



# BARRIERS TO EFFECTIVE TEACHING OF COMPUTER STUDIES IN SELECTED GOVERNMENT JUNIOR SECONDARY SCHOOLS OF MWANSABOMBWE DISTRICT IN LUAPULA PROVINCE.

BY

Mambwe Gregory 714800900

**MDEA 570** 

A dissertation submitted to the University of Zambia in Collaboration with Zimbabwe Open University in partial fulfillment of the Requirements for the award of the degree of Master of Education in Educational Management.

> University of Zambia in Collaboration with Zimbabwe Open University Lusaka 2016

# BARRIERS TO EFFECTIVE TEACHING OF COMPUTER STUDIES IN SELECTED GOVERNMENT JUNIOR SECONDARY SCHOOLS OF MWANSABOMBWE DISTRICT IN LUAPULA PROVINCE.

ΒY

Mambwe Gregory

A dissertation submitted to the University of Zambia in Collaboration with Zimbabwe Open University in partial fulfillment of the Requirements for the award of the degree of Master of Education in Educational Management.

> University of Zambia in Collaboration with Zimbabwe Open University Lusaka 2016

# DECLARATION

I, **MAMBWE GREGORY**, declare that the dissertation hereby submitted is my own work and has not been previously submitted for degree, diploma or any other qualification at the Univers of Zambia/Zimbabwe Open University or any other university.

i

Signed: Menustre

Date: 29 -07 - 2016

#### **APPROVAL**

This dissertation by Mambwe Gregory is approved as partial fulfillment of the requirements the award of the Master of Education (Educational Management) degree of the University Zambia in collaboration with Zimbabwe Open University.

Date. 21812016	Signed
Date	Signed
Date	Signed

# COPYRIGHT

No part of this dissertation may be reproduced, restored in a retrieval system, transmitted in a form or by any means electronic, mechanical, photocopying, recording or otherwise without 1 prior written permission.

# © Gregory Mambwe 2016

#### **DEDICATION**

This study is dedicated to my wife, Steria Jere, and our children for all the patience, encouragement and unconditional love that they rendered to me throughout the period of training. The successful completion of this dissertation was made possible by their presence (and absence at appropriate times). This research is dedicated with respect and gratitude to my Father, Mambwe Clavel, and my mother, Euphemia Chushi, who laid a strong foundation for this venture many years ago by putting me through all the different stages of education. I will always cherish your love and support.

May the good Lord always be with you.

#### ACKNOWLEDGEMENT

My heartfelt gratitude goes to my supervisor, Dr. J. Ziwa whose guidance made this research study possible. Her patience and timely constructive criticism helped me to do the work correctly. My sincere gratitude goes to the Provincial Education Officer (PEO) and the District Education Board Secretary (DEBS) for granting me opportunity to carry out the study in Mwansabombwe district. I am deeply indebted to the 34 respondents from the ten schools that constituted my study sample. I am also grateful to my fellow students Kaluba Patrict, Simulunda and Ndjovu for their assistance whenever I approached them for help.

#### ACRONYMS

- CS: Computer Studies
- DEBS: District Education Board Secretary
- ESO: Education Standards Officer
- ICT: Information Communication Technology
- IICID: International Institute for Communication and Development
- PEO: Provincial Education Officer
- MWD: Mwansabombwe District
- MDGs: Millennium Development Goals
- MODE: Ministry of General Education
- MOGE: Ministry of General Education
- NCST: National Council for Science and Technology
- NGOs: Non Governmental Organisation
- SITES: Second Information Technology in Education Study

# LIST OF FIGURES

Figure 1: Distributions of Respondents by Gender	24
Figure 2: Academic Qualifications of the Respondents	25
Figure 3: Computer adequacy	27
Figure 4: Availability of Computer Laboratories/Rooms in Schools	27
Figure 5: Availability of Antivirus	28
Figure 6: Availability of Discs and Flash	29
Figure 7: Availability of Electricity	29
Figure 8: Printing Facilities	30
Figure 9: Availability of Scanners	31
Figure 9: Projector Availability	31
Figure 10: Computer-Pupil ratio	32
Figure 11: Effects of teachers' Computer Literacy on the Curriculum Implementation	33

# LIST OF TABLES

Table1: Distribution of Respondents by Gender	24
Table 2: Academic Qualifications of the Respondents	25
Table 3: Level of Training in Computers	26
Table 4: Internet Facilities by Respondents	

, ·

# APPENDICES

1.1. Appendix A	Interview Guide for Head teachers4	.3
1.2. Appendix B	Questionnaire Schedule for Teachers	4
1.3. Appendix C	Education Standards Officer's Interview Guide4	.7
1.4 Appendix: D	Observation Checklist	

# TABLE OF CONTENTS

DECLARATIONi
APPROVAL ii
COPYRIGHTiii
DEDICATIONiv
ACKNOWLEDGEMENTv
ACRONYMS
ESO: Education Standards Officer
LIST OF FIGURES
LIST OF TABLES
Table 3: Level of Training in Computers viii
Table 4: Internet Facilities by Respondents viii
APPENDICESix
1.1. Appendix A Interview Guide for Head teachersix
1.2. Appendix B Questionnaire Schedule for Teachersix
1.3. Appendix C Education Standards Officer's Interview Guideix
1.4 Appendix: D Observation Checklistix
TABLE OF CONTENTSx
ABSTRACT xiii
CHAPTER ONE
1.0 Overview of chapter one1
1.1 Background of the study1
1.2 Statement of the Problem
1.3 Purpose of the Study
1.4 Objectives of the Study
1.4.2 Specific Objectives
1.5 Research Questions
1.5.1 General Research Questions
1.5.2 Specific Research Questions
1.6 Significance of the Study
1.7 Limitations of the Study
1.8 Theoretical Framework

l

1.9 THE CONCEPTUAL FRAMWORK	7
1. 10 Operational Definitions	8
1.11 Summary	8
CHAPTER TWO	9
LITERATURE REVIEW	9
2.0 Introduction	9
2.1 Concept of ICT in Education	9
2.2 ICT Policy in Education.	10
2.3 Importance of ICT Use in Instruction	
2.4 Challenges Facing ICT Implementation	13
2.5 Summary	17
CHAPTER THREE	18
RESEARCH METHODOLOGY	18
3.1 Introduction	18
3.2 Research Design	
3.3 Study Location	
3.4 Study Population	19
3.5 Sample and Sampling Procedure	19
3.6 Data Collection Instruments	20
3.7 Ethical Considerations	20
3.8 Validity and Reliability of the Instruments	20
3.9 Data Analysis	21
CHAPTER FOUR	22
PRESENTATION OF FINDINGS	22
4.0 Introduction	.:22
4.1 Demographic Information about the Respondents	22
4.1.1 Gender of Respondents	23
4.1.2 Academic Qualifications of the Respondents	24
4.1.3 Level of Training in Computers	25
Table 3: Level of Training in Computers	25
4.2 ICT Facilities	
4.2.1 Computer adequacy	25

4.2.2 Availability of Computer Laboratories/Rooms in Schools	26
4.2.3 Availability of Antivirus	27
4.2.4. Availability of Discs and Flashes	28
4.2.5 Availability of Electricity	28
4.2.7 Availability of Scanners	30
4.2.8 Projector availability	30
4.2.9: Internet Facilities	31
4.2.10: Computer-Pupil ratio	31
CHAPTER FIVE	34
DISCUSSION OF FINDINGS	34
CHAPTER SIX	36
CONCLUSION AND RECOMMENDATIONS	36
6.0 Introduction	36
6.1 Summary of the Major Findings of the Study	36
6.2 Conclusion	38
6.3 Recommendations	38
REFERENCES	40
APPENDICES	44
APPENDIX: A	44
APPENDIX: B	45
APPENDIX: C	49
APPENDIX: D	50

•

i į

i

•

•

#### ABSTRACT

The study aimed at investigating the barriers to the effective implementation of computer studies curriculum in selected junior public secondary schools of Mwansabombwe District (MWD) in Luapula province. The study further sought to establish the availability of ICT infrastructure and equipment in the selected schools. It also sought to establish the effects of teacher training and exposure to ICT on the implementation of computer studies curriculum in MWD. The third objective was to explore the measures that could be put in place to enhance the implementation of computer studies curriculum in the selected schools in MWD. The target population was 15 junior public secondary schools in the District. A descriptive survey design was used. Purposive sampling techniques and simple random sampling techniques were used to select a study sample of 10 schools. Additionally, 34 respondents were captured as follows: 10 headteachers, 20 computer teachers and 4 Education Standards Officers (ESOs).

Purposive sampling technique was used to select the 10 headteachers and the 4 ESOs. Purposive sampling technique and simple random sampling technique were used to select the 20 computer studies teachers. An Interview guide was used to obtain information from the Headteachers and ESOs while questionnaire guide was administered to the teachers. An Observation Checklist was also used by the researcher. The data collected was analyzed using descriptive statistics and presented in tables, charts and graphs. This study established that only 10% of the schools sampled had implemented computer studies curriculum effectively. 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.

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 infrastructure such as computer laboratories and enhance the connection of the secondary schools with fibre optic cables to enhance easier internet access. The MOGE should also recruit computer teachers in all public junior secondary schools.

#### CHAPTER ONE

#### **INTRODUCTION**

#### 1.0 Overview of chapter one

This chapter discusses the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, assumptions of the study, limitation sand delimitation of the study, significance of the study, theoretical and the conceptual framework.

#### 1.1 Background of the study

In March 2007, the Zambian government launched its national Information Communication and Technology (ICT) policy. At the launch, President Mwanawasa, then President of Zambia, emphasized the creation of an innovative, market responsive, highly competitive, co-ordinated, and well-regulated ICT industry. The policy states that computer studies was introduced as a subject in public schools in 1998 and that Zambia's private schools were producing ICT literate students. It also highlights challenges such as the financial and technological resource constraints, inadequate awareness on the benefits of integrating ICTs in the administration of the delivery chain of the education sector, and the high opportunity costs and lack of coordination.

Computers play a major role in the technological development of different countries 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, play an important role in the education sector, especially in the process of empowering the technology into educational activities. The 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.

1

#### (viii) It supports schools in sharing experience and information with others.

It is, thus, not surprising to find interest, attention and investment being put into the use of ICT in education all over the world (Yuen, Law and Wong 2003). The desire of countries to be globally competitive, grow economically and improve social conditions is often used to up the ante for increased investment in educational improvement and the application of ICT in learning institutions. At the global level, the Millennium Development Goals (MDGs), which have been adopted by the United Nations as the key development targets for the 21st century, mentions achievement of basic education as one of the prominent goals. The gap between the rich and poor nations and between certain groups within a country is a result of several factors. One such factor is inequitable access to resources among the citizenry and lack of technology to exploit the vast natural resources available in most countries.

Lewis (2003) states that one fundamental difference between the developed and the developing countries is that, the former are also rich in information and has a well-informed citizenry which is able to adapt quickly to changing social and economic environments; hence, utilizing opportunities to overcome development challenges such as poverty. In this regard, information is treated as a commodity which has potential to make significant changes in many aspects of social and economic development. ICTs can be used to bridge the digital divide within the context of globalization. The digital divide presents barriers by denying an opportunity for the people to take best practices and make them applicable in different ways.

It is noted that in Africa, the introduction of computers into primary and secondary education is a recent phenomenon. High subscription and ICT infrastructure costs coupled with the poor quality of service providers and the lack of basic infrastructure, such as electricity, can act as barriers to the use of ICT in education. The rapid growth in Information Communication and Technology (ICT) have brought remarkable changes in the twenty-first century, as well as affected the trends in our educational system. Therefore, there is a growing demand on educational institutions to use ICT to teach the skills and knowledge students need for the 21<sup>st</sup> century; thereby, realizing the effect of ICT on the workplace and everyday life (Lewis, 2003).

Norway instituted a national ICT policy (called eNorway) in the year 2000 with the 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 the year 2000, much of the work began in the 1990s with the computer to student ratio in secondary schools being at 1:4 by the time of its launch (Beresford:2002). Additionally, 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 Zambia in which computer to student ratio in many schools was too high in the 2015 grade nine computer compulsory examination.

Zambia has the opportunity to make a difference by adopting the usage of ICT and introduction of the computer studies curriculum as a tool available to reduce the development divide, thereby, increasing the chances of improving the quality of life of the citizens. Kinyanjui (2003) asserts that ICT is an enabler to build an information centered society where everyone can create, access, utilize and share information and knowledge leading to greater productivity, greater competitiveness and sustainable economic growth, a precondition for poverty reduction. ICTs can also be used as an effective tool in enhancing good governance.

According to 2013 curriculum framework, the purpose of the curriculum revision was to equip learners with competencies to operate effectively in a knowledge based economy. The computer studies subject is aimed at enabling learners to achieve the following general objectives among others:

- i. Appreciate the role of computer applications in carrying out day-to-day business and organizational tasks,
- ii. Understand the role of information and communication technology in mental, moral social and spiritual development,
- iii. Develop abilities to interact more efficiently with the wider community,
- iv. Appreciate the use of programming as a tool for problem solving,
- v. Appreciate the impact of computer technology on society,
- vi. 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.

However, it might be a challenge, because of lack of resources, for teachers of computer studies to help learners acquire the knowledge, skills and attitudes related to the achievement of the above objectives.

3

#### 1.2 Statement of the Problem

The demands of the 21st century dictate that learners should be equipped with requisite skills to competently engage and perform in the new information age. The Zambian national ICT policy of 2007 stated that computer studies should be introduced as a subject in government schools. The vision was for ICTs to contribute towards reaching innovative and lifelong education and training in Zambia by 2030 (Mundi, 2009).

Zambia Education Curriculum Framework of 2013 formally introduced computer studies (CS) as a compulsory subject in the junior secondary school curriculum. This was in order to equip learners with essential skills necessary for them to have basic knowledge of ICT (Curriculum Development Centre, 2013). Despite this effort to bridge the digital device, some government junior secondary schools in Mwansabombwe District (MWD) have not implemented computer studies curriculum in their schools. We do not know the barriers to the effective teaching of computer studies in most of the schools in the district. Hence, this study investigated the challenges faced by junior secondary schools in Mwansabombwe District with regard to teaching computer studies.

#### 1.3 Purpose of the Study

The study was conducted to assess the barriers to effective teaching of computer studies in selected public junior secondary schools in MWD in Luapula province.

#### 1.4 Objectives of the Study

The following were the objectives of the study:

#### 1.4.1 General Objective

To examine the barriers to effective teaching of computer studies in selected public junior secondary schools in MWD in Luapula province.

#### 1.4.2 Specific Objectives

The specific objectives of the study were:

i. To establish the availability of ICT infrastructure and equipment in selected junior secondary schools in MWD.

- ii. To establish the effects of teacher training and exposure to ICT on the implementation of computer studies curriculum in selected junior secondary schools in MWD.
- iii. To explore the measures that can be put in place to enhance the implementation of computer studies curriculum in selected junior secondary schools in MWD.

# **1.5 Research Questions**

The following research questions guided the study:

# **1.5.1 General Research Questions**

What are the barriers to effective teaching of computer studies in selected junior secondary schools in Mwansabombwe District?

# **1.5.2 Specific Research Questions**

The following research questions guided the study:

- What ICT infrastructure and equipment is available in selected junior secondary school in MWD.
- ii. What are the effects of teacher training and exposure on the implementation of computer studies curriculum in selected junior secondary schools in MWD?
- iii. What measures can be put in place in order to enhance the implementation of computer studies curriculum in selected junior secondary schools in MWD?

# 1.6 Significance of the Study

This study attempted to unearth the barriers to effective teaching of computer studies in public junior secondary school in MWD. The findings of the study might be significant to policy makers in the MOGE to address the issues and challenges identified in study. These could be policy issues in which the Ministry might be in a position to put mechanisms in place meant to enhance the effective teaching of computer studies in junior secondary schools. The findings of the study might also be useful to education managers at school level. The management might develop strategies addressing the issues and challenges raised in this study. The teachers might also use the findings in realizing their role in the implementation of computer studies curriculum in secondary schools. Finally, the findings of the study might provide a yardstick for further research in the field of computer studies.

#### 1.7 Limitations of the Study

The study covered Mwansabombwe District only due to limitation of time and financial resources. The study sample constituted ten (10) government junior secondary schools in the district. The findings of the study cannot be generalized to other districts.

### **1.8 Theoretical Framework**

The study was largely informed by the Modernization Theory. The major thrust of the theory is that developing countries need to go through a cultural and economic change in which traditional values are substituted by development oriented goals. The theory presupposes that in order to depart from political, economic and social challenges to achieve development and industrialization, there is need for a change of values and attitudes of the developing world. This could be achieved through promoting savings and earnings, having capital to invest, promoting growth in entrepreneurial skills base and investing in modern technology (Billie, 2009). Through these lenses, therefore, the adoption of western technology is one way of reducing the cultural and digital divide between the two worlds. The use of ICT in education would therefore constitute the drive towards a realization of this dream. The Modernization Theory suffered severe attack from the dependency theory for not taking into consideration factors that led to the underdevelopment of the developing countries (Mutunhu, 2011). It is important to note that some very significant insights can be drawn from this theory.

# **Modernization theory**



6

#### **1.9 THE CONCEPTUAL FRAMWORK**

In the framework, the independent variables are the ones that a researcher cannot manipulate or change and they include ICT infrastructure, ICT knowledge and skills. These influence the teachers' efficiency or ability to teach computer studies. The outcomes are the dependent variable and in this case the effective teaching of computer studies. The conceptual framework adopted in this research was based on the assumption that there are certain composite factors that affect the implementation of computer studies in the junior secondary school curriculum in MWD. The following figure illustrates the correlation of factors that determine the level of success of implementation of computer studies in a secondary school's curriculum:



The above figure is a diagrammatic representation of the conceptual framework used in this study which shows a correlation of factors in the implementation of computer studies curriculum in junior secondary schools in MWD. The independent variables considered in this conceptual framework were the resources, infrastructures, the level of the 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. When teachers have basic knowledge in computers or use computers more frequently, they are likely to implement computer studies curriculum in their schools. The teaching methodologies used and the mode of evaluation have also an effect on the implementation process.

#### 1. 10 Operational Definitions

Access: The reach by teachers and learners to ICT in schools for teaching learning.

Computer: A machine that manipulates data according to a list of instructions.

*Computer laboratory:* It is a room or space equipped with computers devoted to pedagogical use in an educational institution.

Computer Programme: Instructions for a computer to execute commands.

*Constructivism:* The learner constructs knowledge; learning is a personal interpretation of experience learning is active, collaborative, and situated in real-world contexts; and assessment of learning is integrated within the learning context itself.

Courseware: Educational software designed especially for use with classroom computers.

*Curriculum:* Contents and processes of learning in schools as well as the outcomes of learning. *Didactic teaching:* Traditional pedagogy of a teacher-centered teaching strategy.

*E-Learning:* The intentional use of networked information and communications technology in teaching and learning.

Hardware: Is the physical part of a computer.

- *Information Communication and Technology:* Forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means.
- *ICT Integration in education:* A comprehensive process of applying technology to the educational system to improve teaching and learning.
- *ICTs in education*: Refers to education models that employ ICTs to support, enhance and enable the delivery of education through computers internet, television or radio.
- *Internet:* A communication network of computers, allowing diffusion of knowledge and sharing of information, experiences and resources at great speed.

# 1.11 Summary

The chapter has presented the background information about ICT in Zambia. The chapter has also presented the statement of the problem, purpose of te study, objectives of the study, the significance of the study, the limitations, delimitations, theoretical and conceptual framework. The next chapter presents the literature review.

#### CHAPTER TWO

#### LITERATURE REVIEW

#### **2.0 Introduction**

In this chapter, the researcher presents the review of related literature, which provided a basis for analysis. In an attempt to do this, literature related to this study was reviewed under the following sub-headings: Concept of ICT in Education, ICT Policy in Education, Importance of ICT and Challenges facing ICT use in Instruction.

#### 2.1 Concept of ICT in Education

Oliver (2002) defines ICT as a term that stresses the role of unified communication and the integration of telecommunications, computers as well as necessary software, storage and audiovisual systems which enable users to create, access, store, transmit and manipulate information. In other words, ICT consists of information technology as well as telecommunications, broadcast media, all types of audio and video processing and transmission and network based control and monitoring functions

Beresford (2002) asserted that ICTs, which include radio and television as well as newer digital technologies such as computers and the internet, had been touted as potentially powerful enabling tools for educational change and reform. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life.

In another study, Kanyeki (2006) asserted that one defining feature of ICTs was their ability to transcend time and space. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its inception by learners. Beresford (2002) also stated that ICT based educational delivery dispensed with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs such as teleconferencing technologies enabled instruction to be received simultaneously by multiple, geographically dispersed learners, that is, synchronous learning.

Brown and Duguid (2000) stated that ICTs also facilitated access to resource persons such as mentors, experts, researchers and professionals all over the world. Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries ( and available in limited quantities) for their educational needs. With the internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by unlimited number of people.

According to Bradley and Yates (2000), ICTs particularly computers, the internet and related technologies are important to better prepare the current generation of students for workplace. Technological literacy or the ability to use ICTs effectively and efficiently is, thus, seen as representing a competitive edge in an increasingly globalizing job market. Haddad and Drexler (2002) stated that ICT supported education could promote the acquisition of knowledge and skills that would empower students for lifelong learning. When used appropriately, ICTs, especially computers and the internet technologies, can enable new ways of teaching and learning rather than simply allowing teachers and students to do what they have done before in a better way.

Orivel (2000) reaffirmed that ICT enhanced learning and acts as a mobilized tool for higher performance in examinations. It provides a platform for student inquiry, analysis and construction of new information. Learners, therefore, learn as they do and whenever appropriate. They work on real-life problems, making learning less abstract and more relevant to the learners' life situation. Orivel (2000) concludes that ICT enhanced learning, promoted increased learner engagement and was also just-in-time learning in which learners could choose what to learn when they needed to learn it.

## 2.2 ICT Policy in Education

With the support of the International Institute for Communication and Development (IICD), the Commonwealth of Learning (COL) and the United States Agency for International Development (USAID), the Zambian Ministry of Education had developed a draft ICT policy for education by October 2006 and an implementation strategy by January 2007. This represented an extension of

Zambia's national education and national ICT policies. The vision is for ICTs to contribute towards reaching innovative and lifelong education and training in Zambia by 2030. The guiding principles of the policy include the following:

- It must fit into national policies on education and ICTs
- There is a commitment to establishing strategic partnership with stakeholders
- There is a combined effort with government, the private sector, and NGOs
- The policy reflects general standards that the Ministry of Education wishes to uphold
- An integrated approach must be adopted that integrates all aspects of the value chain in the education process.

The policy also provides an overview of goals, objectives, and government commitment in key programme areas of ICT infrastructure to education institutions, content development, curriculum integration, teacher training, distance education, administration and support services, and finance. Linked to the policy is an implementation framework that sets out in detail the implementation objectives, activities, time frames, and budgets for each of these programme areas. It also outlines the ministry's commitment to promote collaboration between the private sector and education institutions and to establish appropriate structures meant to facilitate the integration of ICTs in the education system.

# 2.3 Importance of ICT Use in Instruction

ICT can play various roles in learning and teaching processes. According to Bransford et al, (2000), several studies have reviewed the literature on ICT and learning and have concluded that it has great potential to enhance student achievement and teacher learning. Angrist and Lavy (2002) asserted that education systems needed to prepare citizens for lifelong learning in an information society. This could be characterized by societal changes. Therefore, ICT could help many societies change into information societies. This would lead into having competent citizens with new technological skills. Eventually, the education would focus more on creating opportunities for students to acquire new skills related to autonomous learning, communication skills, authentic problem solving and collaborating in teams via various synchronous and asynchronous communication technologies.

According to Grimus (2000), ICT brings about educational innovations which are important in basic education as they have a strong pedagogical focus on student-centered and increasingly student-directed didactical approaches facilitated by ICT. It is evident as Yelland (2001) argues, that the use of new technologies is essential for providing opportunities for students to learn to operate in an information age. Grabe (2002) further pointed out that by teaching ICT skills in primary schools, the pupils are prepared to face future developments based on proper understanding.

According to Wanjohi (2011), ICTs enhance the quality of education by helping teachers to do their job and by helping students to learn more effectively. Technology, as a tool, supports the educational objectives such as skills for searching and assessing information, cooperation and problem solving which are important for the preparation of children for the knowledge society.

Schiller (1991) observed that ICTs have added value to support learning environments that were more student-controlled than traditionally had been the case. He further observed that due to ICTs, teachers reported that students were motivated and that discipline problems disappeared. Additionally, teachers themselves said that even despite heavier workloads as a result of preparing for the new learning arrangements, they found the classroom atmosphere much more relaxed and they enjoyed being better acquainted with their students (Pelgrum, 2010).

Oliver (2002) stated that as the world moved towards an ever more global, more knowledge based economy, many societies were also experiencing a change in the ability profile of their human resource needs. As the creation and dissemination of knowledge are perceived to be of paramount importance, education does not only have to go beyond the framework of initial schooling but the goals and processes of initial schooling should change. ICT is perceived as a crucial vehicle for educational pedagogical reform:

Furthermore, Becta (2001) asserted that ICT prepared people to live in a changing world. Yelland (2001) declared that the creation of an education system capable of preparing people to live in a changing world was one of the crucial and urgent tasks of modern society. Many governments in putting forward their ICT in education master plans expound a vision of bringing the nation into the top countries in the world in terms of education (Yelland. 2001). Furthermore, ICT brings about effectiveness in instruction. Kulik (1994) observed that students learnt more in classes in which they received computer based instruction, lessons took less time, students liked classes more when they received computer lessons. They also developed more positive attitudes towards computers when they received help on the use of computers in schools. Fulton (1998) further asserted that ICT was important in developing skills for the workplace. After leaving school to embark on a career, young people can expect the day-to-day practice of every discipline to be affected by the use of ICT. In the future, economic competitiveness, employment and personal fulfillment may no longer be based on the production of physical goods. Personal and national wealth creation may be linked to the production and dissemination of knowledge and depend on research, education and training and on the capacity to innovate. Having advanced ICT skills and knowing how to use discipline-specific applications may help students secure suitable employment and enhance their productivity once employed. Furthermore, the ability to engage in lifelong learning opportunities offered by educational institutions around the world is increasingly dependent upon access to and use of ICT (Bates, 2004).

#### 2.4 Challenges Facing ICT Implementation

ICT is perceived as a prerequisite for development. However, when it comes to comparing the developing world with the developed world, there is a huge gap in the usage of ICT between these two groups. This gap is referred to as the "Digital Divide" and can be seen within a country and between countries (Parliamentary Office of Science and Technology, 2006). The ICT environment surrounding education in developed countries is relatively abundant. According to the research done by UNESCO (2000), the number of PCs (Personal Computers) in schools was increasing and access to the internet was easy in developed countries. Moreover, ICT was actively adapted in schooling to the extent that ICT changes pedagogical practice innovatively (Kozma, 1999). In contrast, studies by Grabe (2002) reviewed that in underdeveloped countries, ICT infrastructure was weak and the internet access was limited. The study further reviewed that supply of PC (Personal Computer) in school was much less than needed and trained personnel who could resolve computer illiteracy was also in serious shortage.

According to Parliamentary Office of Science and Technology (2006), digital divide is mainly related to such factors as appropriate products, cost, education, literacy, human resources and

government regulations. To tackle the digital divide, carefully selected technology could be used. Open source software, which is basically free because its source code is open to the public, might be a good choice for the countries under financial pressure. Governments have a significant role in reducing the digital divide. They can cut the tax imposed on ICT related imports or liberalize the market for PCs, telecommunication and the internet business. These actions will result in a lower price of ICT related products and an increase in affordability. Industries also have a role in closing this division. Normally, industry works for profit, but corporations have a social responsibility to spend their resources on unprofitable but highly required areas and some of them are actively involved in addressing the digital divide (Lewis, 2003).

In his study, Oliveira (1998), stated that the main challenges for implementing ICT in the education sector in the underdeveloped world included: The first issue, which almost all developing countries faced, was how to deal with the scarcity of financial resources. Oliveira (1998) went on to state that resources in the developing world were always scarce so that they had to be spent mostly on basic supplies such as food, housing and roads. In a sense, investing in ICT for schooling might be regarded as a long term issue which meant adopting ICT in the education system was relatively not an urgent issue considering the serious poverty in many African countries. According to Oliveira (1989), this resulted in a vicious circle between scarcity of funds and underdevelopment. When it came to the controversy of priority of investment between basic services and ICT, both might be linked in the case of education (Parliamentary Office of Science and Technology 2006). Additionally, the study by Oliver (2002) indicated that one piece of good news about cost was that the cost of hardware was decreasing rapidly. The price of PCs and peripherals was reduced to half of the original price every two years. Because of this, the salary of the IT professionals who could teach the new technology was the biggest burden on education budgets and it was followed by software related costs.

Secondly. access to the internet was highly limited in remote areas, and relatively poor infrastructure in developing nations such as supply of electricity, made this worse (Gulati, 2008). Gulati (2008), further asserted that low infrastructure was the fundamental problem for developing countries to deal with and it might take a long time and huge funding to improve. Low literacy rates also hindered locals in remote areas from accessing information through the

internet and due to the dominance of English on the internet; non-English speaking local people were isolated from the benefits of using internet.

In addition, Kozma (1999), stated that another challenge faced by developing nations to adopt ICT in education systems was a lack of trained teachers. When it came to practically applying ICT, which was new to traditional teachers, many did not know how to deal with it and sometimes they were reluctant to accept new technologies in their classrooms. Thus, tutors who could train these teachers about new technology and IT professionals who could technically install and maintain the system were needed.

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

- Lack of qualified teachers to teach ICT in schools. The demand for ICT learning had been tremendous and the number of teachers who were trained to teach ICT cannot met the demand. There were more students willing to be taught computing skills than there were teaches to transfer the skills.
- Lack of computers; computers were still very expensive and despite spirited efforts by the government agencies, NGO, corporate organizations and individuals to donate computers to as many schools as possible, there still remained a big percentage of the schools unable to purchase computers for use by their pupils.
- Lack of electricity; many schools were still not yet connected to electricity; Kenya being a developing country, the government had not been able to connect all parts of the country to the national electricity grid. Consequently, those schools that fell under such areas were left handicapped and might not be able to offer computer studies.

- Broken down computers; while a good number of schools had benefited from donated used computers, they had not been adequately equipped with the same on maintenance and repair; hence, it was very common to see a school's computer lab full of broken down computers, some were repaired and some not. This had actually been a major problem, and the government put strict measures on any person, NGO or corporate bodies willing to donate second hand computers.
- Burglary; the fact that computers were still very expensive in Kenya, made them a target for thieves who usually had ready market to another party at a much less figure. This made many schools to incur extra expenses trying to burglar proof the computer rooms. This extra expense made some schools shy away from purchasing computers for their students.
- Fear by the administration; there was still a strong perception especially by the older generation that computers required highly skilled personnel to operate them, while this might not be the case, some school administrators also feared that their students would be exposed to adult sites and other undesired sites, through the use of the internet. Some also feared the infection of viruses to their computers leading to data loss. While this might be true to some extent, proper education on the safe use of computers helped alleviate some of these fears.
- Fear by the teacher: the teacher feared being rendered irrelevant by the introduction of computers in his/her class. They felt that the teacher still remained an authority and a "know it all" in class was something that most teachers cherished.
- Lack of internet or slow connectivity; most schools were not able to connect to the World Wide Web, due to the high costs involved in the connectivity. On average, it may cost approximately \$120 (9,600 kshs) per month to connect to about 15 computers on a bandwidth of 128/64kbps. This was considered as very expensive for a very slow speed.
- Lack of initiative by the community leaders; the community leaders who were charged with looking at the interests of a given community did not see the need to purchase and subsequent installations of computers to their schools as a priority. They considered health care, provision of water and other amenities as more important than buying computers for their schools.

- Obsolete computers lower the morale of both the teacher and the student; it was very common to find some schools using very old computers running on windows 98 or windows 95.
- Increased moral degradation internet pornography, cyber bullying and other anti-social behaviors was a worrying emerging problem.

The challenges above might also be applicable to the Zambian situation. For example, in his study, Bwalya (2015) stated that the biggest challenge facing potential ICT consumers in Zambia was the high cost of equipment and broadband services. He further said that ICT equipment was already expensive for the citizens of a country with a per capita Gross National Product (GNP) which only just exceeded the cost of a single personal computer. The cost of computers and peripherals such as modems was pushed up further by high rates of taxation. Additionally, the cost of broadband services was high amounting to US\$100 per month, compared with around US\$20 in Europe. As a result, many schools failed to offer ICT lessons. He further said that there was general apathy and lack of interest by teachers to venture into the latest technology which was quite evident especially in rural schools (Bwalya, 2015).

This study may fill the gap to effective implementation of computer studies curriculum in MWD and assist educators to overcome these barriers leading to successful technology adopters in the future. Understanding this environment is crucial because this knowledge could provide guidance for ways to enhance technology integration and encourage greater use of ICT in the education sector.

#### 2.5 Summary

The researcher has discussed various concepts of the term ICT according to various authors. All are in agreement that ICTs are forms of technologies that are used to transmit, store, create, share and exchange information. The researcher has also discussed at the importance of ICT use in education and the role played by teachers in ICT use. The next chapter presents the methodology.

#### **CHAPTER THREE**

#### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the methodology and procedures that were employed in carrying out the study. It describes the research design, location, sample and sampling procedures, data collection techniques, research instruments, administration of research instruments and data analysis.

#### **3.2 Research Design**

A research design includes how data is to be collected, what instruments will be employed, how the instruments will be used and the intended means for analyzing data collected (Ader and Mellenbergh 2008). The study employed a descriptive survey, combining both qualitative and quantitative research strategies. Orodho (2005) defines descriptive survey as a method of collecting information by interviewing or administering questionnaires to a sample of individuals. Descriptive studies are aimed at finding out "what is," so survey methods are frequently used to collect descriptive data (Borg & Gall, 1989). According to Creswell (2003) a survey design provides a quantitative or numeric description of trends, attitudes or opinions of a population by studying a sample of that population. In this study, the survey design was preferred as the researcher wanted to get the precise information by applying research instruments such as questionnaires which allowed for the collection of data from a large number of respondents in a relatively short period.

#### **3.3 Study Location**

The study was carried out in Mwansabombwe District, Luapula province. Gordon (2006) states that Mwansabombwe is situated where the Ngona River enters the swamps of the Luapula River south of Lake Mweru. A number of channels through the swamps and lagoons connect to the main river channel about 5 km away, facilitating fishing and trade (mainly illicit) with the Democratic Republic of Congo. The town lies close to the middle point of the main artery of the Luapula Province, the tarred road informally known as the 'Valley Road' running from Mansa to Nchelenge, and connecting southwards first to the "Samfya Road" (from Mansa to Serenje) and then to the Great North Road at Serenje. A tarred road also connects eastwards via Mbereshi to the northern Zambian plateau at Kawambwa. The District has 15 government junior secondary

school with 15 headteachers and 205 teachers. The District is divided into three zones which are Mbereshi, Kazembe and Salanga. This area forms an ideal setting for the study since no known study on barriers to effective teaching of computer studies has been conducted in this rural district.

# **3.4 Study Population**

Mugenda (1999) defines target population as the members of a real or hypothetic set of people, events or objects, the researcher wishes to generalize the results of the research. The target population for this study comprised all Junior Secondary Schools in MWD, all the Education Standard Officers, head teachers and teachers.

#### 3.5 Sample and Sampling Procedure

Orodho (2005) defines sample population as a small portion of a target population. He continues to define sampling as a means of selecting a given number of subjects from a defined population as representative of that population. In this study, out of the 15 public junior secondary schools in Mwansabombwe, the researcher used stratified random sampling to select 10 schools, which is 66.7% of the target population. According to Gay (1992), the minimum sample size should be 10% when the population is large and 20% if the population is small. However, since the accessible population was not large, a higher percentage of 66.7% was favored. From each of the schools, the researcher used simple random sampling to select two (2) teachers giving a total of 20 teachers. Purposive sampling was used to select all the 10 head teachers from the 10 schools participated in the study including 4 education standard officers. The total sample size for the study was 34 respondents. The reasons for using purposive, stratified and simple random sampling approaches were as follows:

- i. Simple random sampling allowed a situation whereby every member of the generated population per selected subcomponent of a population (school) within a district had equal chance of being selected. This was used to select the teachers to answer the questionnaires.
- ii. Purposive sampling targets a group of people believed to be reliable for the study (extreme case sampling). This was used to sample the head teachers and ESOs.

#### 3.6 Data Collection Instruments

Data collection instruments used in this study were interview guide, questionnaire guide and observation checklist. The questionnaire guide was preferred because as Gay (1992) puts it, it gives respondents freedom to express their views or opinions and also to make suggestions. The questionnaire guide used in the study had both close-ended and open-ended questions. Open-ended questions permit a greater depth of responses. According to Mugenda (1999), questionnaires are commonly used to obtain important information about the population as each item in the questionnaire is developed to address a specific research objective, question or hypothesis of the study.

In this study the questionnaire guide helped in collecting important information from the teachers on the effectiveness of teaching computer studies and the challenges faced by the teachers when teaching the subject. An observation checklist was also used by the researcher to establish the number of computers in each school and the ones in use. The researcher also used an observation checklist to find out the availability of ICT equipment used in the schools.

#### **3.7 Ethical Considerations**

In conducting the study, participants were treated with respect. Consent was sought before carrying out the study and participation was voluntary. The researcher visited the schools captured in the study so as to seek permission from respective head teachers of the schools. The researcher also presented letters of introduction from the District Education Board Secretary. The information about the study was availed to the participants before they took part in the study. Confidentiality of the information and respondents was also ensured.

#### 3.8 Validity and Reliability of the Instruments

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

supervisors, whose expert judgment helped improve content validity. According to Muzumara (1998), reliability refers to consistency between independent measurements of the same phenomenon. The same methods used by different researchers at different times under the same conditions should yield same results. To ensure reliability, the researcher made sure that all questionnaire and interview guides reflected questions which were on computer studies curriculum implementation.

# **3.9 Data Analysis**

Descriptive statistics was used in the analysis of both quantitative and qualitative data. Data analysis was done by editing, coding and tabulation of data according to the research questions. Kathuri e tal (1993) points out that analysis means ordering, categorizing, manipulating and summarizing of data to obtain answers to research questions. The data was entered into the computer and analyzed with the aid of Microsoft excel. In data analysis, percentages have a considerable advantage over more complex statistics (Piel. 1995). The data was presented using tables, bar charts and pie-charts. Qualitative data was analyzed by organizing it into themes and according to the research questions and objectives. Thereafter, inferences were drawn to establish and present the findings.

#### 3.10 Summary

This chapter presented the research methodology used in this study. It included a brief description of the study area; it also covered the research design, target population, study sample, sampling procedures, research instruments, processes and analysis of both primary and secondary data. The next chapter is a presentation of the findings.

#### **CHAPTER FOUR**

#### **PRESENTATION OF FINDINGS**

#### 4.0 Introduction

This chapter gives a systematic presentation of the data collected during the research. The study targeted three categories of respondents namely: Education Standards Officers, Head teachers and teachers. A questionnaire guide was administered to collect data in the sampled schools. The collected data is presented in forms of frequency distribution tables, pie charts and bar graphs. The purpose of this study was to investigate the barriers to effective teaching of computer studies in public junior secondary school in Mwansabombwe District (MWD), Luapula province. Questionnaire guide, interview guide and an observation checklist were used in data collection. Descriptive statistics, mainly averages, were used. The study aimed at answering the following questions:

- What ICT infrastructure and equipment is available in selected junior secondary school in MWD?
- ii. What are the effects of teacher training and exposure on the implementation of computer studies curriculum in selected junior secondary schools in MWD?
- iii. What measures can be put in place in order to enhance the implementation of computer studies curriculum in selected junior secondary schools in MWD?

The findings of the study are presented under the following sub-themes which formed part of the objectives of the study: demographic information of the respondents, ICT components and infrastructure in public junior secondary schools.

#### 4.1 Demographic Information about the Respondents

This section presents demographic description of the respondents, so as to provide a logical background for the study findings as reported in this chapter. Three key groups of respondents were involved in the study, namely: Education Standards officers, Head Teachers and Teachers. The respondents' demographic information is presented in terms of their gender, professional qualification and level of computer literacy where applicable.

#### 4.1.1 Gender of Respondents

A total of 34 respondents participated in the study out of whom 23 (67 %) were males while 11 (37 %) were females. Their distribution was as shown in the table below:

Gender	M	ALE	an sa	FEMALE			
Respondents Category	NO	%		NO	%		0
Just Preter D D 6	18 0	6.19	4 12	0 9	b 0	0	- 0 %
Education Standard officers	2	50		2	50		
Head Teachers	7	70		3	30		
Teachers.	14	70		6	30		
Total	23	63		11	37		

#### Table1: Distribution of Respondents by Gender

Source: field data (2016)

Table 1 shows that out of all the Education Standard Officers who took part in the study, two (50%) were male and two (50%) were female counterparts. A vast majority of the Head teachers who were interviewed were found to be male, that is seven (70%) compared to three (30%) of their female counterparts. The majority of the Teachers who were interviewed fourteen (70%) were male compared to six (30%) of their female counterparts. The same information is presented in Figure 1, for clarity.







# 4.1.2 Academic Qualifications of the Respondents

Academic qualifications were sought from ESOs, head teachers and teachers. The responses were as presented in Table 2.

Table 2. Aca	ucum	e Qua	mica	tions	or the	nesp	onuci	113						
Qualification	Cer	tificate	Dip	loma	BED	(Scie)	BA	.ed	BSC with	th PGDE	M.	ed	Other	'S
Respondents'														
Category	No	%	No	%	No	%-=	No	%	No	%	No	%	No	%
ESOs	0	0	0	0	0	0	3	9	0	0	1	3	0	0
Head teacher	0	0	6	18	0	0	4	12	0	0	0	0	0	0
Teachers	2	6	13	38	1	3	4	12	0	0	0	0	0	0
Total	2	6	19	56	1	3	11	33	0	0	1	3	0	0
			1	5	Source	e: field	data	a (201	16)					

**Table 2: Academic Qualifications of the Respondents** 

According to Table 2, two respondents (6%) had certificates, nineteen respondents (56%) had diplomas, one respondent (3%) had Bachelor of Education degree with science, eleven respondents (32%) had Bachelor of Arts with education and another respondent possessed a Master of education degrees. The same information is presented in the figure below:





Source: field data (2016)

24

#### 4.1.3 Level of Training in Computers

This study further sought to establish the level of training in computer. The findings are presented in Table 3 below:

Qualification	Certif	icate	Diplon	na	Degree			Other	rs	
<b>Respondents'</b>										
Category	No	%	No	%	No	%	No	%		
ESOs	0	0	0	0	0	0		2	6	
Head teacher	0	0	0	0	0	0		6	18	
Teachers	2	6	1	3	0	0		11	32	
Total	2	6	1	3	0	0		19	56	

#### **Table 3: Level of Training in Computers**

Source: field data (2016)

It was observed that among the Education Standards Officers and Head teachers no one had obtained a certificate or higher paper in computer literacy representing 91%. However, two of the ESOs, six head teachers and eleven teachers a total of 19 (56%) attended a two day workshop on computer literacy. Only 2 teachers possed a certificate and one teacher a diploma in computer studies representing (9%).

# 4.2 ICT Facilities

One of the objectives of this study was to find out the level to which schools in the study area had established ICT infrastructure for use in enhancing teaching and learning. This was done through investigation on computer adequacy, adequacy of printing facilities, availability of overhead projectors and the availability of internet services in the school.

#### 4.2.1 Computer adequacy

When teachers were asked about the adequacy of computers in their schools, the result was as indicated in figure 3 below:

#### Figure 3: Computer adequacy



Source: field data (2016)

From figure 3, it can be seen that 80% of the teachers who participated in the study indicated that the number of computers in the schools was inadequate while 10% indicated that the computers in their school were fairly adequate and 10% said that they did not have any computers.

#### 4.2.2 Availability of Computer Laboratories/Rooms in Schools

The respondents were asked about the availability of laboratories and the response was as shown in figure 4 below:







Responding to the item on whether they had or did not have computer laboratories/rooms in their schools the majority of the respondents indicated that they did not have any. Only a small proportion of 17.6%) indicated that they had computer laboratories/rooms in their schools. However, two 7% of those that reported that they had computer laboratories/rooms also added that they were not adequately or properly equipped. The participates indicated that without adequate and well equipped ICT rooms or laboratories it would be very difficult for schools to encourage the stakeholders to adopt the use of ICT. From the above figure, it can be seen that 82.4% did not have laboratories.

#### 4.2.3 Availability of Antivirus

The participants were asked to indicate the status of antivirus on the computers. 79.4% of the participants indicated that they never had antivirus installed on the computers while 14.7 % said they had an updated antivirus. Those who had updated were only 5.9%. This is summarized in the figure below:



#### **Figure 5: Availability of Antivirus**

#### Source: field data (2016)

#### 4.2.4. Availability of Discs and Flashes

The participants were asked to give information on the availability of soft discs in their schools to facilitate transfer of information and data serving. 70.6% stated that this was inadequate while 23.5 indicated fairly adequate. The response of others (5.9%) was that they had adequate discs. No one indicated never. This is presented in the figure 6 below:



Figure 6: Availability of Discs and Flashes

#### Source: field data (2016)

#### 4.2.5 Availability of Electricity

The researcher intended to find out the number of schools that had electricity to enable the effective implementation of computer studies curriculum. 68% of the respondents indicated that they did not have electricity while 32% indicated that they had. This is represented in the figure 7 below:

#### Figure 7: Availability of Electricity



#### Source: field data (2016)

Figure 7 shows that 91.2% of the respondents did not have generators while 8.8% stated that they had a generator.

#### **4.2.6 Printing Facilities**

From figure 8, it can be seen that 44.1% of the respondents indicated that the printing facilities were not available. It was also observed that 35.3% of the respondents indicated that the printing facilities were inadequate. The number of the respondents who indicated that the facilities were fairly adequate was low standing at 20.6% and no one indicated that they had adequate printing facilities.



#### **Figure 8: Printing Facilities**

# 4.2.7 Availability of Scanners

The researcher wanted to find out the availability of scanners in the schools offering computer studies. It was established that 82.4% did not have scanners while 17.6% had scanners as shown in Figure 9 below:





Source: field data (2016)

# 4.2.8 Projector availability

An investigation on projector facilities available in the school yielded the results shown in Figure 10 below:

# Figure 10: Projector availability



Source: field data (2016)

Almost all the respondents indicated that their school did not have an overhead projector. From Figure 10 above, it was established that 94.1% of the respondents indicated that there were no overhead projectors in their schools while 5.9% of the respondents indicated 'yes'. It is worth noting that overhead projectors are very useful when teaching a very large group of students.

### 4.2.9: Internet Facilities

From Table 3 below, it can be seen that 54.7% of the respondents had no access to internet, 35.3% used modems, 10% had no access at all and no institution was connected to fibre Optic.

frequency	Percentage
0	0%
12	35.3%
22	54.7%
	frequency           0           12           22

#### Table 4: Internet Facilities by respondents.

#### 4.2.10: Computer-Pupil ratio

An investigation on the computer-pupil ratio at school gave the following results presented in the figure below:



# Figure 10: Computer-Pupil ratio

52.9% respondents said that there was one computer to 10 pupils (1:10) while 32.4% indicated that the ratio was one computer to twenty pupils (1:20). Additionally, 8.8% indicated that they had a ratio of one computer to seven pupils (1:7) and 5.9% one computer to five pupils (1:5).

# 4.3: Effects of teachers' computer literacy on the curriculum implementation

The information in the Figure below shows that 94.1% of the respondents felt that computer literacy levels of the teachers affected the smooth implementation of computer studies curriculum in a school. It also shows that 5.9% of the respondents felt that it did not affect the implementation while 8.8% did not respond to this question.



Figure 11: Effects of teachers' computer literacy on the curriculum implementation

Source: field data (2016)

#### 4.4. Measures for effective implementation of computer studies curriculum

- Most respondents, 87.5% of the head teachers, 100% of computer studies teachers and 65% of ESOs proposed that the government should provide grants to schools to procure more computers, their accessories and set up infrastructure such as computer laboratories.
- Another suggestion proposed by 25% of head teachers, 100% of ESOs and 50% of computer studies teachers was that the government should recruit qualified computer teachers in all junior public secondary schools in Zambia.
- Further 75% of ESOs and 68% of computer studies teachers proposed that the Ministry of General Education (MOGE) should organize regular seminars and workshops to sensitize

the head teachers and other stakeholders on the importance of implementing the computer studies curriculum.

#### **CHAPTER FIVE**

#### **DISCUSSION OF FINDINGS**

The study established that there were inadequate resources and infrastructure available for the implementation of computer studies curriculum in junior secondary schools in Mwansabombwe District. These included computers, text books for computer studies subject, Uninterrupted Power Supply (UPS), scanners, overhead projectors, backup generator, computer laboratory, Soft discs (CDs and Flash discs) and limited number of computers in schools: The number of computers in the schools was few. 52.9% respondents said that there was one computer to 10 pupils (1:10) while 32.4% indicated that the ratio was one computer to twenty pupils (1:20). It 8.8% indicated that they had a ratio of one computer to seven pupils (1:7) and 5.9% one computer to five pupils (1:5). In the literature review, Afshari (2009), state that limited access to computers is a barrier to effective implementation of ICT based curriculum.

The study discovered that the insufficient power supply in most of the junior secondary schools in the district had contributed to the ineffective implementation of computer studies curriculum. This was because most of the secondary schools were in the rural areas where there was inadequate electricity supply especially in the day schools coupled with inadequate power backup. This is in line with what Conradie (2003) observed that many rural areas in Africa did not yet form part of the national electricity grid. This is particularly an acute problem since technology and internet can only be effective if it is generated by electricity.

It was further established that there was low internet connectivity in the junior secondary schools. It was seen that 54.7% of the respondents had no access to internet, 35.3% used moderns, 10% had no access at all and no institution was connected to fibre Optic. The overreliance on the modem as the main access to the internet was expensive and often disrupted by slow connectivity. This restricted teachers from using the internet to research for teaching learning materials. This is supported by Jensen (2002) in his research finding that unreliable telecommunications networks formed a major hindrance for many people in Africa to use ICTs, education inclusive. These findings agree with Ndwiga (2005) and Mwaniki (2007) who established that low internet connectivity was a major setback in the implementation of computer studies in the educational institutions.

The findings further ascertained that teachers' training and exposure to ICT had more effect on the implementation of computer studies curriculum in secondary schools. Confirming this view Billie (2009) stated that there was a need to equip teachers with ICT skills through their formal training for them to effectively integrate it in teaching. However, none of the administrators captured in the current study, were trained in computer studies as their teaching subject. This adversely affected the implementation of the subject as its value was not realized. These findings are also similar to those of Mburu (2008) who observed that teachers' literacy level in computers had a big influence on the success of the implementation of e-learning in public secondary schools.

The study discovered measures such as the provision of school grants to procure computers, recruitment of computer studies teachers and holding of regular workshops for school managers on the importance of implementing computer studies curriculum as some of the measures.

#### **CHAPTER SIX**

#### **CONCLUSION AND RECOMMENDATIONS**

#### 6.0 Introduction

This chapter gives the summary of the study, implication of the findings, conclusions, recommendations for policy and practice and recommendations for further study.

The study sample constituted ten public junior secondary schools. There were 34 participants who constituted four (4) Education Standard Officer, ten (10) headteachers and twenty (20) computer studies students.

#### 6.1 Summary of the Major Findings of the Study

In most of the junior secondary schools, the teachers were in agreement that the infrastructure was inadequate. The printing facilities were also not adequate or were totally unavailable. Internet facilities were not available in the schools. Overhead projectors were also a facility that was not available in the schools. The percentage of the head teachers who indicated that they did not have the skills to create/edit a document, save a document, send mail and open a file was quite high. This was a clear indication that most of the head teachers did not have any basic idea on use of computers.

#### 6.1.1 Resources and infrastructure available

The resources and infrastructure available for the implementation of computer studies curriculum in junior secondary schools in MWD included: computers, text books for the computer studies subject, Uninterrupted Power Supply (UPS), scanners, overhead projectors, backup generator, computer laboratory, Soft discs (CDs and Flash discs), Revision books or Materials for computer studies and moderns. Only 12.5% of the schools in the study sample were reported to have all these facilities. Different respondents gave varied percentages of availability of the resources and infrastructures.100% of the respondents reported that internet connectivity services through fibre optic cables was not available while 64.7% respondent reported that they did not have any access to the internet and there was uninterrupted Power Supply (USB). Furthermore, 82.4% of the respondents indicated that Scanners were not available and 94.1% did not have overhead projectors. Backup generators and computer laboratories was found by 82.4% of the participants

to be unavailable. It was also further established that 79.4% of the respondents felt that antiviruses' software's were unavailable. The study further established that 62.5% of the schools did not have the computer-pupil ratio that is 20:40 recommended by MOE in 2005 for an ideal computer laboratory in a secondary school.

# 6.1.2 Effects of teachers' training and exposure to ICT

An examination to whether teachers' training and exposure to ICT had any effect on the implementation of computer studies curriculum in secondary schools revealed that it was true that it affected the smooth and effective implementation of computer studies curriculum. Some participants, 76.7% of the head teachers in the study, reported that teachers who did not have any training or exposure to computers usually discouraged students from selecting computer studies subject. According to the ESOs' responses, 87.5% of the teachers were not computer literate while 12.5% were literate and this affected the implementation process. Further 25% of Head teachers gave one reason why they did not implement the computer studies curriculum effectively as due to lack of trained computer teachers in their schools.

#### 6.1.3 Measures to enhance the implementation process

Pertaining to the measures which could be put in place to enhance the smooth and effective implementation of computer studies curriculum in junior public secondary schools in MWD, 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 head teachers, 100% of computer studies teachers and 65% of Education Standard Officers. Further 25% of the head teachers and 50% of computer studies teachers emphasized the need for recruitment of computer studies teachers by the government. 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 teachers (50%) proposed a regular review computer studies curriculum. Computer studies teachers, 10% of the subject. A portion of the respondents; 75% of head teachers and 50% of the teachers, put a suggestion that the MOGE should be organizing regular seminars and workshops to sensitize the

school managers and other stakeholders on the importance of the implementing of computer studies curriculum in secondary schools.

#### **6.2** Conclusion

From the research findings the following conclusion was made:

Only 10% of the schools in the study sample had successively implemented the computer studies curriculum. A number of factors hampered the implementation process such as inadequate funds to procure computers, trained computer teachers, computers and other resources and infrastructures recommended by the MOGE for the implementation of computer studies curriculum.

The types of resources and infrastructure which were needed in a number of schools for the implementation of computer studies curriculum in secondary schools in MWD included 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 availability of electricity.

This study established that the resources and infrastructure for the implementation of computer studies curriculum in secondary schools in MWD were not adequate. The study revealed that 90% of the schools in the study sample had not implemented the computer studies curriculum effectively due to inadequate funds to procure computers and their accessories and set up infrastructure such as computer laboratories, inadequate trained computer teachers and inadequate revision materials were cited as the major challenges in the implementation process.

#### **6.3 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 connect secondary schools with fibre optic cables to enhance easier internet access.

iii) The MOGE should also train and recruit computer teachers in all public junior secondary schools. The MOGE 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.

# **6.3.1 Recommendation for Further Research**

The researcher recommends the following areas for further research:

- 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 junior secondary schools in the rural set up.
- ii) A similar study to be conducted in the private junior secondary schools.

#### REFERENCES

- Ader, H. J. Mellenberg, G.J. and Hand, D. J. (2008). Advising on Research Methods: Huizen: Johannes Van Kessel Publishing.
- Adams, M. D. (1985). Computer at Training, a Practical Guide. New York: The Howoth press inc.
- Angrist, J. and Lavy, V. (2002). New Evidence on Classroom Computers and Pupil Learning. In Economic Journal, 112(482).
- Benzie, D. (1995). Using Computer to Support Young Learners. London: Chapman & Boundary Row Hall.
- Beresford, B. (2002). The Internet in Our Classrooms: Teaching Tomorrows Skills For Tomorrows World. Washington Dc: The World Bank..
- Bhasin, B. (2012). Integration of ICT to Enhance Teaching and Learning. Contemporary Educational Technology: New York, Longman, Publishers Ltd.
- Billie, H. (2009). The Chronicles of Higher Education. Online Journal. Washington D C: Accessed 24/10/2009.
- Borg, W. R. and Gall, M. D. (1989). Educational Research. New York, Longman Publishers Ltd.
- Brankel, V.P.A. and Chisenga, J. (2003). Impact of ICT Based Distance Learning: The African Story. Washington DC: The electronic library, accessed 9th/07/2011
- Bradley, J and Yates, C. (Eds). (2000). **Basic Education at a Distance**: World Review of Distance Education and Learning. London: Routledge Inc
- Bransford, J. (2000). How People Learn: Brain, Mind, Experience and School (2<sup>nd</sup> ed). Washi
- Bwalya, T. (2015). Zambia to Become an Information Society by 2015: A Reality Check. Northeast Normal University China, D.C: National Academy Press.
- Creswell, J. (2003). Research design: Qualitative, Quantitative and Mixed Methods Approaches(2nded). Sage: Thousand Oaks.
- Curriculum Development Centre. (2013). Implementation Curriculum Framework. Lusaka: Zambia. Government Printers.
- David, M. Gordon. (2006). History on the Luapula Retold: Landscape, Memory and Identity in the Kazembe Kingdom. Journal of African History, pp. 21–42. Cambridge

40

University Press.

Dzidomu, C. (2002). A Blue Print for Developing Nations ICT Policy African Technology.

Nairobi: Policy Study Networks.

Grabe, M. (2002). Integrating Technology for Meaningful Learning (5<sup>th</sup> ed). Boston:

Houghton Mifflin

# Kansagbata, C. (2006). Traditional Institutions and Governance in the Jirapa Traditional

Area. Unpublished Mphil Thesis, Center of Development Studies, University of Cape Coast, Cape Coast

# Kanyeki, W.M. (2006). An Investigation into the se and Impact of Information Technology

in Management of Public Secondary Schools. Unpublished M.Edproject,

Nairobi: Kenyatta University.

# Karuru, I.W. (2005). An Investigation Into The Status of Information Communication And

Technology Policy (ICT) in Education System. Nairobi: Unpublished MED

Project Kenyatta University.

# Kathuri, J. K. and Pals, A.D. (1993). Introduction to Educational Research. Njoro:Educational Media Centre (E.M.C) Egerton University .

#### Kinyanjui, L.W. (2003). A survey on ICT Access and use in Secondary Schools. Nairobi:

Schoolsnet Africa.

# Kombo, D. K. and Tromp, D. L. A. (2006). Proposal and Thesis Writing: An Introduction. Nairobi: Paulines Publications Africa.

Kwok-Wing, L. and Pratt, K. (2004). Information and Communication Technology (ICT) in

Secondary Schools. British online Journal, accessed 11th/07/2011.

- Lewis, S. (2003). Enhancing Teaching and Learning of Science Through use of ICT: Methods and materials. School Science Review, 84(309), 41-51.
- Mburu, C. G. (2008). A Survey of Attitudes of Secondary School Teachers and Students Towards e-learning in Thika Municipality. Nairobi. Unpublished ME d Project, Kenyatt University.
- Mojgan, A and Foo, S. (2009). Factors Affecting Teachers' use of Information and Communication Technology. International Journal of Instruction.

Mugenda, O. M. and Mugenda, A.G. (1999). Research Methods: Qualitative and Quantitative

Approaches. Nairobi, Act Press.

- Mutunhu, J. (2011). A critique of Modernization and Dependency Theories in Africa: A Critical Assessment. Zimbabwe: Midlands State University, Department of Developmental studies.
- Muzumara, P. M. (1998). Supporting and improving teaching of the Science in Zambia. M Ed. Dissertation, United Kingdom: University of Huddersfiled.
- Mwaniki, C. M. (2007). Constrains Affecting the Implementation of ICT in Primary Teachers Training Programmes. Nairobi: Unpublished M.Ed Project, Kenyatta University.
- Ndwiga, S. P. (2005). An Appraisal Of The Incorporation Of Computer Courses In Kenya Diploma Teacher Colleges. Nairobi, Unpublished M.E.D Project, Kenyatta University.
- Oliver, R. (2002). The Role of ICT in Higher Education for the 21st Century: ICT as a Change Agent for Education. Australia; Perth University Press.
- Orodho, A. (2005). Elements of Education and Social Science Research Methods. Nairobi: MasolaPublishers.
- Parliamentary Office of Science and Technology (2006). The Dynamics of Technologies for Education. Washington DC: UNESCO and the Academy for Educational Development.

Schiller, J. (1991). Implementation of Computer Education; the Role of the Principal.

Australia: Journal of education technology.

UNESCO. (2000). Integrating ICTs in Education, Lessons Learned. Published by the Asia 42

and Pacific Regional Bureau for Education.

Yelland, N. (2001). Teaching and Learning with ICTs for Numeracy in the Early Childhood

Wilkinson, A. M. (1991). The Scientist's handbook for writing papers and dissertations.

Englewood Cliffs, NJ: Prentice Hall.

Fulton, K. (1997). Learning in a Digital Age: Insights into the issues: The skills students need

for technological fluency. Retrieved from 20th July, 2012 from

http://www.mff.org.

Muhammad, L. J. (2009). The Role of Information and Communication Technology (ICT). www.itrole.htm 13th/07/2011 in education sector. Accessed on 28th/11/2011.

Mundi, H. (2009). Zambia Internet users. Retrieved March 2, 2010 from http://www.indexmundi.com/zambia/internet\_users.html

#### APPENDICES

# **APPENDIX:** A

#### **Interview Guide for Head teachers**

#### **SECTION A: Demographic Information**

- 1. The gender of the Head teacher.
- 2. What is your highest professional qualification?
- 3. What is your professional experience?
- 4. For how long have you been a head teacher at this school?
- 5. Are you a trained computer teacher?
- 6. How many computers do you have in your school and how did you acquire them?
- 7. Has your school implemented computer studies curriculum? Explain
- 8. What kind of facilities do you have for implementing computer studies curriculum?
- 9. What is the computer pupil ratio?
- 10. How do you access the internet network in your school?
- 11. How many teachers for ICT do you have in your school?
- 12. In your own view suggest what should be done to ensure effective and smooth

implementation of computers studies in secondary schools

#### **Questionnaire Schedule for Teachers**

Dear respondent,

The researcher is carrying a research on "Barriers to Effective Teaching of Computer Studies in Public Junior Secondary Schools: A case study of Mwansabombwe District, Luapula. For this reason I would kindly appreciate if you would spare a few minutes of your time to fill in the questionnaire to the best of your knowledge.

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

Thank you in advance.

#### **SECTION A: Demographic Information**

1. a) What is your gender? (i) Ma	le	()	ii) Female ( )	
b) What is your age?				
i) Below 30 years ()	ii)	31-4	0 years ()	
iii) 41–50 years () iv)		51 ar	nd above ()	
2. What is your highest professiona	l qualif	ication?	,	
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 ex	xperien	ce?		

	i) 1.5years	( )	iii) 11-15 years	()	v) 21-25 years	()
	ii) 6-10 years	( )	iv16-20 years	( )	vi) 26 and above	()
4.	For how long	have vo	ou been a teacher in	this schoo	ol?	

For how long have you been a teacher in this school?

45

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**

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

<b>Resources and Infrastructures</b>	Very adequate	Adequate	Fairly adequate	Inadequate	Never
Computers					
Untiviruses 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)		 	

- 8. What is the pupil-computer ratio?.....
- 9. a) Does the computer literacy levels of teachers in the school affect the smooth implementation of computer studies curriculum in this school?
  - (i) Yes ( ) (ii) No ( )
  - b) If yes in (a) above, explain the kind of support teachers offering computer studies need?

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

THANK YOU FOR YOUR PARTICIPATION

# **APPENDIX: C**

# **Education Standards Officer's Interview Guide**

# General Information

1. How long have you been working in the District?

2. In your opinion, is the government committed to the effective implementation of computer studies?

3. Are Junior secondary schools in the District ready for teaching computer studies? Please explain

4. Which interventions have been put in place in Mwansabombwe District in readiness form Junior secondary schools teach computer studies effectively?

5. How many schools in the District have enough computers for all students?

6. Do they have internet connectivity?

7. Are teachers equipped with skills to teach computer studies?

8. Suggest measures that can be taken by the following to ensure that teachers are adequately

prepared for teaching computer studies by:

a) The Government

- b) The school administration
- c) Teachers

#### THANK YOU FOR YOUR PARTICIPATION

#### **APPENDIXA: D**

# **OBSERVATION CHECKLIST**

- 1. Are computers available or not?
- 2. Number or 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. Availability of computer examination results in the Schools' notice board.