

**THE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM IN
SELECTED PUBLIC PRIMARY SCHOOLS IN NDOLA DISTRICT OF ZAMBIA:**

FAILURE OR SUCCESS

by

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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

THE UNIVERSITY OF ZAMBIA

LUSAKA

2016

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AUTHOR'S DECLARATION

I, **Catrina Lwaba Mulenga**, do hereby solemnly declare that this dissertation represents my own work, except where otherwise acknowledged, and that it has never been previously submitted for a degree at the University of Zambia or any other university.

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APPROVAL

This dissertation of **Catrina Lwaba Mulenga** is hereby approved as fulfilling the requirements for the degree of Master of Education in Educational Management by the University of Zambia.

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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 medium. In order to move in pace with the rest of the world in the field of Information and Communication Technology, the Zambian government through Ministry of General Education introduced computer studies curriculum as a compulsory subject to grades 8 and 9 in junior and primary schools in 2014. However, its implementation has faced a number of challenges all over the country. The objective and purpose of this study was to investigate the implementation of the Computer Studies curriculum whether it has been a success or failure in Ndola District of Zambia. A descriptive survey design was used in this study. The target population was 9 public primary schools in the District. Purposive sampling techniques were used to select a study sample of 9 schools. In this study, 72 respondents were reached which included 9 head teachers, 18 computer studies teachers and 45 computer studies pupils. Purposive sampling technique was used to select the 9 head teachers, the 18 computer studies teachers and the 45 grade nine pupils. Interview schedule guides were used to obtain information from the Head teachers and computer studies teachers, while Focus Group Discussions were conducted to pupils. Observation Checklists and Document Analysis were also used. The researcher administered the interview guides and focus group discussions personally. The data collected was analyzed using descriptive statistics and presented in tables, charts and graphs. This study established that all the schools in the study sample had implemented computer studies curriculum though with a number of challenges. Inadequate funds to procure computers, their accessories and set up infrastructure such as computer laboratories, lack of trained computer teachers and inadequate books/materials were found to be the major challenges in the implementation process. The major issues were the examination performance in the subject and the levels of the teachers' exposure to computers as this affected the implementation of the subject. The findings of this study may likely be useful to the policy makers at the MoGE, Curriculum Development Centre and the Head teachers, teachers and pupils. It will aid in formulation of appropriate strategies to address the implementation of computer studies curriculum in Zambia. Based on the research findings, it can be concluded that the implementation of computer studies curriculum has been a failure in Ndola District. Further, basing on the 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. The MoGE should also recruit computer studies teachers in all public primary schools, organize regular seminars, workshops and Continuous Professional Development for teachers and further all Colleges of Education should incorporate ICTs in their curriculum.

DEDICATION

The dissertation is dedicated

To the loving memory of my late sister and brother;

My sister, Astridah Chibwe Mulenga Shamboko and brother Aaron Kalefya Mulenga.

May their souls rest in eternal peace.

ACKNOWLEDGEMENTS

I am deeply beholden to my Lord and personal savior Jesus Christ for His love and grace that provided the strength and courage in my undertaking of this project amidst several challenges. I wish to acknowledge with gratitude the assistance and selfless contributions of the following people;

My special thanks go to my supervisor, Dr. Innocent Mutale Mulenga, Lecturer in the School of Education for his scholarly advice in writing the research proposal and this final dissertation. Indeed you were more than a supervisor but like a father who always wanted to get good things out of the child. Most importantly, you provided excellent direction and advice at all times during my study. You patiently read every chapter, criticized and provided suggestions in time. Your quick technical and editorial expertise gave this study its present shape. Working with you was indeed a blessing that I shall cherish throughout my life. I can ask for no better-quality supervisor than you. For all the guidance which you gave me, may God bless you abundantly.

Dr. Gift Masaiti, who introduced me to Research methods in Education and techniques of writing a Research proposal and dissertation. I wish to thank him for his wise counsel and guidance: who from the inception of this study was also guiding me in several research issues.

My sisters Gertrude Mwila Mulenga and Foster Kabwe Mulenga Simukoko for their spiritual and financial support they rendered to me during the two years I was studying. My brother-in-law Mr Punga Shamboko for the support he gave me in gathering all the information I needed for this report.

Finally, my lovely sons Mwila and Musonda Kauseni for their moral and material support and perseverance during the time I had been away from them doing this work.

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ACRONYMS AND ABBREVIATIONS

CDC	Curriculum Development Centre
CPD	Continuous Professional Development
CS	Computer Studies
ECZ	Examination Council of Zambia
ICT	Information and Communication Technology
MoE	Ministry of Education
MoGE	Ministry of General Education
MoTC	Ministry of Transport and Communications
NICT	National Information and Communication Telecommunications
REA	Rural Electrification Authority
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPS	Uninterrupted Power Supply
ZANIS	Zambia National Information Services
ZECF	Zambia Education Curriculum Framework
ZESCO	Zambia Electricity Supply Corporation
ZNUT	Zambia National Union of Teachers

CHAPTER ONE

INTRODUCTION

Overview

This chapter focused on the background of the study, statement of the problem and the aim of the study. The chapter further outlines the objectives and the research questions, the theoretical and conceptual framework and operational definition of key terms of the study are also discussed.

1.1 Background of the Study

Since the 1980s, implementation of ICT in schools has been compulsory in the developed countries. This has not been so in developing countries, where implementation is considerably more recent, small scale and experimental (Mingaine, 2013). Education systems around the world are under increasing pressure to use Information and Communication Technology (ICT) to teach students the knowledge and skills needed in the 21st century (Omwenga, 2007). Development and application of ICT in African institutions of learning is critically important if the continent is to reduce the knowledge, technological and economic gaps between itself and the rest of the world (Farrell and Shafika, 2007). It is thus, important to implement the curriculum in the education sector which will promote the teaching and learning of ICT.

According to the Ministry of Transport and Communication (MoTC) (2007), the incorporation of ICT in the Zambian education curriculum was aimed at promoting a major step in equipping learners with computer knowledge. We are living in the digital age and hardly any aspect of human endeavor can be effectively carried out without Information Technology as a means of communication. With this in mind, it would be important for the Educational policy makers to come up with strategies that will make the Zambian educational system adapt to the use of ICT. This can only be achieved if learners are computer literate. ICTs are now at the center of

education reform in line with the technological development of the 21st century. Although computer studies was introduced into the Zambian curriculum almost a decade ago the implementation of the subject has not been effectively achieved due to various factors. Further, commitment by the Zambian government in bridging the digital divide through introducing ICT in education is seen in its development of the ICT policy (MoTC, 2007).

In March 2007, the Zambian government launched its National ICT policy with the main objective of integrating ICT into the educational curricula as well as other literacy programmes to provide for equitable access for all students regardless of the academic level. The policy stated that computer studies was to be introduced as a subject in public schools in 1998 and that Zambia's private schools were producing ICT literate students. It also highlighted 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 education sector, and the high opportunity costs and lack of coordination (Isaacs, 2007). It further, suggested for the need to scale up the introduction of computer studies in schools. Though computer studies was introduced as a single subject, it was not compulsory until 2014 when it became compulsory at grade 8 and 9 level.

Further, the government through the Ministry of Education and with the support of various stakeholders also developed an ICT policy for education (MoE, 2006). The policy also provided an overview of goals, objectives, and government commitment in key programme areas of ICT infrastructure to education institutions, content development, curriculum integration and teacher training. The vision was for ICTs to contribute towards reaching innovative and lifelong education and training in Zambia by 2030. The incorporation of ICT in the Zambia education curriculum was aimed at promoting a major step in equipping computer knowledge (MoTC,

2007). This is the reason Computer Studies was introduced in the revised curriculum so that it could equip the learners with the essential skills necessary for them to have basic knowledge of ICTs (MoGE, 2013).

The then Minister of General Education Dr John Phiri, stated that for the past 49 years of Zambia's Independence, there have been consistently loud voices of dissatisfaction with education being given to the children of Zambia (Sichone, 2014). He said, "there was growing need of including ICTs in the curriculum so that pupils are not left behind in the global world. This led to the government revising the curriculum with an emphasis on vocational subjects" (ZANIS, 2014). Before this development, Zambia used a curriculum which was based on the 1966 repealed Education Act.

The then Minister of General Education, Dr John Phiri, further observed that Zambia needed a new look at the curriculum as the 1966 Education Act had become "in many ways archaic and required serious attention" (Ministerial Statement to Parliament, 21st February, 2014). The review of the curriculum was necessitated by the need to provide an education system that would not only incorporate latest social, economic, technological and political developments but also equip learners with vital knowledge, skills and values that are necessary to contribute to the attainment of the Vision 2030 (Republic of Zambia, 2014).

In 1998, the Ministry of Education started an initiative to introduce computer studies in selected secondary schools. The results have not been as expected; however, the initiative needs to be encouraged and scaled up in all schools (MoTC, 2007). Computer Studies (CS) has been introduced as a subject at the primary and junior levels. The subject has been introduced in order to equip learners with essential skills necessary for them to have basic knowledge of ICTs (MoGE, 2013). It is hopeful that the revised curriculum will be responsive to the needs of

individual learners and equip them to contribute effectively to national development (ZANIS, 2014). Computer Studies is relevant for all students because it incorporates a broad range of *transferable skills and techniques, including logical thinking, creative design, synthesis, and evaluation*. It teaches generically useful skills in such areas as communication, time management, organization, and teamwork. Computer Studies will also provide students with the knowledge and skills to understand the underpinnings of current computer technology and prepare them for emerging technologies (Republic of Zambia, 2014).

The Curriculum Framework was developed in 2012 through a laborious consultative and participatory process (Sichone, 2013). In recognition of the importance of Vocational Subjects, every institution of learning is required to offer Vocational Subjects as part of their curriculum. Since the Vocational Subjects will provide sufficient practical skills to prepare learners for subsequent training or entry into the world of work, the curriculum should provide learners with opportunities for hands-on practical experience which is the essence for all the Vocational Subjects. Computer Studies is one of the vocational subjects (MoGE, 2013). Computer Studies subject has been recognized worldwide over the ages of civilization as a vital tool for survival particularly in areas of science and technology (Deepark & Turner, 2006).

Further, the then Ministry of Education Permanent Secretary Dr. Patrick Nkanza cited the factors that had motivated the review of the curriculum as technology change, new learning areas, new priorities and change of learning and teaching systems. He stated that the sources of information for curriculum review were the Education Policy of 1996, Vision 2030, National Implementation Framework, the Education Act of 2011, National Development Plans and the Baseline Surveys and Reports (Lusaka Times, 2014). The penetration levels of ICTs in Zambia's education institutions has still remained low and the integration of ICTs in learning and teaching practice

has been limited, although the introduction of computer studies as a school study subject has begun to change this. The adoption of a national ICT policy, as well as the development of a draft ICT policy for education and an associated implementation framework, has provided an enabling policy environment to promote far greater access and use of ICTs across all sectors of Zambia's education system (Isaacs, 2007).

This study therefore was aimed at investigating the extent to which computer studies curriculum had been effectively implemented in public primary schools in Ndola district.

1.2 Statement of the problem

Information Communication Technologies (ICTs) in Zambia are on the increase almost everywhere, including schools and this is the reason why the Ministry of General Education introduced Computer Studies as a compulsory subject at both primary and junior secondary school. In Zambia, the Ministry of General Education reviewed the curriculum because of the growing need of including ICTs in the curriculum so that pupils are not left behind in the global world (Republic of Zambia, 2014). Mwale (2015) stated that while the Ministry of General Education's decision to introduce ICT as a compulsory subject in secondary schools may be a step in the right direction, its implementation may prove beyond the capabilities of those involved. This is because many schools including those in urban areas did not seem to have the required infrastructure such as computer laboratories, computers and trained computer studies teachers. In the 2015 Junior Secondary School Leaving Examinations the performance of pupils in computer studies was not impressive. According to the ECZ Report (2015), Computer Studies recorded the second lowest mean score of 30.07%.

Despite the Zambian government's efforts to make computer studies compulsory most public primary schools in Ndola district seem to have a number of challenges in implementing Computer Studies. This study therefore tried to investigate the extent to which computer studies curriculum has been effectively implemented in public primary schools in Ndola district of Zambia.

1.3 Aim

The purpose of this study was to investigate the extent to which Computer Studies Curriculum had been effectively implemented in public primary schools in Ndola district of Zambia.

1.4 Objectives

The objectives of the study were:

- i. to establish the types of resources and infrastructure available for the implementation of Computer studies curriculum in Public Primary Schools in Ndola district.
- ii. to establish the availability of trained manpower to manage the implementation of Computer Studies Curriculum in Public Primary Schools in Ndola district.
- iii. to identify remedies of improving the implementation of Computer Studies Curriculum in Public Primary Schools in Ndola district.

1.5 Research questions

This study was guided by the following questions.

- i) What type of resources and infrastructure were available for the implementation of computer studies curriculum in Public Primary Schools in Ndola district?

- ii) Were there trained manpower to teach the subject in the implementation of Computer Studies Curriculum in Public Primary Schools in Ndola district?
- iii) What remedies can be put in place to improve the implementation of Computer Studies Curriculum in Public Primary Schools in Ndola district?

1.6 Theoretical Framework

This study was guided by the curriculum implementation theory propounded by Gross (1971). The theory states that the implementation of any educational programme brings into mind the question of facilities, teachers' capability, management support and compatibility with organizational arrangement and clarity of the implementer of what is to be done. This theory was relevant to guide the study, because the factors that Gross propounded are relevant to the implementation of Computer Studies curriculum in Ndola District. In his theory, Gross advocates four major elements that influence curriculum implementation: clarity of the innovation to implementers, capability of the implementers, and availability of resources and provision of management support. The elements in the theory are explained as follows: clarity of innovation to the implementer requires that teachers who are the implementers should be aware of changes in the curriculum. Resources meant for the new curriculum or existing curriculum must be available and relevant to the curriculum. Capability of the implementer implies that those implementing the curriculum must be trained to be in a position to handle the new curriculum. As far as management support is concerned, principals and management personnel should be involved and put in place by availing finances to make the new curriculum a success.

1.7 Conceptual Framework

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 primary schools curriculum in Zambia. Figure 1.1 illustrates the relationship of factors that are likely to determine the level of success of implementation of computer studies in public primary school’s curriculum:

Figure 1.1: Factors that affect implementation of computer studies curriculum in public primary school curriculum

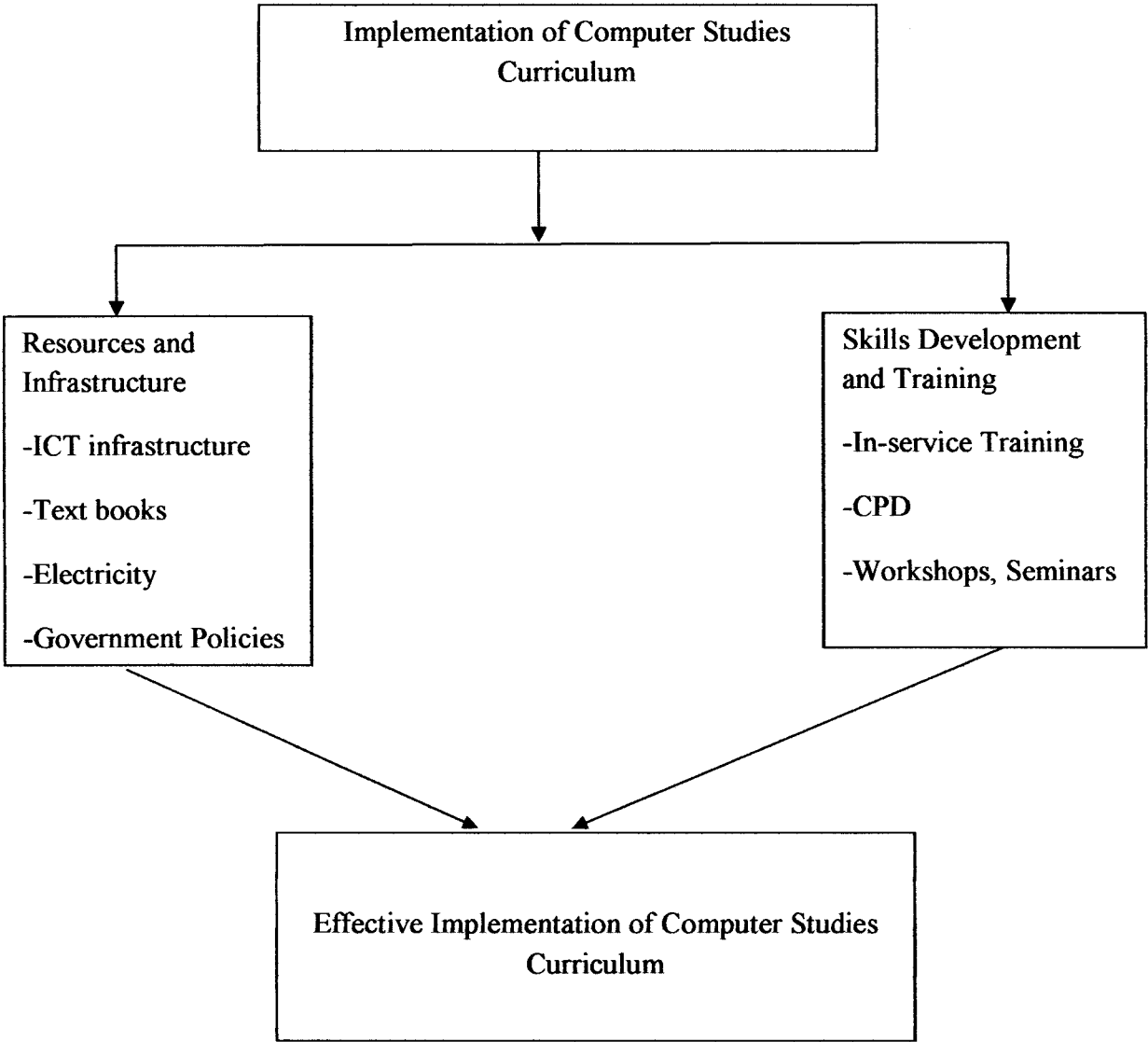


Figure 1.1 is a diagrammatical representation of the conceptual framework which shows the relationship of factors in the implementation of computer studies curriculum in primary schools in Ndola district. The independent variables considered in this conceptual frame work were the resources, infrastructure and skills development. The dependent variable was the implementation of computer studies curriculum in primary schools which is directly or indirectly affected by the above independent factors. When resources are available such as funds for buying computers, schools are likely to implement Computer Studies curriculum. Availability of funds can be influenced positively when government gives grants to schools. Availability of infrastructure such as computer laboratory and electricity in a school will enhance implementation process. When teachers have knowledge in computers or use computers more frequently, such teachers are likely to implement computer studies curriculum in their schools.

1.8 Significance of the study

The importance of computer studies as a subject cannot be over emphasized. Computer studies develop and cement a strong attitude among pupils to undertake things such as project work and assignment on their own as it encourages critical thinking and independent learning. This study's aim was to investigate the extent to which computer studies curriculum has been effectively implemented in public primary schools in Ndola district.

This study is important in many aspects. The findings of the study may be significant to the following stakeholders in the following ways. Firstly, the findings of the study may be used by policy makers in the Ministry of General Education to address the challenges that will be identified in this study. These could be policy issues in which the ministry will be in a position to put mechanisms in place that will enhance effective implementation process. Secondly, findings

of the study may be used by curriculum developers at the Curriculum Development Centre in addressing the curriculum issues raised in this study so that they can effect any necessary changes which could promote effective implementation process. Thirdly, the research findings may further be useful to Head Teachers at school level to develop strategies to address the challenges raised in this study. The research findings may also be useful to teachers and students in realizing their role in the implementation of computer studies curriculum in primary schools.

The findings will also add on the body of knowledge which will be used by future researchers.

1.9 Delimitations

The study covered Ndola district only and the study investigated the implementation of Computer Studies Curriculum in Selected Public Primary Schools in Ndola district of Zambia.

1.10 Limitations

Considering Head teachers' busy schedules, a number of them were not available at their work station for the interview session. They were therefore, represented by their deputies. This was the limitation experienced. Further, the study was conducted during the school holidays so pupils were difficult to locate.

1.11 Operational Definitions

For the purpose of this study, the following terms were taken to have the following meanings:

Implementation: Refers to putting something officially decided upon into effect or action such as the teaching of Computer Studies in primary schools.

Curriculum: A prescribed programme of study for learners in institutions of learning.

Junior Secondary Education: Refers to the formal or school education provided at Grades 8 and 9.

Compulsory Subjects: Subjects to be taken by all learners at a particular level or in a career pathway.

In-service training: a service of short courses and programmes that take place while one is employed.

1.12 Structure of the Dissertation

The study is organized into six chapters. Organization of the study is simply outlining how the work is arranged systematically in the given document. Chapter one presents the background of the study, statement of the problem, purpose of the study, research objectives, research questions, significance of the study, limitation of the study, delimitation of the study, operational definition of terms used in the dissertation, organization of the study and summary of the study.

Chapter Two consists of literature review. The literature that was reviewed in this study was about the elements required in the computer studies curriculum implementation. Methodology which was used in conducting this study is presented in chapter three. Methodology highlights the research design, population, sample and sampling procedure, data collection procedures and data analysis. Chapter four presents research findings. The research findings of the study are expressed using bar graphs, pie charts and frequency tables. In Chapter five, the researcher discusses the findings of the research. Finally, the conclusion and recommendations arising from the research findings are presented in chapter six.

Summary

In summary, this chapter has presented the background of the research, statement of the problem, the purpose of the study as well as the specific objectives of the study. The significance of the

study, assumptions and limitations encountered during the research as well as operational definitions of terms have also been presented.

CHAPTER TWO

LITERATURE REVIEW

Overview

This chapter reviewed literature on the concept of curriculum implementation, on the availability of the resources and infrastructure, the teachers' skills and training in ICT and remedies to improve the implementation of computer studies curriculum. In this section, literature is reviewed on the occurring factors affecting implementation of the computer studies curriculum in general.

2.1 Concept of Curriculum Implementation

Goodlad and Su (1992) referred to a curriculum as a plan that consists of learning opportunities for specific time frames and place, a tool that aims at bringing out behavior change in the learner as a result of planned activities. Computer Studies is a compulsory subject in primary, secondary and post-secondary institutions like the teacher training colleges. There was a growing need of including ICTs in the curriculum so that pupils were not left behind in the global world. Hence, the government saw it necessary to introduce and make computer studies a compulsory and examinable subject from primary and junior schools (ZANIS, 2014). ICT as it was earlier known keeps on growing because it is dynamic. This calls for more new implementing strategies (MoGE, 2013). There have been remarkable changes in the revised Computer Studies Curriculum which was launched in 2012 though it was effected in schools in 2014. The process of curriculum implementation is a complex one. A curriculum remains simply a package if it is not implemented effectively and for that matter if the objectives intended have to be accomplished. The role of the teacher is very crucial. Ornstein and Hunkins (2009) found that implementation is also a systematic process of ensuring that the curriculum reaches the learners.

Curriculum implementation can be defined as a process of putting into practice the developed curriculum (Morrison, 2007). It entails the interaction of students, teachers, and the educational programme to produce the desired objectives. Shiundu and Omulando (1992) supported that curriculum implementation is the making real of that which has been planned. The task of curriculum implementation can be said to involve changing attitude of people. Curriculum implementation is the reaction between the teachers, learners and other stakeholders in education geared towards achieving the objectives of education.

2.2 Resources and Infrastructure Available for Implementation of Computer Studies Curriculum

Investing in ICT for schools might be perceived as an additional cost, and supporting significant ICT implementation is a problem experienced by many schools in developing countries, mainly those that rely on donor support. Farrell (2007) argued that high costs of acquisition and maintenance of ICT infrastructure is a challenge that has continued to hamper adoption and implementation of ICT in schools. Hennessy (2010) observed that one of the greatest challenges in implementation of ICT in school is balancing educational goals with economic realities. Implementing ICT requires large capital investments, schools need to be prudent in making decisions about what models of ICT will be implemented. Magambo (2007) also revealed that there is an outcry from teachers on lack of basic resources like textbooks in schools which affects proper implementation of the curriculum. Several researchers and authors have argued that lack of physical educational facilities, like buildings, is the major hindrance to implementation of ICT in schools in Africa (Hennessy, 2010). ICTs do require supporting physical infrastructure to be in place before they can be implemented. However, for many schools in developing countries like Zambia, there is seldom free room and in some schools, no suitable building at all. For these

schools, the implementation of ICTs often require the construction of computer labs which can be costly. The implementation of ICT usually calls for the purchase of new specialized furniture which is costly and most schools cannot meet the expenses. There are limited resources to equip schools with ICT infrastructure and this has been a barrier in implementation of ICT to support curriculum delivery. According to Ndwiga (2005) he highlighted that there were inadequate resources such as computer laboratories in 33.3% of schools in poor countries which was a major setback in the implementation of computer studies.

Contrary to the governments' plan to invest in ICT in Education, 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. Kinyanjui (2003) findings revealed and established that more than 40.0% of schools in his study sample which was conducted in Kenya had less than 10 computers and only 4.5% of the schools had more than 20 computers. Most of the schools do not have enough computers. The inadequacy in number of computers in schools could be attributed to huge capital required to purchase and install computers in school. ROK (1999), stated that quality and adequacy of resources such as teaching and learning materials determine the effectiveness of curriculum implementation. According to IFIP-UNESCO (2006), they stated that, "in any educational system, the level of available resources places a restriction on the degree to which any new subject can be introduced into the school curriculum".

Most primary schools operate on limited resources to implement competing curriculum projects. Pelgrum (2002) revealed that lack of ICT infrastructure was one of the factors for non-usage of ICT in teaching and learning. A study by Middleton, Flores and Knaupp (1997) also established the hardware factor as a significant barrier to computer education implementation. Computer

studies require a lot of capital outlay and funding for accessories and consumables. According to most research studies, teachers felt more money was needed for gadgets such as printers, scanners, digital projectors and screens. Developing countries lack the resources and appropriate infrastructure for implementing ICTs use in education (James, 2010). The effective use of ICTs would require the availability of equipment, supplies of computers and their proper maintenance including other accessories (Williams et al, 2000).

According to Mwale (2015), the Ministry of General Education spokesperson Hillary Chipango said the ministry was aware of the problems that pupils in rural areas were currently facing in the implementation of the new policy. “The Ministry is working hand in hand with the Rural Electrification Authority (REA) to make sure that all the schools in rural areas are electrified,” Mr Chipango told the Sunday Times in an interview. In this regard, the students in areas where there is no electricity were to learn theory for some time till their schools were connected to the power grid. Being a new subject, it will be the first time that pupils will come face to face with the ICT. There is a deepening concern and worry for those that have never laid their hands on a computer in their lives. 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 the economy onto the global market (Hamdy, 2007). Zambia National Union of Teachers (ZNUT) general secretary Newman Bubala said that the policy was ineffective because there were currently no facilities in both rural and urban schools.

According to Mwale (2015), the implementation of the ICT policy of the Ministry of Education could serve as an important milestone in enhancing technology advancement in Zambia. However, perhaps it is also crucial to realize the fact that many Zambian schools are currently struggling to have adequate learning and teaching materials such as books, laboratories and

classrooms. Many schools in rural areas do not have a laboratory for science subjects and pupils' performances have not been impressive. It is a great idea to have ICT in schools because of the changing world, but such initiative should be accompanied by enough computers and electricity in rural areas. Indisputably, the introduction of ICT subject is a great idea, but requires time, resources and energy in order to achieve the intended objectives. It is, therefore, hoped that as the policy is being implemented, more attention would be placed not only on building the capacity in teachers, but also improving the environment through the provision of electricity and computer labs in schools (Mwale, 2015).

2.3 Teachers' Skills and Training in Computer Studies

Teachers' ICT skills and access to professional development play a significant part in implementation of ICT in schools. Research suggests that teachers' attitudes, beliefs, adequacy, and skills influence successful implementation of ICT in schools (Hennessy 2010). Unfortunately, in many African countries, lack of well trained teachers and low levels of teachers' ICT skill and knowledge has been recognized as major obstacles in implementation of ICT in schools (Dzidonu, 2010). For efficient implementation of ICT in schools, there should be adequate personnel that have correct skills. Where such skills are missing, it would be difficult to fully implement the technology in schools. Mwaniki (2007), also identified low number of qualified teachers being among the factors that had adversely affected the implementation of computer courses.

Teachers are indispensable to successful computer education implementation. Successful implementation of computer education can only be assured through teachers who have acquired necessary knowledge and skills. This means that teachers need to become sufficiently competent to make personal use of computers, to make use of information and communication technology

as a mind tool, to become masters of a range of educational paradigms that use ICT, and also to become sufficiently competent to make use of ICT as a tool for teaching (Krischner & Davis, 2003). On the contrary, Newhouse (2002) found that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices. Further, Yusuf (2005) noted that teachers' competence and self-efficacy in their capacity to work effectively with computers is a significant factor in determining their patterns of implementing the curriculum for the benefit of the pupils.

To successfully implement ICT in schools, there should have comprehensive pre-service courses on ICT that equips teacher trainees with the required skills. A study by Higgins & Moseley, (2011) revealed that inability of teachers to understand why they should implement ICT in teaching and how exactly to implement was an impediment to its implementation. In addition, in-service courses for subject teachers already in the profession should be developed that will guide them on how to use ICT during teaching and offer them basic skills needed for its implementation. Many authors believe that continued professional development of teachers can help to successfully implement ICT in schools (Higgins, & Moseley, (2011). Dzionu, (2010), supported this statement by saying that a promising way forward should be a sustained professional development that draws on teachers local professional capabilities, supports reflective classroom performance, and encourages peer learning by teachers of same age group and similar subjects. Malcolm and Godwyl (2008) reported that lack of professional development programs for teachers to upgrade their skills on emerging technologies is a hindrance to ICT implementation. Afshari et al (2009) further pointed out that teachers who are actively involved in their professional development are able to implement changes in their

teaching. For example, formal certification of in-service professional development that leads to diplomas or degrees in ICT could improve their skills and knowledge. Krysa (1998) pointed to professional development and training as a solution to successful ICT implementation. Ensminger et al (2004) found that low levels of skills and the need to train users influenced ICT implementation. The effective use of computers by teachers depends not only on their attitudes, but also on the training they have received (Afshari et al, 2009).

In recent years there have been numerous efforts and resources directed at improving teachers' competence and confidence in using ICT effectively in classroom teaching and learning (Magambo, 2007). Furthermore, Mooij and Smeets (2001) in the study aimed to investigate the implementation of ICT and its support within the secondary schools in Holland found that teachers' competence and confidence in their skills were one of the main factors to influence teachers' willingness to integrate technology in their teaching-learning process. They claimed that educator's lack of knowledge is a serious hindrance to integrate ICT into secondary schools. Teachers' must attain and maintain technological competence to make instructional strategies more effective. This is supported by Albirini (2006) who stated that technology competence comprises not only technology knowledge but also the skills and experience essential to put them into use. Training all teachers on the educational use of computers gains special importance when considering integrating the computer into regular curriculum. Teachers need to know how to use computers first before they can integrate them in the curriculum. Teachers lack the necessary skills and thus need to be given opportunities to practice using information and communication technology during their teacher training programs so that they can see ways in which technology can be used to augment their classroom activities (Afshari et al, 2009). Much

as training in ICT is emphasized, effective ICT implementation in public primary schools in Ndola District was reported to be minimal and one wonders what could be the logic behind this.

According to a UNESCO (2005) survey, about 35% of the already trained teachers in secondary schools in Europe, Asia and Africa had basic skills in ICT, which leaves 65% of the teaching workforce on the three continents still in need of computer skills. UNESCO (2005) reported that teachers, professors, technical and administrative staff must be given training that enables them to integrate new information and communication technologies into their teaching programs. Numerous problems related to ICT infusion occur among the teachers due to the lack of technical skills and knowledge of maintaining the functionality of the computers. According to Afshari et al, (2009), the success of educational innovations depends largely on the skills and knowledge of teachers. The study reported that teachers' lack of knowledge and skills is among the most inhibiting obstacles to the use of computers in schools.

Teo and Lim (1998) reported that competence of individual teachers handling computers is very low; most of them lack both educational and technical training. Research findings indicated that there is need to equip teachers with computer technology skills and knowledge through effective training on how to use computers in teaching. Hsin-Kai, et al (2007), reported that teachers' technological skills such as technology proficiency and computer literacy are critical for successful implementation of ICT in the classroom. However, much as training is emphasized by Ministry of Education in Zambia, ICT usage is still low. This indicates that skills development may not alone effectively influence ICT implementation and thus, one wonders the role of skills development towards ICT implementation in public primary schools in Ndola district and hence the need for this study.

Sife et al (2007), reported that ICT training and workshops are needed not only to improve the skills of the instructors, but also as a means of getting them involved in the process of integrating ICT in teaching and learning. Nachmis et al (2004) stated that staff training should be a continuous process for regular updates with the development of ICTs. Therefore, teachers need to be trained on educational technologies and the integration of computers into the classroom teaching. It is also discovered by Adegoke (2006) that teachers' incompetency and lack of confidence in the use of computer greatly influenced the implementation of computer education in primary schools. Adebayo (2008) submitted that absence of trained teachers in computer science to teach students practical aspects of computer and non-availability of computer and allied tools in school have been militating against actual implementation of computer education curriculum. Furthermore, recent research in Turkey found that the main problem with the implementation of computer science in institutions was the insufficient amount of in-service training programs for the teachers (Ozden, 2007) and Toprakci (2006) concluded that limited teacher training in the use of ICT in Turkish schools is an obstacle. These claims by researchers on the relationship of teachers' competency and implementation of the computer education curriculum need to be further substantiated through research and hence the need for this research.

According to UNESCO (2009), it was observed that the proportion of teaching staff adapting their skills to an ICT enabled instruction model was small in developing countries and the teacher competency level need to be addressed by training and deployment of teachers to use ICT in education. There has been an emphasis on 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 primary and secondary schools in Zambia in 2014 was consequently followed by its introduction in some

Teacher Training colleges (MoE, 2007). However, implementation of ICT courses in teacher training colleges has been hampered by a number of factors. Oduda (2004) held similar views as he argued that although computer studies are an examinable subject at Grade 9, 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 and they also use those who have a little bit knowledge on computers to teach. Quite good numbers of teachers in primary schools do not have any skills in the use of computers. Such teachers may be slow in implementing computer studies curriculum in the schools.

Seidmen (1996) conducted a study into issues surrounding teacher training and its relationship with the successful implementation of computer studies. The majority of teachers in schools lacked computer training and a few of them had some sound working knowledge of computers. Seidmen (1996) referred to the need for an international trend on the part of educators to train all teachers on the use of computers and the pedagogy of teaching computers in the curriculum. Training all teachers on the educational use of computers is of special importance when considering integrating the computer into the regular curriculum. Mintz (2007), pointed to professional development and training as a solution to successful implementation.

Pelgrum (2001) found that lack of knowledge/competence in technology, among teachers in developing nations, is the primary obstacle to the uptake of ICTs in education. More surprising perhaps, is the findings from a study by Korte and Husing (2007). They analysed an earlier report, carried out by Empirica (2006), on ICTs usage among schools in 27 European countries, where funding should not be as significant an issue. The findings nevertheless, indicated that lack of computer knowledge, was a factor in preventing the successful implementation of ICTs. It is perhaps interesting that similar findings were discovered in both developing and developed

countries. Munyantware (2003) in his study, problems affecting adoption technology by mathematics and science teachers in secondary schools found that teachers with lower ICT proficiency are not willing and have less confidence to use ICT for teaching. The results from these studies reviewed that lack of knowledge and skills affect the implementation of ICT curriculum in general, but did not mention anything concerning the implementation of computer studies as a single subject thus, leaving a gap for this study to close by investigating the implementation of Computer Studies in public primary schools in Ndola district.

2.4 Remedies for Computer Studies Effective Implementation in Primary Schools

Due to the existing constraints in computer studies implementation, remedial action needs to be taken. Lau and Sim (2008) proposed the need to put in place measures to ensure that adequate access to technical support is provided. They further suggested that a teacher with computer literacy and competence be appointed as ICT coordinator in each school to provide the pedagogical support to the teachers. Lau and Sim (2008) established that teachers needed training which should be offered on a continuous, rather than a one off basis so that their computer knowledge is upgraded over time. According to Mintz (2007) a crucial step in successful computer studies implementation is the professional development for teachers that will provide them with materials, strategies and new understanding to meet the learning goals. It is indeed hoped that the use of computers in education can be fully realized and optimized in the teaching and learning processes. Mechanisms need to be put in place to ensure that teachers utilize computers for further development and communication and training programmes need to be designed to increase teachers' familiarity a wider range of ICT applications. Bukaliya and Mubika (2011) advocated for a clear and compulsory national ICT education policy to be drafted to drive ICT development among teachers so that they are able to be conversant with the

necessary skills and knowledge of computers in basic software usage. The responsibility for ICT programme development for teachers should extend to all stakeholders and should not be limited to the Ministry of Education (Bukaliya and Mubika, 2011).

2.4.1 Government Support

The government comes up with policies which the end users are supposed to implement. It is necessary for the government to support policies which they make for them to be successful. Computer Studies was a newly introduced subject which needed support from government by ensuring that they provided the necessary resources, infrastructure and trained and qualified teachers to teach. All this was not done by the government and it made the implementation of the subject to face many challenges. According to Karuru (2005) 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.

2.4.2 Teacher In-Service

In-service and training is a very important remedy in the integration of computer studies in the school curriculum. According to Krysa (1998) in-service sessions for teachers have paved way for the incorporation of computer education and technology in the school set up. Furthermore, according to STEPS (2007), the education policy should be tailor-made to increase, improve and diversify teacher education and support and attempts should also be made to build computer education into general educational policies. Stakeholders should ensure access to quality equipment and learning resources in schools should develop and open knowledge-sharing school culture. Teachers should also be given the opportunity and be encouraged to reflect, and make decisions about their own computer development needs on an on-going basis.

2.4.3 Administrative Support

Another remedy identified by Krysa (1998) as enabling successful implementation of computer studies in the school system is administrative support. Krysa (1998) believed that the implementation of computers in the school is one of the top priorities that is supported by the principal of the school. This is reflected in the fact that some principals have promoted computer use in the schools for use by both the students and teachers. Some of the principals have supported the new network lab by ensuring that money is made available for hardware and software (Krysa, 1998). Middleton, Flores and Knaupp (1997) argued that computer labs are an effective strategy for reducing the student-to-computer ratio in schools. The school administration is therefore encouraged to set up these labs so that students are given the opportunities to visit the labs at different times. However, the competition between teachers for blocks of time in the computer lab may result in some teachers giving up on scheduling time in the computer lab and thereby ceasing to implement computers in instruction (Middleton, Flores and Knaupp, 1997). Administrative support could also take the form of policy enactments where ICT competence is made mandatory for school teachers. This can be an effective measure to improving teachers' ICT knowledge and skills (Bukaliya and Mubika, 2011). Laaria, (2012) argued that in many instances, school leaders support implementation of the technology in their school through acquiring the needed infrastructure.

In Zambia, research has been done on the integration of ICT in teaching and learning and its benefits, but not much has been done on the implementation of computer studies curriculum as a separate subject and hence the reason for carrying out this study.

Summary

As observed from the related literature from various scholars and past researchers collected from secondary sources i.e. textbooks, internet and journals, it shows to a large extent that effective Computer Studies implementation in developing countries is still minimal in public primary schools. As regards the resources and infrastructure used in the implementation of the computer studies curriculum, most studies indicated that to a large extent, costs of these are very high and thus affect Computer Studies curriculum implementation in public primary schools. Some of the resources and infrastructure in a number of schools for the implementation of computer studies curriculum in public primary schools in Zambia were inadequate or completely unavailable. There was inadequate numbers of computers in schools especially in rural schools where most of the schools do not even access electricity. For those schools that had some computers, the computer to student ratio was also very high. In the case of teachers' skills development and training, most scholars and past studies suggested that to a large extent these variables positively affect ICT curriculum implementation. Further, lack of skilled manpower also affects the effective implementation of the computer studies curriculum. Lastly, remedies or ways to improve the implementation had been highlighted. However, no study had been done in the context of Ndola district on the implementation of computer studies curriculum, the gap that this study intended to fill. This study therefore investigated the implementation of Computer Studies Curriculum in Zambian public primary schools.

CHAPTER THREE

METHODOLOGY

Overview

This chapter presents the processes that were undertaken to achieve the objectives of the study by considering the research design and the methods used in the study. The main sections includes the target population, sample and sampling procedures, research instruments and their validity and reliability, data collection procedures, data analysis and ethical considerations.

3.1 Qualitative Research

This study used qualitative methods to carry out this research. Qualitative research is the method of choice when the research question requires an understanding of processes, events and relationships in the context of the social and cultural situation. According to Hancock (2008), qualitative research is concerned with developing explanations of social phenomena. That is to say, it aims at helping the researcher to understand the world in which he/she lives and why things are the way they are. It is concerned with the social aspects of the world. Qualitative research is concerned with the opinions, experiences and feelings of individuals producing subjective data. Qualitative research describes social phenomena as they occur naturally. No attempt is made to manipulate the situation under study as is the case with experimental quantitative research. Qualitative research aims to produce factual descriptions based on face-to-face knowledge of individuals and social groups in their natural settings. Qualitative research is useful for obtaining insight into situations and problems concerning which one may have little knowledge. This method is commonly used for providing in-depth description of procedures, beliefs and knowledge related to health issues, or for exploring the reasons for certain behaviours

including the opinions of respondents about particular issues. Hence, qualitative method was used in that it brought out subjective experiences and views of pupils, computer studies teachers and head teachers on the implementation of Computer Studies Curriculum in Selected Zambian Public Primary Schools of Ndola district.

3.2 Research design

Research design refers to a plan or framework within which research must be carried out so that the desired information can be obtained with greater precision. It is the glue that holds the research project together (Kasonde-Ng'andu, 2013). According to De Vaus (2001), the function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible. Obtaining relevant information, therefore, entails specifying the type of evidence needed to answer the research question, to test a theory, to evaluate a programme or to accurately describe some phenomenon.

This study employed a descriptive survey design which is concerned with conditions of relationships that prevail where the researcher does not manipulate the variables but determines and reports the way things are (Best & Kahn, 2003). It involves collecting information by administering semi-structured interview guides to a sample of individuals that describe events, then organizes, tabulates, depicts and portrays the variables (Kothari, 2004). The researcher considered this type of research design appropriate as it helped to obtain a cross section of information touching on the implementation of computer studies curriculum in public primary schools in Ndola 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 conclusions from the facts discovered whenever possible (Orodho, 2009).

3.3 Target Population

Ndola District comprises of 54 primary schools which are divided into 9 zones. The population of this study consisted of administrators (school head teachers), Computer studies teachers and Computer studies pupils from public primary schools in Ndola District, Copperbelt Province. Ndola District was selected for the study because it was the most central district and is the Provincial Headquarters in Copperbelt Province of Zambia and therefore, offered a suitable information linkage to other districts.

3.4 Sample

The study comprised of nine (9) schools that is one from each zone for equal representation. Nine (9) school head teachers (1 from each zone), 18 teachers of computer studies (2 from each school) and 45 pupils of computer studies (5 from each school). In total the sample size was 72 respondents, thus 8 from each of the nine selected schools. As the study is qualitative in nature, a small number of sample size sufficed (Cohen et al, 2000). Sandelowski (2005) also pointed out that determining adequate sample size in qualitative research is ultimately a matter of judgment and experience on the part of the researcher, and researchers need to evaluate the quality of the information collected in light of the uses to which it will be put.

3.5 Sampling Procedure

The study employed non-probability sampling procedures. Kombo and Tromp (2006) explained that a non-probability sampling procedure is a method of sampling that aims at being theoretically representative of the study population by maximizing the scope or range of variation of the study. Purposive sampling was used in selecting the head teachers, computer studies teachers and computer studies pupils from each selected school. Purposive sampling was used to select these respondents because they were believed to be reliable and were key to the

study. Ngandu-Kasonde (2013) is of the view that the power of purposive sampling lies in selecting cases with rich information for in-input analysis related to the focal issue being studied. According to Patton (1990), purposively selected informants are preferred for the reason that they are likely to be more conversant or well-informed about the phenomenon the researcher is investigating.

3.6 Research Instruments

In this study the, researcher used a semi-structured interview guide, an observation check list guide, document analysis and focus group discussion guide to collect data. These instruments are described in the sections that follow.

3.6.1 Semi-Structured Interview Guide

The researcher used semi-structured interviews because of their flexibility which allowed the researcher to probe participants to gain understanding. De Vos et al. (2005) indicate that the researcher can use semi-structured interviews in order to gain a detailed picture of the participants' beliefs, perceptions or accounts of a particular topic. A set of open-ended and closed-ended questions were prepared before the interviews. These questions were used during the interviews to gain clarity from all the participants depending on their responses (see Appendix I & II). Interview schedule guides were used on this group of people because of the nature of their daily busy schedules.

3.6.2 Observation Check List Guide

This instrument was used to record observable information during the researcher's visit to the sample schools. Kathuri and Pals (2003) 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 has guidelines seeking information such as availability of computers, availability of electricity and computer laboratories, etc (see Appendix III).

3.6.3 Document Analysis

A Document Analysis guide was used to collect secondary data. Document reviews were used to support the interview method, which was the main data collection strategy, and observation. For schools as an institution, the documents sought were the computer studies timetable. The computer studies timetable was examined to ascertain whether the subject has been implemented. Others were: copies of computer studies syllabus; and a school guide for using school ICT facilities. The presence of a computer studies syllabus, together with the visibility of the subject in the school timetable assisted in the confirmation of its implementation. It was important to analyze the contents of these documents so as to verify the information obtained using other methods of data collection.

3.6.4 Focus Group Discussion

This was administered to learners who took computer studies. The focus of the discussion was mainly on the implementation of computer studies curriculum as a compulsory subject to grade 9s at primary levels. The learners were put in groups of five (5). (See Appendix IV).

3.7 Reliability and Validity

Reliability is the measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda & Mugenda, 2003). Reliability is concerned with

precision and accuracy. For a research to be reliable, it must demonstrate that if it is carried out on a similar group of respondents in a similar context, then similar results would be found (Cohen et al, 2000). To ensure reliability of the instrument, the researcher used the test-retest method of assessing the reliability of the instruments. The responses from the pilot study were compared for reliability and it was found that there was stability in the instruments as the responses obtained were almost similar.

Validity is the degree to which a test measures what is supposed to measure (Mugenda, 2003). Validity was ensured through the researcher giving instruments to the supervisor who ensured and determined the relevance and content validity of the interview guides developed. This is one way to measure validity. Besides, the tools were piloted in two (2) schools and the weaknesses therein were found and rectified.

3.8 Data Collection Procedures

The researcher first obtained an introductory letter from the Institute of Distance Education, University of Zambia. The procedures that were used in collecting the data were as follows: The researcher reported to the offices at the schools that were sampled and explained the purpose of the visit in order to obtain permission to carry out the study in their schools. After being granted permission to proceed with the study, the various respondents were identified, the purpose of the study was explained to each of them individually and oral consent was obtained from each before being issued with the interview guides.

3.9 Data analysis

Data was qualitatively analyzed. It was analyzed basing on emerging themes that were used to present the information in form of tables, graphs, charts and with frequencies and percentages.

Some of the data was presented in form of frequency tables, percentages and pie charts. According to Glesne (2006), thematic analysis involves a process of coding, and then grouping the coded information into similar groups forming themes. The themes were used for further analysis and description.

3.10 Ethical Considerations

3.10.1 Researcher and Participant Relationship

During data collection, the researcher made sure that the respondents were treated with all the respect they deserved. It is envisaged that there would be no form of coercion or influence to the participants to respond against their will (Dooley, 2001). In order to gain the goodwill of the respondents the researcher strived her best to establish good rapport with them before the day of the meeting. To accomplish this, the participants were assured of their anonymity by a statement that reassured them that their identities were to be safeguarded. This statement was included in the introductory part of the interview guide. The researcher enjoyed good cooperation and trust from the respondents.

3.10.2 Time and Validity of Research Design

The researcher ensured that the research instruments were not too long to take respondents a lot of time to answer them. Concerning validity, the researcher gave the research instruments to the supervisor who checked them for validity.

3.10.3 Assurance of Confidentiality

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.

Summary

This chapter has described the methodology which was used to collect data for this study. The researcher began by presenting the research design, a description of the sample and the research instruments. This was followed by an explanation of the data collection procedures, data analysis, validity and ethical considerations.

CHAPTER FOUR

FINDINGS

Overview

This chapter presents the findings of the study. The results of the data collected were analyzed in tables, pie-charts and graphs according to the study objectives. The chapter begins by presenting the demographic characteristics of the respondents, followed by the presentation of the responses of head teachers, teachers and pupils on the types of resources and infrastructure, availability of trained manpower and remedies of improving the implementation of the computer studies curriculum. The responses were based on the research questions which were related to the study question. The data is also presented in forms of frequency distribution tables, pie charts and bar graphs. The analysis of the data and presentation of the findings are organized under the following themes:

- i) Demographic information.
- ii) Computer Studies Curriculum Implementation.
- iii) Type of the resources and infrastructure available.
- iv) The teachers' skills and training in ICTs.
- v) Remedies for effective implementation of Computer Studies curriculum.

4.1 Demographic Characteristics of Respondents

This section presents a brief demographic description of the head teachers and teachers. It shows their gender, professional qualification and the number of years in the teaching profession.

4.1.1 Gender of the Respondents

Table 4.1 shows information on the gender of the respondents.

Table 4.1: Frequency and percentage distribution of head teachers and computer studies teachers according to gender

Gender	Computer Studies Teachers		Head teachers	
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
Male	9	50	6	66.7
Female	9	50	3	33.3
Total	18	100	9	100.0

Twenty seven (27) respondents were reached in this study. There were six (6) male head teachers, three (3) female head teachers, nine (9) male computer studies teachers and nine (9) female Computer Studies teachers. The teacher respondents were equally represented.

4.1.2 Professional Qualification of Head teachers and Computer Studies Teachers

This study also aimed at establishing the professional qualifications of the Computer Studies teachers and the Head teachers. The findings obtained are recorded in table 4.2.

Table 4.2: Frequency and percentage distribution of head teachers and computer studies teachers according to professional qualifications

Professional Qualification	Computer Studies Teachers		Head teachers	
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
Degree	2	11.1	1	11.1
Diploma	12	66.7	8	88.9
Certificate	4	22.2	0	0
Total	18	100.0	9	100.0

The information in table 4.2 indicates that 12% (2) computer studies teachers had a Degree in Education, while 66% (12) had Diplomas in various teaching subjects and 22% (4) had primary school certificates. Most of the head teachers were diploma holders which made up 88.9%. There was only one (1) head teacher with a degree which constituted 11.1%.

4.1.3 Teaching Experience

This study further sought to establish the professional teaching experience of the Computer Studies teachers and Head teachers. The findings are presented in table 4.3.

Table 4.3: Frequency and percentage distribution of head teachers and computer studies teachers according to professional teaching experience

Professional Teaching Experience (Years)	Computer Studies Teachers		Head teachers	
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
0 – 5	4	22.2	0	0
6 – 10	8	44.4	0	0
11 and above	6	33.4	9	100.0
Total	18	100.0	9	100.0

Table 4.3 shows that 22.2% (4) respondents had served for the period of 0 -5 years. The majority of the computer studies teachers were in the range 6 – 10 years representing 44.4% (8). The rest of the teachers representing 33.4% (6) were in between 11 and above years of professional teaching experience. However, the study established that all the head teachers representing 100% (9) had more than ten years of teaching experience. It can be deduced from

the findings that most respondents had been in the service for 6-10 years and only six had served for over 11 years.

4.2 Computer Studies Curriculum Implementation

This study further sought to establish if the schools in the study sample had implemented the Computer Studies Curriculum. This was aimed at establishing the actual extent to which the implementation of computer studies curriculum in public primary schools in Ndola district was implemented. Head teachers and teachers were asked if their schools had implemented the Computer Studies curriculum. The results obtained were as presented in table 4.4.

Table 4.4: Percentage distribution of implementation of computer studies curriculum in schools

Implementation of Computer Studies Curriculum in schools	Implemented	Not Implemented
Computer Studies Pupils	100	0
Computer Studies Teachers	100	0
Head teachers	100	0

Table 4.4 suggests that the Computer Studies curriculum was implemented in all the schools. All the respondents who included head teachers, computer studies teachers and pupils representing 100.0% indicated that it was implemented in all their schools.

This study also sought to establish from the Head teachers and computer studies teachers if the introduction of computer studies into the curriculum was a good policy. The responses from the eighteen (18) computer studies teachers and nine (9) head teachers all stated that it was a good initiative though the government had rushed into implementing this policy.

Concerning the issue of whether the computer studies curriculum policy was good or not, one head teacher said that,

ICT cannot be done in theory alone, because it is a practical subject.

He further said that this policy will not be effective in the sense that computers in both rural and urban schools were not just there.

Further, commenting on the Computer Studies curriculum policy one teacher said that,

The policy was welcome but would not serve the purpose without being accompanied by adequate facilities. He further said that, the ICT subject should not have been compulsory at the moment until there was improved infrastructure and facilities in schools.

Another teacher said that the computer studies curriculum policy was good but he went on to say that,

The government had rushed into implementing the policy because there were no computers in schools to help pupils.

4.3. Research Question One: Availability of Resources and Infrastructure

4.3.1 Types of Resources and Infrastructure

This study also sought to establish the type of resources and infrastructure that was available in the schools for effective implementation of the computer studies curriculum. Thus, head teachers and computer studies teachers were asked to assess the rate of the availability of facilities and resources. The responses from eighteen (18) computer studies teachers and nine (9) head teachers are presented in table 4.5.

Table 4.5: Frequency and percentage distribution of the availability of computer resources and infrastructure in schools.

Resources and Infrastructure	Available		Not Available	
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
Computers	27	100.0	0	0.0
Electricity	27	100.0	0	0.0
Backup Generator	2	7.4	25	92.6
Uninterrupted Power Supply (UPS)	1	3.7	26	96.3
Printers	25	92.6	2	7.4
Overhead Projectors	1	3.7	26	96.3
Computer Laboratory	25	92.6	2	7.4
Books/Materials	8	29.6	19	70.4

Results in table 4.5, reviewed that 100% of respondents indicated that computers and electricity were available though they were inadequate. Further 92.6% of the respondents reported that printers and computer laboratories were available. Books / materials for Computer studies were reported by 70.4% of the respondents to be unavailable while only 29.6% reported that they had some reference materials. Uninterrupted Power Supply (UPS) and overhead projectors were unavailable according to 96.3% of the respondents. Backup generators were missing according to 92.6% of the respondents. Availability of computer laboratories was further investigated in the pupils Focus Group Discussion and 100% of the pupils reported that their schools had a

computer laboratory even though the majority were just renovated from classrooms and turned into computer laboratories. It was also stated by 80% of the pupils that computers were available though they were inadequate. Further, majority of the pupils who included 98% stated that text books, printers, projectors, backup generators and Uninterrupted Power Supply were not available.

During the Focus Group Discussions pupils were asked to comment on the facilities and resources that are used in the teaching and learning of Computer Studies.

Pupils were asked to comment on the facilities and resources available at their schools. One pupil said that,

We have few computers. If you consider the number of pupils who take computer studies as a subject, with the number of computers and computer labs you will find the pupils are too many than these facilities. That can be a threat to pupils who can't learn because of the situation.

On pupils' responses concerning the availability of electricity in schools, 100% of the learners said that their schools were supplied with electricity by Zambia Electricity Supply Corporation (ZESCO). However, they expressed some sentiments that load shedding was so frequent and it affected their learning at times.

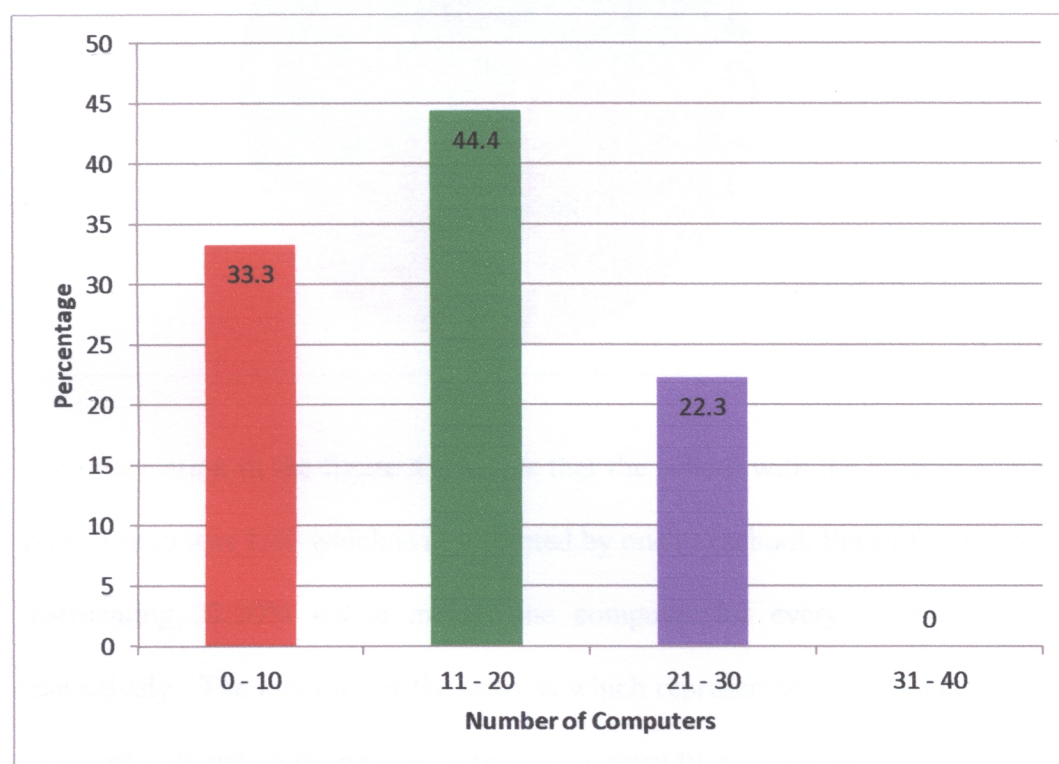
The researcher also observed that in almost all the schools computers were available though they were inadequate. Another observation made by the researcher was that classrooms are the ones

which were being used as computer laboratories. Other resources such as the backup generators, UPS, projectors were not available in almost all schools.

4.3.2 Distribution of Computers in Schools

The study further sought to establish the number of computers in schools in the study sample. The Head teachers and computer studies teachers were both asked through interviews to indicate how many computers their schools had. The results obtained are presented in figure 4.1.

Figure 4.1: Percentage of the availability of computers in schools

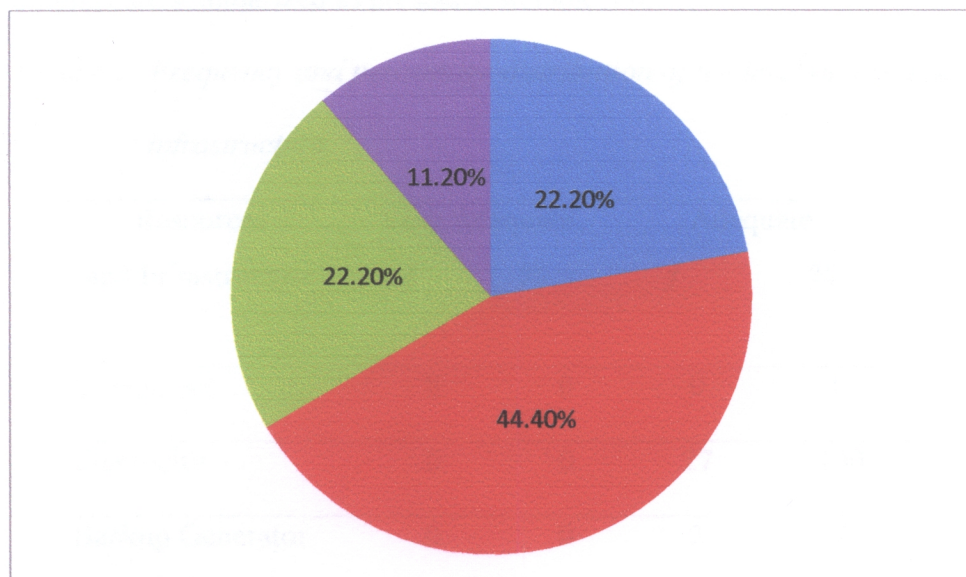


The data in figure 4.1 shows that 33.3 % of the schools in the study sample had between 1 – 10 computers. Then further 44.4 % of the schools in the study sample had between 11 – 20 computers while 22.3 % of the schools in the study sample had between 21 – 30 computers. This study further sought to establish the number of computers which were in good working condition. It was established that 91.1 % of the computers were in good working condition with 8.9 % being defective. The researcher also observed that schools did not have enough computers for use by the pupils.

4.3.3 Computer Pupil Ratio in Primary Schools

The study further sought to establish the computer to student ratio for the schools in the study sample. The head teachers and computer studies teachers were asked to state the computer to pupil ratio in their respective schools. The results obtained are presented in figure 4.2.

Figure 4.2: Percentage of the computer pupil ratio



The information in the figure 4.2 shows that the school with the biggest number of computer to student ratio was 1:30 which is represented by one (1) school. Four (4) schools had 1:15 and 1:25 representing 22.20% which means one computer for every fifteen and twenty-five pupils respectively. The majority of the schools which represented 44.40% (12) revealed that they had a ratio of 1:20 which meant one computer to every twenty pupils.

The researcher also observed that in all the schools as many as 10 pupils were sharing one computer when learning.

4.3.4 Adequacy of Resources and Infrastructure

This study also sought to establish the level of adequacy of the resources and infrastructure availability for the implementation of computer studies curriculum. This was captured in computer studies teachers' interview guide and head teachers interview guide. The results of the findings are summarized as presented in table 4.6.

Table 4.6: Frequency and percentage distribution of the level of adequacy of the resources and infrastructure

Resources and Infrastructure	Very Adequate		Adequate		Very Inadequate	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Computers	0	0	0	0	27	100
Electricity	0	0	27	100	0	0
Backup Generator	0	0	2	7	25	93
Uninterrupted Power Supply	0	0	1	3	26	97
Printers	0	0	12	44	15	56
Overhead Projectors	0	0	1	3	26	97
Computer Laboratory	0	0	15	56	12	44
Books/Materials	0	0	7	25	20	75

Table 4.6 shows that electricity was very adequate in all the schools of the study sample with a percentage of 100% according to head teachers, computer studies teachers and pupils. It was

also evident from the observations the researcher made that all schools were supplied with electricity by ZESCO. According to 96% of the respondents (Head teachers, Teachers and Pupils) they stated that UPS and overhead projectors were very inadequate in their schools.

Further, findings revealed that 93% (25) respondents indicated that backup generators were very inadequate, while only 7% (2) indicated that they were adequate. However, 44% (12) revealed that printers were adequate, whilst the remaining of the respondents who made up 56% (15) stated that they were very inadequate. Concerning the computer laboratory, only 44% (12) indicated that they were very inadequate and 56% (15) stated that they were adequate. On teaching and learning materials such as books, majority of the respondents representing 74% (20) indicated that books were very inadequate, whilst the remaining 26% (7) stated that they were adequate.

It was revealed during the pupils' focus group discussions that the resources and infrastructure in this section were not adequate. When pupils were asked to discuss if they had enough computers, all of them representing 100% indicated that they did not have enough computers and hence this affected their learning.

For instance, one pupil said that,

We only have 10 computers at our school and we are many who learn computer studies. So it is very difficult to even touch a mouse or keyboard when you are doing a practical.

The researcher also observed that none of the respondents indicated any of the resources and infrastructure to be very adequate. Regarding text books, the researcher observed that schools that had textbooks only had one or two which they were sharing amongst themselves. Pupils'

text books were non-existent in all these schools. All the mentioned resources and infrastructure in this section were very inadequate according to the researcher’s observations.

4.3.5 Government Involvement

This study sought to establish if the government was involved in the provision of computers and human resources development in public primary schools in Ndola district. Teachers were asked to state if there was any government initiative which had helped the schools in the implementation of the Computer Studies in schools. The results obtained are presented in table 4.7.

Table 4.7: Frequency and percentage distribution of Government involvement in provision of computers and human resources development

Government Involvement	Yes		No	
	<i>f</i>	<i>%</i>	<i>F</i>	<i>%</i>
Recruiting trained computer teachers	1	5.6	17	94.4
Organizing Workshops and Seminars	8	44.4	10	55.6
Organizing and sponsoring in-service training for computer studies teachers	2	11.1	16	88.9
The government has donated some funds to the school to procure computers and accessories.	0	0.0	18	100.0
The government has supplied computers to the schools.	0	0.0	18	100.0

The data in table 4.7 shows that 44.4% of the respondents were of the view that the government was involved in organizing regular workshops and seminars, while 55.6% indicated that the government was not doing anything in that line. Further only 5.6% of the respondents representing only one (1) person felt that the government had recruited computer studies teachers in primary schools in Ndola district. On the issue of in-service training courses, 11.1 % of the respondents were of view that the government had been organizing these courses for computer studies teachers in Ndola district. However 100% of the respondents were of the view that the government was not involved in donating funds to schools to procure computers and their accessories. Further 100% of the respondents felt that the government had not supplied computers to schools.

4.4 Research Question Two: Teachers' Skills and Training in ICTs

The study further sought to establish teachers' skills and training for teachers of computer studies in the schools.

4.4.1 Teachers' Training in ICTs

This study further sought to establish the level of computer training of computer studies teachers. Computer studies teachers were asked if they were trained computer teachers and state the level of qualification they had if at all they were trained in ICTs. The findings are presented in table

4.8

Table 4.8: Frequency and percentage distribution of the level of ICT training among teachers of computer studies teachers

Level of the Computer Training	Computer Studies Teachers	
	<i>f</i>	%
No computer training	9	50.0
Certificate	1	5.6
Diploma	2	11.1
Degree	0	0
Others	6	33.3
Total	18	100

Table 4.8 shows that 50.0% of the teachers of computer studies had no computer training at all, while one (1) representing 5.6% had a certificate having done some computer packages and 11.1% indicated that they had diplomas. It was also established that 33.3% of the computer studies teachers had no formal computer training. However those computer studies teachers with no formal computer training reported that they had gained some computer literacy through use of school, personal computers or internet cafes. It was established that there was only one trained employed teacher in one school in the study sample who had a certificate in computer packages. Further, Head teachers were asked to state if the teachers teaching computer studies were qualified and one of them said that,

We have no skilled teachers, so how do you expect them to teach, she further said that, teachers have not yet been trained on how to teach the subject.

4.4.2 Computer Literacy Level

The researcher sought to find out the computer literacy levels amongst other teachers in the school who do not teach computer studies. The respondents were asked to comment on the computer literacy level among other teachers in their schools. The responses given by 27 respondents in the study sample were as presented in table 4.9.

Table 4.9: Frequency and percentage distribution of computer literacy among other teachers

Computer Literacy Level	Responses	
	<i>f</i>	%
Very Literate	0	0.0
Literate	5	18.5
Fairly Literate	12	44.4
Illiterate	10	37.1
Very Illiterate	0	0.0
Total	27	100

The results in table 4.9 show that 18.5% of the respondents felt that the teachers are computer literate. According to 44.4% of the respondents, the teachers are fairly computer literate. Another 37.1% of the respondents felt that teachers in their school were computer illiterate.

4.4.3 Effect of Computer Literacy Level on curriculum implementation

This study further sought to establish whether computer literacy levels of the teachers affected the effective implementation of computer studies curriculum in a school. The research findings from all the respondents who included the 9 head teachers, 18 computer studies teachers and 45 computer studies pupils indicated that computer literacy levels among teachers affected the implementation of the curriculum.

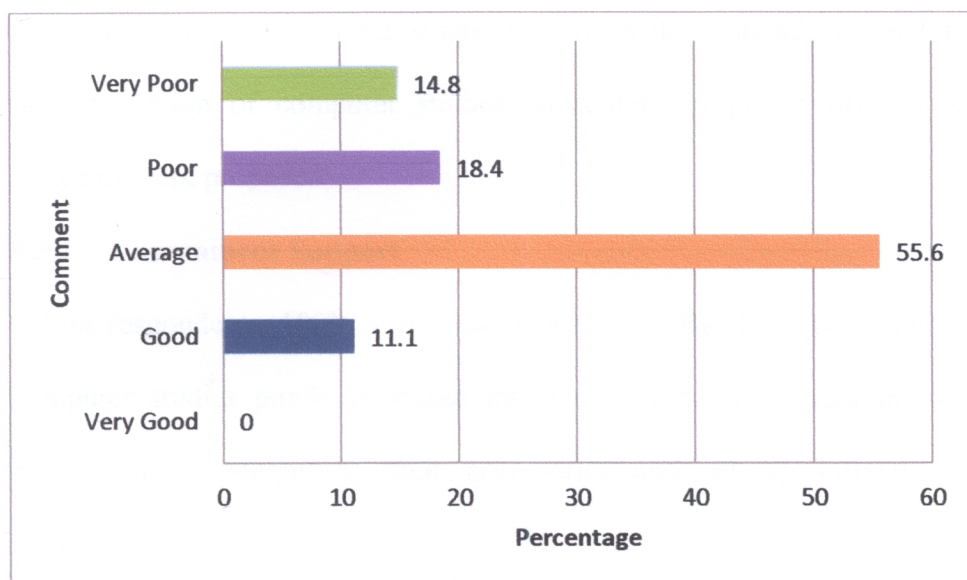
Most of the respondents representing (66.7%) felt that teachers who were not computer literate discouraged the pupils about the subject as they told them it was a difficult subject to learn. Another section of respondents (27.3%) felt that teachers who were not computer literate did not embrace the technological advancements. Other respondents (6.0%) felt that teachers who were not computer literate did not offer career guidance on computer related courses to the pupils. However, majority of those who had low levels of computer literacy indicated that this subject should not be compulsory.

4.4.4 Pupils Performance in Final Examinations

This study also sought to establish the performance of pupils who wrote the first national (final) examinations. Head teachers and computer studies teachers were asked to rate the performance of the first computer studies subject final examination which was written in 2015.

The respondents, representing 11.1% indicated that the results were good, while 55.6% said they were average. Further, 18.5% gave responses that the results were poor and 14.8% said the results were very poor. The findings were rated on a 5 point Likert scale ranked as Very good (5), Good (4) Average (3), Poor (2) and Very poor (1). The responses of eighteen (18) computer studies teachers and nine (9) head teachers from the school that had implemented the computer studies curriculum are presented in figure 4.3.

Figure. 4.3: Percentage of Pupils Performance in Computer Studies Final Examinations



Teachers were asked to comment on pupils' performance in the 2015 final examinations and one of the teachers said that,

The results of pupils in the first examinations were terrible at our school as most of the pupils got below the passing rate of 40%. He further said that conducting of practical examination was a challenge as we only managed to complete the following day in the morning. We had to borrow laptops for pupils to use and this greatly affected the performance of the pupils in the final examinations.

It was further observed by the researcher that the performance of pupils was very poor. The researcher also further verified with the 2015 ECZ Report document which indicated that Computer Studies had the second lowest mean score of 30.07% amongst all the other subjects that the grade 9s wrote.

4.5 Research Question Three: Remedies for the effective implementation of the Computer Studies Curriculum

The study further sought for suggestions from the respondents on the remedies for effective implementation of computer studies curriculum in public primary schools. The following remedies were proposed;

4.5.1 Government Support

All the respondents; 100% of the head teachers, 100% of computer studies teachers and 100% of computer studies pupils proposed that the government should provide grants to schools to procure more computers, their accessories and set up infrastructure such as computer laboratories.

On the recruitment of qualified staff, suggestions proposed by all the head teachers representing 100% from all the (9) schools and (15) representing 83.3% of computer studies teachers stated that the government should recruit computer studies teachers in all public primary schools. Further findings from all the respondents (Head teachers, Teachers and Pupils) representing 100% indicated that government should also employ technical persons to be repairing the equipment.

4.5.2 Teacher In-service Training

In-service programmes include seminars, workshop and conferences. The findings established that 66.7% of head teachers and 72.2% of computer studies teachers proposed that MoGE should organize regular seminars and workshops to sensitize head teachers and other stakeholders on the importance of implementing computer studies curriculum. Another suggestion proposed by head teachers representing 66.7% and 83.3% of the computer studies teachers was that teachers engaged in teaching this subject should be sponsored and sent for further training in ICTs.

Further, it was suggested that even CPDs should be encouraged amongst the teachers teaching computer studies and all head teachers in schools should provide financial and material support.

4.5.3 Administrative Support

From the findings, it was established that all the respondents representing 100% indicated that administrators in schools were all supporting the computer studies curriculum implementation since it was now a compulsory subject. All the Head teachers indicated that they were putting up some initiative such as fundraising ventures in order to raise funds to purchase the necessary accessories to make sure that resources and infrastructure are provided. Further, 100% of the head teachers indicated that they were also lobbying for trained computer studies teachers and others said they had employed some teachers to teach computer studies on the Board/PTA.

The researcher also observed that one school had a teacher who was employed and paid by the Board to teach computers studies classes only.

4.5.4 Other Suggestions

One (1) head teacher representing 11.1% indicated that there was need for the CDC to provide text books to schools. Another head teacher suggested that there was need for all schools to organize fundraising ventures through the PTA and raise funds to purchase the resources that were required in the effective implementation of the computer studies curriculum. Further, one (1) head teacher proposed that the government should also purchase generators due to load shedding which was being experienced.

With regards to the pupils' focus group discussions, it was discussed and suggested by 90% of the pupils that computer studies should not be compulsory but an optional subject. This was due to inadequate facilities and resources in schools, which the pupils witnessed in the final examination of 2015, where pupils had to spend a night within the school premises. It was further

suggested and proposed by 95% of the pupils that since it was now government policy to make it compulsory, then the Examination Council of Zambia could increase the days for conducting the practicals like they do for other subjects such as Home Economics.

Summary

This chapter has presented the findings of the study it gathered from respondents during the interviews, observations carried out and also from pupils during the focus group discussion.

The findings on the resources and infrastructure indicated that though they were available in schools, they were inadequate. The number of computers in schools was not enough and hence, it was revealed that there was a high computer pupil ratio. Trained teachers of computer studies were not available. On suggestions, it was said that government should support the implementation of the computer studies curriculum by providing grants to schools and also recruit trained and qualified teachers to teach computer studies subject. Further, administrators were encouraged to give support to the new curriculum implementation.

These findings were presented in form of tables, graphs and pie charts as well as basing on emerging themes and verbatim statements.

CHAPTER FIVE

DISCUSSION

Overview

This chapter presents the discussions of the findings that have been presented in chapter four. The purpose of this study was to investigate the implementation of the computer studies curriculum in public primary schools in Ndola district, Zambia. Themes that emerged from the findings as presented in the preceding chapter provided the basis for this chapter in which the researcher discusses the implementation of computer studies curriculum. In addition, this chapter relates the outcomes of the study to the literature and theory used. Four (4) themes that surfaced from this study were Implementation of Computer Studies Curriculum, type of resources and infrastructure available, teachers' skills and training and finally remedies for effective implementation of the computer studies curriculum.

5.1. Implementation of the Computer Studies Curriculum

From the findings of the study, all the respondents (Head teachers, Computer Studies Teachers and Pupils) indicated that they had implemented computer studies in all their schools and it was being offered as a single subject. The findings from the observations showed that Computer Studies was even on the timetable for all the grades 8 and 9 as a compulsory subject.

5.2 Type of resources and infrastructure available.

5.2.1 Availability of Resources and Infrastructure

From the findings, the majority of the respondents (Head teachers, Computer Studies Teachers and Pupils) indicated that backup generators, UPS, printers, overhead projectors and text books were unavailable. This is likely to affect the implementation of the computer studies curriculum

a great deal since effective implementation requires availability of teaching and learning materials. These findings concur with Magambo (2007) who supported these findings that there was an outcry from teachers on lack of basic resources like textbooks which affected the implementation of the curriculum. These findings were in line with these researchers and authors who have argued that lack of physical educational facilities, like buildings, is the major hindrance to implementation of ICT in schools in Africa (Hennessy, 2010). ICTs do require supporting physical infrastructure to be in place before they can be implemented. However, for many schools in developing countries like Zambia, there is no free room and in some schools no suitable building at all that can be turned into a computer laboratory.

From the findings of the study, most of the respondents (Head teachers, teachers and pupils) stated that all the facilities and resources computers, computer laboratory, printers, backup generator, UPS, overhead projectors, text books and electricity were available in some schools though all of them were inadequate. However, based on observations made by the researcher computers, electricity and computer laboratories were available in all the schools though they were inadequate. The findings in this study were in agreement with Ndwiga (2005) who indicated that there were inadequate resources such as computer laboratories in 33.3% of schools in poor countries which was a major setback in the implementation of computer studies.

The findings were also in line with IFIP-UNESCO (2006) which pointed out that, “In any educational system, the level of available resources places a restriction on the degree to which any new subject can be introduced into the school curriculum”.

Implementing a new curriculum requires the availability of resources and infrastructure in order for it to be effective and produce good results in terms of academic performance by pupils.

5.2.2 Distribution of Computers in Schools

From the findings of the study, all the schools under study had less than thirty (30) computers. These results are in agreement with Kinyanjui (2003) findings who established that more than 40.0% of schools in his study sample which was conducted in Kenya had less than 10 computers and only 4.5% of the schools had more than 20 computers.

Computer studies is a practical subject and hence it requires hands-on experience by the pupils. The population of pupils is very high in schools and hence the number of computers available in schools is not adequate to enhance effective teaching and learning. From the study, it is evident that schools did not have enough computers to use and hence this affected their learning of this new subject.

5.2.3 Computer Pupil Ratio

The findings revealed that the computer pupil ratio was very high (above 1:15) due to few computers that schools had. 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. This is an un-favourable computer to pupil ratio and hence is a major hindrance in the implementation of computer studies curriculum in public primary schools in Ndola district.

Pupils above 10 were sharing one (1) computer whilst the teacher was conducting his/her lessons. This proved to be very difficult to pupils as they were not able to have hands-on experience by touching the different gadgets when the teacher was teaching and seeing what was happening on the screen of the computer. This is one of the reasons pupils found this subject to be difficult and suggested that it should be an optional subject rather than a compulsory subject because most of them were not able to touch even a key board once they went to learn computer studies.

5.2.4 Adequacy of Resources and Infrastructure

The findings revealed that all the resources and infrastructure were not adequate. These findings are in line with (ROK, 1999) that quality and adequacy of resources such as teaching and learning materials determine the effectiveness of curriculum implementation. This shows that when resources and infrastructure are inadequate both teaching and learning becomes difficult. This means that pupils are likely not to understand the subject as most of them will not have access to the computers and other facilities that are supposed to be used when learning.

5.2.5 Government Involvement

The findings from the respondents (Head teachers and computer studies teachers) showed that government did not support this newly introduced subject from inception. The majority of the respondents indicated that despite the government making computer studies a compulsory subject, it had not done enough in effectively implementing the subject. This is in agreement with Karuru (2005) who 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.

5.3 Level of Teachers' exposure and training in ICTs.

The findings revealed that the majority of the teachers who were teaching computer studies were not professionally trained to handle this subject. These results were in agreement with Waiharo (2007) findings who established that 87.2% of teachers in the secondary schools in Kenya did not have any computer training. Other findings indicated that most teachers who teach computer studies teach other subjects such as Mathematics, Science and other subjects but the majority are

those who teach Business Studies. The findings showed that head teachers instructed anyone who had some computer knowledge and gave them the responsibility to teach computer studies. Further, only one school had employed someone a teacher on the Board (PTA) to be teaching computer studies but this teacher had not done teaching methodology. These findings are similar to those of Oduda (1998) as he said that although computer studies is an examinable subject at grade nine (9), few teachers were trained in the subject. He further stressed that schools depend on hired personnel to teach the subject most of whom are not professional in classroom delivery. Similarly, Mwaniki (2007) identified low number of qualified teachers being among the factors that had adversely affected the implementation of computer courses.

5.3.1 Effects of teachers' computer literacy on the curriculum implementation

From the findings of the study, most of the respondents indicated that the majority of the teachers were computer illiterate. These finding are in line 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 teachers who were computer literate. Teachers who are computer illiterate are not likely to encourage pupils to learn computer studies as they may term it to be a difficult subject, thus affecting its implementation.

The findings revealed that all the respondents stated that computer literacy levels of the teachers affected the effective implementation of computer studies curriculum in schools. 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 primary schools. On the other hand, when teachers are computer literate, they tend to encourage pupils to learn computer studies and provide career guidance to them and stir an interest in learning ICTs.

5.4 Remedies for effective implementation of computer studies curriculum

5.4.1 Government Involvement

Pertaining to the remedies which can be put in place to enhance the effective implementation of computer studies curriculum in public primary schools in Ndola district, the following strategies were proposed: Provision of government grants to schools to procure more computers, their accessories and set up infrastructure such as computer laboratories. The findings also revealed that the government should recruit qualified teachers to be teaching computer studies in schools. This is important in the implementation of computer studies as a new subject in the curriculum because the government is the one which employs teachers in government schools. It is therefore, cardinal that in order to implement the computer studies curriculum effectively trained and qualified teachers are required to teach this new subject.

5.4.2 Teacher In-service Training

The findings revealed that the majority of the teachers did not attend any in-service training in computers. Further, the majority of the respondents indicated that it was important for them to attend in-service training such as such courses, seminars, workshops and CPDs where they could learn new ideas and techniques from each other as teachers. It is through the in-service training that teachers get the opportunity to advance their knowledge on their areas of specialization. The findings from this study are also supported by Bishop (1995) who explained that a more conventional way of introducing teachers to new ideas and techniques and methodologies in education is by courses such as seminars, workshops and conferences. During these sessions teachers get the opportunity to advance their knowledge on their areas of specialization hence improving the quality of curriculum implementation. The findings are also similar to those by Godwyl (2008) in his study who reported that lack of professional development programs for

teachers to upgrade their skills on emerging technologies is a hindrance to ICT implementation. Afshari et al (2009) further pointed out that teachers who are actively involved in their professional development are able to implement changes in their teaching. For example, formal certification of in-service professional development that leads to diplomas or degrees in ICT could improve their skills and knowledge. This is also in line with Krysa (1998) who observed that professional development and training was a solution to successful ICT implementation. Further, it was proposed that in-service programmes such as organizing regular seminars and workshops and sending of computer studies teachers for further training was also important. Further, CPDs were to be encouraged amongst the teachers. Hence, in-service of teachers greatly affects the quality of curriculum implementation.

5.4.3 Administrative Support

From the findings, it was established that the majority of the respondents indicated that administrators in schools were supportive of the computer studies curriculum implementation in schools. The findings are similar to Laaria, (2012) who argued that in many instances, school leaders support the implementation of technology in their school through acquiring the needed infrastructure. The researcher also observed that one school had a teacher who was employed and paid by the Board to teach computer studies classes only as they did not have a qualified teacher at the school. These findings are similar to what Krysa (1998) stated that administrative support was an enabling factor to successful implementation of computer studies in the school. He further said that the implementation of computers in the school is one of the top priorities that is supported by the head teachers of the schools. This is reflected in the fact that some head teachers have promoted computer use in the schools for use by both the students and teachers. Some of the head teachers had supported the new network lab by ensuring that money was made

available for hardware and software (Krysa, 1998). The findings are also supported by Bulaliya & Mubika (2011) who said that administrative support could also take the form of policy enactments where ICT competence is made mandatory for school teachers. This could be an effective measure to improving teachers' ICT knowledge and skills.

5.5 Implementation of Computer Studies Curriculum whether it has been a failure or success

From the findings gathered and observations made by the researcher, it can be established that the implementation of computer studies curriculum had been a failure in public primary schools in Ndola district.

This is due to the many challenges that schools faced when implementing the subject such as lack of and inadequate resources and infrastructure, lack of trained computer studies teachers and also lack of government support.

Summary

This chapter has presented the discussions of the findings of the study. From the findings gathered it can be seen that resources and infrastructure were inadequate and hence they affected the effective implementation of the curriculum. Further, teachers teaching computer studies were not qualified and trained to teach this subject as shown by the findings and this also affected the implementation.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

Overview

This chapter presents the conclusion and recommendations of the study based on the findings and discussions on the implementation of the computer studies curriculum in public primary schools in Ndola. It will further give a suggestion for further research.

6.1 Conclusions

From the research findings the following conclusions were made:

This study revealed that computer studies curriculum implementation in education still has a long way to go. Thus, it can be concluded that the implementation of computer studies curriculum in public primary schools had been a failure due to the many hindrances the schools faced. It can be concluded that all the schools in the study sample had implemented the computer studies curriculum though a number of factors had hampered the implementation process such as inadequate funds to procure computers, lack of trained computer studies teachers and other resources and infrastructure required for the implementation of computer studies curriculum.

6.1.1 Types of Resources and Infrastructure

The types of resources and infrastructure which were available in a number of schools for the implementation of computer studies curriculum in public primary schools in Ndola district include computers, computer laboratory, backup generators, overhead projectors, Uninterrupted Power Supply (UPS), computer text books, printers and electricity. The

resources and infrastructure which were available in the study sample of the schools were reported to be inadequate.

Thus, it can be concluded that without proper infrastructure, facilities such as electricity, and computer related materials and accessories it is impossible to effectively implement Computer Studies curriculum.

6.1.2 Teachers' Skills and Training in ICT

It was established that the level of the teachers' skills and training in ICT had an influence on the implementation of computer studies curriculum in public primary schools in Ndola district. It can also be concluded that there were inadequate trained computer studies teachers. It was reported that the majority of teachers were not computer literate and this affected the implementation process negatively as they did not encourage the pupils to learn the subject or even guide the pupils in computer related careers. Most teachers of computer studies were not trained to teach this subject but had their other subjects which they were trained for. It was further discovered that head teachers asked any teacher who had some knowledge in ICT to be handling ICT classes. Furthermore, it was established that lack of training resulted in teachers lacking the necessary skills and competencies to teach pupils.

Therefore, it can be concluded that without trained and qualified teachers in ICT it is impossible to effectively implement Computer Studies Curriculum.

6.1.3 Remedies

Lastly, to enhance effective implementation process of the computer studies curriculum, respondents proposed that; the government should be involved in giving support by

offering grants to schools to enable them procure computers and their accessories; provide and facilitate teacher in-service training and recruit more qualified computer studies teachers; and ensure there is administrative support in schools and regularly sensitize all stakeholders on the importance of implementing computer studies curriculum.

6.2 Recommendations

In the light of the findings, the following recommendations were made:

- a) The government should provide funds (grants) to schools to procure more computers, their accessories and set up infrastructure such as computer laboratories.
- b) MoGE should also recruit trained computer studies teachers in all public primary schools.
- c) Continuous professional development should be a must for all teaching staff to acquaint themselves with the evolving nature of ICT.
- d) Colleges of Education and Universities should incorporate computer studies education into their curriculum so that all teachers are taught ICT.
- e) Finally, MoGE should organize regular seminars and workshops to train teachers, head teachers and other stakeholders such as the communities on the importance of implementing computer studies curriculum in primary schools.

6.3 Suggestion for Further Research

There is need to replicate this study in other districts especially in rural areas.

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8th April.

APPENDICES

APPENDIX I

INTERVIEW GUIDE

TO BE ADMINISTRED TO HEAD TEACHERS

This interview is aimed at finding out your opinion concerning the implementation of computer studies curriculum in primary schools. You are therefore requested to be as objective as you can in view of what you know about Computer Studies Curriculum in Zambian Primary Schools.

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?

.....

SECTION B:

PART I: THE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM

- 5) Have your school implemented computer studies curriculum?

i) Yes ☐

ii) No ☐

- 6). If yes to question 5 above, how is it being offered?

i) Integrated in all the subjects

☐

ii) Integrated in some subjects

☐

iii) As a separate subject

☐

iv) As part of extra curricula activities

☐

v) Any other specify.....

7). If no to question (5) above, give reasons why.

.....

.....

8a). Is the introduction of computer studies into the curriculum a good policy?

Yes ☐ No ☐

b) If yes to question (8a) above, give reasons why.

.....

.....

c) If no to question (8a) above, give reasons why.

.....

.....

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

9a). Has your school got computers for use in the implementation of computer studies curriculum?

.....

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

.....

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

.....

10). How many pupils take computer studies?

.....

11). What is the ratio of computer to students at this school?

.....

- 12a). 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		
Electricity		
Backup generator		
Uninterrupted Power Supply (USB)		
Printers		
Overhead Projectors		
Computer Laboratory		

b) Others (specify)

c) How can you rate the level of adequacy for the facilities and resources?

Resources and Infrastructure	Very Adequate	Adequate	Very Inadequate
Computers			
Electricity			
Backup Generator			
Uninterrupted Power Supply (UPS)			
Printers			
Overhead Projectors			
Computer Laboratory			
Books/Materials			

PART III: THE LEVEL OF TEACHERS’ TRAINING IN COMPUTERS

13a). Are teachers who teach computer studies trained in computers?
.....

b). If yes in (a) above, for how long were they trained?
.....

14a). How do you rate the computer literacy levels of teachers in the school?
.....
.....

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

c). If yes, how does it affect?
.....
.....

15). Do you have computer technicians to provide the technical know-how at your school?
.....

16). How can you rate the performances of computer studies subject in the previous final Examinations (2015)?

Very good	<input type="text"/>
Good	<input type="text"/>
Average	<input type="text"/>
Poor	<input type="text"/>
Very poor	<input type="text"/>

17a). Do you as a leader of the school support the implementation of the computer studies curriculum? Yes ☐ No ☐

b) If you answered 'yes' to question '16' above, state the type of support?

.....

.....

.....

.....

c) If you answered 'no' to question '16' above, give reasons why.

.....

.....

18). What challenges does your school face in implementing computer studies curriculum?

.....

.....

.....

PART IV: REMEDIES TO IMPROVE THE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM

19). What remedies would you give to ensure effective implementation of computers studies in primary schools?

.....

.....

Thank you for your participation.

THE END

APPENDIX II

INTERVIEW GUIDE

TO BE ADMINISTRED TO COMPUTER STUDIES TEACHERS

This interview is aimed at finding out your opinion concerning the implementation of computer studies curriculum in primary schools. You are therefore requested to be as objective as you can in view of what you know about Computer Studies Curriculum in Zambian Primary Schools.

SECTION A: DEMOGRAPHIC INFORMATION

- 1). The gender of the teacher.

.....

- 2). What is your highest professional qualification?

.....

- 3). What is your professional experience?

.....

- 4). How many years of teaching experience do you have?

.....

SECTION B:

PART I: THE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM

- 5). Have your school implemented computer studies curriculum?

i) Yes ☐

ii) No ☐

- 6). If yes to question 5 above, how is it being offered?

i) Integrated in all the subjects ☐

ii) Integrated in some subjects ☐

iii) As a separate subject ☐

iv) As part of extra curricula activities ☐

v) Any other specify.....

7). If no to question (5) above, give reasons why.

.....

.....

8a). Is the introduction of computer studies into the curriculum a good policy?

Yes ☐ No ☐

b) If yes to question (8a) above, give reasons why.

.....

.....

c) If no to question (8a) above, give reasons why.

.....

.....

PART II: TYPES OF THE RESOURCES AND INFRASTRUCTURES AVAILABLE

FOR THE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM

9a). Does your school have computers for use in the implementation of computer studies curriculum?

.....

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

.....

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

.....

10). How many pupils take computer studies?

.....

11). What is the ratio of computer to students at this school?

.....

12a). How do you rate the availability of the following facilities and resources?

Resources and Infrastructures	Available	Not Available
Computers		
Electricity		
Backup generator		
Uninterrupted Power Supply (USB)		
Printers		
Overhead Projectors		
Computer Laboratory		

b) Others (specify).....

13). How many computer studies teachers in this school are employed by:

(a) BOARD (b) Others (specify)

14). Identify any government initiatives which have helped in implementation of
Computer Studies in the school.

- a) Recruiting trained computer studies teachers ☐
- b) Organizing workshops and seminars ☐
- c) Organizing and sponsoring in-service training for computer studies teachers ☐
- d) The government has donated some funds to the school to procure computers and accessories. ☐
- e) The government has supplied computers to the schools. ☐

- 15). How can you rate the level of adequacy for the facilities and resources?

Resources and Infrastructure	Very Adequate	Adequate	Very Inadequate
Computers			
Electricity			
Backup Generator			
Uninterrupted Power Supply (UPS)			
Printers			
Overhead Projectors			
Computer Laboratory			
Books/Materials			

- 16a). Do you as a leader of the school support the implementation of the computer studies curriculum? Yes ☐ No ☐

- b) If you answered 'yes' to question '16' above, state the type of support?

.....

.....

.....

- c) If you answered 'no' to question '16' above, give reasons why.

.....

.....

PART III: THE LEVEL OF TEACHERS' TRAINING IN COMPUTERS

- 17). Which are your teaching subjects in this school?

.....

18a). Are you a trained computer teacher by training?

.....

b). If yes, what is your level of qualification in computers?

.....

19a). 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). How can you rate the performances of computer studies subject in final examinations (2015)?

Very good

Good

Average

Poor

Very poor

21). What challenges does your school face in implementing computer studies curriculum?

.....

.....

.....

.....

PART IV: REMEDIES TO IMPROVE THE IMPLEMENTATION OF COMPUTER STUDIES CURRICULUM

22). What remedies would you give to ensure effective implementation of computers studies in primary schools?

.....

.....

.....

Thank you for your participation.

THE END

APPENDIX III

Focus Group Discussion Guide for Pupils

Name of School.....

Dear Pupils,

This FGD guide intends to investigate more about the implementation of Computer Studies curriculum in primary schools. Please assist. Your contribution in this discussion is highly valued and the information recorded will be treated confidentially. The discussion will take one hour. Two questions will be involved in the discussion. Time allotted for each question is 30 minutes.

Discussion Questions:

- 1) In your opinion, what challenges does Computer Studies teaching and learning face in primary schools? (Probe questions will be whether: pupils have easy access to computers; pupils have enough computers; pupils access the computer laboratory; enough time on the timetable to learn this subject; it should be a compulsory or optional subject)
- 2) What ways (measures/remedies) should be taken in order to improve the situation? (Probe questions will be on what pupils would like: what the government should do; what schools should do; what other stake holders should do).

Thank you

APPENDIX IV

OBSERVATION CHECKLIST

1. Are computers available or not?
2. Number of computers available in the school.
3. Are computers enough?
4. Number of computers in working condition.
5. Number of computers not in working condition.
6. Availability of computer laboratory.
7. Are the computer lessons scheduled in the block time table?
8. Computer examination results in the past final examinations.
9. Are there overhead projectors used in teaching?
10. What is the ratio of computers to pupils?