n	%	n	%
Diploma in Education	0	0.0	0	0.0
BEd (Science)	0	0.0	0	0.0
BEd (Arts)	0	0.0	4	50.0
BSc with PGDE	1	50.0	3	37.5
B.A. with PGDE	0	0.0	1	12.5
M.Ed	0	0.0	0	0.0
Others (Diploma in IT)	1	50.0	0	0.0
Total	2	100.0	8	100.0

The information in Table 4.3 indicates one computer teacher had BSc with PGDE while the other one had Diploma in IT. Most of the school principals were holder of Bed (Arts)

which made up 50%. The principals with BSc with PGDE constituted 37.5% while 12.5% of the principals had BA with PGDE.

This study further sought to establish the professional teaching experience of the computer teachers and school principals in years. The findings are presented in Table 4.4

Table 4.4: Professional teaching experience of the computer teachers and principals

Professional teaching Experience (Years)	Computer teachers		School Principals	
	n	%	n	%
1-5	2	100.0	0	0.0
6-10	0	0.0	0	0.0
11-15	0	0.0	1	12.5
16-20	0	0.0	5	62.5
21-25	0	0.0	2	25.0
26 and above	0	0.0	0	0.0
Total	2	100.0	8	100.0

The data in Table 4.4 shows that the professional teaching experience for the 100% of the computer teachers was 1-5 years. The professional teaching experience for 12.5% of the principals was 11-15 years while 25% of the principals had professional teaching experience for 21-25 years. Majority of the principals; 62.5% had professional teaching experience for 16-20 years. It is clear that computer teachers have the lowest professional experience.

This study also aimed at establishing the length of stay of the computer teachers and principals in their current positions. The results obtained were as shown in Table 4.5.

Table 4.5: Length of stay of the computer teachers and principals in their current position

Number of years in the current position	Computer teachers		School	Principals
	n	%	n	%
1-5	2	100.0	4	50.0
6-10	0	0.0	4	50.0
11-15	0	0.0	0	0.0
16-20	0	0.0	0	0.0
21-25	0	0.0	0	0.0
26 and above	0	0.0	0	0.0
Total	2	100.0	8	100.0

The data in Table 4.5 shows that the length of stay for 100% of the computer teachers and 50% of the principals in their current position were 1-5 years while 50% of the principals had stayed in their current position for 6-10 years. On the type and the status of the schools, 100% computer studies students and 100% of computer teachers were from Provincial Girls Boarding school, 12.5% of the principals from Provincial Girls Boarding school, 12.5% of the principals from Provincial Boys Boarding school, 12.5% of the principals from District Girls Boarding school, 12.5% of the principals from District Girls Boarding school, 12.5% of the principals from District Mixed day and boarding school and 37.5% of the principals from District Mixed day secondary school.

This study further sought to establish the level of the computer training for computer teachers and the principals. The findings are presented in Table 4.6

Table 4.6: The level of the computer training for computer teachers and principals

Level of the computer training	Computer teachers		School Principals	
	n	%	n	%
	No computer training at all	0	0.0	0
Certificate (Computer packages)	0	0.0	2	25.0
Diploma	1	50.0	0	0.0
Bachelor degree	1	50.0	0	0.0
Masters	0	0.0	0	0.0
Others	0	0.0	6	75.0
Total	2	100.0	8	100.0

The data in Table 4.6 shows that 100% of the computer teachers had computer training with one having a diploma while the other had a bachelor degree. It was also established that 25% of the principals had attained computer literacy having done computer packages. The other 75% of the principals had no formal computer training. However those principals with no formal computer training reported that they had gained some computer literacy through use of school, personal computers or cyber cafes. These results were in agreement with Waiharo (2007) findings who established that 87.2% of teachers in the secondary schools in North Eastern province did not have any computers training.

4.3 Type of the resources and infrastructures available for the implementation process

This study also sought to establish the type of resources and infrastructures available in the schools for implementation of computer studies curriculum. The responses from two computer teachers and eight Principals are presented in Table 4.7

Table 4.7: Availability of resources for implementation of computer studies curriculum

Resources and infrastructures	Available		Not available	
	n	%	n	%
Computers	10	100.0	0	0.0
Antiviruses software	9	90.0	1	10.0
Soft discs (CDs and Flash discs)	7	70.0	3	30.0
Text books for Computer studies subject	3	30.0	7	70.0
Revision books / Materials for Computer studies	2	20.0	8	80.0
Electricity	10	100.0	0	0.0
Backup generator	4	40.0	6	60.0
Uninterrupted Power Supply (UPS)	3	30.0	7	70.0
Printers	10	100.0	0	0.0
Scanners	3	30.0	7	70.0
Overhead projectors	3	30.0	7	70.0
Computer Laboratory	4	40.0	6	60.0
Internet connectivity services	0	0.0	10	100.0
Others e.g. Modems	8	80.0	2	20.0

From the Table 4.7, it is clear that 100% of respondents said that computers, electricity and printers were available. Further 90% of the respondents reported that Antiviruses' software were available. Another 80% of the respondents said that modems were available. Revision books / materials for Computer studies subject were reported by 80% of the respondents to be unavailable. Text books for computer studies subject; Uninterrupted Power Supply (UPS), scanners and overhead projectors were unavailable according to 70% of the respondents. Backup generator and computer laboratory was missing according to 60% of the respondents.

On the other hand internet connectivity services were reported by 100% of the respondents to be unavailable. Even in the school which had implemented the computer studies curriculum depends on modems for internet connectivity. The respondents, 75% of the students rated the internet network in their school through use of a modem as average while 25% rated it as poor. The findings in this study are in agreement with Ndwiga (2005) who highlighted that there were inadequate resources such as computer Laboratories in 33.3% of diploma Teachers Training Colleges which was a major setback in the implementation of computer studies. The findings of this study on the issue of internet connectivity agree with Karuru (2005) who rated the internet connectivity in schools to be very low. Availability of the computer laboratory was further investigated in the computer students' questionnaire and unlike the principals, all 100% of the students reported that their school has a computer laboratory. This was further confirmed in the observation checklist. On students' responses, 100% of the students said that their school was supplied with electricity by KPLC.

This study sought to establish the number of computers available in public secondary schools in the study sample. The information obtained from the eight principals in the study sample is presented in Table 4.8

Table 4.8: Number of computers available in public secondary schools

No. of computers	No. of schools	%
1 - 10	5	62.5
11 - 20	0	0.0
21 - 30	2	25.0
31 - 40	1	12.5

The data in Table 4.8 shows that 62.5% of the schools in the study sample had between 1 – 10 computers. The further 25.0 % of the schools in the study sample had between 21 – 30 computers while 12.5% of the schools in the study sample had between 31 – 40 computers. These results are in agreement with Kinyanjui (2003) findings who established that more than 40.0% of schools in his study sample had less than 10 computers and only 4.5% of the schools had more than 20 computers. Mburu (2008) obtained similar results as he found that 75% of schools in the study sample had less than 10 computers, 12.5% had 10 computers and 12.5 % had 16 computers. None of the schools had 20-40 computers as recommended by the Ministry of Education for ideal school computer laboratory. This study further sought to establish the number of computers which were in good working condition. It was established that 83.5 % of the computers were in good working condition with 16.5 % being defective.

The study further sought to establish the computers to student ratio for the schools in the study sample. The results obtained are represented in Figure 4.1

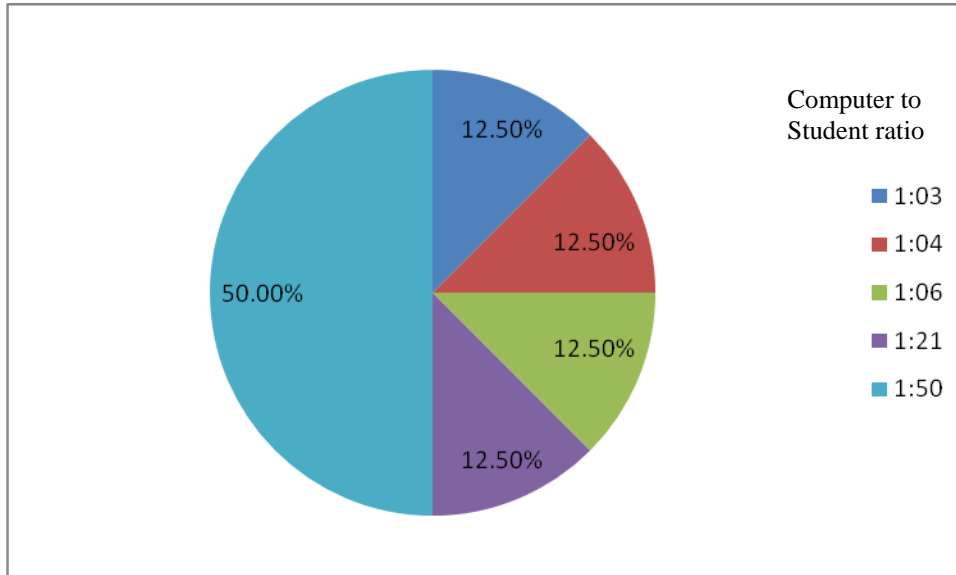


Figure 4.1: Computer to student ratio

The information in the Figure 4.1 shows that the school with the biggest computer to student ratio has 1:3 which is still below the recommended Ministry of Education recommended ratio of 1:2. Most schools have the ratio being as low as 1:50 which means one computer for every fifty student. This is in line with Waiharo (2007) findings who established that more than 50% of the schools had students to computer ratio of 1:30. These are unfavourable students to computer ratio which is a major challenge in the implementation of computer studies curriculum in public secondary schools.

This study sought to establish if the government was involved in provision of computers and human resources development in public secondary schools in Kahuro district. The results obtained are represented in Table 4.9.

Table 4.9: Government involvement in provision of computers and human resources development in public secondary schools

Government involvement	Yes		No	
	n	%	n	%
i) The government has recruited computer teacher(s) to schools through TSC	3	30.0	7	70.0
ii) The government has been organising regular workshops and seminars for computer teachers in this district	2	20.0	8	80.0
iii) The government has been organising in service training courses for computer teacher (s) in this district	1	10.0	9	90.0
iv) The government through MOE has been organising regular workshops and seminars for school principals to be sensitized on importance of computer study curriculum	1 0	100. 0	0	0.0
v) The government has donated some funds to this school to procure computers and their accessories	0	0.0	10	100.0
vi) The government has supplied computers to this schools	0	0.0	10	100.0
vii) The government has been guiding the school managers on approved suppliers of school computers.	0	0.0	10	100.0

The data in Table 4.9 shows 100% of the respondents were of view that the government was involved in organising regular workshops and seminars for school principals to be sensitized on importance of computer studies curriculum. Further 30% of the respondents

felt that the government has recruited computer teachers in secondary schools in Kahuro districts. Other 20% of the respondents said that the government has been organising regular workshops and seminars for computer teachers in the district. On the issue of in-service training courses, 10% of the respondents were of view that the government has been organising these courses for computer teachers in Kahuro district. However 100% of the respondents were of view that the government was not involved in donating funds to schools to procure computers and their accessories. The further 100% of the respondents felt that the government had not supplied computers to schools. According to 100% of the respondents the government had not been guiding the school managers on approved suppliers for school computers. Similarly, Karuru (2005) established that the government had not done enough on the issue of assisting schools to procure computers and called for the Government's intervention in their supply by putting in place regulatory and supervisory oversight to safeguard access, equity and quality of ICT facilities.

The study further sought to establish the availability of trained computer teachers in the schools in the study sample. It was established that there was only one trained TSC employed teacher and one BOG employed teacher in one school in the study sample. The BOG employed teacher however holds a diploma in IT but was not trained teacher.

This study further sought to establish if the schools in the study sample have implemented computer studies curriculum. This was aimed at establishing the actual extent of implementation of computer studies curriculum in public secondary schools in Kahuro district. The results obtained are presented in the Table 4.10.

Table 4.10: Implementation of computer studies curriculum in public secondary schools

Implementation of computer studies curriculum in schools	Implemented	Not implemented
Computer students	100.0%	0.0%
Computer teachers	100.0%	0.0%
Principals	12.5%	87.5%

Table 4.10 shows that computer studies curriculum was implemented in 12.5% of the schools in the study sample according to principals' response. This is a very low percentage. Similar results were obtained by Kinyanjui (2003) who established there was low number of computers in secondary schools in Kenya which hampered the implementation process. She established that more than 50% of secondary school in her study sample had less than 20 computers which are minimum number of computers approved by MOE for implementation of computer studies curriculum in a secondary school. However, 100% of the computer teachers and computer students reported that 100% of the schools have implemented computer studies curriculum. This is because these respondents were selected from the school that had implemented the computer studies curriculum.

This study also sought to establish the number of computer studies students in each form in the secondary school which had implemented computer studies curriculum. The findings are presented in Table 4.11

Table 4.11: Number of computer studies students in each form

Form	Total	Number of computer students per form	
		n	%
Form 4	160	10	6.3
Form 3	217	11	5.1
Form 2	279	52	18.6
Form 1	295	60	20.3
Total	951	133	13.9

The data in Table 4.11 shows that the total percentage of the computer students in the school was 13.9%. This is a low percentage but according to MOE (2008) it is slightly higher than the KCSE candidature in 2007 which was 1.75%. Form 1 class had 30.0% of students taking computer while form 3 had the lowest percentage 5.1%.

The study further sought to establish from the principals in study sample the reasons for not implementing computer studies in their schools. The results obtained are presented in Table 4.12.

Table 4.12 Reasons for not implementing computer studies curriculum

Reasons	Principals' response	
	n	%
Inadequate number of computers	6	75.0
Lack of trained computer teachers	2	25.0
Inadequate funds to implement the programme	7	87.5
Inadequate infrastructure e.g. Computer laboratories	2	25.0
Inadequate computer accessories	1	12.5

The findings in Table 4.12 show that inadequate funds in schools 87.5% was the main reason hindering implementing the computer studies curriculum in public secondary schools. Another reason slowing down the implementation process which was rated 75.0% is inadequate number of computers. Lack of trained computer teachers and inadequate infrastructure such as computer laboratories were each rated at 25% as a reason hindering implementing the computer studies curriculum in public secondary schools. Inadequate computer accessories were rated at 12.5% as slowing down the implementation process. These findings are in agreement with Schiller (1991) who established that the introduction of computer education in Newcastle placed unique pressures on school principals. This is because computer education is not the only priority at school to be implemented as schools have competing educational needs which when coupled with high cost of computers usually slow down computer studies curriculum implementation.

4.4 Adequacy of the resources for the implementation of computer studies curriculum

This study also sought to establish the level of adequacy of the resources and infrastructures available for the implementation of computer studies curriculum. This was captured in computer teachers' questionnaire and in school principals' interview schedule. The responses were rated in 5 points Likert scale with points distributed as follows; Very adequate (5), Adequate (4), Fairly adequate (3), Inadequate (2) and Very inadequate (1). The results of the findings are summarized and presented in Table 4.13.

Table 4.13: Level of adequacy of the resources for the implementation of process

Resources	Computer teachers (Mean)	Principals (Mean)
Computers	4.000	1.375
Antiviruses software	3.500	1.250
Soft discs (CDs and Flash discs)	4.500	1.375
Text books for Computer studies subject	4.000	1.250
Revision books / Materials for Computer studies	3.000	1.250
Electricity	5.000	4.500
Backup generator	4.000	1.125
Uninterrupted Power Supply (USB)	3.000	1.175
Printers	4.500	1.250
Scanners	4.000	1.125
Overhead projectors	4.000	1.125
Computer Laboratory	4.500	1.125
Internet connectivity services	3.500	1.000
Others e.g. Modems	3.000	1.125

Table 4.13 shows that electricity was the most adequate infrastructure in the schools in the study sample with a mean of 5.000 according to computer teachers and 4.500 according to the principals. According to computer teachers; Soft discs (CDs and Flash discs), printers and computer laboratories were very adequate with a mean of 4.500 but according principals these facilities were very inadequate with a mean of 1.375, 1.125 and 1.125 respectively. According to computer teachers, computers, text books for computer studies subject, backup generator, scanners and overhead projectors were adequate with a mean of 4.000. However the principals felt that these facilities were very inadequate with each having the following mean; computers (1.375), text books for

computer studies subject (1.250), backup generator (1.125), scanners (1.125) and overhead projectors (1.125). Computer teachers further felt that antiviruses' software and internet connectivity services were adequately available with a mean of 3.500 each.

According to principals, antiviruses' software and internet connectivity services were very inadequate with a mean of 1.250 and 1.000 respectively. According to computer teachers; revision books / materials for computer studies, Uninterrupted Power Supply (USB) and modems were fairly adequate with a mean of 3.000 each. However the principals felt that revision books / materials for computer studies, Uninterrupted Power Supply (USB) and modems were very inadequate with each having a mean of 1.250, 1.175 and 1.125 respectively. Internet service was the most inadequate infrastructure with the mean on the principals response been 1.000 (Very inadequate). These findings perfectly agrees with Ndwiga (2005) and Mwaniki (2007) who established that low internet connectivity was a major setback in implementation of computer studies in the educational institutions.

This study further investigated whether the computer laboratory were adequately equipped. This was done in two folds; in computer teachers and students questionnaire. The assessment of the respondents was based on 5 points Likert scale with points distributed as follow; Very adequately equipped (5), Adequately equipped (4), Fairly equipped (3), Inadequate equipped (2) and Very inadequately equipped (1). The results of the findings are summarized and presented in Table 4.14.

Table 4.14: Level of adequacy in the equipment of the computer laboratory

Adequacy of equipment in the computer laboratory	Mean	Comment
Computer students	3.75	Adequately equipped
Computer teacher	4.00	Adequately equipped
Total	3.78	Adequately equipped

The information in Table 4.14 shows that both the computer students and teachers felt that the computer laboratory was adequately equipped with a means of 3.75 and 4.00 respectively. Their average mean was 3.78 which imply that the computer laboratory was adequately equipped. The findings in this study differ with Kanyeki (2006) findings who established that computer laboratories in secondary schools were not adequately equipped.

4.5 Teachers' exposure and training in computers

The study further sought to establish the level of teachers' exposure and training in computer studies. One computer teacher had a Bachelor of Education degree in Mathematics/Computer as his teaching subjects while the other computer teacher was not professionally trained but had a diploma in IT. However none of the principals was trained in computer studies as his /her teaching subject which can adversely affect the implementation. These findings are similar to those of Oduda (1998) as he said that although computer studies are an examinable subject at Form 4, few teachers were trained on the subject. He further stressed that schools depend on hired personnel to

teach the subject most of whom are not professional in classroom delivery. The problem of trained teachers in both secondary and tertiary institution is compounded by the high level of brain wash in teaching career as the IT trained graduates often quit teaching profession to join private sectors where there is a lucrative opportunities. Similarly, Mwaniki (2007) identified low number of qualified tutors been among the factors that had adversely affected the implementation of computer courses in Primary Teacher Training colleges.

This study further sought to establish from the principals whether they were computer literate or not. The research findings are represented in Table 4.15

Table 4.15: Computer literacy among principals in Kahuro district

Computer literacy	Principals Among principals	n	%
Literate		8	100.0
Not literate		0	0.0
Total		8	100.0

The data in Table 4.15 shows that all the principals were computer literate with their percentage been 100%. These findings differ from that of Mburu (2008) who established that 41.7% of teachers in the secondary schools in Thika municipality had never used computers. It seems that most of the principals had taken initiatives to gain computer literacy which can impact positively on the implementation process.

The respondents were asked to comment on the computer literacy level among other teachers in their school. The responses given by 30 respondents in the study sample are represented in the Table 4.16.

Table 4.16: Computer literacy among other teachers

Computer literacy level	Responses	
	n	%
Very literate	0	0.0
Literate	5	16.7
Fairly literate	22	73.3
Illiterate	1	3.3
Very illiterate	0	0.0
No response	2	6.7
Total	30	100.0

The results in Table 4.16 show that 16.7% of the respondents felt that the secondary school teachers are computer literate. According to 73.3% of the respondents, the secondary school teachers are fairly computer literate. Another 3.3% of the respondents felt that teachers in their school were computer illiterate while 6.7% of the respondents did not respond to this question. This finding differs with those of Mwaniki (2007) who established that implementation of computer studies in educational institutions was affected by a number of factors among them low number of tutors who were computer literate.

This study further sought to establish whether computer literacy level among the teachers affect the smooth implementation of computer studies curriculum in a school.

The research findings from the eight principals, two computer studies teachers and 20 computer studies students are represented in Figure 4.2

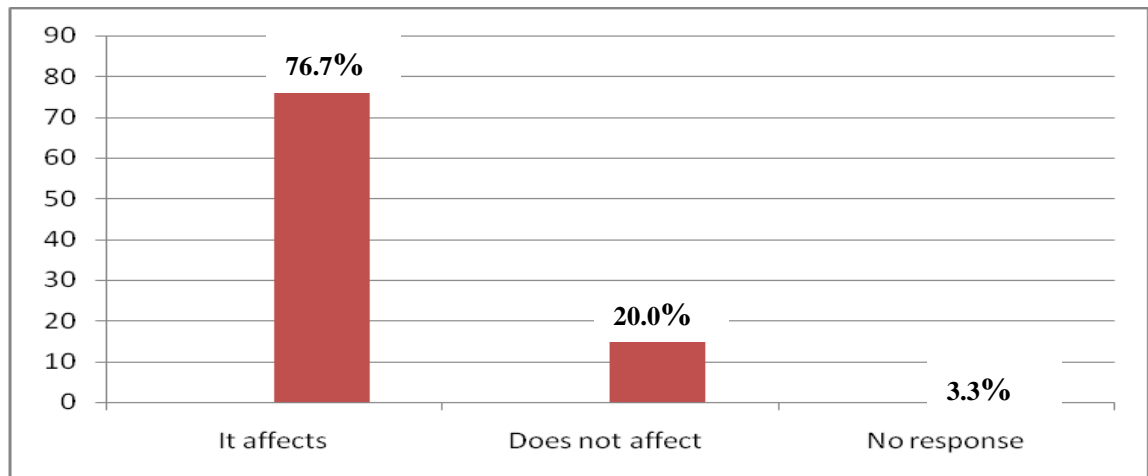


Figure 4.2: Effects of teachers' computer literacy on the curriculum implementation

The information in Figure 4.2 shows that 76.7% of the respondents felt that computer literacy levels of the teachers affect the smooth implementation of computer studies curriculum in a school. It also shows that 20% of the respondents felt that it does not affect while 3.3% did not respond to this question. This is in line with Mburu (2008) who observed that teachers' literacy level in computers have a big influence on success of implementation of e-learning in public secondary schools.

This study went further to investigate from the principals, computer teachers and computer students how the literacy levels of the teachers affect the smooth implementation of computer studies curriculum in a school. The following are the ways suggested by the respondents. Most of the respondents (63.3%) felt that teachers who are

not computer literate discourage the students from selecting the subject. Another section of respondents (56.7%) felt that teachers who are not computer literate do not embrace the technological advances like use of computer in analysing examinations. Other respondents (40%) felt that teachers who are not computer literate do not offer career guidance on computer related courses to the students.

This study also enquired on the availability of personal computers for the computer teachers and the school principals. The research findings are represented in Table 4.17

Table 4.17: Teachers' personal computers

Response	Computer teachers		Principals	
	n	%	n	%
Have personal computer	2	100.0	2	25.0
Do not have personal computer	0	0.0	6	75.0
Total	2	100.0	8	100.0

The data in the Table 4.17 both computer teachers and 25% of the principals have personal computers while 75% of the principals do not have personal computers. This shows that most principals have not fully embraced the computer technology which has consequently impacted negatively on the implementation process. Those who do not have personal computers said they use computers services from schools or cyber cafes. This is in agreement with Waiharo (2007) findings who established that 81.3% of teachers in North Eastern province do not own a personal computer.

This study further sought to establish from the computer teachers and the school principals how they use computers. The uses were listed as follow; Some respondents (30%) use their computers for internet services. Another section of respondents (30%) use their computers to play computer games. Other respondents (20%) said that their computers are used by children at home to enhance the computer literacy while 20% of the respondents use their computers as instructional tool. The percentage of the respondents who use computers as instructional tool is 20% which is very low hence there is lower implementation of computer studies curriculum. This study also established from the 30 respondents the use of the school computers as represented in table 4.18.

Table 4.18: Uses of the school computers

Use of the school computers	Computer students		Computer teachers		Principals	
	n	%	n	%	n	%
i) To offer literacy courses to students	20	100.0	2	100.0	3	37.5
ii) To offer literacy courses to school communities at a cost.	0	0.0	0	0.0	0	0.0
iii) In management of student data such as examination results, enrollment, etc	20	100.0	2	100.0	3	37.5
iv) Used by bursar/account clerk in management of school finances.	20	100.0	2	100.0	1	12.5
v) For typing official documents	20	100.0	2	100.0	8	100.0
vi) For instructional process (teaching/ learning process)	20	100.0	2	100.0	1	12.5
vii) For typing students examinations	20	100.0	2	100.0	5	62.5
viii) As communication tool through e-mails and websites	20	100.0	2	100.0	8	100.0

The information in the table 4.18 shows that 100% of the schools in the study sample use computers for typing official documents and as communication tool through e-mails and websites browsing. It is also clear that 62.5% of the schools use computers for in management of student data such as analysis of the examination results, enrollment records etc. In 37.5% of the schools, computers are used to offer computer literacy course to the students. Only 12.5% of the schools in the study sample use computers as instructional tool. It was further established that 12.5 % of the schools use computers in management of school finances by bursar and accounts clerk. There was no school which uses computers to offer computer literacy course to the school community at a cost.

These findings agree with Vota (2009) who established that despite the rapid growth, Africa ICT penetration levels in 2009 was still very far behind the rest of the world. He further argues that, very few African countries reach ICT levels comparable to global averages as very small percentage of Africans use internet.

4.6 Teaching methodologies and evaluation process

This study also enquired from the respondents about the Teaching-Learning methods used during teaching of computer studies subject. The two computer teachers (100%) said they use class practicals oftenly. Both the computer teachers (100%) said they use class discussions sometimes. The computer teachers, 100% also said that they use teacher's demonstration sometimes. Other respondents, 25% of the students and 12.5% of the principals said that theory lessons are used sometimes resulting to poor mastery of concepts by learners. According to the computer studies teachers and 100% of the computer studies students, Practical lesson enhance good understanding of concepts

learned in during computer studies lesson. The responses by computer teachers differed slightly from those of principals and computer students on the use of theory lessons as the learners said theory lessons were used resulting to poor mastery of concepts. The computer teachers responses were more trusted as they were the professional respondents in field of computer studies.

The study further investigated from the principals, Computer teachers, and computer students whether the Teaching-Learning methods used in the school have any influence on implementation of computer studies in your school. The findings was that 100% of the respondents were of opinion that Teaching-Learning methods used in the school have some influence of implementation of computer studies as the practical lesson enhance good understanding of concepts learned in during computer studies lesson while theory lesson was said not to be effective. This study also sought the students' opinion on the levels of the learners' involvement in learning process. The students 65% rated it as very high, 20% as high, 10% as average while 5% did not respond.

This study also sought to establish the performance of computer studies subject in internal and national examinations. The respondents, 100% of the computer teachers, 100% of students and 12.5% of the principals gave responses on performance as only their school had implemented the computer studies curriculum. The findings were rated in 5 a point Likert scale ranked as Very good (5), Good (4) Average (3), Poor (2) and Very poor (1). The responses of 20 computer studies students, two computer studies teachers and one principal from the school that had implemented the computer studies curriculum are represented in Table 4.19.

Table: 4.19: Performance in computer studies in internal and national examinations

Examination performance	Mean	Comment
CATS and internal school examinations	3.7391	Good
National KCSE examinations	3.3913	Average

The information in the Table 4.19 shows that performance of computer studies in CATS and internal school examinations was good with (Mean = 3.7391). The performance in the national KCSE examinations was average (Mean = 3.3913). The good performance according to 100% of the respondents was attributed to use of practical lessons and smaller number of students per each class. The average performance in KCSE according to 73.9% of the respondents was due to inadequate revision materials for computer studies while. However this was in disagreement with the information on the observation checklist which recorded performance these examinations to be below average.

The respondents, 100% of Computer teachers, 100% of students and 12.5% of the principals were of opinion that the examinations performance in computer studies subject affect its enrollment and hence the implementation process. This is because when the subject is performed poorly, the students shy off from selecting the subject. Those already taking the subject develop negative attitude toward the subject which consequently affects their performance in the subject and the implementation of its curriculum.

4.7 Strategies for effective implementation of computer studies curriculum

The study further sought suggestions from the respondents on the strategies for effective and smooth implementation of computer studies curriculum in public secondary schools. The following strategies were proposed; Most respondents; 87.5% of the principals, 100% of computer studies teachers and 65% of computer studies students proposed that the government should provide grants to schools to procure more computers, their accessories and set up infrastructures such as computer laboratories. Another suggestion proposed by 25% of principals and 50% of computer studies teachers was that the government should recruit computer teachers in all public secondary schools. In order to improve the internet connectivity in schools, 100% of computer studies teachers suggested that the government should connect schools with fibre optic cables. All computer teachers (100%) and simple majority of computer studies students (55%) proposed that MOE should make computer studies a part of core curriculum. On the issues pertaining the computer studies curriculum, 50% of computer studies teachers proposed that MOE through KICD should review the curriculum on a more regular basis to address the dynamic nature of the subject. Further 75% of principals and 50% of computer studies teachers proposed that MOE should organise regular seminars and workshops to sensitize the school managers and other stakeholders on the importance of implementing computer studies curriculum.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarises and describes the findings of this research. The study was aimed at investigating the issues and challenges in the implementation of computer studies curriculum in public secondary schools in Kahuro district. The various issues and challenges indentified are outlined in the following summary.

5.2 Summary

This study was guided by the following objectives:

- i. To establish the types of the resources and infrastructures available for the implementation of computer studies curriculum in secondary schools in Kahuro district.
- ii. To establish the effects of teacher training and exposure to ICT on the implementation of computer studies curriculum in secondary schools in Kahuro district.
- iii. To establish the effects of the teaching methodologies and evaluation on the implementation of computer studies curriculum in secondary schools in Kahuro district.
- iv. To explore the measures which can be put in place to enhance the implementation of computer studies curriculum in public secondary schools in Kahuro district.

5.2.1 Summary of the findings

This section outlines summary of the findings obtained in this study. The study sample constituted of eight public secondary schools. There were 30 respondents who constituted eight principals, two computer studies teachers and 20 computer studies students.

a) Extent of implementation of computer studies curriculum

This study established that only 12.5% of the schools had implemented the computer studies curriculum with candidates sitting KCSE computer studies examinations. Other 37.5% of the schools had computer which they use to offer computer literacy courses to the students.

b) Resources and infrastructure available

The resources and infrastructures available for the implementation of computer studies curriculum in secondary schools in Kahuro district include; computers, text books for computer studies subject, Uninterrupted Power Supply (UPS), scanners, overhead projectors, backup generator, computer laboratory, Soft discs (CDs and Flash discs), Revision books / Materials for computer studies and modems. Only 12.5% of the schools in the study sample was reported to have all these facilities. Different respondents gave varied percentages of availability of the resources and infrastructures. In this study 100% of the respondents reported that internet connectivity services through fibre optic cables was not available while 80% respondent reported that Revision books for the computer subject were not unavailable. Text books for computer studies subject, Uninterrupted Power Supply (USB), Scanners and overhead projectors, scanners and overhead projectors were

reported by 70% of the respondents to be unavailable. Back up generators and computer laboratories was found by 30% of the respondent to be unavailable. It was also further established that 10% of the respondents felt that antivirus softwares were unavailable.

The study further established that 62.5% of the schools did not have the set number of computers; 20-40 recommended by MOE in 2005 for an ideal computer laboratory in a secondary school.

c) Adequacy of the resources and infrastructures.

On the issue of whether the resources are adequate or not, the following was established:

Connection to main electricity was found to be adequate with a mean of 5.000 in computer teachers' responses and 4.500 principals' responses. Other resources were found to be very inadequate with connection to internet services being the most inadequate with a mean of 1.000 in principal responses. Computer laboratory, backup generators, scanners and overhead projectors were also very inadequate with a mean of 1.125 in principal responses. However, computer laboratory, backup generators, scanners and overhead projectors had mean of 3.500 and above on computer teachers' responses as these teachers were from the school that had implemented the computer studies curriculum. Uninterrupted Power Supply (UPS) was also very inadequate with a mean of 1.175 in principal responses. Text books, Antivirus softwares and Printers were also very inadequate with a mean of 1.250 in principal responses.

Computers and Soft discs (CDs and Flash discs) were also very inadequate with a mean of 1.375 in principal responses. Inadequate funds and number of computers in schools were established as the main reason why 87.5% of the schools in the study sample had not implemented computer studies curriculum.

d) Effects of teachers' training and exposure to ICT

An examination to whether teachers' training and exposure to ICT have any effect on the implementation of computer studies curriculum in secondary schools revealed that it is true that it affects the smooth and effective implementation of computer studies curriculum. Some respondents, 76.7% of the students in the study sample reported that teachers who do not have any training or exposure to computers usually discourage students from selecting computer studies subject. It was further established that 75% of principals do not have personal computers which implies that they have not fully embraced the computer technology which has consequently impacted negatively on the implementation process. According to the principals response 87.5% of teachers are computer literate while 12.5% are illiterate and this affects the implementation process. Further 25% of principals give one reason why they have not implemented the computer studies curriculum being due to lack of trained computer teachers in their schools.

e) Effects of teaching methodologies and evaluation on the implementation process

Teaching methodologies and evaluation process was found to have an effect on the implementation of computer studies curriculum in secondary schools. Both the

computer studies teachers said that they use practical lessons oftenly which ensure that there is effective mastery of concepts by learners which translates to good academic performance in the subject. Consequently this result to good enrollment and effective implementation process. Conversely, according to 25% of the students and 12.5% of the principals, when theory lessons are used there poor mastery of concepts by learners which translates to poor academic performance in the subject, poor enrolment hence resulting to poor implementation process.

On the evaluation process, 100% of the computer teachers, 100% of students and 12.5% of the principals said that when the subject is poorly performed, the result is poor enrollment and negative attitude among the computer students which affects learning. Consequently, this affects the smooth implementation of computer studies curriculum

f) Measures to enhance the implementation process

Pertaining the measures which can be put in place to enhance the smooth and effective implementation of computer studies curriculum in public secondary schools in Kahuro district, the following strategies were proposed: Provision of government grants to schools to procure more computers, their accessories and set up infrastructures such as computer laboratories. This was proposed by 87.5% of the principals, 100% of computer studies teachers and 65% of computer studies students. Further 25% of principals and 50% of computer studies teachers emphasised on the need for recruitment of computer studies teachers in all public secondary schools by TSC. Another suggestion put forward by 100% of computer studies teachers was a

proposal for interconnection of each school with fibre optic cables for easier internet access. It was also proposed by 100% computer studies teachers and 55% of computer studies students that computer studies should be made part of the core curriculum. Computer studies teachers (50%) proposed a regular review computer studies curriculum to address the dynamic nature of the subject. A portion of the respondents; 75% of principals and 50% of put a suggestion that MOE should be organising regular seminars and workshops to sensitize the school managers and other stakeholders on the importance of the implementing computer studies curriculum in secondary schools.

5.3 Conclusion

From the research findings the following conclusion was made:

Only 12.5% of the schools in the study sample had successively implemented computer studies curriculum. A number of factors have hampered the implementation process such as inadequate funds to procure computers, trained computer teachers, computers and other resources and infrastructures recommended by the MOE for implementation of computer studies curriculum.

The types of resources and infrastructures which were available in a number of schools for the implementation of computer studies curriculum in secondary schools in Kahuro district include computers, computer laboratory, backup generators, scanners, overhead projectors, Uninterrupted Power Supply (UPS), Computer text books, Antiviruses softwares, Printers, Soft discs (CDs and Flash discs) Text books, Revision books and main electricity. The resources and infrastructures are available in 12.5% of the schools

in the study sample while 87.5% of the schools reported not to have most of the resources and infrastructures.

This study established that the resources and infrastructures for the implementation of computer studies curriculum in secondary schools in Kahuro district were not adequate. The study revealed that 87.5% of the schools in the study sample had not implemented the computer studies curriculum due to inadequate resources. Inadequate funds to procure computers and their accessories and set up infrastructures such as computer laboratories, inadequate trained computer teachers and inadequate revision materials were cited as the major challenges in the implementation process.

It was established that the level of the teachers training and exposure in ICT have an influence the implementation of computer studies curriculum in secondary schools in Kahuro district. Majority of the respondents (76.7%) reported that when teachers do not embrace computer technology or they are not computer literate, they affect the implementation process negatively as they do not encourage the student to learn the subject or even guide the students computer related careers.

Teaching methodology and the evaluation process was also found to influence the implementation process. All the respondents (100%) felt that practical lessons and good performance in examinations enhance the implementation process while theory lessons and while poor examination performance in the subject affects the implementation process negatively.

To enhance the implementation process the respondents proposed that; the government should offer grants to schools to procure computers and its accessories, recruit more computer studies teachers, regularly sensitize the principals on importance of implementing computer studies curriculum and make the subject part of core curriculum.

5.4 Recommendations

Based on the research findings, the following recommendations were made:

- i) The government should provide grants to schools to procure more computers, their accessories and set up infrastructures such as computer laboratories.
- ii) The government should also enhance the interconnection of the secondary schools with fibre optic cables to enhance easier internet access.
- iii) The MOE through TSC should also recruit computer teachers in all public secondary schools. The MOE should organize regular seminars and workshops to sensitize the school managers and other stakeholders on the importance of the implementing computer studies curriculum in secondary schools.
- iv) The MOE through KICD should regularly revise the computer studies syllabus to accommodate the dynamic nature of the subject. It should also make the subject part of the core curriculum.

5.5 Areas for further research

The researcher recommends the following areas for further research:

- i) Further research should be carried out on challenges in the implementation of computer studies curriculum in public secondary schools in urban set up since this research was limited to public secondary schools in rural set ups.
- ii) Further research should be carried out on attitude of BOG and PTA members on the implementation of computer studies curriculum in public secondary schools in Kahuro district, Murang'a county since this research was limited to teachers and students.
- iii) Further research should be carried out on use of ICT in public secondary schools in other districts in different counties in Kenya.

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APPENDICES

APPENDIX I

PRINCIPALS' INTERVIEW SCHEDULE

SECTION A: DEMOGRAPHIC INFORMATION

1. The gender of the principal.

.....
.....

2. What is your highest professional qualification?

.....
.....

3. What is your professional experience?

.....
.....

4. For how long have you been a principal in this school?

.....
.....

5. a) Are you a trained computer teacher?

.....
.....

b) If yes, what is your level of training in computers

.....
.....

6. What is the status of your school?

.....
.....

**SECTION B: ISSUES AND CHALLENGES IN THE IMPLEMENTATION
OF COMPUTER STUDIES CURRICULUM**

**PART I: EXTENT OF THE IMPLEMENTATION OF COMPUTER STUDIES
CURRICULUM IN SECONDARY SCHOOLS**

7. Does your school have any computer(s)

.....
.....

8. Have your school implemented computer studies curriculum?

.....
.....

9. a.i) If yes, in (8) above, how many students are taking computer studies subject in each form?

.....
.....

ii) What is the total number of students in each form your school?

.....
.....

b) If your school has implemented computer studies curriculum partially and **not** up to KCSE level, give reasons why?.....

.....
.....

c) If your school have **not** implemented computer studies curriculum **at all**, give reasons why?.....

.....
.....

PART II: TYPES OF THE RESOURCES AND INFRASTRUCTURES

**AVAILABLE FOR THE IMPLEMENTATION OF COMPUTER
STUDIES CURRICULUM**

10. Are the following facilities and resources for implementation of computer studies curriculum available or not available in your school?

Resources and Infrastructures	Available	Not available
Computers		
Antivirus software		
Soft discs (CDs and Flash discs)		
Text books for Computer studies subject		
Revision books / Materials for Computer studies subject		
Electricity		
Backup generator		
Uninterrupted Power Supply (UPS)		
Printers		
Scanners		
Overhead projectors		
Computer Laboratory		
Internet services		
Others (specify).....		

11. a) How can you rate the internet network in your school?

.....

b) Is your school connected to fibre optic cables?

.....

c) If your school is not connected to internet how do you access the internet?

.....

12. a) If your school have computers, how many computers does your school have?

.....

b.i) How many computers listed in (a) above are in good working condition?

.....

c) What is the ratio of computer to students this school?

.....

13. Do you agree or disagree with the following statements?

Government involvement on provision of computers	Yes	No
i) The government has donated some funds to this school to procure computers and their accessories.		
ii. The government has supplied computers this schools.		
iii. The government has been guiding the school managers on approved suppliers of school computers		

14. How many computer teachers in your school are who are employed by:

.....

.....

15. a) Do you agree or disagree with the following statements?

i) Government involvement in human resources establishment/development	Yes	No
ii) The government has recruited computer teacher(s) to secondary schools in this district through TSC.		
iii) The government has been organizing regular workshops and seminars for computer teachers in this district.		
iv) The government has been organizing in service training for computer teacher (s) in this district.		
v) The government through MOE has been organizing regular workshops and seminars for school principals to be sanitized on importance of computer studies curriculum		

b. Identify any other government policy/initiatives which have helped in implementation of computer studies in this school

.....

.....

.....

PART III: THE LEVEL OF ADEQUACY OF THE RESOURCES AND INFRASTRUCTURES AVAILABLE.

16. How can you rate the level of adequacy for the facilities and resources?

Resources and Infrastructures	Very adequate	Adequate	Fairly adequate	Inadequate	Very Inadequate
Computers					
Antivirus software's					
Soft discs (CDs and Flash discs)					
Text books for Computer studies					
Revision books / Materials					
Electricity					
Backup generator					
Uninterrupted Power Supply (UPS)					
Printers					
Scanners					
Overhead projectors					
Computer Laboratory					
Internet services					

PART IV: THE LEVEL OF TEACHERS' TRAINING IN COMPUTERS

17. Which are your teaching subjects in this school?

.....

18. a) Are you computer literate?

.....

b) What is your level of qualifications in computer studies?

.....

.....

19. a) How do you rate the computer literacy levels of the other teachers in this school?

.....

.....

b) Does the literacy level of teachers in the school affect the smooth implementation of computer studies curriculum in this school?

.....

.....

c) If yes, how does it affect?

.....

.....

20. a) Do you have a personal computer?

.....

.....

b. If yes in, how do you use the computer?

.....

.....

21. What are the uses of computers in your school? (Tick where appropriate)

.....

PART V: TEACHING METHODOLOGIES AND EVALUATION PROCEDURES

22. (a) Which methods do your school use in teaching computer studies?

.....
.....

b) Do the methods of teaching mentioned above have any influence on implementation of computer studies in your school?

.....
.....

23. a) How can you rate the performances of computer studies subject in national examinations?

.....
.....

b) How can you rate your school performances of computer studies subject in national and internal examinations?.....

.....
.....

c) How does the examinations performance in computer studies subject affect its enrollment?

.....
.....

SECTION C: STRATEGIES FOR EFFECTIVE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM

24. In your own view suggest what should be done to ensure effective and smooth implementation of computers studies in secondary schools

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

APPENDIX II

COMPUTER STUDIES TEACHERS QUESTIONNAIRE

SECTION A: DEMOGRAPHIC INFORMATION

1. a) What is your gender? (i) Male ii) Female
- b) What is your age?
 - i) Below 30 years ii) 31-40 years
 - iii) 41-50 years iv) 51 and above
2. What is your highest professional qualification?
 - i) Diploma in Education ii) BEd (Science)
 - iii) BEd (Art) iv) BSc with PGDE
 - v) M.A. with PGDE vi) M.ED
 - vii) Others
3. What is your professional experience?
 - i) 1.5years iii) 11-15 years v) 21-25 years
 - ii) 6-10 years iv) 16-20 years vi) 26 and above
4. For how long have you been a teacher in this school?
 - i) 1-5years iii) 11-15 years v) 21-25 years
 - ii) 6-10 years iv) 16-20 years vi) 26 and above
5. a) Are you a trained computer teacher by training? i) Yes ii) No
- b) If yes, indicate your level of training in computers
 - i) Certificate/Computer packages ii) Diploma
 - iii) Bachelor degree iv) Masters
 - v) Others (specify).....

6. State the status of your school (Tick where appropriate)

- (i) Provincial school Boys Boarding () (iv) District school Girls Boarding ()
 (ii) Provincial school Girls Boarding () (v) District Mixed Day & Boarding ()
 (iii) District school Girls Boarding () (vi) District Mixed Day school ()

**SECTION B: ISSUES AND CHALLENGES IN THE IMPLEMENTATION OF
COMPUTER STUDIES CURRICULUM**

**PART I: EXTENT OF THE IMPLEMENTATION OF COMPUTER STUDIES
CURRICULUM IN SECONDARY SCHOOLS**

7. Does your school have any computer(s) i) Yes () ii) No ()
8. Have your school implemented computer studies curriculum?
 i) Yes () ii) No ()
9. a) If yes in (8) above give the number of students who are at each level of implementation of computer studies in the table below

Level of implementation	Number of computer students	Number of students In the form
Form 4		
Form 3		
Form 2		
Form 1		
Total number of students in this school		

- b) If your school has implemented computer studies curriculum partially and **not** up to KCSE level, give reasons why?.....

c) If your school have **not** implemented computer studies curriculum **at all**, give reasons why?

.....

PART II: TYPES OF THE RESOURCES AND INFRASTRUCTURES AVAILABLE FOR THE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM

10. Tick in the table below the availability of the following facilities and resources for implementation of computer studies curriculum

Resources and Infrastructures	Available	Not available
Computers		
Antivirus software		
Soft discs (CDs and Flash discs)		
Text books for Computer studies subject		
Revision books / Materials for Computer studies subject		
Electricity		
Backup generator		
Uninterrupted Power Supply (UPS)		
Printers		
Scanners		
Overhead projectors		
Computer Laboratory		
Internet services		
Others (specify).....		

11. a) How can you rate the internet network in your school?

Very good	Good	Average	Poor	Very poor

b) Is your school connected to fibre optic cables? i) Yes () ii) No ()

c) If your school is not connected to internet how do you access the internet?

.....

12. a) If your school have computers, give the number of computers in your school.....

.....

b. How many computers listed in (a) above are in good working condition?.....

c. What is the ratio of computer to students this school?.....

13. Do you agree or disagree with the following statements?

Government involvement on provision of computers	Yes	No
i) The government has donated some funds to this school to procure computers and their accessories.		
ii) The government has supplied computers this schools.		
iii) The government has been guiding the school managers on approved suppliers of school computers		

14. How many computer teachers in this school are employed by:

TSC	BOG	Others (specify)

15. a) Do you agree or disagree with the following statements?

Government involvement in human resources establishment/development	Yes	No
i) The government has recruited computer teacher(s) to secondary schools in this district through TSC.		
ii) The government has been organizing regular workshops and seminars for computer teachers in this district.		
iii) The government has been organizing in service training for computer teacher (s) in this district.		
iv) The government through MOE has been organizing regular workshops and seminars for school principals to be sanitized on importance of computer studies curriculum		

b. Identify any other government policy/initiatives which have helped in implementation of computer studies in this school.....

.....

.....

.....

PART III: THE LEVEL OF ADEQUACY OF THE RESOURCES AND INFRASTRUCTURES AVAILABLE.

16. For the facilities and resources available in your school, rate their level of adequacy for the implementation of computer studies curriculum.

Resources and Infrastructures	Very adequate	Adequate	Fairly adequate	Inadequate	Very Inadequate
Computers					
Antivirus software's					
Soft discs (CDs and Flash discs)					
Text books for Computer studies					
Revision books / Materials					
Electricity					
Backup generator					
Uninterrupted Power Supply					
Printers					
Scanners					
Overhead projectors					
Computer Laboratory					
Internet services					
Other (specify).....					

PART IV: THE LEVEL OF TEACHERS' TRAINING IN COMPUTERS

17. Which are your teaching subjects in this school?

.....

18. a) Are you computer literate? (i) Yes () (ii) No ()

b) If yes, indicate your level of qualifications by ticking where appropriate.

i) Certificate () (ii) Diploma () (iii) Bachelor degree ()

iv) Others (Specify)

19. a) How do you rate the computer literacy levels of the other teachers in this school?

Very literate	Literate	Fairly literate	Illiterate	Very illiterate

b) Does the literacy level of teachers in the school affect the smooth implementation of computer studies curriculum in this school?

(i) Yes () (ii) No ()

c) If yes in (b) above, explain how:.....

.....

20. a) Do you have a personal computer? (i) Yes () (ii) No ()

b) If yes in (a) above, how do you use the computer?.....

21. What are the uses of computers in your school? (Tick where appropriate)

i) To offer literacy courses to students	
ii) To offer literacy courses to school communities at a cost.	
iii) In management of student data such as examination results, enrollment, etc	
iv) Used by bursar/account clerk in management of school finances.	
v) For typing official documents	
vi) For instructional process (teaching/learning process)	
vii) For typing students examinations	
viii) As communication tool through e-mails and websites	
ix) Others (specify).....	

PART V: TEACHING METHODOLOGIES AND EVALUATION PROCEDURES

22. a) Which methods do your school use in teaching computer studies?

b) Do the methods of teaching mentioned above have any influence on
 Implementation of computer studies in your school?.....

23. a) How can you rate the performances of computer studies subject in national
 examinations?

Examination	Very good	Good	Average	Poor	Very poor
CATS and internal school exams					
National KCSE examinations					

b) How can you rate your school performances of computer studies subject in national
 and internal examinations?.....

c) How does the examinations performance in computer studies subject affect its
 enrollment?.....

**SECTION C: STRATEGIES FOR EFFECTIVE IMPLEMENTATION OF
 COMPUTER STUDIES CURRICULUM**

24. In your own view suggest what should be done to ensure effective and smooth
 implementation of computers studies in secondary schools.....

APPENDIX III

STUDENTS' QUESTIONNAIRE

The questions in this questionnaire are aimed to obtaining information about implementation of computer studies curriculum in public secondary schools in Kahuro district. This is not an examination and there is no correct or wrong answer. **Do not write your name on this paper.** All the information obtained in this research will be treated with almost confidentiality.

SECTION A: DEMOGRAPHIC INFORMATION

1. Indicates your gender. Male () Female ()
2. Indicate your form. (Tick where appropriate)

i) Form 1 ()	ii) Form 2 ()
iii) Form 3 ()	iv) Form 4 ()
3. State the status of your school (Tick where appropriate)

(i) Provincial school Boys Boarding ()	(iv) District school Girls Boarding ()
(ii) Provincial school Girls Boarding ()	(v) District Mixed Day & Boarding ()
(iii) District school Girls Boarding ()	(vi) District Boarding school ()

APPENDIX IV

OBSERVATION CHECKLIST

1. Are computers available or not?
2. Number of computers available in the school.
3. Number of computers in working condition.
4. Number of computers not in working condition.
5. Availability of computer laboratory.
6. Are the computer lessons scheduled in the block time table?
7. Computer examination results in the Schools' notice board.

APPENDIX V**THE STUDY BUDGET**

NO	DESCRIPTION	COST(KSHS)
1	Typing proposal 50 pages @ Kshs20.00	1,000.00
2	Printing proposal 50x2 pages Kshs 5.00	500.00
3	Typing research report 70 pages @ Kshs 5.00	1,400.00
4	Printing research report 70 x 6 pages @Ksh50.00	2,100.00
5	Photocopies: Literature materials Proposal 50 pages @ Kshs 2.00 Project report 70 pages @ Kshs2.00	3,000.00 100.00 104.00
6	Binding: Proposal 3 @ Kshs70.00 Project report @ Kshs150.00	210.00 750.00
7	Transport cost to sample schools	5,000.00
8	Breakfast and lunch for 10 days @ Kshs700.00	7,000.00
	Total	21,300.00

APPENDIX VI**STUDY WORK PLAN**

MONTH	ACTIVITY
August 2010	Topic identification
September 2010 - January 2011	Research proposal writing
February 2011- July 2011	Refining of research proposal
August 2011 – Dec 2011	Submitting the proposal to the Postgraduate School
January 2012	Data collection
February 2012 - March 2012	Data analysis, Research report writing and submission to the School of education, Kenyatta University
April - October 2012	Refining of research report and submission to the Graduate school for marking