COMPUTER STUDIES CURRICULUM IMPLEMENTATION IN SELECTED SECONDARY SCHOOLS IN MUFUMBWE DISTRICT, ZAMBIA: SUCCESSES AND CHALLENGES

By

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A dissertation submitted to the University of Zambia in partial fulfilment of the requirements of the degree of Master of Education in Curriculum Studies

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DECLARATION

I, **Collins Kasoka Masumba**, 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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Date: _____

APPROVAL

This dissertation of **Collins Kasoka Masumba** has been approved as partial fulfilment of the requirements for the award of the degree of Master of Education in Curriculum Studies by the University of Zambia.

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ABSTRACT

Globalisation and technological development in the world has accelerated and created a new global economy fuelled by information and driven by innovations. One way in which information spreads is by the use of computers. In the 2013 revised curriculum, the Ministry of General Education in Zambia introduced Computer Studies into the education system. The few studies in this area were done in urban areas. The rural setting has been ignored as regards to implementation of Computer Studies Curriculum. Mufumbwe district being a rural setting is a special case especially in a Zambian context considering development trends in Zambia. Specifically, the study sought to establish the availability of facilities and equipment for the implementation of Computer Studies, find out the availability of qualified Computer Studies teachers, examine the appropriateness of teaching methods and establish the views of Head Teachers, Teachers, learners and parents on the implementation of Computer Studies in Secondary Schools in Mufumbwe district.

The concurrent embedded design of mixed methods research approach was employed. Four head teachers of secondary schools and eight parents were interviewed and questionnaires were employed to collect data from twelve teachers of Computer Studies and fifty-one learners bringing the total to seventy-five participants. An observation schedule was also used to collect data from teachers. Quantitative data was analysed using descriptive statistics while qualitative data was analysed according to themes.

The findings of the study revealed that there were insufficient facilities and equipment such as computer laboratories and computers, internet connectivity, printers, backup generators, overhead projectors and photocopiers. Findings further indicated that there were no qualified teachers of Computer Studies and inappropriate teaching methods such as lecture methods were being used during lessons. However, head teachers, teachers, learners and parents indicated that the introduction of Computer Studies was a good thing, hence there was need to encourage the teaching of the subject in rural secondary schools.

From this study, it was concluded that there was need to provide facilities and equipment for Computer Studies in secondary schools in Mufumbwe district, teachers qualified to teach Computer Studies should be sent to schools in order to encourage the teaching and learning of the subject in rural secondary schools. Teachers teaching Computer Studies should also be in-serviced so as to enable them use appropriate teaching methods during computer lessons in order to encourage the teaching and learning of the subject in schools. The rural settings have been neglected as regards the implementation of the computer studies curriculum in Zambian schools of Mufumbwe district.

Keywords: *Computer Studies Curriculum, Innovations*

DEDICATION

This work is dedicated to my kind and loving wife Nosiku, and children; Muzang'alu and Pumulo for the patience, moral and spiritual support they rendered to me during the entire period that I was kept busy doing this study. Their endurance gave me hope and encouragement in times when I was almost failing to complete this study.

To my late uncle, Mr. Geoffrey Kasoka, I will always remember the encouragements and hope you gave me more especially your wise counsel and encouragements that *"who you are tomorrow begins with what you do today"*. How I wish he was here to see the fruits of this work. Uncle, you were by far the best teacher and my inspiration I have ever had. To my entire family, thank you so much for believing in me.

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Martin Luther King Jr. an American Baptist minister and activist, said, "If you can't fly, then run, If you can't run, then walk, If you can't walk, then crawl, but whatever you do, you have to keep moving forward." Such sermons have kept me pulling through despite hardships. Above all, I believe in God's wise counsel and in Him alone base my faith.

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ACRONYMS AND ABBREVIATIONS

CS	Computer Studies
ICT	Information and Communication Technology
UNMDG	United Nations Millennium Development Goals
MCT	Ministry of Communication and Transport
FNDP	Fifth National Development Plan
MoGE	Ministry of General Education
CBE	Competence Based Education
CBC	Competence Based Curriculum
ECE	Early Childhood Education
ZECF	Zambia Education Curriculum Framework
MESTVEE	Ministry of Education, Science, Vocational Training and Early Education
DEBS	District Education Board Secretary
NGOs	Non-Governmental Organisations
ESOs	Education Standard Officers
SMCE	Science, Mathematics and Computer Education
SDGs	Sustainable Development Goals
GRZ	Government of the Republic of Zambia
TSC	Teachers Service Commission
UNESCO	United Nations Educational, Scientific and Cultural Organisation
RE	Religious Education
WWW	World Wide Web
ZESCO	Zambia Electricity Supply Cooperation

CHAPTER ONE: INTRODUCTION

1.1. Overview

This chapter contains the background to the study, statement of the problem and purpose of the study. In it, the objectives, research questions, the theoretical and conceptual frameworks, significance of the study, delimitations of the study and limitations are outlined. Finally, operational definition of terms used in the study have also been given.

1.2. Background to the Study

In a rapidly changing world, Information and Communication Technology (ICT) in general and computer skills in particular are essential for an individual to be able to access and use information. There has been a rapid need for computer skills in schools marking the beginning of the information age worldwide (Isaacs, 2007). ICT use in general and Computer Studies (CS) in education are at a particularly dynamic stage in Africa encompassing new developments and announcements happening on a daily basis on the continent. Computers play an important role in the education sector, especially in the process of empowering learners with technological skills needed for effective educational activities. Thus, the education sector could be the most effective sector to anticipate and eliminate the impact of using ICT equipment such as computers (Macharia, 2013). Similarly, the Economic Commission for Africa indicated that the ability to access and use information is no longer a luxury, but a necessity for development (Yusuf & Afolabi, 2010).

Despite the focus by world bodies towards fostering a computer literate world, most developing countries, Zambia inclusive, seem to have challenges to implement Computer Studies curricular in schools. It is believed that through acquiring computer skills and knowledge, schools shall produce learners who are innovative and self-sustaining. According to Muhammad (2009) Computer Studies enhances the promotion of equal opportunities to obtain education and information, principles of life-long learning and technology literacy among citizens.

Although Computer Studies as a subject is offered (taught) in few schools in developing countries, "they are pervasive in developed countries and is considered integral to the efforts to build social, political and economic emancipation" (Perron et al., 2010: 67). Developed countries such as the United States of America, Japan, German, the United Kingdom, Canada, France, Russia and Italy often referred to as group eight (G8) countries are in very advanced levels in terms of Computer Studies curricular implementation in schools (Mwaniki, 2007). Computer Studies in education has proved very useful and effective in the teaching and learning process in most schools world over.

Studies that have been done by different scholars around the globe, regional and within Zambia such as: Jerotichl et al., (2017), Kimosop (2015), Gimba (2018), Kiamba and Mutua (2017), Mulima (2015), Mulenga (2016) and Chaamwe (2017) have revealed that Computer Studies curriculum is faced with numerous challenges of its implementation in schools. Some of the challenges that the scholars have pointed out include; lack of computers in schools and other facilities, inadequate trained teachers to teach Computer Studies, lack of computer skills and knowledge by some teachers and administrators. Despite the researcher of this study being aware of some of the stated challenges, he was of the view that the importance of Computer Studies Curriculum in selected rural secondary schools of Mufumbwe district: An analysis of successes and challenges still needed to be investigated. Moreover, rural secondary schools have a very unique context in so many ways.

Similarly, a study by Ijioma (2004) in Nigeria titled 'Implementation Issues in Secondary Education Curriculum in Nigeria: Problems and Prospects' revealed that poor socio-economic conditions in most developing countries of the world, including Nigeria had compelled the government and institutions of learning to show little concern for the application of Computer Studies in education. Ijioma further established that even where computers were available; there was lack of electricity, human and material resources hence influencing the effective implementation of Computer Studies curriculum. A study by Ijioma and many other studies by different scholars are important to this study. It could be because the challenges pointed out have eventually made the implementation of

Computer Studies not so easy hence bringing about a growing body of literature pertaining to Computer Studies curriculum implementation in secondary schools.

In Zambia, the need and urgency to have computer literate learners was evident through the launch of the Zambia National ICT Policy as early as March 2007. By then, the president of the republic of Zambia His Excellency Levy P. Mwanawasa emphasised on the creation of an innovative, market responsive, highly competitive, coordinated and well-regulated ICT industry in Zambia, (MTC, 2007). The inclusion of Computer Studies in the Zambian education curriculum six years later was aimed at promoting a major step in equipping learners with computer knowledge (MTC, 2007). It is indicated in the ICT policy that in the sphere of education, Computer Studies has the potential to improve the quality of education. Its vision is to have "information and communication technology that will contribute towards achieving the objective of providing innovative and productive life long education and training accessible to all by 2030" (Mwale, Chilala & Kumar, 2011: 6). ICT is used in many ways of which communication cannot be done without. Hence, it is cardinal that the education system is tailored towards achieving universal literacy in as far as computer literacy is concerned. One way to achieve computer literacy among learners is through enhanced Computer Studies Curriculum implementation especially in rural schools.

In addition, Computer Studies has been receiving focus at various platforms as demonstrated by the United Nations Millennium Development Goals (UNMDGs) and The World Summit on the Information Society (MCT, 2006). In Zambia, the importance of Computer Studies in education was demonstrated by its inclusion in the Fifth National Development Plan, 2006 – 2010 and other subsequent national plans, by the country's participation in the E-African Commission, by the enactment of the Zambia national ICT policy where Computer Studies was seen as a favourite subject to be taught in schools and by the formulation of the Ministry of Education Draft ICT policy (Mwale, Chilala & Kumar, 2011). Consequently, the inclusion of Computer Studies in the 2013 revised Zambia education curriculum framework as a subject to be taught in all schools was a good move which is likely to help to achieve Zambian computer literate citizens (MoGE,

2013). Despite these pronouncements put forward, implementation of Computer Studies in rural secondary schools of Mufumbwe district is still questionable.

Actually, a study conducted by Kwok-Wing and Pratt (2004) revealed that Computer Studies is an integral part of the existing curriculum in primary and secondary schools' curriculum in Scotland. They further found that Computer Studies was a core curriculum subject in Scotland and teachers were adequately trained in handling the subject. The situation in Zambia may be different from that of Scotland. Hence the need for this study to investigate the Computer Studies Curriculum implementation in rural secondary schools of Zambia's Mufumbwe district.

Conversely, studies by Aduwa-Ogiegbaen and Iyamu (2005) and Mutarubukwa (2014) both revealed that many developing countries, especially in African schools are still behind in the implementation, application and use of computers and other forms of ICTs. Explaining some of the benefits of literate ICT nation, Mutarubukwa (2014) established that if Computer Studies can be established and implemented effectively, it could be very important for teachers and learners in future in solving various matters in their daily activities, sending and receiving emails, the use of google, file storage and designing various programmes. Like other African countries, Zambia can also benefit by having a computer literate society hence the need to find out how the implementation is being done in rural secondary schools of Mufumbwe district in Zambia.

Furthermore, Kalila, et al (2012) in a report of the Committee on Education, Science and Technology for the first session of the Eleventh National Assembly of Zambia, appointed on Friday, 21st October, 2011 stated that the use of computers and the internet have been touted as potentially powerful enabling tools for educational change and reform. In the report by Kalila, et al, it was further indicated that when used appropriately, computers can help to expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life. Therefore, Computer Studies has the potential to innovate, accelerate, enrich and deepen skills, to motivate and engage learners, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthen teaching and

learning in schools. Obota, et al (2015) argued that computers have been utilized in education ever since their inception, but they have not always been massively present. These and other many sentiments could have led to the urgency by the Ministry of General Education in Zambia to have Computer Studies curriculum introduced in the education system.

As a result, in 2013, the Zambian school curriculum was revised and Computer Studies was included to be taught in all schools as a compulsory subject from grade eight to grade twelve in order to equip learners with essential skills necessary for them to have basic knowledge of ICTs (MESTVEE, 2013). Through the revised Competence Based Education (CBE), it was hoped that skills, knowledge and values in ICT should be developed from Early Child Education (ECE) to tertiary education (Education Act, 2011). However, the CBE requires teachers of the 21st century to be interpreters of the curriculum, facilitators, experts, scholars, lifelong learners, mediators and designers of learning programmes as well as teaching materials and subject specialists. Besides, the designers of the Zambia Education Curriculum Framework (ZECF) considered the process of learning as important as the content, hence one of its critical outcomes envisages to re-define the desired learner, the teacher-educator/instructor and the teaching and learning outcomes so as to make education relevant and responsive to the individual and the society (MESTVEE, 2013). CBE helps to develop learners who will be able to use science and technology effectively and critically showing responsibility towards the environment and the health of others (Education Act, 2011).

The introduction of Computer Studies as a subject in the Zambian curriculum is characterised by low implementation rates especially in public schools (Lufungulo 2015, Mulima 2015, Chilala 2015, Mulenga 2016 and Chaamwe 2017). It was reported in the Zambia National ICT Policy (2007) that there are over 6,000 public schools out of which very few have Computer Studies as a subject in their schools. The Ministry of General Education (MoGE) has since embarked on the distribution of computers in schools countrywide although at a very small scale. In 2015, the supply of computers in schools was at 20,026 countrywide (Zambia Education Bulletin, 2015) of which North Western Province received 1132 computers representing 5.7 percent of computers against 780 and

286 640 schools and students respectively. From this allocation Mufumbwe district received only nine (9) desktop computers which were allocated to Kaminzekenzeke Secondary School (Mufumbwe DEBS Office, 2017). However, the other remaining secondary schools had not received Computer Studies equipment at the time of this study. Mwalongo (2011) stressed that in some schools where computers and other ICT equipment existed, teachers were neither competent enough to use them nor were sceptical of them. Mwalongo's (2011: 43) findings give a picture of this scenario;

> In some schools there is a culture of looking at ICT resources as sacred objects. It is beyond human comprehension to learn that in some schools, ICT resources are not used at all despite their presence, the availability of users and the need to use them is not easily noticed.

Similarly, a literature review conducted by Chaamwe (2017) on the challenges that hinder sustainable implementation of ICT as a subject in rural Zambia revealed lack of electricity, inadequate ICT teachers, high pupil-computer ratio and lack of enough ICT learning and teaching materials as factors that hindered implementation of Computer Studies. In reality, adequate infrastructure (such as security rooms for safekeeping of computer equipment, electricity, infrastructure, laboratories, etc.) had to be put in place prior to the provision of computer resources, in order to ensure effective implementation of Computer Studies curriculum. Thus, in a bid to improve the quality of teaching and learning, government, in collaboration with the private sector, parastatals and non-governmental organisations (NGOs), had begun to provide resources, in particular computers in some schools and Mufumbwe secondary school benefited two hubs of computers and internet connectivity (Mufumbwe DEBS Office, 2017). It is from this contention that, while the government's intentions and plans with regard to provision of computers are without doubt commendable, implementation of Computer Studies curriculum in rural secondary schools in Mufumbwe district still needed investigation.

1.3. Statement of the Problem

Globalization and technological change in the world has accelerated and created new global economy fuelled by information and driven by innovations. The use of computers in secondary schools and other sectors of education has been and remains in a state of

fluidity (Isaacs, 2007). According to the Zambia National ICT Policy (2007) it was reported that the introduction of Computer Studies (CS) in the school curriculum shall increase opportunities for learners to acquire computer literacy skills and contribute towards innovative and lifelong education. In 2013 the Ministry of General Education (MoGE) introduced Computer Studies as a compulsory subject to be taught in all secondary schools in Zambia (MESTVEE, 2013). However, the implementation of Computer Studies curriculum in secondary schools in Zambia seems not to be adequately handled although its introduction is a good idea (Mwale, 2015). A study by Mulenga (2016) on the implementation of Computer Studies in public primary schools in Ndola urban revealed that primary schools had implemented Computer Studies Curriculum (CSC) though with some challenges such as lack of facilities, lack of trained manpower and poor acquisition of computer literacy skills by learners. Despite the challenges outlined by the scholar, it was important to investigate the situation on the implementation of CSC in rural secondary schools of Mufumbwe district in North Western Province.

Lack of computer skills among learners in Zambia, may hinder technological advancement and fail to achieve the national ICT policy goal of 2007 which introduced CS as an enabler in a diversified and export-oriented economy, capable to improve livelihoods and protect the vulnerable through service delivery and provide an efficient and effective public sector. Further, Zambia may fail to achieve the vision 2030 whose vision is to have a prosperous middle-income nation by 2030 through having a technologically proficient, fully able to adapt, innovate and invest using its human and natural resources (Republic of Zambia, 2006). It was therefore important that this study was conducted in order to investigate how CSC was being implemented in rural secondary schools in Mufumbwe district.

1.4. Purpose of the Study

The purpose of this study was to investigate the Computer Studies Curriculum implementation in rural secondary schools of Zambia's Mufumbwe district.

1.5. Objectives

The objectives of this study were to:

i. establish the availability of facilities and equipment for the implementation of the Computer Studies Curriculum in selected secondary schools in Mufumbwe district.
ii. find out the availability of qualified teachers for the effective implementation of the Computer Studies Curriculum in selected secondary schools in Mufumbwe district.
iii. examine the appropriateness of the teaching methods used in the implementation of the Computer Studies Curriculum in selected secondary schools in Mufumbwe district.
iv. establish the views of head teachers, teachers, learners and parents on the teaching and learning of Computer Studies in selected secondary schools in Mufumbwe district.

1.6. Research Questions

This study was guided by the following questions:

i. What facilities and equipment are available for the implementation of the Computer Studies Curriculum in selected secondary schools of Mufumbwe district?
ii. Are there enough qualified teachers to enhance the effective implementation of the Computer Studies Curriculum in selected secondary schools of Mufumbwe district?
iii. How appropriate are the teaching methodologies in the implementation of the Computer Studies Curriculum in selected secondary schools of Mufumbwe district?
iv. What are the head teachers', teachers', learners' and parents' views on the teaching of Computer Studies in selected rural secondary schools of Mufumbwe district?

1.7. Theoretical Framework

A theoretical framework consists of theories which act as a background and guide the investigation in question (Orodho, 2005). This research was guided by the curriculum implementation theory by Gross (1971), who stated that for an effective implementation of any educational programme, it must be based on the four elements namely; clarity of the innovation to the implementer (teacher's ability), availability of resources, capacity of the implementer, management support of facilities. The first element in curriculum implementation according to Gross (1971) is the clarity of the innovation to the implementer. In the Computer Studies curriculum implementation, the implementer who is the teacher should be aware of the changes in the curriculum. Teachers need to adapt to change and innovation as a result of a revised or new curriculum. When the teacher is not aware of the changes in a curriculum he/she cannot implement it effectively. Therefore, the implementer should be innovative and be aware of what is expected or involved in implementing the Computer Studies curriculum. Computer Studies being a new subject introduced in the curriculum needs teachers who are innovative to produce learners who can adapt to change in the changing world (MoGE, 2013).

The other element of curriculum implementation theory according to Gross (1971) is that there should be resources available for a curriculum to be implemented effectively. Resources to be used by teachers and learners should be made available before the implementation of a curriculum (Patton, 2001). Like in any subject, Computer Studies require that resources are put in place and are available and relevant to support a new or existing curriculum. Resources in this regard may include infrastructure, computers, internet connectivity, syllabus, reading materials, and teaching and learning resources.

Furthermore, for a person to be called a teacher, he must have undergone a teacher education programme. Hence, Gross' other element namely; 'the capacity of the implementer'. If one has not been to a college of education or university to be prepared in a specific subject, then he is not fit to be called a teacher. Whoever teaches without having gone for teacher education preparation may not teach as expected and as a result demoralise the learners. According to Gross (1971), he advised that there should be different levels of teacher education and a teacher should adhere to his or her level of

education. This study found the theory by Gross appropriate in that Computer Studies teachers need to undergo teacher education in Computer Studies in order to teach learners well. If teachers are not educated to teach a specific subject in this case Computer Studies, they may find the subject challenging. It is for this reason that this study used Gross' curriculum implementation theory to find out even the availability of qualified teachers of Computer Studies in secondary schools in Mufumbwe district.

The other element by Gross (1971) focussed on the management support. The head teachers of schools must ensure that they carry out their roles such as supervisory, advisory, giving financial support, motivation of teachers, and provision of teaching resources. In addition, Orodho (2005) supported Gross's theory when he stated that there is no programme that can be implemented well without involving three factors which included school related factors (presence of teachers, resources, in-service of teachers, education policy); teacher related factors (teacher qualifications, class and time management, motivation, attitudes and preparations) and the third factor which is school management related supervisory, financial and resource management. Therefore, Gross' curriculum implementation theory was identified to adequately inform and guide this study.

1.8. Conceptual Framework

Orodho (2009) defined a conceptual framework as a model of presentation of relationship between variables in the study depicted graphically or diagrammatically. Figure 1.1. shows a conceptual framework indicating the relationship between the implementation of the Computer Studies curriculum and facilities for computer studies, infrastructure and human resources in the implementation of the Computer Studies curriculum.

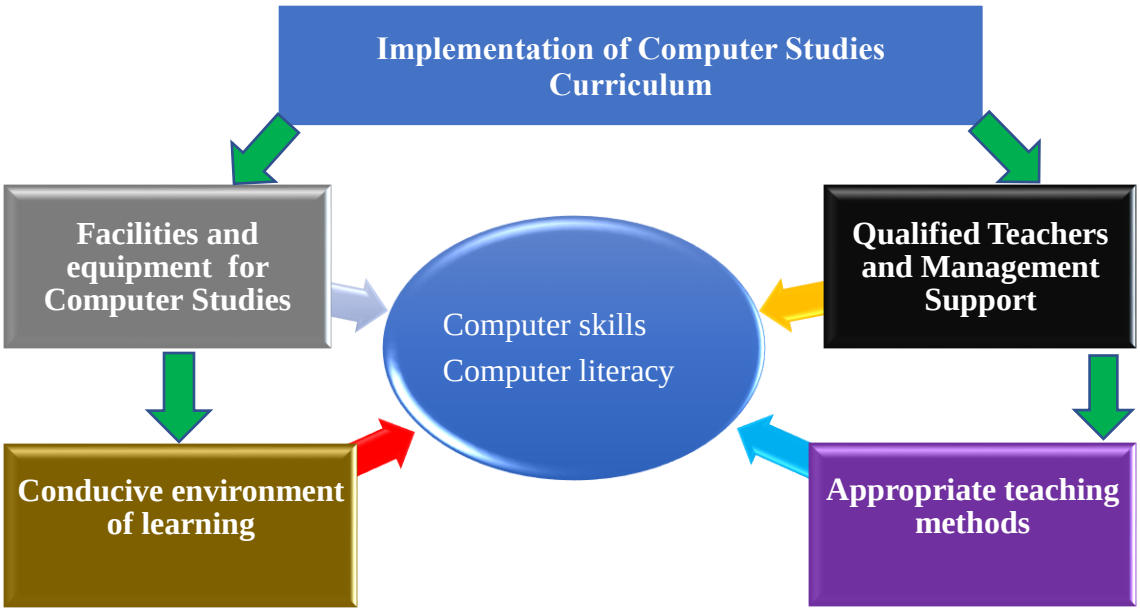

Figure 1. 1: *Conceptual Framework*

Figure 1.1 is a conceptual framework for this study. It is hoped that if Computer Studies facilities, equipment, adequately trained and motivated teachers, conducive learning environment and appropriate teaching methods are put in place, schools are likely to implement the Computer Studies Curriculum effectively. Availability of facilities and equipment that support the implementation of Computer Studies coupled with a conducive learning environment and appropriate teaching and learning methodologies are likely to result in learners acquiring computer skills and being computer literate.

1.9. Significance of the Study

This study is likely to contribute to existing literature on the Computer Studies curriculum implementation in selected secondary schools in Mufumbwe district. It is also hoped that the study would provide an insight to curriculum developers and MoGE policy makers on what needs to be done to enhance the learning and teaching of Computer Studies in Mufumbwe district of North Western Province.

Furthermore, it is hoped that this study maybe of significance to teacher educators and Education Standard Officers (ESOs) on the importance of providing the necessary teaching and learning resources in Mufumbwe district. Through this study, head teachers

and teachers of Computer Studies maybe enlightened on the importance of implementing Computer Studies and improve on their teaching methods in Mufumbwe district.

1.10. Delimitation of the Study

This study was restricted to Mufumbwe district and was conducted in selected rural secondary schools. It was further delimited to investigate the Computer Studies Curriculum implementation in rural secondary schools of Zambia's Mufumbwe district.

1.11. Limitations

Class lesson observation would have further enriched the study with the real scenario at hand in terms of subject content and teaching methodology by teachers of Computer Studies and how learners are able to grasp the concepts in Computer Studies. However, lesson observation was not done to all teachers because during data collection, the teachers were administering end of term tests. Hence, only one teacher was observed. The study would have further been enriched if it covered all the seven secondary schools offering Computer Studies in the district. Due to limited time available, the researcher could not carry out a study of such a magnitude. Therefore, results may not be generalised to other schools beyond the population of the study.

1.12. Operational Definition of Terms

The following terms were taken to have the following meanings:

Compulsory subjects: areas of study to be taken by all learners at a particular level of learning.

Computer Studies: study of computer processes, including computer principles, hardware and software designs, and applications.

Curriculum Implementation: putting organised learning material into effect or action such as the teaching of Computer Studies curriculum in secondary schools.

Information and Communication Technology: different types of technology tools which are used for creating, storing, managing and disseminating information to and from one place to another.

1.13. Summary

In this chapter, the researcher has presented the background of the study which has shown what is contained in this study. Thereafter, a description of the statement of the problem has been given. Furthermore, the researcher has explained the aim of the study, objectives and research questions. Lastly, a theoretical framework, conceptual framework, significance of the study, delimitations, limitations and operational definition of terms has been given. In chapter two, the researcher focussed on reviewing literature that is related to this study as a way of identifying the gap.

CHAPTER TWO: LITERATURE REVIEW

2.1. Overview

In this chapter, the different sources of literature to be used in the study has been presented. Kombo and Tromp (2006) defined literature review as the written materials that a researcher has consulted so as to understand and investigate the research problem at hand. In this chapter therefore, literature will be reviewed in order to establish the extent to which Computer Studies curriculum has been implemented in secondary schools in Mufumbwe district by establishing the availability of computer facilities and equipment, availability of teachers, teacher education and significance of the need for appropriate teaching methodologies. Furthermore, a discussion on teachers' and learners' mind-set regarding the use of computers in schools and state some of the challenges faced during the implementation of Computer Studies in other parts of Zambia.

2.2. Importance of Teaching Computer Studies in Institutions of Learning

There is a growing concern in Africa and the whole world about the use of computers to support learning in institutions of learning. According to Guzdial and DiSalvo (2013), computers are used to gather, analyse, modify and exchange information. They are used in almost all spheres of human activity. In this study, the term Computer Studies refer to the study of computer education processes, including computer principles, hardware and software designs and applications. In institutions of learning, Computer Studies is relevant for all learners because it incorporates a broad range of transferable problem-solving skills and techniques, including logical thinking, creative design, synthesis, and evaluation (Bennett, 2013). It also teaches generically useful skills in such areas as communication, time management, organization, and teamwork. For instance, learners who live in a technologically rich world, easily acquire knowledge and skills which help them to understand the underpinnings of current computer technology and prepare them for emerging technologies. Hence, it is important that Computer Studies is taught in secondary schools to lay a foundation for learners as they are prepared for a range of rewarding careers in society.

In addition, the use of computer and internet is increasingly making an easy way into teaching and learning processes (Boakye & Banini, 2008). Computer Studies is believed to be an important element in people's lives and plays a central role in the education system. Many studies have been conducted around the globe on the importance of Computer Studies in schools (Isaacs, 2007; Richards & Tamillenthi, 2013; Olan'g, 2015; Mulima, 2013 and Mulenga, 2016). Most educational systems have proliferated in the field of ICT and Computer Studies in both developed and developing countries. The aforementioned studies dwelled much on urban secondary schools leaving out the rural schools. It was important to ensure that studies of such nature were subjected to both rural and urban schools in order to ascertain the extent of Computer Studies curriculum implementation. Studies on the implementation of computer studies curriculum have focused so much on schools in urban areas. In the long run, rural schools have been neglected.

Similarly, a study by Kozma (2003) on the 'technology, innovation and educational change' expressed that national studies conducted in the United States of America (USA) found a negative relationship between the frequency of use of school computers and school achievement among learners and teachers. Though Kozma (2003) in his study found that there was a negative relationship between the frequency in the use of school computers and school achievement among learners and teachers in the USA, this study focused on the implementation of Computer Studies in Zambia particularly in Mufumbwe district.

Further findings by Pelgrum and Plomp (2002) and Bakare (2014) showed that lack of practice in Computer Studies recorded poor results among learners. They established that the use of computers can enrich the educational system. Students need to gain the skills and understanding to get the best out of the innovating and use of Computer Studies in schools. However, technology is not everything but it plays an important role in the systems used to learn in school. The studies by Pelgrum and Plomp (2002) and Bakare (2014) gave the researcher grounds to carry out this study to ascertain how skills were being acquired by learners learning Computer Studies in secondary schools in Mufumbwe district.

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) policy on ICT holds that ICTs can help strengthen democratic and transparent education planning and management. Communications technology can expand access to learning, improve equality and ensure inclusion. Where resources are scarce, judicious use of open-source material through technologies can provide the means to bypass the bottleneck of textbook production, distribution and updating (UNESCO, 2005). Mooiji (2007) observed that the world is moving rapidly into digital media and information, hence the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century.

Additionally, Isaacs (2007) asserted that there is growing evidence to suggest that ICT may be the only feasible and economically sound means of expanding access to, and improving the quality of, secondary education in the short run. There are several rationales for the uptake of ICT in education, namely economic, social, vocational and pedagogic (Peter, 2010). Peter (2010) further argued that the economic rationale of ICT in education relates to potential increase of efficiency and effectiveness in educational tasks, which will result in labour-saving costs. Pedagogic rationale on the other hand "emphasises the contribution that ICT can make to the improvement of the quality of education by providing rich, exciting, motivating and new environments for learning" (Peter, 2010:10). Uhomoibhi (2006) asserted that there is a growing consensus that ICT utilisation and E-learning have serious implications for leaders and teachers, parents and learners alike. If learners are educated on computers with "built-in-motivation" (Bennett, 2013:10), then they can develop the necessary levels of both confidence and knowledge. According to Guzdial and DiSalvo (2013), studying computer science cannot be regarded as just another subject or topic of research. Computing has emerged as a kind of literacy, which can be described as an indispensable groundwork upon which knowledge of other academic subjects can be built. Furthermore, Guzdial and DiSalvo (2013) established that new developments in computing education are about bringing computer literacy to everyone, from young children to working adults and retirees. In order to exploit the full potential of informatics in the society, it is a good idea to teach Computer Studies at every level of education such as primary, secondary, college and university levels of education. For this

dream to become a reality, it was important that the extent of Computer Studies curriculum implementation in rural secondary schools such as in Mufumbwe district was investigated.

The MoGE in Zambia also attests to the centrality of ICT in the transformation of education specifically, and to Zambian society in general. To this effect, there is much emphasis on the use of ICT tools and to be accessible to all Zambians as opposed to few as it was in the past when the only beneficiaries were learners in private schools (Ministry of Education, Science, Vocational Training and Early Education, 2013).

In another study on the importance of computers in institutions of learning can be drawn from Tayo, Ajibade and Ojedokum (2009) in a paper titled 'uses of computer and its relevance to teaching and learning' in Nigerian Schools. In the paper by Tayo, Ajibade and Ojedokum, it was established that computer education was very cardinal in the ever-changing global village. In their paper, they further stated that computers provided a convenient technique for designing and developing a course of instruction. It was also important to note that computers encompass almost all facets of human endeavours. This is one of the reasons why computers are widely used in institutions of learning; hence computer technology had become more relevant. Computers have been found to be effective devices for presenting an instructional programme. In agreement with Tayo, Ajibade and Ojedokum, McCormick (1993) stated that computers can be used to diversify, develop and improve pedagogical relation of teaching and learning. Also, technological development can be enhanced through timely acquisition of scientific knowledge which can be realised through relevant training in Science, Mathematics, and Computer Education (SMCE). It is with this view that the MoGE in Zambia launched the National ICT Policy in order to equip learners with skills that would help them understand thoroughly the concept of computers in order to fit well into the next generation. Such a notion, can be realised if Computer Studies curriculum is effectively implemented. Hence, do we know the extent to which Computer Studies curriculum was being implemented in rural secondary schools in Zambia? This and many other questions drove this study.

In another study by Lufungulo (2015) titled 'Primary School Teachers' Attitudes towards ICT integration in Social Studies: A study of Lusaka and Katete Districts' revealed that primary school teachers in Lusaka and Katete held positive views towards the integration

of ICT in the teaching and learning of social studies. This was mainly attributed to the training they had undergone with iSchool and Impact Network on the usage of ICTs. The study further established that although the schools were located in different spatial dimensions, the urban and rural setup, the teachers' attitudes towards ICT integration was positive. Furthermore, teachers across the schools regarded ICT as advantageous over traditional methods of instruction and as suitable for the curriculum. However, Lufungulo found that although the ICTs were available in the schools, they were not adequate to the extent that each pupil could have had one and use at the same time in the classroom. Therefore, the teachers sampled in the study by Lufungulo called on the MESVTEE to subsidize the purchase of ICT tool and resources, as it was hoped that such a move could benefit both the pupils and teachers. The study by Lufungulo focused on integration of ICT with social studies. Integration of a subject with another subject can be assessed after seeing how the subject is being implemented. It was therefore the essence of this study in that it sought to investigate the Computer Studies Curriculum implementation in rural secondary schools of Zambia's Mufumbwe district. When we know whether or not Computer Studies curriculum is being effectively implemented will help to find possible ways on how Computer Studies can be integrated with another subject.

However, while the use of computers has been seen as playing an important role and has far-reaching effects on the performance in many aspects of life (such as economic, pedagogic and social) (van Ark, 2011), the focus of this research was to investigate the Computer Studies Curriculum implementation in rural secondary schools of Zambia's Mufumbwe district.

2.3. Availability of Facilities and Equipment for Implementation of the Curriculum

Computer Studies facilities and equipment can be described as infrastructure, electronic device, equipment, or tools used for collection, processing, storage, retrieval or transfer of information, and its associated services (Egoeze, Akman & Colomo-Palacious, 2014). Computer equipment refers to the hardware, software applications, and services associated with ICTs, including telecom networks. Computer equipment could be categorized into hardware, which comprises telephone, computer, LAN network, hub, printer, scanner, television, fax, codec camera, projector, radio, Video CD, audio tape players and

microphone, software that includes windows, Ms Office and others. Computer equipment comprise even the earlier technologies such as radio and television (Akinsola, Herselman & Jacobs, 2005). However, the various facilities used in the teaching and learning Computer Studies in secondary schools according to Babajide and Bolaji (2003), Bamidele (2006) and Ofodu (2007) include; computers, overhead projectors, optical fibres, fax machines, CD-Rom, internet, electronic notice board, slides, digital multimedia, video/VCD machine and so on. It appears some of these facilities are not sufficiently provided for teaching and learning process in rural secondary schools. This might account for reasons why teachers may not use them in their teaching. Hence the need of this study to establish the availability of facilities and equipment used in the teaching and learning of Computer Studies in rural secondary schools in Mufumbwe district of Zambia.

Additionally, a study by Chamanlal (2014) on the role of computer applications and tools in the scientific research process highlighted that computers play a major role in every field of education as it leads the way to a globalized information portal that is the world wide web, a role which is hard to realise if Computer Studies curriculum is not effectively implemented in schools. The study by Chamanlal (2014) focussed on the role of computer applications and tools in the scientific research process. Despite the researcher bringing out the roles of computer applications and tools, he did not find out how Computer Studies curriculum was being implemented in schools. In this study, the researcher found out how Computer Studies curriculum was being implemented in rural secondary schools of Zambia, Mufumbwe district to be specific. It was hoped that taking such a study may help in realising the importance of computer applications and tools in academic work. If the Computer Studies curriculum is not implemented well, one may not be able to appreciate the importance that computers play in human life.

Furthermore, a study by Kanyeki (2006) established that the percentage of schools with computers in some countries in Africa was very low as illustrated in the table 2.1.

Table 2. 1: *Percentages of computer distribution in some countries in Africa*

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

The data in Table 2.1 shows that Egypt was among the African countries having high numbers of schools with computers 31.2 percent. The situation was worst in Mozambique where only 0.3 percent of its schools had computers. The inadequacy in number of computers in schools could have been attributed to huge capital required to purchase and install computers in schools. Most secondary schools operate on limited resources to implement competing curriculum projects. In Zambia, the education authorities have embarked on building and capitalizing on Computer Studies as a gateway for sustainable development a situation that is seen as a tool for integrating economy onto the global market (Mulima, 2015). But it seems nothing much is done to revitalise Computer Studies sector in rural secondary schools in Zambia. Hence, was the need for this study.

However, the full potential of Computer Studies curriculum implementation in Zambia is hampered by lack of availability of computer facilities and equipment and non-capacity of communities to make the best use of computer services as shown in Tables 2.2, 2.3 and 2.4.

Table 2. 2: *Number of schools with computers in Zambia by running agency*

Running Agency	Number of Schools		
	2014	**2015**	**2016**
GRZ	687	935	2565
Grant Aided	99	99	450
Private	405	650	701
Community	71	75	91
TOTAL	**1262**	**1769**	**3807**

Source: 2016 Educational Statistical Bulletin

Table 2.2. shows the number of schools with computers in Zambia according to its categories. The table is important to this research as it contains information that helped the researcher realise how computer distribution corresponds with the schools in Zambia. Table 2.3. shows computer distribution in Zambian schools.

Table 2. 3: *Number of computers by education level*

Education Level	2014	2015	2016
Secondary	7 961	9 785	11 985
Primary	7 529	10 241	14 590
Total	**15490**	**20026**	**26575**

Source: 2016 Educational Statistical Bulletin

Table 2.3 shows computer distribution level in schools by educational level from the period 2014 to 2016. It is evident from Table 2.3 that the secondary level of education is the mostly affected section in terms of computer distribution in Zambia.

Table 2. 4: *Pupil enrolment versus Computer distribution*

Province	**2014**		**2015**		**2016**	
	Enrol	**Computer**	**Enrol**	**Computer**	**Enrol**	**Computer**
Central	476 542	1281	491 692	1682	504 735	2255
Copperbelt	660 019	4135	634 638	5203	621 862	6647
Eastern	438 717	714	437 220	1221	435 703	2205
Luapula	308 345	541	306 830	934	312 625	1386
Lusaka	516 922	3713	519 313	4786	490 017	5406
Muchinga	245 979	478	230 930	567	245 032	817
North western	275 969	753	286 640	1132	285 796	1657
Northern	321 449	508	328 381	746	339 006	1133
Southern	494 360	2537	489 306	2851	495 787	3942
Western	281 164	830	293 114	904	294 817	1127
Totals	**4 019 466**	**15,490**	**4018 064**	**20,026**	**4 025 380**	**26,575**

Source: 2016 Educational Statistical Bulletin

The data in Table 2.4 shows the relationship between school enrolment and computer distribution in Zambia. From the information in Table 2.4 we can deduce that computer to pupil ratio is very low. For instance, in 2016 one computer was shared by one hundred fifty-one learners.

In Table 2.4, enrol is used conveniently for enrolment. From the information given in Tables 2.2, 2.3, and 2.4, it can be deduced that there is low computer distribution in schools in Zambia.

Similarly, a study carried out by Apagu and Wakili (2015) in Nigeria on the 'availability and utilisation of ICT facilities for teaching and learning of vocational and technical education in Yobe State Technical Colleges' revealed that ICT facilities such as computers were lacking in technical colleges and teachers and student's exposure to ICT facilities was also very low. However, the study recorded some benefits of using ICT in technical colleges which included making teaching and learning interesting and helping teachers to be up to date in enhancing the quality of work of both teachers and students. Despite the aforementioned benefit the study revealed some challenges faced in the implementation of ICTs as irregular power supply, inadequate computer literate teachers, and inadequate ICT facilities. The foregoing study was essential because it guided this study on what to focus on and what questions to ask in understanding how infrastructure and its utilisation was important in Computer Studies curriculum implementation in rural secondary schools in a Zambian setup.

In another study by Atsumbe et al (2012) in Nigeria titled 'Availability and Utilization of e-Learning Infrastructures in Federal University of Technology, Minna' revealed that learning infrastructure was not adequate in the university for teaching and learning and management's efforts towards the development of ICT was mainly for administrative purposes and not learners. In addition, lecturers and learners had computers and laptops and could access the internet but, they did not use them for teaching and learning purposes. If teachers view computers with fear, what then will be the stance for the learners that they handle? The foregoing study was necessary to this study because it gave an insight of how infrastructure and equipment affected the implementation of Computer Studies curriculum in secondary schools. Challenges observed by Atsumbe et al (2012) may have been similar to the study site but no research had been carried out in Mufumbwe district as regards to Computer Studies other than this one. It was therefore important to carry out a study in the district to ascertain whether infrastructure such as internet, computer networking was available for effective implementation of Computer Studies in schools.

In their study, Obota, Oluoch and Makani (2015) in Kenya on 'An Assessment of the Availability of ICT Infrastructure for Curriculum Instruction in Public Secondary Schools in Mumias Sub-County' found that the main ICT facilities in place in most secondary

schools were radios which were used for interactive instruction and computers which were inadequate and showed a ratio of 30:1 (30 pupils to 1 computer). The study by Obota, Oluoch and Makani (2015) was a mixed method and established that most facilities that were available for the teaching of ICT in Mumias sub-county were radio for interactive radio instruction and computers although they were inadequate. Computer Studies curriculum implementation can only be realised when the necessary teaching and learning materials are available and utilised as well as facilities. Though the study by Obota, Oluoch and Makani assessed the availability of ICT infrastructure for curriculum instruction in public secondary schools, this study investigated the Computer Studies Curriculum implementation in rural secondary schools of Zambia's Mufumbwe district.

Equally, Kasaji (2010) in a study on the relevance of the upper basic school curriculum to the life experiences of learners in Lusaka district found that curriculum relevance was sometimes minimised by lack of its proper implementation due to lack of facilities/equipment. He further revealed that teachers taught practical subjects theoretically due to lack of facilities/equipment. The study by Kasaji was important to this study as it revealed the importance of availability and utilisation of facilities and equipment for effective curriculum implementation. Facilities and equipment meant for curriculum implementation are cardinal for effective curriculum implementation. For instance, laboratories, sufficient textbooks and supplementary books needs to be provided in order for teachers to teach efficiently and effectively. Kasaji's study was carried out in Lusaka district and focussed on the relevance of upper basic school curriculum in general, this study was conducted in Mufumbwe district and dwelt on Computer Studies curriculum implementation in rural secondary schools there.

In addition, Nganga (2012) in her study on the effect of using computer-based library management system on information provision at the University of Zambia (UNZA) library revealed that library staff and users faced challenges such as high computer-student ratio, poor internet connectivity, shortage of manpower for operations and poor maintenance of computers which hindered effective use and access of library facilities. She further reported that most ICT equipment in the institution were in obsolete state mainly as a result of lack of funds to rehabilitate and replace them. The study by Nganga (2012)

assessed the relevance of computer-based library management system at UNZA library but this study established the availability and use of computer facilities and equipment in rural secondary schools in Mufumbwe district.

In another study by Chaamwe (2017) titled 'A review on the challenges that hinder sustainable implementation of ICT as a subject in rural Zambia' revealed that lack of electricity, inadequate ICT teachers to teach the subject, high pupil to computer ratio and lack of enough ICT learning and teaching materials hindered effectively delivery of Computer Studies in schools. Chaamwe's study was based on review of relevant literature published from printed and electronic sources including research studies, evaluation reports, government policy documents, donor policy documents and project reports, newspaper reports and so on but this study was based on field work whose results are expected to add detail to such literature reviews.

In another study by Mulima (2015) on the 'perception of teachers and learners on the role of ICTs in the teaching and learning of RE in Kabwe district' found that computers, DSTV kits, DVD players, TV's, printers, and phones were the available ICTs in the three selected schools. Mulima (2015) further revealed that the schools had computer programmes like Bible Pro, What the Bible Says, Bible commentaries, and the Bible in softcopy. The levels of ICTs usage varied from teacher to teacher, pupil to pupil, subject to subject, and school to school. Science-based subjects employed more usage of ICTs compared to other subjects, including RE, because sciences had more readily available materials. The study by Mulima was very important in that he showed the availability and utilisation of ICT facilities in urban schools in Kabwe district. Despite having knowledge on the availability and utilisation of ICT facilities in urban schools in Zambia, little if any is known about rural secondary schools especially in Mufumbwe district.

Furthermore, Mulenga (2016) conducted a study to investigate the implementation of the Computer Studies curriculum whether it was a success or failure in Ndola district of Zambia. The study was descriptive in nature and sampled 72 participants drawn from nine (9) public primary schools. She established that all the schools in the study sample had implemented Computer Studies curriculum though had faced a number of challenges such as inadequate funds to procure computers, their accessories and set up infrastructure such

as computer laboratories, lack of trained computer teachers. Other challenges hindering the implementation process were inadequate books/materials. Lack and inadequacy of teaching and learning resources is likely to affect the implementation of the Computer Studies curriculum a great deal since effective implementation requires availability of these materials. Therefore, Mulenga's study was very important to the current study. However, Mulenga focused on public primary schools in Ndola district, this study focused on secondary schools in rural areas such as Mufumbwe district.

2.4. Teacher Preparedness in Teaching Computer Studies

Effective classroom teaching and learning is facilitated by the teacher who sees to it that a curriculum is implemented effectively. Teaching and learning is based on common phenomena of achieving the national goals of education. This can only be determined by the ability of the teacher to interpret, plan and implement the curriculum by following the procedures required by the profession to ensure that the learning objectives are accomplished (Kimosop, 2015).

In their study, Kiamba and Mutua (2017) titled 'a critical review of the effect of teacher preparedness on student's academic achievement: a research agenda' found that it is very clear teacher preparedness significantly affected learner's academic achievement in the various subjects in which studies have been carried out. Teacher education is seen to be the key factor in grounding prospective teachers for the purposes of effective and efficient classroom instruction in all educational levels. The researchers further found that for any serious and efficient teacher, professional documents which include syllabus, schemes of work, record of work, progress record, lesson plans among others are necessary. These documents are essential in keeping track of the teaching and learning process especially in ensuring that the expected learning outcomes are fully met. Teaching and learning resources including textbooks, audio visual aids, charts and other aids are part of teacher preparedness to teaching. Finally, other intervening variables were also found to be very influential in teacher preparedness hence student's academic achievement and these include student's attitude and interests, teacher motivation, classroom climate, physical infrastructure and administrative role in teaching and learning process. This was in line with the teacher efficacy theory. Berman (1977) defined teacher efficacy as the extent to

which the teacher believes he or she has the capacity to affect student's performance. Proponents of this theory believed that student's motivation and performance are very significant reinforcers for teaching behaviour and hence teachers who have high level of efficacy are able to control or at least strongly influence student achievement and motivation. The foregoing study was done in Kenya but this study was conducted in Zambia whose geographical positions may be different. The prevailing conditions in the two countries might be different hence this study was important to secondary schools in Mufumbwe district. Teaching does not happen accidentally, and for it to be effective it needs thorough planning and preparation. Teaching is a complex endeavour, involving classroom management, lesson preparation and organization of teaching and learning activities, evaluation and feedback. Students' success in the classroom therefore is largely based on effective classroom instruction and adequate preparation by teachers.

In another study by Awoniyi (1982) on 'teacher preparedness and efficiency' he found that the best teaching resource is still the teacher. Although many teachers may be familiar with the new and emerging trends in curriculum changes, they may not effectively implement curriculum innovation and therefore may not attain desirable learning outcomes. Kafu (2010) observed that there is need for further training so that teachers are able to cope up with new challenges in the implementation of new curriculum innovations. The question then was: how are Computer Studies teachers prepared in the implementation of the Computer Studies curriculum in secondary schools in Mufumbwe district given that this study area was introduced in the 2013 Zambian revised curriculum? It was hoped that this study would help to find out how far Zambia has gone in preparing teachers for Computer Studies.

Furthermore, Kimosop (2015) established that teachers need to prepare all the stages of the implementation of curriculum documents before they are actually used by the learners through their assistance. It involves the preparation of the lessons by putting in place a scheme of work and a lesson plan having identified the instructional objectives, teaching aids and assessment tools, and use of the appropriate methods of teaching. It is expected that curriculum instruction will be based on these sound teaching principles which the teacher ought to follow for effective classroom teaching. The subject's performance has

been threatened by the belief that it is a booster subject pursued by average learners academically so as to boost their grades hence lacks the seriousness it deserves from both teachers and learners, where they assume that it can be passed even with less input.

In addition, Kimosop (2015) noted that effective classroom teaching entails three main stages and the teacher is the pivotal figure who sees the implementation of these stages where each stage is confirmed by the performance of the other through proper classroom teaching starting from the preparation stage which includes planning. At this stage, the teacher needs to identify the content to be covered in the syllabus and then break it down into topics. Then the objectives (both general and specific) are identified, scheming the content and lesson planning comes later. From the planning stage, a teacher has to undergo the implementation stage where actual teaching takes place. At this stage, appropriate teaching methodologies, teaching and learning materials and its use, and assessment and evaluation is done.

Planning a lesson can help a teacher to cover the whole content of the subject taught. Content coverage plays a very important role in teaching and learning because the learners will not be short of content in some areas. The teacher must clear the content in every class to avoid it spilling to the next class level. This requires the teacher to coordinate his or her teaching by thorough planning. A study by Kimosop (2015) on teacher preparedness for effective classroom teaching of the secondary school Christian religious education curriculum in Kenya revealed that teachers never cleared the syllabus in time and content of particular classes spilled to the next class which was attributed to poor planning. Kimosop further revealed that from the sampled participants, 25 teachers representing 55.6 percent of the sample never stated the objectives before teaching and they taught right from the start of the lesson as confirmed by an interview before he conducted classroom teaching. His investigations with those who had set up their objectives before classroom teaching showed that 22 teachers representing 48.9 percent of the sample indicated that they did not evaluate the learning objectives because of lack of time while other teachers comprising of 22 representing 48.6 percent never accomplished the learning objectives. The teachers further elaborated in an interview after classroom teaching that the learning objectives were not accomplished because most teachers never planned their

lessons in advance. One reason that could have contributed to this was due to poor teacher preparation in colleges of education. Learning objectives are directly linked to curriculum implementation. If the objectives are not achieved by learners, then learning cannot be said to have taken place. It was therefore cardinal to examine whether teachers are prepared to successfully implement Computer Studies curriculum or not as shown in Figure 2.1.

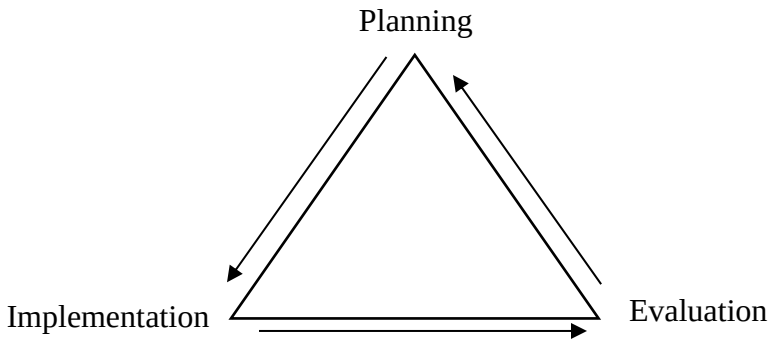

Figure 2. 1: *Elements of Teacher preparedness*

Source: Adapted from Kimosop (2015).

Figure 2.1 shows that for effective classroom teaching to be a reality, the three main stages in Computer Studies curriculum implementation is important. As such, a teacher plays a key role in ensuring that the three elements (stages) for teacher preparedness are achieved. The stages include, planning (preparation), implementation (actual teaching) and evaluation stage (achievement of objectives).

In addition, a study by Twoli (2006) found that lesson planning give teachers the confidence in curriculum implementation processes. He argued that during planning, teachers selects the relevant content to the lesson to be presented and organises it in a functional way to help achieve the learning objectives. From the sampled population, Twoli established that 31 teachers comprising 69.0 percent expressed that it was not necessary to do lesson plans and 14 teachers comprising 31.1 percent were not certain about preparing lesson plans. However, 39 teachers which represented 86.7 percent seemed to know the need of preparing lesson plans. Teachers need to follow all the stages of the implementing a curriculum such as documents before they are actually used by the learners. It involves the preparation of the lessons by putting in place a scheme of work

and a lesson plan having identified the teaching objectives, teaching aids and assessment tools, and use of the appropriate methods of teaching. It is expected that curriculum teaching will be based on these sound teaching principles which the teacher ought to follow for effective classroom teaching and evaluation to ascertain whether the objectives have been met or not. Studies of this nature was important to this study as it helped to show the importance of ensuring teacher preparedness for effective implementation of Computer Studies curriculum in selected secondary schools in Mufumbwe district.

2.4.1. Pre-service Training of Teachers

Pre-service teacher education is the preparation that occurs before teachers enter the teaching profession and/or take up employment in a range of different education institutions. Pre-service teacher education takes different forms in a range of different institutional settings, public and private, including colleges of education, universities, specialist institutes or other training providers. It may also be delivered through different modalities (including residential training and distance education) using various technologies such as print, radio, internet among others (UNESCO, 2011). During this period of teacher education programmes, student teachers go on teaching practice in order for them to experience actual classroom teaching. Pre-service education is carried out to prepare teachers in different fields of studies. It is therefore important that teacher educators can learn the methodology of how to get in touch with the core qualities of a good teacher and how they can stimulate these qualities in student teachers. If trainee teachers in Computer Studies acquire computer skills, curriculum implementation is likely to become a reality.

However, Huge (1992) argued that the implementation of curriculum changes and the continuation of the new approaches in schools depend not only on the retraining of teachers but also on knowledge, skills and attitudes fostered during initial training of teachers. Hugh (1982) further observed that pre-service education of teachers, which is supposed to facilitate curriculum implementations is in most countries riddled with problems. However, the purpose of teacher education is to equip individuals with the personal and professional skills needed in schools and other learning contexts. Teachers are required to facilitate the acquisition of content knowledge, develop skills and foster

attitudes that will enable learners to reach their potential. Pre-service and in-service teacher education form a continuum of professional development and may take place over a number of years, in a range of different settings and with differing purposes.

In a study by Govinda (2004) titled 'Teacher Preparation for the World of work: A study of pre-service primary teacher education in Fiji' revealed that beginning teachers were not adequately prepared for the demands of work and responsibilities expected of them as perceived by the profession and other stakeholders. He further found that lack of physical facilities, quality of educational resources, outdated and foreign based curriculum, lack of support from management were among the factors that hindered adequate professional preparation of beginning teachers. The revelations by Govinda in his study had an important role to play in this study in that it established the importance of teacher education more especially pre-service education. Teachers need to be prepared in order to meet the demands of their work with confidence. It is on this premise that this study sought to establish the availability of teachers teaching Computer Studies in secondary schools. Have they received adequate education or not is a question yet to be answered?

In another study by Myalla (2014) in Tanzania on 'Assessing the impact of the duration of pre-service teacher education on teachers work performance and teaching competences in Tanzania: the case of Nyamagana municipality' revealed that teachers for grade III A lacked competences and skills in teaching which was against the professional code of conduct and moral principles. The lack of education was attributed to short time or duration for pre-service training as they lacked theoretical and practical skills for them to effectively teach in class. Teacher preparation is cardinal for Computer Studies curriculum implementation. Myalla's study focused on pre-service teacher education, this study looked at teachers' preparation in relation to Computer Studies curriculum implementation in secondary schools in Mufumbwe district.

2.4.2. In-service Training of Teachers

In-service education covers those activities directed towards remedies of perceived lack of skill understanding. It is an on-going process that promotes professionalism and personal growth for teachers (Daresh & Playko, 1995). In-service education is necessary and appropriate when people need special training to correct deficits in their skills. It takes

place anytime, either as full time or part time, during the professional life of a teacher (Namunga & Otunga, 2012). Daresh and Playko (1995) gave useful guidelines about in-service education. They claimed that in-service education should ensure that programmes are directed towards local needs of the participants and that the participants are fully involved and encouraged to identify their needs and areas of re-training.

Additionally, Shiundu and Omulando (1992) noted that in-servicing of teachers greatly improves the quality of curriculum implementation. Hugh (1982) said that the tried and tested way of introducing a new curriculum is by offering a series of specially organized in-service programmes for teachers. Hugh further maintained that when teachers are afforded this opportunity, they are in-serviced and the extent of such in-servicing vary greatly from one day, one evening, one weekend to longer residential courses depending on the availability of resources such as money and human resource.

In the same line, Ornstein and Hunkins (2009) observed that in-service programmes that work have resulted from collaborative efforts and have addressed the needs of those who are to be affected by the new curricula. Effective in-service education has the necessary flexibility to respond to the changing needs of the staff. Ornstein and Hunkins (2009) further argued that not all details of in-service education can be planned prior to implementation, and all problems and concerns cannot be anticipated. In-service education therefore prepares teachers for their role in curriculum implementation. Arguments by Ornstein and Hunkins (2009) are important to this study because they helped to stress the need for in-service training of teachers for effective implementation of Computer Studies curriculum in secondary schools in Mufumbwe district.

Similarly, Jerotichl, Kurgat and Kimutai (2017) in their study on teacher preparedness in the implementation of the integrated business studies curriculum in public secondary schools in Kenya emphasised that teachers need regular in-service opportunities within the educational system to enhance their teaching methodology. Jerotichl, Kurgat and Kimutai further stressed that teachers needed to equip themselves with new forms of knowledge, new teaching methods and strategies, purpose and scope of a new curriculum. Because teacher in-service education programmes must reach their intended audience, they should be accessibly scheduled for teachers who are curriculum implementers. It is

expected that the teachers should receive their first professional support from the head teachers of their respective schools and from the ESOs who support the teachers through supervisory visits as well as organising refresher courses, especially when new curriculum innovations are being introduced. The foregoing study was done on how teachers were prepared in the implementation of business studies. This study focussed on investigating the availability of teachers for effective Computer Studies curriculum implementation in rural secondary schools in Mufumbwe district.

2.5. Teaching Methods in Computer Studies

In the teaching fraternity, teachers employ various teaching strategies just like there are different teachers. Shinn (1997) stressed that teaching activities are usually represented by teachers' teaching attitudes and their preferences regarding teaching methods. For effective teaching and learning to take place, two things are cardinal, the content (what to teach) and the teaching methods (how to teach). During the curriculum implementation process, teachers use a variety of teaching methods to enable learners acquire the necessary skills, values and knowledge. According to Hugh (1982) postulated that implementation of a curriculum innovation and the continuance of the new approaches in schools depend not only on the retraining of teachers but also on knowledge, skills and attitudes fostered during initial education of teachers. This knowledge and skills can be seen through the use of various strategies that would bring attention of learners into learning. Hugh (1982) further observed institutions of higher learning and their teacher preparation curricula may be remote from the realities of school and the curriculum at large. Therefore, institution of higher learning should aim at preparing student teachers for what should be rather than what is. Institutions of higher learning curricula are monstrously overloaded often with academic content some of which is of doubtful value to the teacher in the real classroom environment. UNESCO (2010) established that schools of education have been established in nearly all the public as well as private universities and colleges and have embarked on an extensive staff development programs to satisfy their teaching work force.

According to Billie (2009) teaching/learning activities can be categorized as either student-centered pedagogy or teacher-centered pedagogy. The use of these strategies can

positively or negatively affect learning and the consequent achievement in particular subject. Many variables come into play when we try to determine which teaching style to be used during the teaching/learning process. The variables include class size, subject within the discipline, room layout, environmental factors in the room, teacher personality and classroom dynamics.

2.6. Views of Teachers, Learners and Parents on the Teaching of Computer Studies

A study in Malasiya by Gimba et al (2018) titled 'Teachers' and Students' Perceptions on the Problems of Effective Teaching and Learning of Science and Technology in Junior Secondary Schools' revealed that the foundation of most Science and Technology teachers in Science and Technology was poor. Science and technology are important subjects from primary level through to senior secondary school levels of education. As such a lot of emphasis should be put in place to ensure effective implementation of a curriculum. The important position occupied by these subjects in the school curricula is its component of Technology in scientific and technological development, as a necessary condition or requirement in national building. However, the teaching of these relevant subjects is surrounded by challenges; such as the problem of inadequate and substandard teaching and learning materials, poor reading habits, class size, culture and belief, science and technology anxiety, and general attitudes of students. The foregoing study was important to this study as it helped the researcher have an insight on the perceptions of teachers, learners and parents towards effective teaching and learning.

In addition, a study by Adekunle (2016) titled 'Perception of Secondary Schools' Students on Computer Education in Federal Capital Territory (FCT-Abuja), Nigeria' confirmed that learners had a positive perception on computer education. The findings also identified some factors that affected students' perception on computer education. These factors included teachers' proficiency, institutional characteristics, emotional and social factors, gender, economic factors, environmental factors, curriculum contents, educational policy and parents' attitudes technological supports. Computer Studies being a newly introduced subject in the Zambia education curriculum, may attract either positive or negative perceptions among teachers, learners and parents. The study by Adekunle was conducted in Nigeria, Abuja whose geographical positions and conditions of living maybe different

to that of Zambia, Mufumbwe district. Hence, there was need to carry out this study as there seemed to be no study done in rural secondary schools in Mufumbwe district.

Furthermore, a study in Kabwe by Mulima (2013) titled 'The Perceptions of Teachers and Learners on the Role of ICTS in Teaching Religious Education in Zambia: A Case of Selected Secondary Schools in Kabwe district' revealed that the ICTs were valuable pedagogical tools in enhancing the teaching and learning of the subject. ICTs were perceived to help RE teachers teach better and learners learn better. Mulima further stated that ICT was perceived as having led to promoted participation, ambiance transformation in class, creativity, motivation, easier understanding, and higher retention levels among learners in RE. In addition, the study showed that teachers and learners considered ICTs as beneficial to RE as it helped to create a more enabling environment that best fitted the social scenario of increased ICTs in Zambia. Mulima's study focussed on the benefits of using ICTs but never looked at how the Computer Studies curriculum was being implemented in secondary schools and views of head teachers, teachers, learners and parents in relation to Computer Studies curriculum implementation in secondary schools. It was on this question that this study sought to address. If Computer Studies curriculum is effectively implemented, the usage of computers in schools may be a success. The foregoing study was carried out in Kabwe which is an urban district in Zambia, this study was conducted in Mufumbwe district which is a rural district in Zambia.

2.7. Research Gap

The researcher has reviewed related literature on Computer Studies curriculum implementation in secondary schools. Selwood & Pilkington, (2005) noted that the implementation of Computer Studies in schools has been considered a key factor globally and has gained momentum in the recent years. Various studies on the implementation of Computer Studies in schools have been conducted in many parts of the world. However, in Zambia, there is still limited research that has been conducted in Computer Studies curriculum implementation as many studies focused on the implementation, use and integration of ICTs in schools. Additionally, most of the reviewed studies did not take the mixed method approach that this study employed. Hence, this study attempted to fill the gap by investigating the extent to which Computer Studies curriculum was being

implemented in selected secondary schools in Mufumbwe district of North Western Province.

2.8.Summary

In chapter two, literature related to this study has been reviewed and the gap identified is that studies did not employ a mixed methods approach. The researcher reviewed literature from a global perspective, regional perspective and local perspective. It was discovered from the literature reviewed that facilities and equipment, availability of teachers and use of appropriate methodology is cardinal for Computer Studies implementation in secondary schools. In the next chapter, the methodology that was used in this study shall be discussed.

CHAPTER THREE: METHODOLOGY

3.1. Overview

In this chapter, the methodology used in this study have been explained. These include the research design, the target population, sample and sampling procedures, research instruments and their validity and reliability, data collection procedures, data analysis and ethical considerations.

3.2. Research Paradigm

Cohen, Manion and Morrison (2007) defined a paradigm as a conceptual framework shared by a community of scientists which provides them with a convenient model for examining problems and finding solutions. Researchers, such as Creswell and Plano (2011) described this framework as either a world view or a paradigm. Pring (2000) explained that research paradigms inherently reflect human beliefs about the world they live in. Mackenzie and Knipe (2006) argued that without nominating a paradigm as the first step, there is no basis for subsequent choices regarding methods, literature or research design.

This study was guided by the mixed methods paradigm. According to Creswell (2015: 2) a mixed method research is;

> An approach to research in the social, behavioural, and health sciences in which the investigator gathers both quantitative and qualitative data, integrates the two, and then makes interpretations based on the combined strengths of both sets of data to understand research problems.

Mulenga (2015) explained that mixed methods paradigm combines the collection and analysis of both quantitative and qualitative data into one empirical study. He further stated that it integrates the strengths and minimizes the weaknesses of both qualitative and quantitative methods. Creswell and Plano Clark (2011) suggested that quantitative research may be weak in revealing the contexts and situations in which people respond to questions about a certain phenomenon, and as quantitative research is primarily about numbers, participants' explanations are not so important. Kombo and Tromp (2006)

explained that the mixed methods design maximises the strengths and minimises the limitations of both qualitative and quantitative designs. Hence, it was cardinal in this research to employ the mixed methods in the sense that it helped mitigate the limitations and biases found in both the qualitative and quantitative designs. According to Creswell (2015: 535) "the basic assumption is that the use of both quantitative and qualitative methods, in combination, provide a better understanding of the research problem and question than either method by itself". Therefore, the use of mixed methods approach enabled the researcher to be confident and the design yielded good results for the study. Creswell (2015: 535) further explained that;

> Mixed methods research is a good design to use if you seek to build on the strengths of both quantitative and qualitative data. Quantitative data, such as scores on instruments, yield specific numbers that can be statistically analysed, can produce results to assess the frequency and magnitude of trends, and can provide useful information if you need to describe trends about a large number of people.

When one combines quantitative and qualitative data, "we have a very powerful mix" (Miles & Huberman, 1994:42) added. For example, by assessing both outcomes of a study that is quantitative as well as qualitative, we can develop a complex picture of social phenomenon (Greene & Caracelli, 1997). This study used mixed methods design under the concurrent embedded research design which enabled the researcher to collect both qualitative and quantitative data simultaneously.

3.3. Research Design

According to McCaston (2005:1), "a research design is a step-by-step plan that guides data collection and analysis." It acts as the glue that holds all the elements in a research project together (Kombo & Tromp, 2006). In this study, the researcher employed concurrent embedded design. This design enabled the researcher to gain perspectives from the different types of data or form different levels within the study (Creswell, 2009). The purpose of this design was to answer different questions that required different types of data, meanwhile, the data that was collected was descriptive in nature and it was used to get detailed information pertaining to Computer Studies curriculum implementation in selected secondary schools in Mufumbwe district of Zambia. Through the use of the

concurrent embedded design, the researcher got answers to both "what" and "why" questions and gained a more complete understanding of the research problem by focussing on the qualitative and quantitative findings (Mwanza, 2017). It was hoped by the researcher that mixed methods approach in general and concurrent embedded research design in particular would provide a thorough understanding of how selected secondary schools in Mufumbwe district were implementing Computer Studies curriculum. Figure 3.1 presents an illustration of the concurrent embedded design that was employed in this study.

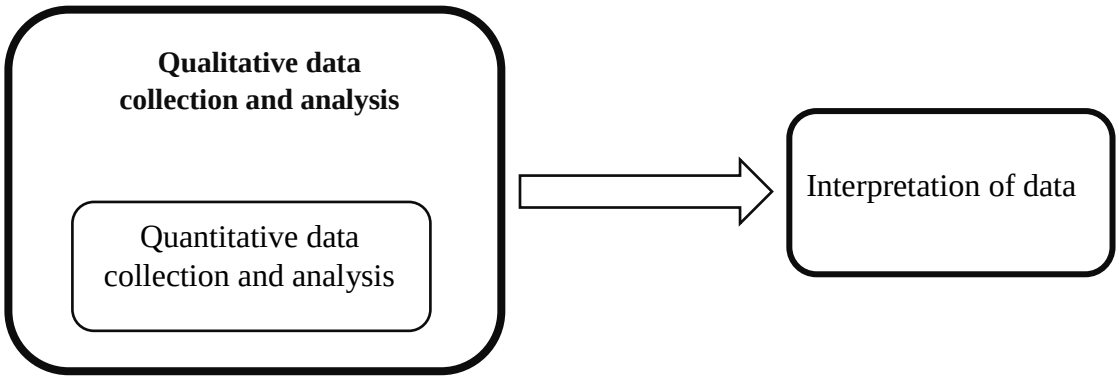

Figure 3. 1*: Concurrent Embedded Design Illustration*

Source: Adopted from Creswell 2013

Creswell (2015) described the purpose of using embedded research design that it would enable the researcher to collect quantitative and qualitative data simultaneously or sequentially, but to have one form of data play a supportive role to the other form of data. In this study, the researcher collected in-depth data from head teachers and parents through the use of qualitative approach. However, the data collected through quantitative approach added detail to the qualitative data. Both quantitative data and qualitative data were collected at the same period and analysed simultaneously. Qualitative data in this study was supported by quantitative data. Results obtained through qualitative data provided in-depth information on the availability of computer facilities and equipment, availability of qualified teachers to teach Computer Studies and the views regarding the teaching of Computer Studies in selected secondary schools in Mufumbwe district, Zambia. Quantitative data was used to establish the availability of computer facilities and

equipment, find out the availability of teachers qualified to teach Computer Studies, appropriateness of teaching methods used and views of teachers and learners on the teaching and learning of Computer Studies in selected secondary schools in Mufumbwe district of Zambia. The results obtained from both qualitative and quantitative approaches were integrated and interpreted before arriving at conclusions and recommendations.

3.4. Study Site

This study was conducted in some selected secondary schools in Mufumbwe district of Zambia. Mufumbwe district was selected to be appropriate for this study bearing in mind that the few studies done regarding Computer Studies curriculum implementation were confined to urban areas. Hence, the researcher was of the view that conducting this study in a rural part of the country (Zambia) shall help review what is prevailing in the implementation of Computer Studies curriculum in rural secondary schools.

3.5. Target Population

A population is a group of persons, objects, items or events which is the entity of the research and acts as the researcher's library for information on the problem being studied (Kombo & Tromp, 2006). In addition, Kombo and Tromp explained that a population refers to a group of people or elements with one thing in common and from which a sample is taken. Newby (2010) referred to a population as a group of elements or cases, which can be objects, individuals or events, that conform to specific criteria and to which we intend to generalize the findings. The target population of this study was all the head teachers, all the teachers of Computer Studies, and all the parents in Mufumbwe district. The population also consisted of all grade nine learners who were learning Computer Studies as a subject at the time of the study.

3.6. Sample Size

The sample size refers to the number of items to be selected from the entire population to constitute a study sample. Bryman (2008) postulated that a sample is the segment of the population that is selected for investigation in a study. It is a subset of the population whose method of selection may be based on probability or non-probability approach. In

this study, the total sample size of participants was 75. It was hoped that the targeted sample population would provide the rich data to answer the research questions in this study. A summary of participants is shown in Table 3.1.

Table 3. 1: *Summary of participants and intended samples and actual sample*

Participants	*Intended sample*	*Actual sample*
Head teachers	4	4
Teachers of Computer Studies	16	12
Learners	64	51
Parents	12	8
Total	**96**	**75**

The ideal sample is large enough to serve as an adequate representation of the population about which the researcher wishes to generalise and small enough to be selected economically in terms of subject availability and expense in both time and money (Best & Khan, 2006). In this study, the intended sample was 96 participants. The researcher captured 75 participants representing 78 percent of the intended sample of participants. This sample was considered adequate for this study as it comprised a sample population that was considered to have rich information regarding the topic of interest.

3.7. Sampling Techniques

Mixed methods research uses more than one kind of sampling procedure (probability and non-probability) and samples of different sizes, scope and types (cases: people; materials: written; other elements in social situations: locations, times, events) within the same piece of research (Teddlie & Tashakkori, 2009; Teddlie & Yu, 2007). In this study, both probability and non-probability sampling techniques were used when selecting participants.

3.7.1. Schools

In Mufumbwe district, there were nine secondary schools. Out of the nine secondary schools, Computer Studies was offered in seven secondary schools. Secondary schools

were stratified into zones, following MoGE zoning of schools and one school was randomly selected from each stratum until the total number of four was attained.

3.7.2. Head Teachers

Head teachers play an important role in the implementation of any curriculum as they carry out various roles such as supervisory, advisory, giving financial support, motivation of teachers, and provision of teaching resources. Purposive sampling was used to homogeneously select four head teachers one from each selected school. Homogeneous purposive sampling according to Kombo and Tromp (2006) helps to pick a small sample with similar characteristic in order to describe some particular subgroup in depth.

3.7.3. Teachers

For an education programme to be successfully achieved, teachers play a key role in its implementation. In this study, in order to have a well-represented sample of both sexes, teachers were stratified into two stratums of male and female. However, the situation was that the number of female teachers was smaller than what the researcher anticipated. Thus, only one female teacher teaching Computer Studies was found and therefore she was automatically included in the sample without considering the stratum. Then eleven male teachers were randomly selected from the male stratum. Thus, a total of twelve teachers participated in the study.

3.7.4. Learners

Random sampling according to Kombo and Tromp (2006) is a method in which every member of the population has an equal chance of being included in the sample. In random sampling, the participants are randomly selected from a list of a total population. Based on the merits of random sampling technique as stated by Kombo and Tromp (2006), in this study, grade nine learners were selected because at the time of this study they had interacted with the Computer Studies curriculum for a period exceeding one year than those who were in grade eight as a result they were aware of the any successes and challenges. The grade nine learners were selected using stratified sampling. Stratified sampling was appropriate in this study because learners were stratified according to their sexes, thus boys and girls. Cohen, Manion and Morrison (2007) argued that stratified

sampling involves dividing the population into homogenous groups, each group containing subjects with similar characteristics. In each school which participated in the study, the researcher requested for a class register for all grade nine learners learning Computer Studies in the particular school. After obtaining the class register, the researcher stratified the names of the learners according to their sexes. Stratified sampling was best for this study as it gave a sample that allowed equal participation by both sexes. Then, simple random sampling was used to select eight males and eight females from each stratum. This gave a total sample of sixteen learners that were sampled in each school and sixty-four learners from the four sampled schools. However, fifty-one grade nine learners managed to return completed questionnaires as shown in Table 3.1.

3.7.5. Parents

The sample also included parents of learners learning Computer Studies in the schools sampled in this study. Suffice to state that parents are the indirect beneficiaries of an effectively implemented curriculum. Attaining a good number of parents in each school was a big challenge to the researcher since learners come from different parts of the district (weekly boarders). As a result, with the help of the school administration, two parents were identified from each school, giving the study a total number of eight parents who participated. More female parents were present and interviewed as compared to male parents.

3.8. Data Collection Instruments

Data collection according to Kasonde-Ngandu (2013) is the gathering of specific information to answer research questions. However, research instruments according to Kasonde-Ngandu (2013) refers to tools that the researcher uses in collecting the necessary data.

3.8.1. Description of data collection instruments

Kombo and Tromp (2006) explained that the most commonly used research instruments include questionnaires, interview guides and observation guide. In this study, the researcher used structured interview guides in order to conduct face to face interviews with head teachers and parents and lesson observation guide to observe lessons of teachers

of Computer Studies. Questionnaires were used to collect data from teachers of Computer Studies and grade nine learners learning Computer Studies. It was also important to triangulate using three different instruments of data collection (interview schedules, questionnaires and lesson observation guide) as a way of ensuring validity and credibility of the research findings as presented in the next section.

3.8.2. Interview schedules

Kasonde-Ngandu (2013) described an interview schedule as a written list of questions or topics that need to be asked by the interviewer. These could be semi-structured or structured interview guides. Borg (1963) postulated that there is no system of inquiry that can be as revealing as an interview. In agreement with Borg, it could be so due to the fact that when using interviews to collect data, the interviewee would express his or her emotions and feelings immediately the question is asked. First-hand information is collected now and then. Similarly, interviews are well suited for exploring and confirming ideas and provide in-depth information about particular cases of interest (Kombo and Tromp, 2006). Interview schedules were used to collect in-depth data from head teachers and parents to give answers to the research questions of this study. This technique of data collection was very important as it helped the researcher to probe information from the participants. Furthermore, this instrument was convenient to the head teachers and parents who have busy schedules.

3.7.2.1. Interview Schedule for Head Teachers

Structured interviews were used to find out from the four (4) head teachers on the availability of Computer Studies facilities and equipment meant to support the teaching and learning of Computer Studies in secondary schools, availability of trained teachers to teach Computer Studies in secondary schools. The instrument was also used to seek information about the views of head teachers on the teaching and learning of Computer Studies in the secondary schools sampled in this study. Interviews were used because of its flexibility and enabled the researcher to collect in-depth information from the head teachers. The interviews were recorded with permission from the participants.

3.7.2.2. Interview Schedules for Parents

Interviews were also used to collect information about the parent's views about the teaching and learning of Computer Studies by their children in secondary schools. The researcher also requested parents to give their views on the strengths and challenges of the process, level of involvement in the process and suggestions for effective implementation of the programme.

3.8.3. Questionnaires

Questionnaires were another type of instruments that were used to collect information from teachers of Computer Studies and learners learning Computer Studies as a subject. Kombo and Tromp (2006) defined a questionnaire as a research instrument that gathers data over a large sample. The questionnaire that was used had both open-ended questions and closed-ended questions. Questionnaires were thoroughly checked by the supervisor before piloting them. Each questionnaire had an introductory remark where the study was introduced and confidentiality assurance to the participants.

3.8.3.1. Questionnaires for Teachers

Questionnaires for teachers comprised of two (2) sections. In the first section, demographic data of the participants was collected. The second section focused on finding out the availability of Computer Studies facilities and equipment, availability of teachers, and the appropriateness of the teaching methods used. Lastly, the researcher sought the participant's views on the teaching and learning of Computer Studies in secondary schools.

3.8.3.2. Questionnaires for Learners

Questionnaires for learners comprised of two sections. The first section was used to collect demographic data of the participants. The second section focused on finding out the availability of Computer Studies facilities and equipment, the availability of teachers and methods used to teach learners in Computer Studies. The last part collected data on learners' views on the teaching and learning of Computer Studies.

3.8.4. Lesson Observation Schedule for Teachers of Computer Studies

Kathuri and Pals (2003) recommended the use of an observation checklist as an important instrument which minimizes or eliminates the biasness that may result from people offering information about themselves. This could be so because an observation checklist depicts the exact situation at hand than data collected using other methods. Mugenda and Mugenda (1999) noted that a researcher should utilise what he or she observes during data collection in order to collect quality data. In this study, the lesson observation checklist had guidelines seeking information on the teaching methods and its appropriate use in the teaching and learning of Computer Studies in secondary schools.

3.9. Data Collection Procedure

The researcher sought authority from the Assistant Dean Postgraduate School of Education, the University of Zambia and the District Education Board Secretary for Mufumbwe district. Authority was also sought to enable the researcher to interact with the selected schools and participants without interference. The researcher also got consent from the participants and research instruments were administered. The researcher made a tentative plan for school visits and made appointments with the school head teachers of the sampled secondary schools well in advance so that the participants were found within reach on the day of the visit. During the visits, questionnaires were distributed, completed then the researcher collected them later as per plan. Interviews were done with the participants on the agreed days and time, first with the head teachers and then parents. Thereafter, the researcher observed two teachers of computer studies in two schools while the other teachers shunned lesson observations. The information gathered through lesson observations enabled the researcher to compare the information obtained from the head teacher, teachers and learners on the implementation of Computer Studies curriculum with what actually took place in class during Computer Studies lesson.

3.10. Data Analysis

Kombo and Tromp (2006: 117) referred to data analysis as "examining what has been collected in a survey or experiment and making deductions and inferences. It involves uncovering underlying structures; extracting important variables, detecting any anomalies

and testing any underlying assumptions". Data was analysed separately, thus quantitative data and qualitative data and then compared both datasets before drawing conclusion.

3.10.1. Qualitative Data Analysis

Kombo and Tromp (2006) explained that the analysis of qualitative data varies from simple descriptive analysis to more elaborate reduction and multivariate associate techniques. Qualitative data analysis is usually broken down in three key stages which include familiarisation and organisation, coding and recoding as well as summarising and interpreting (Ary, 2006). In this study, the researcher listened to the recorded interviews repeatedly as soon as data collection started in order to be familiar with the data during the collection process. It was cardinal for the researcher to familiarise himself with data so that data can easily be retrieved. Ary et al. (2006) added that the researcher should become familiar with the data through reading and rereading notes and transcripts and listening repeatedly to audiotapes when analysing qualitative data. In this regard, all interview responses were transcribed. Once all the transcriptions were done, the researcher did all the analysis manually, using the constant comparative method. According to Neuman (2003) in Mulenga 2015 postulated that constant comparative method involves making three passes through data. This included open coding, axial coding and selective coding as shown in Figure 3.2.

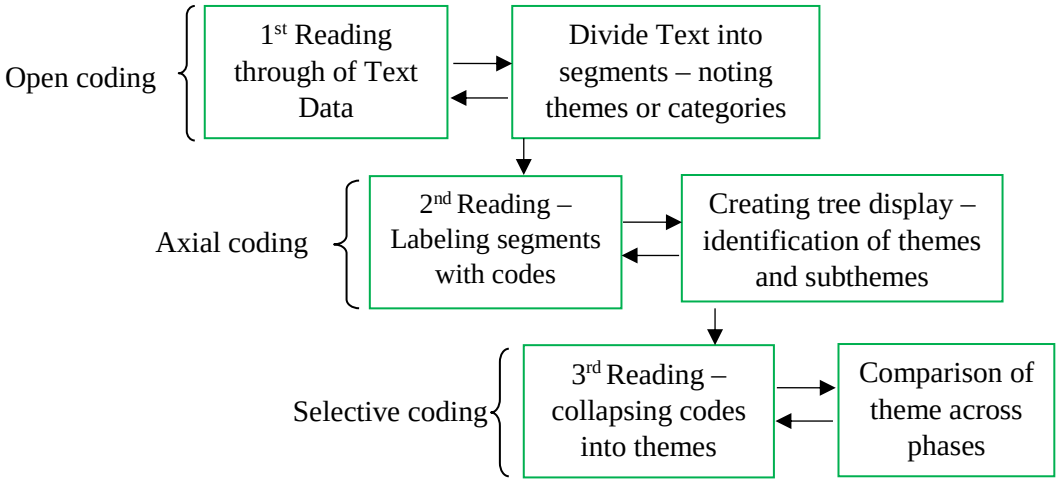

Figure 3. 2: *Visual model of the Constant Comparative Method of Qualitative Data Analysis*

Source: Adopted from Mulenga (2015)

This method enabled the researcher to compare responses from different head teachers and parents and determined patterns and trends in the responses from different teachers and learners. Data was then summarised using narrative reports.

3.10.2. Quantitative Data Analysis

Quantitative data analysis according to Kombo and Tromp (2006) is the measuring of numerical values from which descriptions such as mean and standard deviations are made. In this study, all answered questionnaire items were organised, categorised, quantified and then subjected to statistical analysis. Using the Statistical Package for Social Sciences (SPSS) and excel computer packages, the data was then summarised in frequencies, percentages and cross-tabulations. Thereafter, the data was presented using frequency tables, pie charts and cross-tabulation tables. However, quantitative data was compared with qualitative data before drawing a conclusion.

3.11. Reliability and Trustworthiness

McMillan and Schumacher (2010) reliability refers to measures the replicability of the results. In order to have credible research findings, reliability and trustworthiness are very important features and must be considered henceforth. The researcher ensured reliability and trustworthiness as follows:

3.11.1. Reliability

Reliability is the measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda & Mugenda, 2003). According to Miller (2011), reliability is defined as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials. In short, it is the stability or consistency of scores over time. For a research to be reliable, it must demonstrate that if it is carried out on a similar group of participants in a similar contact, then similar results would be found (Cohen, Manion & Morrison, 2000). To ensure reliability of the research instruments, the test and retest method was used. This was done through a pilot study that was conducted in a different school other than the one sampled. The results that was obtained after piloting was compared to ensure consistency in the instruments that were used for data collection.

3.11.2. Trustworthiness

In a qualitative study, it is important to ensure that qualitative data collected is as truthful as possible for it to be credible, dependable and confirmable. Trustworthiness was ensured through triangulation, member checking and recording interviews.

3.10.2.1. Credibility

Credibility is defined as the confidence that can be placed in the truth of the research findings (Holloway & Wheeler, 2002; Macnee & McCabe, 2008). This ensures that the research findings are true and accurate. In this study, credibility was ensured through the use of various methods for data collection (triangulation).

3.10.2.2. Dependability

According to Bitsch (2005: 86), dependability refers to the stability of findings over time. Dependability involves participants evaluating the findings and the interpretation and recommendations of the study to make sure that they are all supported by the data received from the informants of the study (Cohen et al., 2011; Tobin & Begley, 2004). Dependability was ensured through the use of inquiry audit. Inquiry audit helped to ensure that the findings were consistent and could be repeated.

3.10.2.3. Confirmability

Confirmability refers to the degree to which the results of an inquiry could be confirmed or corroborated by other researchers (Baxter & Eyles, 1997). It ensures that there is a degree of neutrality in the research findings. The researcher in this study ensured that the findings were based on participant's responses and not any potential bias or personal motivations. This was done by ensuring that interviews were recorded and member checking.

3.12. Ethical Considerations

According to Wellington (2000) an ethic is a moral principle or a code of conduct which guides what people do. Deyle et al., (1992) identified several critical ethical issues that need to be addressed in approaching a research: how does one present oneself in the field? As who does one present oneself? How ethically defensible is it to pretend to be somebody

that you are not in order to gain knowledge that you would otherwise not be able to acquire, and obtain the preserve to places which otherwise you would be unable to secure or sustain? Cohen, et al. (2011) explained that ethical issues concerns the issues of informed consent in order to allow the participant to participate and disclose information willingly without any interferences. The participants in this study comprised head teachers, teachers of Computer Studies, learners and parents whose children learnt Computer Studies in secondary schools of Zambia's Mufumbwe district of North Western Province.

3.12.1. Informed Consent

The researcher sought informed consent from the participants. Informed consent is a communication between the researcher and the participants. The researcher informed the participants the advantages of being part of the study. Permission was sought from the District Education Board Secretary (DEBS) in order for the researcher to freely interact with head teachers and teachers. Furthermore, the researcher sought permission from the head teachers in the respective schools to enable him interact with the learners as shown in appendix 1. Learners were issued with a consent form and asked to read and understand it before signing.

3.12.2. Research Description

The researcher had a duty to ensure that the participants are aware of the purpose of the study. The researcher informed the participants the purpose of the study and asked for their wilfully participation in the study.

3.12.3. Benefits and Risks

Participants were informed that positive participation in this study was expected as it could help improve the teaching and learning in Computer Studies for the benefit of the learners. However, the participants were also told that participation in this study was not to subject them into any form of risk as the data to be collected was for academic purposes only.

3.12.4. Anonymity and Confidentiality

Considering the significance of ethical issues in every research, in this study responses from participants were treated with maximum confidentiality as the data was used purely

for academic purposes. The participants who included the head teachers, teachers of Computer Studies, grade nine learners and parents were asked not to write their names and that of their schools on the research instruments.

3.12.5. Voluntary Participation

Furthermore, the researcher ensured that the participants were treated with all the respect they deserved. It was imagined 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 participants, the researcher tried by all means to establish a good rapport with them before the day of the meeting. The participants were also asked to feel free to withdraw from the study at any time if they felt that they could not give the needed information.

3.13. Summary

In this chapter, the methodology that was used to collect data for this study has been discussed. The research paradigm, research design, study site, study population and a description of the sample has been given. Data collection methods and instruments have also been discussed. This was followed by an explanation of the data collection procedures, validity and reliability, data analysis procedures and ethical considerations. What follows next is now the presentation of the research findings.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.1. Overview

In the previous chapter, the researcher described the methodology which was employed in this study. In this chapter, the findings of the study have been presented. The results are based on the data that was collected through interviews, lesson observations and questionnaires which were administered to secondary school head teachers, teachers of Computer Studies, grade nine learners learning Computer Studies and parents of learners in grade nine level of education. The data collected through interviews and lesson observations provided several themes which were aligned as answers to the research questions and data from questionnaires added detail.

4.2. Demographics of the Participants

Participants who took part in this study were asked to indicate a brief background information in order to help in analysing data in terms of gender, age, highest professional qualification, subject combinations/specialisation and teaching experience. Tables 4.1, 4.2, 4.3 and 4.4 indicate the background information of respondents.

Table 4. 1: Frequency and percentage distribution of participants by gender for the combination of head teachers, teachers, learners and parents

Variable	***f***	***%***
Gender (n = 75)		
Male	41	54.7
Female	34	45.3
Total	**75**	**100.0**

Table 4.1 indicates that most 54.7 percent of the participants were male while the remaining 45.3 percent were female.

Table 4. 2: *Frequency and percentage distributions of teachers according to gender and working experiences*

Variable	***f***	**%**	**Total**	
			Number	**Cumulative %**
Gender (n =12)			12	83
Male	10	83		
Female	2	17		100
Work Experience				
0 - 5 years	4	33		33
6 -10 years	4	33		67
11-15 years	1	83		75
16 years and above	3	25		100
Years of teaching Computer Studies				
0 -5 years	12	100		100

Table 4.2 shows that the majority 10, representing 83 percent of teachers who participated in this study were males while two, representing 17 percent were female. Further, 12, representing 100 percent of the participants taught Computer Studies in the period between zero to five years. So, there were no teachers that had taught Computer Studies for more than five years.

Table 4. 3: *Frequency and percentage distributions of grade nine learners according to gender and age group*

Variable	***f***	**%**	**Total**	
			Number	**Cumulative %**
Male	19	37	51	37
Female	32	63		100
Age group				
10-12	5	10		10
13-15	40	78		88
16-18	5	10		98
19 years and above	1	2		100

Table 4.3 shows that the majority 63 percent of learners that participated in the study were female while 37 percent of learners were male. Further, the highest age group 78 percent

were in the age group 13 years to 15 years, 10 percent of learners were either in the age group 10 years to 12 years or 16 years to 18 years and only two percent were above 19 years of age.

Table 4. 4: *Frequency and percentage distributions according to teachers' subject combinations/specialisations*

Subject combinations/specialisations	***f***	**%**	**Cumulative %**
Computer Studies	1	8	8
Business Studies	9	75	83
Home Economics	1	8	92
Mathematics and Physical Education	1	8	100
Total	**12**	**100**	

Generally, Table 4.4 shows that the majority 75 percent of teachers teaching Computer Studies in the schools sampled were specialised in business studies and the rest eight percent of teachers were either specialised in Computer Studies, home economics or mathematics and physical education.

4.3. Pilot Study

A pilot study was carried out amongst sixteen grade nine learners, four teachers of Computer Studies, one head teacher and two parents in a different school other than where the study was conducted. A pilot study was important as it helped the researcher to ensure that any anomalies and ambiguous questions were corrected before the research instruments were administered to the sampled population. The pilot study was thus done to ensure that the research instruments were measuring what they were anticipated to measure, whether the questions were rightly set and could provoke a right response. The pilot study also enabled the researcher to check for the clarity of the wording and find out whether the participants could interpret the questions in a similar manner.

However, the research findings were not in any way different from the results of the field study. The findings showed that facilities and equipment and qualified teachers of Computer Studies were not available for the implementation of Computer Studies. It was

further reviewed that most teachers used inappropriate teaching methods. The pilot study was successful and gave the researcher a foundation for this study.

4.4. Facilities and Equipment for Computer Studies Curriculum Implementation

The first research question of this study sought to establish the availability of facilities and equipment for the implementation of Computer Studies curriculum in selected secondary schools in Mufumbwe district. The research question was as follows;

What facilities and equipment are available for the implementation of the Computer Studies Curriculum in selected secondary schools of Mufumbwe district?

In order to answer this question, questionnaire for teachers of Computer Studies, items number 7 to 13, questionnaire for learners' items number 4, 5, 6, 7, and 9 and interview schedule for head teachers sought information on the availability of facilities and equipment for the implementation of the Computer Studies curriculum in secondary schools. This was in view of establishing whether there were adequate facilities and equipment in order to effectively implement the Computer Studies curriculum in secondary schools. School buildings, classrooms and laboratories were vital determinants of quality education delivery. In trying to answer research question one, the researcher asked the participants on the availability of physical facilities in the schools that would enable a conducive environment for teaching and learning Computer Studies and whether they were adequate. These facilities included classrooms and computer laboratories.

4.4.1. Computer Laboratories

Teachers of Computer Studies and learners were asked whether the schools had adequate computer laboratories for learners learning Computer Studies. These were asked to indicate with a yes or no if computer laboratories were available. Three, representing 25 percent of teachers reported that computer laboratories were available while eight, representing 66.7 percent of teachers reported that there were no computer laboratories and then one, representing 8.3 percent did not respond. In addition, fifteen representing 29.4 percent, of learners reported that computer laboratories were available in their schools while the majority thirty-six, representing 70.6 percent reported that computer

laboratories were not available at all. A summary of the responses by teachers of Computer Studies and learners is given in Table 4.5.

Table 4. 5: *Frequency and percentage distribution of learners and teachers' responses on the availability of computer laboratories.*

Responses on computer laboratories	***Learners***		***Teachers***	
	f	%	*f*	%
Yes	15	29.4	3	25.0
No	36	70.6	8	66.7
Missing	-	-	1	8.3
Total	**51**	**100.0**	**12**	**100.0**

However, one representing 25 percent of the head teachers said that their school had classrooms and a fairly furnished computer laboratory while three, representing 75 percent said that their schools did not have computer laboratories but had classrooms in place where computer lessons and practicals were taking place.

Head teacher 1 commented that:

> *We have a computer laboratory but it is not well equipped as it lacks most of the necessary equipment such as printers, photocopier, scanners, overhead projectors, internet, etc. The computer laboratory has no proper furniture in place although we use it mainly for practicals and examinations.*

Head teacher 2 explained that:

> *We have an improvised computer laboratory which is used as a classroom and rearranged into a laboratory during practicals. It is a cumbersome condition though as much time is lost and difficult to take care of the few computers the school has. Additionally, learners do not have a feel of what goes on in a computer laboratory.*

When the researcher probed further as to whether he was confirming that the school had a computer laboratory though in a bad shape, head teacher 2 further stated that:

> *No, we do not have any computer laboratory at all.*

Moreover, on the same issue, head teacher 3 commented that:

> *The school does not have any computer laboratory at all. All the lessons take place in the classroom and no practical is done as they did not have any computers at all. Government should consider providing some computers and build computer laboratories so that learners are taught holistically unlike the traditional lecture methods that our learners are subjected to.*

The response by head teacher 3 was actually similar to that of head teacher 4.

In addition, the issue of learners learning Computer Studies in a classroom was also seen by the researcher as shown in the Appendix 8 picture number 3 where learners were found and observed by the researcher learning computer lessons which requires a practical aspect in a classroom.

4.5. Source of Power Generation

Out of the four secondary schools that the researcher visited, two were connected to the electricity national grid while the other two were not connected at the time of the research. However, in one of these schools, the researcher was informed that plans were underway to have the school electrified through the Rural Electrification Authority (REA). At the time of the research, the researcher found one teacher struggling to switch on a petrol generator so that he could teach learners. Reliable source of power supply is very important for effective implementation of Computer Studies as it involves hands on activities. The researcher observed that while the teacher was still struggling to switch on a generator, time for learning was lost. Head teachers, teachers and learners were asked about the source of power generation; Table 4.6 reveals their responses.

Table 4. 6: *Percentage distributions of learners, teachers and head teachers' responses on the source of power generation in schools*

Responses	**Learners**		**Teachers**		**Head teachers**	
	f	%	*f*	%	*f*	%
ZESCO	33	64.7	7	58.3	2	50.0
Generator	18	35.3	5	41.7	2	50.0
Total	**51**	**100.0**	**12**	**100.0**	**4**	**100.0**

From Table 4.6, the majority 64.7 percent of the learners agreed that the main source of power in schools was provided by the Zambia Electricity Supply Cooperation (ZESCO) while 35 percent indicated that they were using a generator. In addition, most teachers and head teachers, 58.3 percent and 50.0 percent respectively responded that ZESCO was the main source of power generation in schools while 41.7 percent and 50.0 percent indicated that they were using a generator as their source of power. However, during the interviews with the head teachers concerning power generation whether they were facing challenges or not, they gave the responses as follows:

Head teacher 2 said that:

> *We are connected to the national electricity grid and we do not face much challenge in terms of power supply as there has been no load shedding as you may be aware. The only times we face power shortages is when the units get finished. Power shortages happens in very rare situations only when all the power was used up in the night or weekends and as you report for work you may find that there is no power. However, in that case we quickly plan and ensure that units are bought and power installed. I can assure you that such a situation happens in very rare moments. As for power we do not have any challenges.*

In a different view from that of head teacher 2, head teacher 3 responded that:

> *Our school is not connected to the ZESCO grid. As a result, we have challenges in terms of power generation. We bought a petrol generator but we have challenges due to insufficient funds to buy fuel to ensure that the generator is kept running.*

Similarly, head teacher 4 had similar views with that of head teacher 3 but added that:

> *In terms of power generation, the school bought a petrol generator but broke down a long time ago. So, during practical we borrow a generator from the DEBS office. But all the same, we face challenges of buying petrol to use in the generator.*

But head teacher 1 argued that:

> *The school has no challenges in terms of power supply. We are connected to the national grid and do not experience any power outages.*

The views given by participants in line with the source of power generation indicated that two (2) out of the four (4) schools sampled in this study had challenges with power supply while the other two (2) were not facing any challenge. However, this does not imply that

the two schools connected to electricity national grid had no challenges with power supply as they did not have standby generators to keep them running in case of power failure by ZESCO. The two (2) schools that were not connected to the national electricity grid seemed to be struggling so much as evidenced by the findings when a teacher was observed struggling to switch on a fault generator during computer practicals.

4.6. Materials for Computer Studies

4.6.1. Textbooks

The researcher wanted to know whether there were pupil's textbooks available in secondary schools. Information was gathered from head teachers, teachers of Computer Studies and learners. These were asked to indicate with a yes or no if pupil's textbooks were available. A summary of the results obtained is presented in Table 4.7.

Table 4. 7: *Frequency and percentage distributions of learners', teachers' and head teachers' responses on the availability of textbooks in schools*

Responses	***f***	***%***	**Cumulative %**
Yes	62	92.5	91.2
No	5	7.5	100.0
Total	**67**	**100.0**	

The results in Table 4.7 reveal that textbooks for Computer Studies in secondary schools are available. The majority 92.5 percent of the respondents agreed that textbooks for Computer Studies were available and learners were using them in class while 7.5 percent disagreed that textbooks for Computer Studies were not available in secondary schools. Similarly, all head teachers interviewed indicated that textbooks books were in good supply and their schools had received them though late comparing to the time Computer Studies was introduced in the schools.

For instance, responding to the question on availability of textbooks head teacher 2 stressed that:

> *Our school received enough textbooks from the MoGE through DEBS office. In fact, Computer Studies is one of the subjects in the school with*

well stocked textbooks. Apart from textbooks, the school also received other materials for use in Computer Studies. Among the materials received included syllabus, charts and teacher's guide. So, we do not have any challenges in terms of textbooks for Computer Studies in the school.

However, Head teacher 1 explained that:

We have textbooks for Computer Studies in place. However, there challenges with the kind of textbooks that we received from the MoGE through DEBS office. Teachers are equally complaining that the textbooks are not detailed. Hence, it is my appeal that the government should consider supplying more detailed textbooks for Computer Studies especially from different publishers other than MK publishers.

Just like the views of head teacher 1, head teacher 3 had this to say:

Textbooks for Computer Studies were supplied to the school though they were not adequate for all the learners in class. Due to the shortfall of the textbooks in class, learners are always put in groups in order to share the books. Also, teacher's guide not adequate. I only hope the government shall consider us in the next allocation of textbooks. Otherwise sharing textbooks is not helping the learners at all.

The researcher also observed that in all the schools that were visited, despite the learners' textbooks having been supplied to secondary schools, they were inadequate. For instance, learners were put in groups of five to six to share one textbook. However, the textbooks were not available to all learners each time they needed them during study times and extra periods because they were either under key and lock or being used by another class. Similarly, teachers' guidebooks were not adequate. Most teachers were found teaching without teachers' guidebooks. Learners were asked to indicate using a yes or no whether or not teachers' guidebooks were adequate. Table 4.8 shows the learner's responses regarding the usage of textbooks during Computer Studies lessons.

Table 4. 8*: Frequency and percentage distribution of learners' response about the usage of textbooks in Computer Studies lessons*

Responses	***f***	**%**
Yes	5	9.8
No	46	90.2
Total	**51**	**100.0**

The data in Table 4.8 shows that the majority 90.2 percent of the learners disagreed that they did not use textbooks in Computer Studies lessons while 9.8 percent agreed that they used textbooks in their classes. The responses by the majority learners is in line with what the researcher observed that textbooks were there but not enough for all learners.

Furthermore, textbooks should be well prepared and up-to-date. The pie chart in Figure 4.1 shows the learners' response to the extent to which the textbooks were up-to-date and of quality.

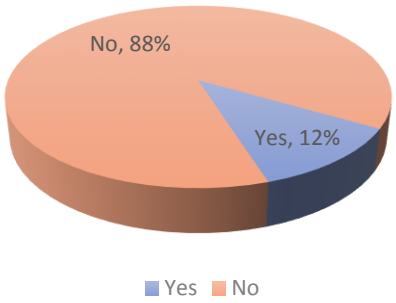

Figure 4. 1: *Frequency and percentage distribution of learners' responses on their views concerning the up-to date of textbooks*

The pie chart in Figure 4.1 reveals that most of learners said the textbooks for Computer Studies were not up-to-date. The majority 45, representing 88 percent of the learners revealed that the textbooks were not up-to-date as they lacked much of the information needed for the subject a situation which has led to teachers using notes from different sources. This finding confirms what the head teachers said concerning the accuracy of the textbooks found in their secondary schools.

4.7. Equipment for Computer Studies

4.7.1. Computers

The study also sought to establish the availability of computers for use by learners in schools for effective implementation of Computer Studies. This was captured in the questionnaires for teachers of Computer Studies and learners, interviews conducted with head teachers and researchers' observation where yes indicates the availability of

computers while no represented the non-availability of computers. The results of the findings are summarized in Table 4.9.

Table 4. 9: *Frequency and percentage distribution of learners, teachers and head teachers' responses on the availability of computers*

Responses	**Learners**		**Teachers**		**Head teachers**	
	f	%	*f*	%	*f*	%
Yes	30	58.8	8	66.7	2	50.0
No	21	41.2	4	33.3	2	50.0
Total	**51**	**100.0**	**12**	**100.0**	**4**	**100.0**

The results in Table 4.9 reveals that computers were available in secondary schools. Majority eight, representing 66.7 percent of teachers indicated that they had computers in their schools while four, representing 33.3 percent of teachers did respond that computers were not available. Equally 30, representing 58.8 percent of learners agreed that computers were available while 21, representing 41.2 percent of learners did not confirm any availability of computers in their schools. However, two representing 50 percent of head teachers interviewed revealed that computers were available in their secondary schools while two, representing 50 percent of head teachers denied having computers for learners.

Head teacher 1 commented that:

> *Yes, I can confirm that we have computers in the school but going by the number of learners that we have, I can say our computers are very few as compared to the number of learners taking Computer Studies. The total number of grade 8 and 9 taking Computer Studies are about 260 learners……so going by this number, the computers are very few to cater all of them.*

Similarly, head teacher 2 explained that:

> *We have a combination of desktops and laptops computers. We have seven desktops and five laptops though they are not enough as compared to the 106 learners that we have in grade 8 and 9. …we do not have enough financial resources to procure more computers. Just recently, we bought two laptop computers. All these laptops and computers that I have mentioned were bought by the school. The MoGE has never provided us*

with any computers at all. We just used our little resources to procure these gadgets.

However, when asked if they had computers for learners in their school head teacher 4 had this to say:

> *We have nil. We do not have any computer in the school to be used by learners for Computer Studies. The school has 49 learners in grade 8 and 62 in grade 9 giving a total of 111 learners taking Computer Studies. During practical, we just borrow laptops from teachers. For instance, during the previous examination, we borrowed 4 laptops from teachers and 3 desktops from DEBS office. Even this year, we are hoping to borrow laptops from the teachers and also borrow from the DEBS…… Even if we borrow the computers, its by far to state that they there are by far not enough for all learners taking Computer Studies at this school.*

And head teacher 3 said that:

> *Since the school was opened in 2014, we just received only one computer from DEBS office which does not function. So, this has made it very difficult for us to teach Computer Studies since the subject requires a practical aspect. So, during practicals we borrow computers from teachers and then lobby for some from a nearby primary school. However, the borrowed computers are by very inadequate for all the learners.*

Furthermore, the lack of computers in secondary schools was observed by the researcher as most of the schools lacked the equipment. This was also evident during lesson observation when most teachers were shunning practical lessons but preferred theory lessons. Secondary school teachers of Computer Studies were also asked to state the ratio of learners to computers. The responses on the ratio of computers to learners are given in Figure 4.2.

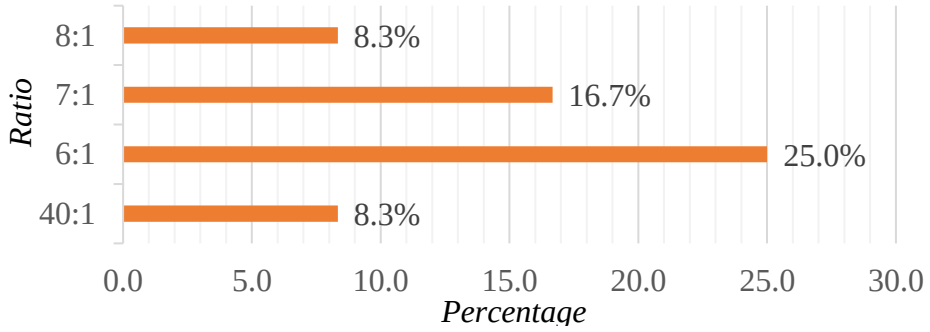

Figure 4. 2*: Percentages distributions of teachers' responses on a learner to computer ratio*

In response to the ratio of learners to computers, 25.0 percent of teachers stated that there were six learners sharing one computer, 16.7 percent reported that seven learners shared one computer and 8.3 percent reported that eight learners and 40 learners shared one computer respectively.

4.7.2. Scanners

The researcher also wanted to know whether there were scanners available in schools. On this item, information was gathered from head teachers, teachers of Computer Studies and learners. Yes, indicates the availability of scanners while no represents the non-availability of scanners. Results obtained were as presented in Table 4.10.

Table 4. 10: *Frequency and percentage distribution of learners', teachers' and head teachers' responses on the availability of scanners in schools*

Responses	**Learners**		**Teachers**		**Head teachers**	
	f	%	*f*	%	*f*	%
Yes	4	7.8	2	16.7	1	25.0
No	47	92.2	10	83.3	3	75.0
Total	**51**	**100.0**	**12**	**100.0**	**4**	**100.0**

Data collected from learners in line with the availability of scanners in secondary schools revealed that 92.2 percent of learners said there were no scanners in their schools while 7.8 percent agreed that scanners were available. Additionally, majority 83.3 percent of teachers also indicated that there were no scanners while 16.7 percent agreed having scanners. Seventy-five percent of head teachers denied having scanners and 25 percent responded with a yes.

During an interview with the head teachers, head teacher 2 said that:

> *We only have one small printer that also does some scanning although at a very small scale.*

The other three head teachers also responded that they did not have any scanners in their schools. The researcher also observed that scanners were not available in most of the schools that were visited. Most learners did not even know how a scanner looked like as a case was in one of the classes of school 2 where the researcher observed a lesson. When

the teacher asked learners as to whether they knew how a scanner looked like, they all didn't know it even when the equipment was available at the time the teacher was teaching.

4.7.3. Internet

The researcher observed that there was no internet connectivity in all the schools he visited. During an interview with the head teachers on internet connectivity in their respective schools, three out of four head teachers said that they did not have any internet connectivity at all.

However, head teacher 1 said that:

> *In terms of internet connectivity, we have a small router… mainly our router is not used by our learners but used for purpose of online candidate registration during grade nine and twelve examination data entries.*

The response by the head teacher 1 does not in any way qualify that the school had internet connectivity for use by learners. However, head teachers 2, 3 and 4 explained that their schools had no internet connectivity. They further expressed worry on how their schools will manage to enter candidates for examinations as the system for Examination Council of Zambia has completely changed from electronic candidate registration system to online candidate registration system.

Teachers and learners were also asked to give their views by indicating with yes if internet was available or a no showing that internet connectivity was not available. The responses are summarised in Table 4.11.

Table 4. 11: *Frequency and Percentage distribution of learners, and teachers' responses on the availability of internet connectivity*

Responses	**Learners**		**Teachers**	
	f	*%*	*f*	*%*
Yes	1	2.0	0	0.0
No	50	98.0	12	100.0
Total	**51**	**100.0**	**12**	**100.0**

From the data given in Table 4.11, it can be deduced that the schools visited did not have any internet connectivity in place. Out of 51 learners, one representing 2.0 percent of the learners said there was internet connectivity in their schools while the majority 50, representing 98.0 percent of the respondents argued that there was no internet connectivity in their schools as shown in Table 4.11. Similarly, all 12, representing 100 percent of teachers said there were no internet connectivity available in schools.

4.7.4. Printers

The study also sought to establish the availability of printers for use by learners in schools. The information was captured in the questionnaires for learners and teachers, interviews conducted with the head teachers and researchers' observation. Table 4.12 summaries the responses by the participants where yes indicates the availability of printers while no represents the non-availability of printers in schools. Table 4.12 presents a summary for responses from learners and teachers.

Table 4. 12: *Frequency and percentage distribution of learners' and teachers' responses on the availability of printers in schools*

Responses	**Learners**		**Teachers**	
	f	*%*	*f*	*%*
Yes	3	5.9	2	16.7
No	48	94.1	10	83.3
Total	**51**	**100.0**	**12**	**100.0**

The results in Table 4.12 shows that the majority 94.1 percent of learners were of the opinion that there were no printers available in their schools while 5.9 percent agreed that printers were available. Similarly, the majority 83.3 percent of teachers stated that there were no printers to be used by learners in schools and 16.7 percent agreed that indeed printers were available.

When asked whether printers were available in schools, head teachers had different comments though mostly having similar views.

Head teacher 1 commented:

> *As a school, we have a duplicating machine (Riso Machine) which does the job of printing as well. It can photocopy and print though it is quiet an expensive venture as the duplicating machine is not user friendly and quite expensive to run. We also had a small printer that could photocopy but it has since broken down. We have failed to fix it due to financial constraints.*

Head teacher 2 explained that:

> *We do not have a printer in the school that I can say can be used by learners in computer lessons. It is very difficult that I cannot confirm that we are able to buy a printer soon due to insufficient funds in the school. We travel to the BOMA (township) when we want to print anything. Otherwise during computer lessons and practical, our learners do not access the printers. It is actually a very difficult task that we have in ensuring that Computer Studies is implemented.*

Head teacher 3 stated that:

> *We had a printer but it has run out of ink. I think I would say we have a printer because I am hopefully when resources permit, we shall be able to buy ink and this will see the machine be functional.*

Head teacher 4 argued that:

> *The issue of a printer is never heard of at this school. We do not have any printers in place at all. During examinations, we borrowed one printer from the DEBS office and was returned immediately after the examinations were over.*

From the above responses, it is quite clear that printers were not available in schools. For instance, the response given by head teacher 1 does not qualify such a school to have a printer. The Riso Machine is by far different from a printer in terms of its operations and very expensive to be used in Computer Studies lessons. The lack of printers in schools was also observed by the researcher in all the schools that were sampled.

4.7.5. Overhead projectors

The study also sought to establish the availability of overhead projectors for use by learners in schools. The information was captured in the questionnaires for learners and teachers, interviews conducted with the head teachers and researchers' observation. Table

4.13 summaries the responses by the participants where yes indicates the availability of overhead projectors while no represents the non-availability of overhead projectors in schools. Results of the findings on this issue are summarised in Table 4.13.

Table 4. 13: *Frequency and percentage distribution of learners, teachers, and head teachers' responses on the availability of overhead projectors in schools.*

Responses	**Learners**		**Teachers**		**Head teachers**	
	f	%	*f*	%	*f*	%
Yes	0	0.0	0	0.0	0	0.0
No	51	100.0	12	100.0	4	100.0
Total	**51**	**100.0**	**12**	**100.0**	**4**	**100.0**

From the data given in Table 4.13, it can be concluded that overhead projectors were not available in all the schools sampled in this study. All 100 percent of the learners, teachers, and head teachers disagreed that there were no overhead projectors in their schools.

If we juxtapose the views of teachers of Computer Studies and those from head teachers, we would notice clear similar positions that equipment such as computers, printers, scanners, internet gadgets, and overhead projectors were not available in schools. The data show that schools were asked to implement a curriculum without putting the necessary equipment in place. The implication of lack of this equipment may be that the teaching and learning of Computer Studies could not be effective. In the next section, the researcher sought to have a general picture of the adequacy of facilities and equipment available in schools.

4.8. Adequacy of facilities and equipment

Having gathered and presented information on the availability of facilities and equipment, the researcher also wanted to have a general picture of the adequacy of facilities and equipment available in schools for effective implementation of Computer Studies curriculum. This was captured in the questionnaires for teachers of Computer Studies and learners and head teachers interview schedule. The results of the findings are summarized in Table 4.14.

Table 4. 14: *Frequency and percentage distribution of the level of adequacy of the facilities, equipment and materials by teachers*

Facilities/equipment /resources/ infrastructure	**Very Adequate**		**Adequate**		**Fairly Adequate**		**Inadequate**	
	f	%	*f*	%	*f*	%	*f*	%
Computers	0	0.0	0	0.0	5	41.7	7	58.3
Computer laboratory	0	0.0	2	16.7	0	0.0	10	83.3
Textbooks	2	16.7	9	75.0	1	8.3	0	0.0
Scanners	0	0.0	0	0.0	2	16.7	10	83.3
Printers	0	0.0	0	0.0	2	16.7	10	83.3
Internet	0	0.0	0	0.0	0	0.0	12	100.0
Electricity	6	50.0	1	8.3	0	0.0	5	41.7
Overhead projectors	0	0.0	0	0.0	0	0.0	12	100.0
Photocopiers	0	0.0	0	0.0	2	16.7	10	83.3

From the information given in Table 4.14, it can be deduced that textbooks for computers studies were adequate in schools and favourably supply of electricity. However, equipment such as computers were either fairly adequate or inadequate in most schools that were sampled while internet and overhead projectors were not adequate in all schools. Majority of the teachers responded that scanners, printers and photocopiers were inadequate while facilities such as computer laboratories were inadequate too. Computer Studies being a practical subject requires that facilities and equipment are adequate for effective implementation of a curriculum. Unlike other subjects, Computer Studies require hands on activities by the learners. For instance, learners cannot be taught in abstract or theoretically but are expected to spend most their time practicing with computers. After all, at the end of it all they write a practical examination. Apart from the responses given by teachers who are the direct implementers of a curriculum, head teachers also alluded to the issue with regret.

During interviews with the head teachers on the adequacy of facilities and equipment, the following were their responses;

Head teacher 3 commented that:

> *In line with Computer Studies, the only materials that I can say we have in abundance are the textbooks. Otherwise computers for use by learners, computer laboratory, scanners, printers, internet, electricity, overhead projectors and photocopiers that you are talking about are not there. The is completely nothing…… I may not be in a position to predict when these things shall be put in place.*
>
> *……. the lack of these materials has got negative effects on the performance of learners in Computer Studies even though we see learners having a zeal to learn Computer Studies. I feel if these things were put in place in the schools, learners would have performed better. How I wish these facilities were put in place before the subject was introduced to be taught in schools.*

Head teacher 4 explained that:

> *Our school has short supply of all equipment needed for Computer Studies. The only materials that teachers use are the pupil's books though they are not adequate. As for computers and other things, (photocopiers, scanners, printers, computer laboratory) are not there. We were given only one desktop computer but it is also not working. ……. mostly, learners do not even know how these things look like in reality apart from the pictures they see in the textbooks. Due to this shortage of the materials, we wanted to stop offering this subject but DEBS office encouraged us not to stop.*
>
> *For electricity, we are not yet connected to the national grid but plans are underway through REA. Previously we were using this (generator) which we procured but it has since broken down.*

Head teacher 2 said that:

> *Actually, MoGE supplied us with all the necessary textbooks for use by our pupils. I think they are being used by all learners though they are not adequate, we still need some more. Computers are there (7 in total) but they are not enough to cater for all learners.*
>
> *We do not have a computer laboratory, but learners learn from the classroom.*
>
> *We have a small printer which also does photocopying though not very much reliable because it is mainly used by management and not learners. So, it is not adequate. The other equipment such as scanners, internet, etc are not even heard of at all at this school. With internet we just improvise using smaller gadgets during online candidate registration and not during lessons.*

However, Head teacher 1 sounded a little bit positive when he said that:

> *We managed to procure 11 computers using PTA funds and MoGE gave us 10 more seeing the efforts that we had put up ourselves. However, these computers are inadequate for all the learners because of the overwhelming numbers of enrolment at our school taking into consideration that it is centrally located.*
>
> *Again, we saw the insecurity in our computers, so we decided to construct a computer laboratory. We hope that with funds we shall furnish it to a standard of a computer laboratory. But as it stands, practical are taking place in the improvised laboratory.*
>
> *At least with textbooks we received some from the MoGE through DEBS office. I believe that our learners are utilising these materials in classes.*
>
> *……electricity is provided by ZESCO and I can happily inform you that we do not face any challenges in line with power supply. At least with power supply is adequate. As long as we have money to buy units then we are done.*
>
> *We have one printer, which at the same time can be used for scanning and photocopying. It is used for administration purpose. With funds we can buy one specifically for that room (Computer Laboratory).*

In addition, grade nine learners who are the direct beneficiaries of an effectively implemented curriculum were asked if their schools had adequate facilities and equipment for use during Computer Studies lessons. This was done using question number 4 in the questionnaire for learners. Figure 4.3 provides a summary of responses from the learners on the adequacy of facilities and equipment for Computer Studies.

4.9. Summary on the availability of Facilities and Equipment

Research question one found out the availability of facilities and equipment for the implementation of Computer Studies. in secondary schools. Generally, respondents indicated that to a large extent facilities and equipment such as computer laboratories, computers, scanners, printers, photocopiers, overhead projectors and internet in secondary schools were inadequate. Surprisingly, very few teachers and learners were conversant with some of these equipment despite teaching and learning Computer Studies respectively. Additionally, respondents expressed that textbooks and electricity were satisfactorily available and adequate though it was noted in very few circumstances that they were inadequate. It was also a concern by respondents that lack of these facilities and

equipment had a negative effect on the teaching and learning of Computer Studies in schools.

4.10. Availability of Qualified Teachers of Computer Studies

For teaching and learning to be viable, teachers need to undertake holistic teacher education. The teacher should not only undergo teacher education but have a capacity to implement a curriculum. If one has not been to a college of education or university to be prepared in a specific subject, then he or she is not fit to be called a teacher. Whoever teaches without having gone for teacher education preparation may destroy and demoralise the learners. Therefore, there should be different levels of teacher education and a teacher should adhere to his or her level of education (Gross, 1971). It is for this reason that this study sought to find out if the teachers teaching Computer Studies in secondary schools in Mufumbwe district were educated to teach Computer Studies.

The second research question of this study was;

Are there enough qualified teachers to enhance the effective implementation of the Computer Studies Curriculum in selected secondary schools of Mufumbwe district?

In order to find out this, the researcher had to find out if there were teachers qualified to teach learners in Computer Studies. The second research question was answered through question 4 and 14 in the teachers' questionnaire and question 10 in the learners' questionnaire. The researcher also interviewed the head teacher on question 10 and 11 of the interview schedule to gather the same information. This was supplemented by the findings from the Computer Studies lessons which were observed by the researcher. Question 4 in the teachers' questionnaire collected data on teacher's subject specialisation. The results of the study are given in Table 4.15.

Table 4. 15: *Frequency and percentage distribution of the subject specialisation of teachers teaching Computer Studies.*

Subject specialisation	*f*	%	Cumulative %
Computer Studies	1	8.3	8.3
Business Studies	9	75.0	83.3
Home Economics	1	8.3	91.7
Mathematics and Physical Education	1	8.3	100.0
Total	**12**	**100.0**	

The subject combinations/specialisation of the teachers in the schools that were visited was as shown in Table 4.15. The data shows that one teacher representing 8.3 percent had attained education to teach Computer Studies, nine teachers representing 75.0 percent were specialised in business studies, and one representing 8.3 percent was either specialised in home economics or mathematics and physical education. Teacher education is very important for effective curriculum implementation. However, there seems to be no qualified teachers to teach learners in Computer Studies in the schools sampled apart from one school that had only one teacher as shown in Figure 4.3. Question 14 in the teachers' questionnaire, question 10 in learners' questionnaire and question 11 in head teachers' interview schedule were used to collect information on the availability of qualified teachers of Computer Studies. The results of the study are given in Figure 4.3.

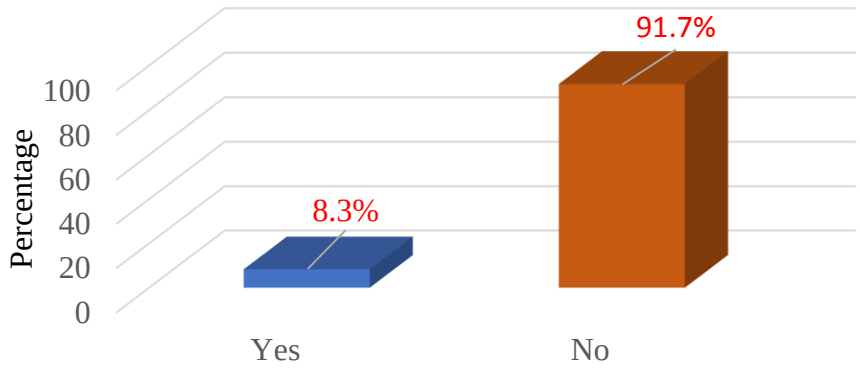

Figure 4. 3: *Percentage distribution of the number of teachers qualified to teach Computer Studies*

It was clear from the responses that were provided on whether teachers had undergone teacher education on how to teach Computer Studies that teachers had not received any teacher education in Computer Studies. In trying to gather information on how much education they had received in order to teach Computer Studies, the majority 91.7 percent of teachers responded that they had never undergone any teacher education in Computer Studies while only 8.3 percent had received teacher education in Computer Studies especially in the schools sampled. Lack of attaining the required teacher education was also revealed by the head teachers during interviews.

Head teacher 1 explained that:

> *We have four teachers under business studies department, those are the ones who are teaching learners in Computer Studies but currently government gave us one teacher who is trained to teach Computer Studies. .....we still need some more teachers because we would like to introduce Computer Studies at senior level.*
>
> *Out of the four teachers, three are trained in business studies though not in Computer Studies. They are only asked to teach Computer Studies due to some knowledge and interest they exhibit in computers, we asked them to teach Computer Studies. But luckily, we have one teacher who is a qualified teacher trained to teach Computer Studies.*
>
> *Among the four who are in the department, only two are able to teach learners effectively but the other two still have challenges. We actually need some more teachers so that we will be able to introduce Computer Studies at senior secondary level.*

Head teacher 2 said that:

> *At the moment we have only one teacher teaching Computer Studies to grade 8 and grade 9 classes. .....not per say, I think he just have some basics. He did some computer lessons somewhere but a qualified teacher to teach business studies. He has never undergone teacher training courses on how to teach Computer Studies in anywhere.*
>
> *Otherwise we have a challenge due to the fact that we do not have a qualified teacher to teach learners competently in this subject.*

Head teacher 4 commented that:

> *We have only one teacher teaching Computer Studies in the school. He was identified to teach because he is the only one who has interest in computers and also the only trained teacher in business studies which was closely associated to Computer Studies.*
>
> *…..he is in trouble in terms of work overloads because he has to teach Computer Studies and business studies to grade 8 and 9 learners as well as commerce and principles of accounts to grade 11.*

Head teacher 3 had this to say:

> *In terms of teachers, we do not have any teacher qualified to teach Computer Studies. There is only one teacher helping in Computer Studies due to the interest he had shown in computers. Otherwise what I can say is that we do not have a teacher trained to teach the subject effectively.*

Lack of teachers qualified to teach Computer Studies was seen as a deterrent to learner performance either in formative or summative assessment. Head teachers were asked for their views on learner performance in Computer Studies, their responses were similar as all of them indicated that the performance was not good. When asked why they thought it was so, they (head teachers) said despite not having all the necessary equipment and facilities, teachers also contributed to poor performance by learners in the subject.

Head teacher 2 attributed the learners' average performance:

> *to the passion that the learners have for the subject (Computer Studies) despite the fact that we have unqualified teachers.*

4.11. Summary on the availability of Qualified Teachers of Computer Studies

Overall, participants indicated that there were no teachers qualified to teach Computer Studies in the sampled secondary schools in Mufumbwe district. Participants also explained that teachers were asked to teach Computer Studies based on their interest in computers. Lack of teachers qualified to teach Computer Studies can result in poor performance of learners and implementation of a curriculum. Respondents also wondered whether or not we can be able to achieve the 2018 World Teachers' Day Theme *"The Right to Education means the Right to a Qualified Teacher".* Therefore, teacher education is cardinal towards effective curriculum implementation.

4.12. Teaching Methods used in Teaching Computer Studies

The researcher in research question three sought information from head teachers, teachers of Computer Studies and learners on the appropriateness of teaching methods used by teachers during computer lessons and practical. The third research question was as follows: *how appropriate are the teaching methodologies in the implementation of the Computer Studies Curriculum in selected secondary schools of Mufumbwe district?*

4.13. Teaching Methods mostly used in Computer Studies

For effective teaching and learning to take place, two things are cardinal, the content (what to teach) and the teaching methods (how to teach). During the curriculum implementation process, teachers use a variety of teaching methods to enable learners acquire the necessary skills, values and knowledge. However, depending on the subject content, some teaching methods may not lead a learner to achieve the set objectives. In this study, secondary school teachers were asked in question 15 of the teachers' questionnaire to indicate on the Likert scale ranging from Very Often to Not at All as a way of establishing their views on the use of some of the methods in computer lessons for effective Computer Studies curriculum implementation. The four Likert scale was represented as follows; 1 = Very Often, 2 = Often, 3 = Not Often, 4 = Not at All. The responses from the teachers are summarised in Table 4.15.

Table 4. 16: *Frequency and percentage distribution of teachers' responses on the teaching methods frequently used*

		Total Positive	**1**	**2**	**3**	**4**	***Total Negative***	**Response Total**
Educational visits	*f*	1	0	1	1	10	11	12
	%	8.3	0.0	8.3	8.3	83.3	91.6	100.0
Lectures	*f*	8	4	4	2	2	4	12
	%	66.6	33.3	33.3	16.7	16.7	33.3	100.0
Practical	*f*	4	1	3	5	3	8	12
	%	33.3	8.3	25.0	41.7	25.0	66.7	100.0
Demonstrations	*f*	7	3	4	4	1	5	12
	%	58.3	25.0	33.3	33.3	8.3	41.7	100.0

Discussions	*f*	9	4	5	1	2	3	12
	%	75.0	33.3	41.7	8.3	16.7	25.0	100.0
Simulations software	*f*	4	1	3	3	5	8	12
	%	33.3	8.3	25.0	25.0	41.7	66.7	100.0
Questions and answers	*f*	9	6	3	2	1	3	12
	%	75.0	50.0	25.0	16.7	8.3	25.0	100.0
Computer aided	*f*	2	1	1	2	8	10	12
	%	16.6	8.3	8.3	16.7	66.7	83.3	100.0

The results in Table 4.16 indicates that the majority 75.0 percent of the respondents utilised discussions and questions and answers methods when teaching Computer Studies with the majority 91.6 percent either indicating not often or not at all on the usage of educational visits and computer aided methods.

Among the respondents, 66.7 percent of the teachers indicated that they did not use practical method while 66.6 percent indicated that they mostly utilised lecture methods when teaching learners Computer Studies.

Learners were also asked to indicate on the Likert scale ranging from Strongly Agree to Strongly Disagree as a way of establishing their views on the appropriateness of teaching methods used by their teachers in Computer Studies. This was captured using item number 12 in learners' questionnaire. The five Likert scale was represented as follows; 1 = Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, 5 = Strongly Disagree. The responses from learners are summarised in Table 4.17.

Table 4. 17: *Frequency and percentage distribution of learners' responses on the teaching methods frequently used by their teachers*

		Total Positive	**1**	**2**	**3**	**4**	**5**	***Total Negative***	**Response Total**
We visit many places to see different works that a computer can do, e.g. a bank	*f*	0	0	0	2	20	29	49	51
	%	0.0	0.0	0.0	3.9	39.2	56.9	96.1	100.0
Our teacher stands in front while explaining to us	*f*	39	20	19	6	4	2	6	51
	%	76.4	39.2	37.3	11.8	7.8	3.9	11.8	100.0
	f	1	0	1	5	22	23	45	51

Our teacher shows us how to open a computer, type, play games and practice	%	1.9	0.0	1.9	9.8	43.1	45.1	88.2	100.0
Our teacher asks us to show/demonstrate to others what we have learnt	*f*	3	1	2	3	18	27	45	49
	%	5.9	1.9	3.9	5.9	35.2	52.9	88.2	100.0
We are always put in groups and asked to share idea with others	*f*	46	30	16	2	1	2	3	51
	%	90.2	58.8	31.3	3.9	1.9	3.9	5.9	100.0
Our teacher teaches us how to use games, songs, art work, from the computer	*f*	2	1	1	1	23	25	48	51
	%	3.9	1.9	1.9	1.9	45.1	49.0	94.1	100.0
During Computer Studies lessons our teacher asks us questions which we answer	*f*	35	14	21	4	3	9	12	51
	%	68.6	27.4	41.2	7.8	5.9	17.6	23.5	100.0
Sometimes we learn how to type using different computer programmes	*f*	1	0	1	4	15	30	45	10
	%	1.9	0.0	1.9	7.8	29.4	58.8	88.2	100.0

The results in Table 4.17 shows that the majority 90.2 percent of learners were mainly subjected to group discussion method and a further 76.4 percent of the participants confirmed that lectures method was mainly used when teaching Computer Studies lessons as they either strongly agreed or agreed to the statements.

Among the teaching methods, the worst used method was educational visits where majority 96.1 percent of learners indicated in a total negative by either disagreeing or strongly disagreeing with the statement given.

A large number, 94.1 percent of learners were not exposed to simulations software such as games, art work, songs as they either disagreed or strongly disagreed to the statement. Additionally, the majority 88.2 percent of participants claimed that they did not have any practical, demonstrations and computer aided learning during computer lessons as it is evident from responses that they gave.

4.14. Views of teachers on appropriate teaching methods in Computer Studies

Teachers were asked to indicate on the Likert scale ranging from Excellent to Not well as a way of establishing their views on the appropriateness of the teaching methods to be used in Computer Studies. This was done using item number 16 in the secondary school teachers' questionnaires. The five Likert scale was represented as follows; 1 = Excellent,

2 = Very Well, 3 = Well, 4 = Fairly Well, 5 = Not Well. The responses from the teachers are summarised in Table 4.18.

Table 4. 18: *Frequency and percentage distribution of teachers' responses on the most appropriate teaching methods in Computer Studies lessons*

Methods		***Total Positive***	**1**	**2**	**3**	**4**	**5**	***Total Negative***	**Response Total**
Educational visits	*f*	9	6	3	1	1	1	2	12
	%	75.0	50.0	25.0	8.3	8.3	8.3	16.7	100.0
Lectures	*f*	1	0	1	0	3	6	9	10
	%	8.3	0.0	8.3	0.0	25.0	50.0	75.0	100.0
Practical	*f*	11	3	8	1	0	0	0	12
	%	91.7	25.0	66.7	8.3	0.0	0.0	0.0	100.0
Demonstrations	*f*	3	1	2	6	3	0	3	12
	%	25.0	8.3	16.7	50.0	25.0	0.0	25.0	100.0
Discussions	*f*	3	1	2	2	3	4	7	12
	%	25.0	8.3	16.7	16.7	25.0	33.3	58.3	100.0
Simulations software	*f*	3	0	3	2	5	0	5	10
	%	25.0	0.0	25.0	16.7	41.7	0	41.7	83.3
Questions and answers	*f*	0	0	0	4	4	4	8	12
	%	0.0	0.0	0.0	33.3	33.3	33.3	66.7	100.0
Computer aided learning	*f*	8	6	2	1	3	0	3	12
	%	66.7	50.0	16.7	8.3	25.0	0.0	25.0	100.0

From the results in Table 4.18, it is clear that the majority 91.7 percent were of a view that practical was the most appropriate method to be used in Computer Studies while the least appropriate method according to 75.0 percent of the participants was lecture method and yet that was what they used.

Educational visit was also considered an appropriate method by 75.0 percent of the respondents. Another method considered to be appropriate was computer aided learning where 66.7 percent of respondents agreed to the question.

Following the results given in Table 4.16, the researcher asked participants to explain why they preferred the teaching methods that they indicated. This was done using item number 17 of the teacher's questionnaire. Results in Figure 4.4 indicate that 69 percent of the teachers stated that their preferably method was used because they did not have the necessary equipment and facilities while 26 percent and 5 percent taught using their preferably methods because they felt the method captured learners' attention and that it was good for hands on experience respectively.

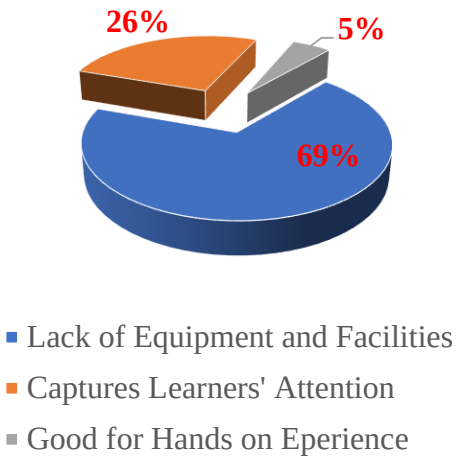

Figure 4. 4: *Percentage distribution of teachers' responses on their use of teaching methods*

The results in Figure 4.4 proposed that teachers knew the appropriate methods to be used when teaching learners Computer Studies but due to lack of facilities, equipment and knowledge in Computer Studies, they ended up using inappropriate methods. The data is suggesting that teachers knew that lecture and discussion methods were not appropriate methods to be used in Computer Studies. These results seem to suggest that teachers were not provided with the necessary equipment to use in order to apply appropriate methods. Teachers were also not well prepared to teach learners in Computer Studies.

In all the schools visited, the researcher found teachers either using the lecture method or the question and answer method. However, to effectively learn on how to use a computer, the learners should be exposed to hands on activities (practical), educational visits, and video-based tutoring. These methods seem to be most suited.

4.15. Respondent's views about Computer Studies in Schools

Research question number four sought to bring out views of head teachers, teachers, learners and parents on the teaching and learning of Computer Studies in secondary schools. the fourth research question was as follows: *What are the head teachers', teachers', learners' and parents' views on the teaching of Computer Studies in selected rural secondary schools of Mufumbwe district?*

What is presented in this section are the views of the participants on what their views were regarding the implementation of Computer Studies curriculum. This is so because head teachers and teachers are the curriculum implementers, learners are the direct beneficiaries and parents are the indirect beneficiaries of an implemented curriculum.

The researcher wanted to find out from the respondents if MoGE did a good thing to have Computer Studies introduced in secondary schools in Zambia. To help collect data, item number 18 in the teachers' questionnaire, item number 12 in the learners' questionnaire, item number 14 in the head teachers' interview schedule and item number 1 in the parents' interview guide sought to gather information on this issue. Figure 4.5 presents a summary of the respondents' views on whether the introduction of computer in secondary schools was a good thing.

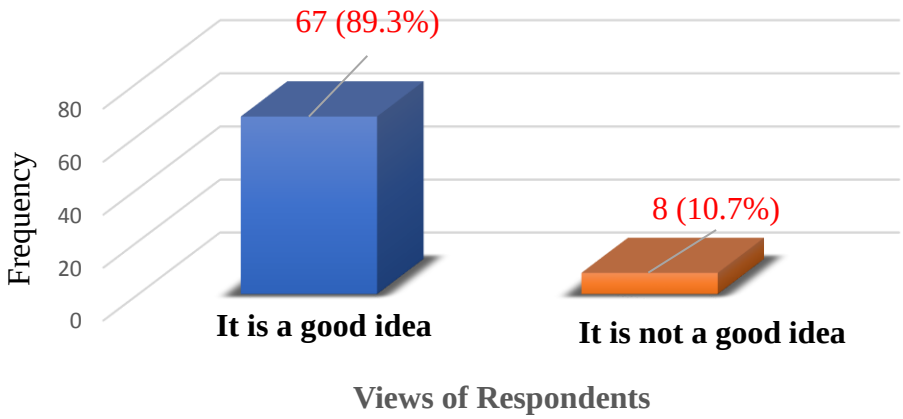

Figure 4.5: *Frequency and percentage distribution of head teachers, teachers, learners and parents' responses on whether the introduction of Computer Studies is a good thing*

Results in Figure 4.5 indicate that the majority 67, representing 89.3 percent of the respondents agreed that the introduction of Computer Studies was a good thing while eight representing 10.7 percent disagreed with the statement at hand. In an interview with the head teachers and parents, they indicated gladness on the introduction of Computer Studies in secondary schools.

Head teacher 1 commented that:

> *Yes, it is because even a number of teachers who never learnt computers are now learning and it has really helped them. In fact, that is a good thing. We have seen people struggling in the usage of computers and other ICT gadgets including me the head teacher I'm struggling because I never had a background in computers.*
>
> *Nowadays if you do not know how to operate a computer, you will find it very hard for you to write even an assignment. So, but now with the introduction of Computer Studies in schools, those that are learning would be able to know what is going on around the world. You know that we are living in a global world where we need to match with everyone and whatever is taking place. So, if Computer Studies were not introduced, I believe people would have limited access to information and the happenings around the world.*
>
> *So, at least if these (learners) will be taught the way they are learning now even by the time they will go to colleges and universities I think they will not find it hard for them to write their own assignments. I think it is a good move. That's the way to go.*

Head teacher 2 had this to say:

> *It was a good idea. But the only challenge is that government has even forgotten its obligation of trying to assist these schools with some of these computers. If there people (schools) that have been assisted…….a school like Kalende we are still crying to the government if one time or the other they may remember us at least even with two computers. You can imagine from the time this Computer Studies was introduced, we have never received not even not even I don't know what I can say not even one not even a laptop. The others (computers) that the school has were bought using the little resources we have as a school.*

Head teacher 3 said that:

> *It was a very good thing to have Computer Studies introduced in secondary schools. However, it was done in a hurry as no computers and teachers were sent into schools to kick start the commencement of the programme. Computer Studies being a practical subject needs learner to have*

computers in place and as they start practising they will enjoy. Now this hurriedness in introducing such a subject to a school like this one where there is no power and computers becomes a challenge. That is why learning is becoming boring to learners due to lack of computers. Just imagine you see our school has only one laptop.

Head teacher 4 commented similar comments as head teacher 3 though he added that:

Ya (yes) government did well to bring about Computer Studies in schools because as you are aware our world today technology has gone high but the only problem that we have seen is that the bringing in of Computer Studies it came as early. They (government) were supposed to wait until the computers, the labs are set in schools. That's when it was supposed to be there. But it's a good idea it is just a matter of facilities that are not there.

Furthermore, the researcher gathered information regarding the introduction of Computer Studies from parents whose learners were learning Computer Studies in the sampled secondary schools.

Parent 1 during an interview in Kiikaonde indicated that:

Kufunjisha kwa ma computer muma sikulu kyawama bingi mwane. Mambo banyike bafwainwa kuyuka mwakwingisha abuno computer pa ku bamba nangwa batana mingilo yapusana pusana muji yino computer kechi bankonsha ku kankalwa kwingila ine. Nanchi insa kwamba amba kufunjisha computer kubana bakusukulu kyawama bingi.

Translated as follows:

(Teaching of Computer Studies in schools is a very good thing. Because children need to know how to operate a computer so that if they find a job in different sectors involving computers, they cannot fail to execute the work. So, I can unresistingly say that teaching computers to school going children is a very good thing.)

Similarly, parent 2 speaking in Bemba commented that:

Awe ukusambilisha computer muma sukulu cisuma sana, pantu umwana kuti ayishiba ifyaku bomfya computer pachinto. Elyo futi chino chalo nachichinja apakalamba sana. Nachifika apa shupa apakuti umuntu teti ekalefye ukwabula ukwishiba ukubomfya ama computers.

Translated as follows:

(It is ideal or important to teach computers in schools, because it equips pupils with skills to use computers when they become employees. At the

same time, it should be noted that the world has advanced in technology, hence no child should be left out without knowing computers in this era.)

Parent 3 also explained that:

> *Actually, it is a good move to have Computer Studies introduced in schools because this time the age in which we are now, it is encouraged that people should be computer literate. And everything which is being done now is based on computers. When you go in hospitals you find computer usage, you go in education sector, you find computers, you go in mines you find computers, in RTSA you find computers. So, when they learn computers at schools, they will be able to know its functionality.*

Despite the challenges that schools seem to be facing in the process of implementation Computer Studies curriculum, the respondents had a positive view that the introduction of the subject was good. When successfully implemented, Computer Studies can instil into a learner skills and knowledge that can help advance his/her technological and innovative mind. The respondents were also of a view that the world is changing to a computer age where almost everything will be computerised. Hence, it is cardinal that learners learn Computer Studies to prepare them face the future with less challenges. In the next section, the researcher addresses the benefits of Computer Studies to learners.

4.16. Benefits of Computer Studies to Learners

Teachers and learners were also asked to explain the benefits of learning Computer Studies in schools. Table 4.18 gives a summary of the responses given by teachers and learners on the benefits of learning Computer Studies in schools.

Table 4. 19: *Frequency and percentage distributions of teachers and learners' responses on the benefits of learning Computer Studies*

Views of participants	**Teachers**		**Learners**	
	f	***%***	***f***	***%***
It equips learners with basic skills (e.g. research and study skills) needed in today's society.	2	16.8	8	15.7
Equips learners with ability to use modern technology.	1	8.3	5	9.8
Learners are able to manipulate Microsoft Office, calculate using excel, type and insert pictures,	4	33.3	16	31.4

shapes, and design magazines and save documents.				
Learning Computer Studies can be a source of self-employment and income.	3	25.0	12	23.5
Motivates learners and promotes critical thinking.	1	8.3	4	7.8
Computers are very useful in human life such as mining, hospitals and education.	1	8.3	4	7.8
Using computers is a fastest way of communication and promoting modernity.	-	-	2	4.0
Totals	**12**	**100**	**51**	**100**

From the reasons in Table 4.19, teachers and learners seemed to have given similar views on the benefits of learning Computer Studies in secondary schools. For example, 3 teachers and 12 learners stated that learning Computer Studies can be a source of self-employment and income to the learners. Furthermore, 4 teachers and 16 learners consented that through Computer Studies learners are able to manipulate Microsoft Office, calculate using excel, type and insert pictures, shapes, and design magazines and save documents. A further 8.3 percent of teachers and 7.8 percent of learners indicated that computers motivates learners and promotes critical thinking and that they are very useful in human life e.g. mining, hospitals, education respectively and 4.0 percent of learners indicated that computers provide a fastest way of communication.

4.17. Learners' Motivation to Learning Computer Studies

Having gathered and presented information on the benefits of Computer Studies to learners, the researcher also wanted to find out if at all learners were motivated to learn Computer Studies. This was captured in the questionnaires for teachers of Computer Studies and learners and head teachers' interview schedule. Item number 19 in the teachers' questionnaire, item number 11 in the learners' questionnaire and item number 13 in the head teachers' interview schedule were used to collect data. Respondents were asked to indicate with a yes if learners were motivated or no if they were not motivated to learn Computer Studies. Table 4.20 summarises the responses given by the participants.

Table 4. 20: *Frequency and percentage distributions of Teachers, Learners' and Head teachers' responses on learners' motivation in learning computers*

Responses	Teachers		Learners		Head teachers	
	f	*%*	*f*	*%*	*f*	*%*
Yes	9	75.0	44	86.3	2	50
No	3	25.0	7	13.7	2	50
Total	**12**	**100.0**	**51**	**100.0**	**4**	**100.0**

Results shown in Table 4.20 indicate that the majority 75.0 percent of teachers stated that learners enjoyed learning Computer Studies in class while 25.0 percent explained that learners did not enjoy learning Computer Studies. Some of the reasons they gave as to why they did not enjoy was mainly due to lack of equipment and facilities that enhance effective learning of Computer Studies in schools.

Similarly, learners' responses showed that the majority 86.3 percent of learners agreed that they enjoyed learning Computer Studies while 13.7 percent expressed that they did not enjoy at all. Learners indicated that they enjoyed learning the subject because it opened them to a lot of new ideas which the peers had not a chance to.

However, half 50 percent of the head teachers agreed that learners enjoyed learning Computer Studies while the other half 50 percent responded in the negative. In an interview that was conducted with the head teachers revealed the following:

Head teacher 2 commented:

> *I can say learners enjoy Computer Studies due to the passion that they have towards the subject. It is like the learners have the liking for the subject. Despite the fact that we have unqualified staff and we have very few computers, learners seem to have a liking for the subject. How I wish each child had his or her computer, I think the children would perform very well.*
>
> *But the challenge we have as you are aware there are only very few computers against a large number of pupils. So, by the time they will be sharing these thing (computers) and so forth, time elapses. That is one of the challenges that is making learners to even perform the way they did. Otherwise if we had enough computers each child with his or her own computer, I think even learner's performance would be better.*

Head teachers 1 had this to say:

> *Very much, learners are enjoying learning computers because most of the time even when they don't have a period, you will find that they are busy troubling the teachers that are teaching them computers that they want to be in a computer lab.*

In a negative response head teacher 3 stated that:

> *No, they don't enjoy because of lack of computers, then the issue of borrowing laptops also is a challenge due to bad pupil to computer ratio. The other thing is also having one teacher who is at the same time overloaded with other subjects making it difficult for learners to participate fully especially that most if not lessons are theoretically and not practically as the case should have been.*

The views expressed by head teacher 3 were similar to that for head teacher 4.

Teachers gave reasons that explained how learners enjoyed Computer Studies during their lessons. Figure 4.6 shows the responses from teachers.

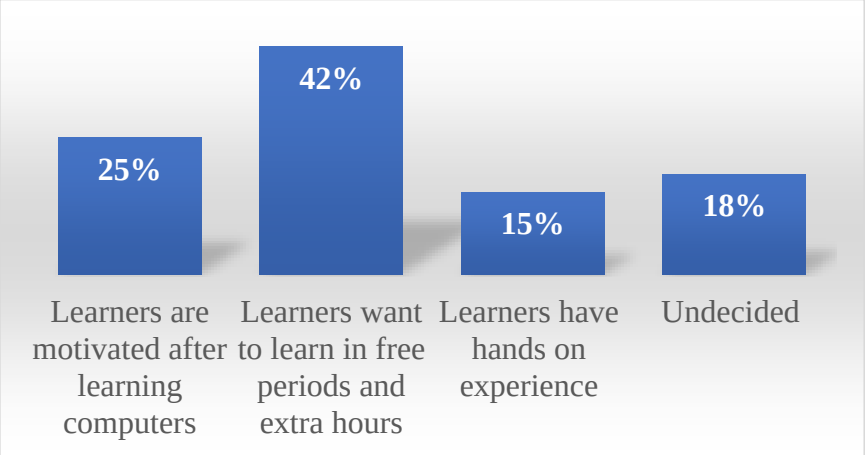

Figure 4. 6: *Percentage distributions of teachers' responses on learners' motivation to learn to learn Computer Studies*

Figure 4.6 shows that 25 percent of participants believed learners were motivated after learning computers, 42 percent said that learners always wanted to learn computers in free periods and extra hours and a further 15 percent explained that learners enjoyed learning computers because they had hands on experiences and 18 percent declined to comment.

From the responses given by the respondents, it is clear that learners enjoy learning Computer Studies as it was evident from the passion they had towards the subject. Respondents stated that learners always wanted to learn Computer Studies even it was not a period for the subject. It was evident that learners enjoyed learning Computer Studies more especially during practical lessons.

4.18. Effects of learning Computer Studies on Learners

The researcher in item number 20 of the teachers' questionnaire wanted to find out whether there has been any behavioural change observed among learners after learning Computer Studies in secondary schools. It was clear from the responses that there was a positive change in behaviour among learners as a result of learning Computer Studies. The change in behaviour by learners was seen in so many areas as the teachers had further put it. Table 4.21 gives the views of teachers.

Table 4. 21: *Frequency and percentage distribution of teachers views on learners' change in behaviour*

Views of Teachers	**(n = 12)**	
	f	***%***
Learners are able to use computer terminologies, type and calculate.	1	8.3
They are able to operate a computer and some programmes such as Microsoft Office, and share photos and songs.	4	33.3
They are able to type correspondence.	2	16.7
They exhibit critical thinking and analytical skills.	3	25.0
They have developed interest in social media, such as Facebook and WhatsApp, able to manipulate different computer software.	1	8.3
Missing	1	8.3
Totals	**12**	**100.0**

The information given in Table 4.21 shows that most 33.3 percent of teachers were of the view that learners were able to operate a computer and some programmes such as

Microsoft office and they are able to share photos and songs and 25.0 percent said learners exhibited critical thinking and analytical skills after they had learnt computers.

When a curriculum is effectively implemented, change in behaviour is inevitable especially among practically oriented subjects such as Computer Studies. In this study, the researcher wanted to find out from head teachers and parents as well if they observed any change in behaviour since the learners and children started learning Computer Studies respectively. Most of the responses were similar and as such they were merged.

Head teacher 3 commented that:

> *The change in behaviour is there, usually we see a change when children starts exhibiting what they have learnt in class and put into practice. I have a child myself who is in grade nine. What she does when she comes back home, I see her busy playing with my laptop. She opens tries to work on something. This she is doing now that she did not do in the past is enough to confirm that there is positive change in behaviour especially in line with computer literacy as you have rightly put it.*

Head teacher 4 said that:

> *I have observed change in behaviour among learners in terms of computer literacy. In the past days, learners were looking at computers as a machine that can harm them. But nowadays despite the school lacking these equipment, in times when we borrow computers our learners who had fear in the past now would like to know how to use it. So, the few who are active as I speak are able to use type documents, and at least they are able to explore the other functions especially after being guided by the teacher. The only thing that is killing our pupils is lack of the most delicate ones such as a computer.*

Similar sentiments were also put forward by other head teachers interviewed. In a similar manner, parents interviewed also indicated existence of change in behaviour among their children in line with computer literacy.

Parent 6 speaking in Luvale said that:

> *Eyoo! Chakuhakilako mucima ngwamono mwanami wamukweze nakukwata nakuhasa kuzacisa makina amakumbi ano akufwana nge ji computer vene, jishinga namakina akwavo akulinga yami chisemi chenyi kangwatokweleko mu Lola lwami. Eci chakusoloka hatoma nge ou*

mwanami nakulilongesa mumucano vene. Kusakwila kuli va longeshi vana kumutangisa pamwe likumbi limwe natukapwa na nyamutekenya wa ji ndeke muno muzuvo. Eci kulinangula camakumbi ano mwane chapwa camwaza kuhambakana cize twatangile yetu. Ingililenu moo kukuzangamisa momo wahono kufunda nakuhaka mbimba majina amujimba wenyi. Acize chinyingi kana vapwile nakutuhana yetu lola twapwile kushikola catutwale kuli mwane? Kwauci. Twatela kukokweza kutwalila vilongeselo vyamakina mangana viyenga kulutwe.

Translated as follows:

Yes, I have observed with keen interest the way my boy is able to cope with the modern equipment such as computers, phones and machines that I as a parent didn't have a chance to. So, this clearly shows that my child is learning this subject in good faith. Thanks be to the teachers teaching him may be one day we might have a pilot in this home. These modern subjects are nice as opposed to those that us their parents used to learn. Just imagine we were being punished in class just because we have failed to draw and label a locust! Where has such knowledge taken us? Nowhere. So, we need to encourage the progression of such subjects (Computer Studies).

Parent 4 speaking in Kiikaonde commented that:

Inge wabweela kufuma kusukuulu buloondolola byo bafuunda kusukuulu kweeseka nabya ma computers. Naketeekela amba kufuunjisha kwaabuno computer kwafainwa kutwajijila. Pa kino kiimye mwanetu watendeeka ne kuleemba ne kuleenga tubilubi kwingijisha bikoope bya katataka (computers). Mino naagwa tufwaayo computer mu nzuubo awe mwana buya paba neeba po beyifuunjisha ne bakwabo mwakwingijishila ano ma computer. Ikino kyo kileengela amiwa kuyuka namba nanchi buno mwaana bwaataako maana ku ano masaambijiilo.

Translated as follows:

When he comes back from school, he explains what they learn at school concerning computers. I believe teaching of computers must continue. This time around our child has even started typing and making or creating drawings, cartoons using the modem machines (computers). Even if we do not have a computer in our home, our child goes to the friends in the neighbour where they teach each other on how to use computers. This is what makes me to know that our child is committed to these lessons.

4.19. Participants' Views on the Successes of Computer Studies

The researcher sought to find out from the head teachers, teachers, learners and parents whether the introduction of Computer Studies in secondary school was a success. Interview item number 20 from the head teachers' interview schedule, item number 22 from the teachers' questionnaire, item number 17 from the learners' questionnaire and item number 5 from the parents' interview schedule was used to gather information on this subject. The Table 4.22. gives a summary of the responses from teachers and learners.

Table 4. 22: *Frequency and percentage distribution of teachers and learners' responses on whether Computer Studies was a success*

Responses	**Teachers**		**Learners**	
	f	*%*	*f*	*%*
Yes	0	0.0	0	0.0
No	12	100.0	49	96.1
Missing	-	-	2	3.9
Total	12	100.0	51	100.0

All 100 percent of the teachers and the majority 96.1 percent of the learners indicated that the introduction of Computer Studies was not successful. Similar sentiments were resounded by head teachers and parents interviewed who expressed happiness over the introduction of Computer Studies in secondary schools but that they could not state the successfulness of the subject. Head teachers had similar views on this issue.

One head teacher 1 commented that:

> *I think it is not very successful. I have said so because there seems to be more challenges as compared to successes. For instance, during the 2016 practical examination, we failed to finish on time a situation that saw learners finishing after 24 hours. This was because we did not have enough computers, hence learners were shared in groups. In the year 2017 we thought of reducing on the number of learners to take Computer Studies but the challenge of having practical lessons seems to go beyond our efforts. Teachers to teach learners effectively in Computer Studies are not there. It cannot be a success now until necessities are put in place.*

Similarly, head teacher 2 argued that:

> *No, it is not a successful story. I cannot say the programme is a success because of the numerous challenges that we are going through as a school. Yes, I can say it is a good programme but its success cannot be guaranteed. We have had a situation whereby during practical for grade nine examinations, learners knock off after mid night all because the equipment to use are not enough. So, we group them and the enter in turns until everyone is examined. Now you can imagine the stress that the teachers including the learners go through.*
>
> *The other thing is that we end up examining learners in a subject where they don't even understand some of these gadgets. It is so surprising that in most cases you may find that learners do not even know how to hold a mouse. This all goes to preparations by us as curriculum implementers.*
>
> *Apart from these mentioned I feel government should have taken time to ensure that teachers are trained to teach the subject. Unlike the situation in which we are whereby teachers teaching the subject are doing it on what I may call self-will. When I asked for a teacher from the DEBS office, I was told that in the whole district there is only one teacher trained to teach Computer Studies. Just imagine such a situation, can you say there is success? Maybe in some schools not at this school. We are really hit Sir.*

Similarly, head teacher 3 emphasised that:

> *At the moment I would not say it is a successful story because the challenges are there. So, with the challenges in place I don't feel it is a success. As long as we still have challenges especially as a school, I cannot say it is a successful story until further notice.*

Moreover, on the same issue head teacher 3 expressed that:

> *Meantime it is not a success story because of the issues which we lack as a school. So, me (head teacher) I am saying that it is not a success. It will only be successful if the government maybe come in and put in pace the things which I have just mentioned such as facilities, equipment and even teachers. That is when I will say it is a success.*

Conversely, parents gave different views pertaining the introduction of Computer Studies. However, their responses were similar and only a few have been presented.

Parent 4 argued that:

> *Yes, it is a success. I have said so because my child has acquired knowledge on how to cope with the modern technology and is able to advance his academic journey. The things that he has not been able to do before is able to do it now. I have been seeing him type some work on the laptop at home, operate smart phones and other devices that he was not able to operate in the past. So, all this is because the knowledge he has acquired from school which me the father didn't have when I was at school.*

In agreement with parent 4, parent 8 speaking in Kiikaonde stated that:

> */.....mwane kufuunda kwa fwaninwa kutwajijila mambo inge bana bateendeka kuyifunda jimo kusuukulu yo bakafika kutuleningi ninshi bayuka kala mwakwingijisha ano ma computer. Nanchi ke kintu kimo kyawama bingi kabiji kyafwainwa kutwajijila mumasuukulu. Nanchi insa kwamba amba kijitu buloongo mambo bana betu bankonsha kwingijisha ano ma computer o twabujile kuyuka atweba basemi babo.*
>
> Translated as follows:
>
> */….yes, learning Computer Studies should continue because if our children start learning how to use computers at school, by the time the go for college or university education they will not have any challenges. Hence, it is a very good thing indeed and so learning of Computer Studies should continue in schools. Therefore, what I am saying is that it is a welcome move because our children will be able to know a computer which us their parents had never a chance to.*

The views for the other respondents were similar to those given by parent 4 and parent 8. All the parents agreed that the teaching and learning of Computer Studies was a success because of the skills that they learners exhibited. However, despite the positive viewss exhibited by parents, the teaching and learning of Computer Studies cannot be guaranteed to be a success owing to the challenges faced during its implementation.

4.20. Summary

Overall, despite the successes achieved in the process of implementing Computer Studies in secondary schools in Mufumbwe district, there are numerous challenges that are faced. As explained by the head teachers, the challenges were also observed by the researcher. According to the researcher's observation, the schools did not have enough computers for use by learners during Computer Studies lessons and practical. Other equipment such as

scanners, printers, photocopiers, overhead projectors, backup generators and internet needed for effective implementation of computers were not in place. Teachers to teach Computer Studies were either inadequate or unskilled to teach learners effectively. During lesson observation, the researcher observed that most teachers resorted to lecture methods of teaching which denies learners the opportunity to participate fully. In one school where the researcher observed a practical lesson, the learners were overcrowded such that most of them were unable to concentrate when they were asked to do a practical. For instance, the average learner to computer ratio was 10 learners to 1 computer. Such a ratio is very big, hence cannot promote effective learning. It was also observed that the teaching was more than practical. Compute studies being a practical subject, should be practically oriented with little emphasis on theory. The next chapter is a discussion of the findings that have been presented in this chapter.

CHAPTER FIVE: DISCUSSION

5.1. Overview

The researcher in the previous chapter presented the findings of this study. Through the use of related literature presented in chapter two and themes derived from the research objectives and questions, the researcher in this chapter will endeavour to discuss the research findings.

5.2. Physical Facilities, Equipment and Resources for Computer Studies

For teaching and learning to take place, a conducive environment, physical facilities, equipment, resources should be put in place. Craig and Heneveld (1995) stated that school buildings, classrooms and laboratories were vital determinants of quality education delivery if a curriculum is to be effectively implemented. In this study, the findings on the facilities, equipment and resources for Computer Studies showed that there was inadequacy of the computer laboratories, computers, textbooks, overhead projectors, internet, printers, photocopiers and electricity in secondary schools teaching Computer Studies in Mufumbwe district.

Computer Studies being a practical subject, requires learners who are actively involved in practical learning. Practical learning enables learners to practice as a result acquire the necessary skills and experience in the area of study. The findings of this study indicated that in three (3) out of four (4) secondary schools did not have computer laboratories instead were using classrooms which did not provide suitable settings for practical lessons. In such schools, equipment such as computers were always parked denying learners the chance to have hands on experience. In one school, the researcher found desktop computers parked due to lack of space where to display the computers. These findings of this study are in line with Mulenga (2006) who said that none of the schools he visited had a computer laboratory making it difficult for teachers to effectively conduct practical lessons. Furthermore, the revelation by three out of the four head teachers interviewed indicated that teaching and learning of Computer Studies was done theoretically. In Computer Studies, the ideal situation must be that computer lessons should be learnt in a computer laboratory to allow learners have hands on experience. Furlonder in Chaamwe

(2017) postulated that in most rural schools it is unlikely that you will find a computer laboratory, unlike the urban schools. Actually, rural schools in Mufumbwe district do not have computer laboratories to conduct practicals effectively.

The lack of computer laboratories affects the way teachers teach learners as they mainly use lecture methods as leaving out practical aspects which encourage learners to experience real learning through hands on exercises. The implication of lacking necessary facilities such as a computer laboratory is that teachers tend to use inappropriate teaching methods a situation which may make learners fail to benefit academically as a result limiting the relevance of the curriculum. These findings are in line with Kasaji (2010) who concluded that curriculum relevance was sometimes minimised by lack of its proper implementation due to lack of facilities/equipment. Curriculum implementation is dependent upon the availability and adequacy of facilities such as computer laboratories. As it is indicated by Gross (1971) in his curriculum implementation theory that resources need to be made available in order to effectively implement a curriculum.

Source of power generation was another issue of concern that the researcher in this study wanted to find out. From the findings in Table 4.6 indicated that two schools, 50 percent were connected to the national grid and hence were not facing any power shortages while the other two schools, 50 percent did not have any reliable source of power generation. The schools that were not connected to the national grid reported a lot of challenges related to cost of fuel to ensure that generators run and maintenance of the generators. The shortage of reliable source of power caused intermittent power supply especially during Computer Studies practical lessons.

It should be noted that Computer Studies depend on the availability of electricity. The fact that power supply was not available in some schools make it difficult for teachers to effectively teach learners in Computer Studies as a result leaving them behind when trying to understand the use of computers as anticipated in the curriculum. While the country has made Computer Studies a priority issue (Olan'g, 2015) observed, it appears from the findings of his study that the dream was far from reality. It was observed by the researcher that in school C and school D there was no electricity for use when learning Computer Studies. These findings appear to send the message that schools are not preparing learners

to be competent in the 21st century where technology is being emphasised the most. These findings are in line with Aduwa-Ogiegbaen and Iyam (2005) who argued that when electricity supply is not stable and constant, it is difficult to keep high-tech equipment such as computers functioning, especially under extreme weather conditions as obtained in African countries. In most cases, learning time is lost as a teacher struggles to switch on a generator. The amount of energy produced by a generator may in some cases not be well regulated a situation that can cause damage to equipment such as computers, printers, Wi-Fi switch boards and photocopiers. Chaamwe (2017) noted that the government of the republic of Zambia has not been able to connect all parts of the country to the national electricity grid leaving schools under such areas handicapped in terms of the provision of Computer Studies to learners. Information on the Zambia Energy Regulation Board website also indicates that only 22 percent of the Zambian population has access to electricity and in the rural areas, the level of access is less than one percent and 77.9 percent have no access to electricity at all (ERB official website). The lack of electricity in schools was also confirmed by the Ministry of General Education that learners in areas where there was no electricity were learning theory for some time till their schools will be connected to the national grid (Times of Zambia, 2015). However, five years down the line, infrastructures such as electricity was not yet provided in some schools in Mufumbwe district hence making the teaching and learning of a practical subject such as Computer Studies very difficult to manage. Therefore, electricity infrastructure has to be put in place if the Computer Studies curriculum is to be effectively implemented in secondary schools of Mufumbwe district.

Furthermore, teaching and learning materials such as textbooks were available in schools though they were not adequate and up-to date. The results shown in Table 4.7 is an indication that textbooks were supplied to schools and learners were using them. However, the textbooks were not up-to date to give learners all the information needed for effective computer curriculum implementation as shown in Figure 4.1 where 88 percent of the participants responded that the textbooks were lacking vital information needed for effective learning to take place. These findings are in harmony with Mulenga (2006) who argued that having and using textbooks is one thing but using up-to-date books is another. In a similar way, Mwanza (2017) found that curriculum materials such as textbooks were

of poor quality. The compromised quality and inadequacy of textbooks for Computer Studies could have been one of the reasons why learners in Table 4.8 responded that they did not use textbooks during computer lessons.

Computers are yet another important equipment that needs to be put in place in order to effectively implement a Computer Studies curriculum. The findings of this study indicated that computers were available in some schools though they were to a large extent inadequate. Some schools however, did not have any computers in place but learners were learning Computer Studies. During interviews with head teachers, when asked whether they had computers or not one commented that *'we have nil, we do not have any computer in the school'* a situation that has led into failure to teach learners practically. The findings in this study are in line with Obota, Oluoch and Makani (2015) and Olan'g (2015) who highlighted that there were inadequate resources such as computers to use by learners which leads to the challenges of improper method of teaching being used by teachers. In Zambia, Computer Studies was introduced five (5) years ago but the situation in most secondary schools in Mufumbwe district is that computers which are an important equipment in the implementation of the curriculum have never provided by the MoGE. Non-provision of necessary equipment such as computers makes the teaching of Computer Studies very difficult since the subject requires a practical aspect as observed by Olan'g (2015) in his study. The passion that some teachers have towards Computer Studies has led some of them to borrow computers from teachers and nearby schools which are also not adequate. Borrowing computers by teachers teaching in secondary schools could not guarantee positive learning among learners as they are not exposed to this equipment often. Teachers are curriculum implementers not equipment providers. The lack of computers was evident during lesson observation when most teachers shunned practical lessons but preferred theory lessons even at a school where computers were available. These findings are in line with Mwalongo (2011) who stated that in some schools there is a culture of looking at computers as sacred objects and teachers do not exhibit knowledge in equipment such as computers. It is beyond human comprehension to learn that in some schools, computers are not used at all despite their presence, the availability of users and the need to use them is not easily noticed.

In addition, the lack of computers in schools has caused high learner to computer ratio in most schools in Mufumbwe district. This study established that the lowest learner to computer ratio was six learners to one computer while the highest ratio was forty learners sharing one computer. This ratio is too high for effective implementation of Computer Studies curriculum. These findings are in line with Waiharo (2007) and Macharia (2013) who in more than 50 percent of the schools they visited had learners to computer ratio of thirty (30) learners to one (1) computer. The implications for such high ratio (learner to computer ratio) is that learning in such an environment may only benefit the fast learners at the expense of the slow learners. Hence, leading to challenges in the implementation of Computer Studies in secondary schools. In an ideal situation, one or at least two learners should share a computer.

Internet connectivity was also not available in the secondary schools where the research was carried out. Internet connectivity is very important for computer software and application updates. Updating computer software and applications is important as the process helps to protect the equipment from malware and other attacks that may be harmful to computers. The findings of this study on the issue of internet connectivity agree with Karuru (2005) and Atsumbe, et al (2012) who expressed that the internet connectivity in schools was low. Furthermore, the findings shown in Table 4.11 of this study needs serious attention if the welfare of computers in secondary schools was to be taken care of. The implication of not having internet connectivity is that due to lack of regular updating of the computers, they shall be prone to attacks and become vulnerable to malware and other harmful programmes which can lead to infections. If infected, computers cannot perform according to its expectation.

Furthermore, the effective implementation of the Computer Studies curriculum requires the provision of other equipment such as printers, scanners, photocopiers and overhead projectors. The findings of this study established that the aforementioned equipment were not available at all in the schools where the researcher visited. For instance, results in Table 4.13 showed that no school had an overhead projector. Similarly, results in Table 4.12 showed that 89 percent of the participants revealed that printers were not available in schools. Like any other equipment, printers are very cardinal in the implementation of

Computer Studies curriculum because the typed work has to be printed. In addition, the argument by head teacher 4 on the issue of printers clearly shows that schools were facing challenges in as far as the implementation of Computer Studies curriculum is concerned. A situation whereby schools go to an extent of borrowing printers from DEBS office for the sake of examination is in itself a worrisome one. One would wonder how learners manage to use this equipment during an examination when they are not exposed to it during class work. Do they manage to use the printers for instance, effectively? From this study it was clear that the practical aspect of learning Computer Studies was done during examinations and not while learners were learning. The MoGE has not done enough on the issue of assisting schools procure equipment needed for Computer Studies curriculum implementation in Mufumbwe district. These findings are similar with Karuru (2005) and Apagu and Wakili (2015) who established that the government had not done enough to support schools financially to procurement equipment meant for Computer Studies. The implication is that learners acquire knowledge without skills in Computer Studies.

Furthermore, it is evident that most facilities, equipment and material/resources to be used for implementation of Computer Studies curriculum are not available in schools in Mufumbwe district. However, in some schools there are a few of them available. It was therefore cardinal for this study to establish the adequacy of these facilities, equipment and resources. Results given in Table 4.14 indicates that computers were fairly adequate in schools. Despite some schools indicating that they had computers available, it was not adequate to cater for all learners learning Computer Studies. In addition, results in Table 4.14 showed that 83.3 percent of teachers stated that computer laboratories were inadequate in schools. The only resource and infrastructure that was adequate in schools was textbooks and favourably supply of electricity as indicated by 75 percent and 50 percent of the teachers respectively. The findings perfectly agree with Ndwiga (2005), Mwaniki (2007), Macharia (2013) and Mulenga (2016) who established that inadequacy of facilities, equipment and resources was a major setback in the implementation of Computer Studies curriculum in educational institutions. For instance, Computer Studies require a conducive environment where learners must be subjected to practicals. However, the reality prevailing in schools underscore the need for practical assessments. The head teachers who were interviewed also attested to the fact that computer laboratories,

computers and other equipment were inadequate. The inadequacy of computer laboratories, computers and other equipment in schools can lead to failure by learners to acquire the necessary skills meant to help them develop their computer literacy levels. This assertion was supported by Makunja (2016) who argued that laboratory-based teaching helps learners to develop practical skills, problem solving ability, inquisitive minds and innovative learning. The absence of computer laboratories, computers and other equipment in secondary schools in Mufumbwe district, therefore, deprives learners an opportunity to become computer scientists and engineers in the future.

The aim of introducing Computer Studies in a competency-based curriculum in schools was that through the learning of Computer Studies, schools shall increase opportunities of producing learners who able to acquire computer literacy skills and contribute towards innovative and lifelong education (MESTVEE, 2013). Despite the intention of the MoGE as stated in the curriculum framework being positive towards achieving a learner who is computer literate, the situation in Mufumbwe district needs much to be desired. Due to inadequacy of the facilities, equipment and resources as explained earlier, it would be difficult for schools to effectively implement Computer Studies curriculum. This is because learners are most subjected to OBE unlike CBC hence failing to have learners who are competent and able to exhibit skills in Computer Studies. One would then ask why is it that good curriculum innovations fail? One way that leads to failure by institutions of learning such as school to effectively implement CBC is due to inadequacy of facilities and equipment. To effectively implement a CBC, facilities and equipment must be put in place first so that teachers and learners are able to utilise them accordingly. These findings are in line with Muneja (2015) and Makunja (2016) who argued that insufficient teaching and learning resources were some of the challenges that teachers faced in implementing a CBC in secondary schools. If the situation remains unchecked, generally education in Zambia and Mufumbwe in particular in line with computer literacy shall decline. Hence, failing to achieve the objectives set in the 2013 Zambia education curriculum framework.

5.3. Availability of Qualified Teachers of Computer Studies

Education improves living conditions, offers opportunities and contributes to the economic development of any country, Zambia inclusive, as underlined in the Sustainable Development Goals, (SDGs) goal number 4. SDG 4 calls for the provision of quality education. In order to provide quality education, there is need to ensure that teachers teaching learners in schools are qualified (UNESCO, 2018). In relation to qualified teachers of Computer Studies, there is need to ensure that teacher education is provided to teachers in order to help attain SDG 4. This can be possible if the supply of trained and qualified teachers is increased. A qualified teacher is one who receives an academic qualification while a trained teacher is one who has completed the minimum organised teacher education requirements. Hence, the 2018 World Teachers' Day Theme *'The Right to Education means the Right to a Qualified Teacher'* (UNESCO, 2018). Is it feasible to achieve the 2018 world teachers' day theme or just an academic exercise? Therefore, in this study the situation at hand in terms of teacher education in Computer Studies is brought forward.

For teaching and learning to be successful teacher education is very cardinal. Teachers play an important role for effective curriculum implementation process. A teacher needs to undergo various levels of teacher education and should adhere to his or her level of education (Gross, 1971). However, the teacher should not only undergo teacher education but must have the capacity to implement a curriculum. The findings in Figure 4.3 indicates that 91.7 percent of teachers teaching Computer Studies had not attained any education on how to teach Computer Studies. Teachers were mainly considered to teach learners in Computer Studies depending on their interest in the subject. In an interview with head teachers, head teacher 4 commented that the teacher asked to teach Computer Studies was the only one in the school who had interest in computers. Head teacher 2 also said that the teachers teaching Computer Studies were asked to teach because they had some basic computer knowledge which they attained during some computer lessons they had undergone some years back. Otherwise they had not undergone teacher education in Computer Studies but in other subjects. These findings are in line with Waiharo (2007) who established that 87 percent of teachers in secondary schools in Kenya did not have

any education in computers. Lack of teacher education can attribute to lack of skill acquisition among learners learning Computer Studies. Similarly, Mwaniki (2007) identified low number of qualified teachers being among the factors that had affected the implementation of Computer Studies in secondary schools.

It is evident from the findings that there were no teachers qualified and educated to teach Computer Studies in secondary schools in Mufumbwe district. Lack of teachers qualified and educated to teach Computer Studies can result into poor performance of learners and implementation of a curriculum as a result failure to acquire skills by learners expected in a CBC. Why then is this so? Does is it mean that MoGE hurried to implement Computer Studies? Is it because of lack of policy or people at MoGE who could oversee failures to implement a CBC? In the first place, it is important to acknowledge the fact that MoGE hurried to implement Computer Studies even before all the necessities such as computer laboratories, computers, scanners, printers, well updated textbooks and teachers qualified to teach computers were put in place. CBC cannot be effectively implemented if teachers who are the implementers of the curriculum have not received pre-service or in-service teacher education (UNESCO, 2018). Teaching learners effectively cannot be based on interest alone but how one has been adequately prepared to teach. In an interview with head teachers, head teacher 3 said that the introduction of Computer Studies was done in a hurry as no computers and teachers were sent into schools to kick start the commencement of the programme. The findings are in line with Kiamba and Mutua (2017) who found that teacher preparedness significantly affected learner's academic achievement in the various subjects in which studies have been carried out. Teacher education is seen to be the key factor in grounding prospective teachers for the purposes of effective and efficient classroom teaching in all levels of education.

Furthermore, Computer Studies being a practical subject requires that learners have computers in place and allow them more time to practice. Head teachers and teachers also attested to the fact that teachers needed the teacher education in order to effectively teach learners. They further said that teachers needed to undergo pre-service and in-service teacher education if they were to be prepared to teach learners in Computer Studies. These findings were in agreement with Makunja (2016) who stressed that before any

implementation of the new curriculum, the government should make sure that they train all teachers to equip them with skills and knowledge. The implication of these findings is that it is the responsibility of the government to provide in-service teacher education not only when there are changes in the curriculum but also in-service to employees is important because it helps them develop professionally. Gross (1971) and Pelgrum and Plomp (2002) added that the success of educational innovations depends largely on the skills and knowledge of teachers. Hence, stressing the importance of teacher education if CSC is to be effectively implemented in schools as stated by Gross in his curriculum implementation theory. Gross (1971) argued that there is need for the curriculum implementers to be capacity built in order for them to demonstration the appropriate skills and knowledge.

Apart from teacher education in colleges and university, in-service teacher education is also very important. If well utilised, in-service teacher education shall help beef up the existing shortages of Computer Studies teachers in secondary schools. In this study, it was found that teachers did not receive any in-service teacher education. In order to ensure that teacher in-service education programmes reach its intended audience, there should be accessibility to the intended teachers who are the curriculum implementers. It is expected that the teachers should receive their first professional support from the head teachers of their respective schools and from the ESOs who support the teachers through supervisory visits as well as organising refresher courses, especially when new curriculum innovations are being introduced. This finding was similar to what was revealed in the research findings done by Jerotichl, Kurgat, and Kimutai (2017) who stressed that teachers needed to equip themselves with new forms of knowledge, new teaching methods and strategies, purpose and scope of a new curriculum.

5.4. Teaching Methods for Computer Studies

As explained in Chapter 4, effective teaching and learning can take place if the teacher considers as important the two things; what to teach (content) and how to teach (teaching methods). Teachers employ a variety of teaching methods as a way of capturing learners' attention in an effort to impart into them the necessary skills and knowledge. Like in the previous section, teachers can execute appropriate teaching methods when they have

undergone teacher education to teach that particular subject. Computer Studies being a practical subject, requires teachers who have skills and knowledge on how a computer function. These skills and knowledge can be acquired through teacher education. In his theory, Gross (1971) argued that teachers need to undergo teacher education in Computer Studies in order to teach learners competency. It is when teachers have attained the necessary skills and knowledge that they would be able to employ desirable methods in their teaching such as practical (hands-on) methods. The findings are consistent with Pelgrum and Plomp (2002) and Bakare (2014) who found that lack of practice in Computer Studies recorded poor results among learners. Learners can only gain skills through practical learning in order to get the best out of the innovations and use of Computer Studies in schools.

In this study, the researcher found that teachers were using inappropriate methods that would impede the acquisition of competencies in a CBC such as Computer Studies curriculum. Lectures, discussions and question and answer methods were being used to a large extent as shown in Table 4.16, giving an indication that practical was used less. If learners are to acquire the necessary skills and knowledge, CBC emphasises more on learner centred approaches unlike teacher centred approaches which were being utilised in secondary schools of Mufumbwe district when teaching Computer Studies. These findings are in line with Makunja (2016) who found that lack of readiness to employ learner-centred approaches was a major hinderance to the achievement of CBC. In Computer Studies, learners should be practical oriented, be engaged in educational tours to visit sites such as banks, shopping malls with modern facilities and equipment, use of simulations and computer aided learning. It was also surprising to learn that teachers were not embracing practical learning when learners were expected to sit for a practical examination. The responses of learners in Table 4.17 also indicated that they (learners) did not learn practically in computers studies even when they expected to do practical during the final examination. Among the teaching methods, the worst used according to majority 96.1 percent of learners was educational visits and 88.2 percent of learners stated that they never had any practical, demonstrations and computer aided learning at all. Hence, teaching in Computer Studies was more theoretical than practical. Practical lessons enhance good understanding of concepts leading to innovation on the part of the learner

while theory lessons encouraged rote learning and memorisation of concepts. These findings are in line with Macharia (2013) who stressed that practical lessons enhanced good learning. Now, how do learners acquire the necessary skills in a subject without practical? It would be another interesting area of study.

However, when teachers were asked to give their views concerning appropriate methods to be used during computer lessons, result given in Table 4.18 clearly showed that practical was the best method as it would enable learners to acquire the necessary skills and knowledge in Computer Studies. Lecture, discussions and questions and answer were considered the worst method and yet that was what was used. Therefore, it is clear from the responses that teachers were aware that practical method captures learners' attention and promote positive achievement of a CBC. Why is it that teachers did not do what they knew? One of the major reasons observed by the researcher was that there were no facilities, equipment and resources to be used in Computer Studies lessons. When facilities, equipment and resources are not put in place, one would not expect teachers to do practical from nowhere bearing in mind that learners in rural areas do not have access to computers even in their homes. In supporting this finding, Olan'g (2015) argued that teachers mainly teaching in public schools were theoretically oriented and they were not good when learners needed to practice the knowledge. The argument put forward by Olan'g was that teachers in private schools had facilities and equipment for Computer Studies in place hence they had a chance to increase knowledge in practical lessons as well. Furthermore, teachers were asked to give their views why they used inappropriate methods in class. The result that were given as shown in Figure 4.5 clearly showed that teachers had different views regarding the used methods but generally it was because of lack of equipment and facilities. As stated earlier, teachers are curriculum implementers and not material or resource providers. So, in a situation where there are no resources or equipment to use, curriculum implementation fails.

It is worthwhile remarking that teaching methods are the complement of content, just as teaching is the complement of a curriculum. Teachers of Computer Studies tend to over use the lecture and question and answer methods, ignoring the options and opportunities that the balance of teaching methods can offer. In a CBC, it is essential that teachers

maintain a refined sense of how to teach learners in order for them to acquire the necessary skills and knowledge which is the essence of the 2013 revised curriculum. It is important that teachers teaching learners in Computer Studies have a command over value clarification methods such as practical, demonstration, project methods and computer aided learning software. In this study, the researcher observed that much emphasis was placed on lecture and question and answer methods. In all the schools visited, the researcher found teachers either using the lecture method or the question and answer method. However, to effectively learn on how to use a computer, the learners should be exposed to hands on activities (practical), educational visits, and video-based tutoring among other learner centred approaches. These methods or approaches are likely to place learners on a good pace in terms of learning.

5.5. Views of Teachers, Learners and Parents about the teaching of Computer Studies

The teaching and learning of Computer Studies is hoped to help learners acquire knowledge and ability to use computers and related technology efficiently, with a range of skills covering levels from basic use to advanced. The use of computer has an ever-increasing impact on all aspects of human life and education is not an exceptional. One may ask, with the numerous benefits of having computer literate learners, what are the insights of teachers, learners and parents on computer education? The fourth objective meant to answer such a question. The views of the head teachers, teachers, learners and parents that were collected and presented in Figure 4.5 clearly shows that 89.3 percent of the participants viewed that the teaching and learning of Computer Studies was a good thing. The participants were of a view that learning Computer Studies was encouraging learners to be innovative and technologically advanced. Furthermore, teachers, learners and parents agreed that through learning Computer Studies, learners are able to explore different avenues and come up with tangible results. For instance, some learners are able to browse for information online using their phones, type in word, excel, publisher, PowerPoint, insert pictures and design different documents using a computer. These findings are in contrast with Olan'g (2015) who found that some teachers do not believe that computers have a useful educational objective and that they are non-essential and supplemental to their teaching and classrooms. Similarly, Mwalongo (2011) found that in

some schools there was a culture of looking at computers as sacred objects. It could be because of lack of facilities, equipment and resources that hinders the motivation of learning Computer Studies in some schools of Mufumbwe district. Despite lacking facilities, equipment and resources in schools, Computer Studies was cited as one of the best subjects and that learners should continue learning. Head teachers also commented similar sentiments indicating that it was a good idea to have Computer Studies introduced in secondary schools. These findings are in consistent with Adekunle (2016) who confirmed that learners in Federal Capital Territory (FCT) had positive views on computer education despite challenges that they were facing. As stated earlier, computer education has been faced with numerous challenges in its implementation which includes lack of competent teachers, technological support and financial support to procure computer facilities.

In an ideal situation, Computer Studies being a practical subject, needs a learner to have computers in place and as they start practising, they would enjoy learning the subject and teachers to help learners acquire relevant knowledge and skills in computer education. When learners acquire the relevant knowledge and skills, they shall be able to solve specific technological problems and be ready for the world of work. Practical lessons help learners to be directly responsible for their learning but the situation in some schools in Mufumbwe was not good whereby a practical subject was introduced without putting into place the necessary facilities, equipment and resources. Failure to put in place these facilities, equipment and material and human resources may lead to a boring lesson among learners and fail to acquire the relevant skills and knowledge in computer education. This is in line with the curriculum implementation theory by Gross that was adopted in this study. According to Gross (1971), resources needs to be put in place before any curriculum innovation is rolled up. In line with Computer Studies, resources such as computers, textbooks, internet gadgets, printers, photocopiers and scanners needed to be provided in schools in Mufumbwe district if the introduction of the subject was going to be success.

However, amidst some of the challenges that teachers and learners faced when learning Computer Studies, most of them regarded the introduction of the subject to schools was important. When teachers and learners were asked to give reasons why teaching and

learning of Computer Studies was a good thing, they gave similar responses as shown in Table 4.19. The effectiveness of teaching and learning Computer Studies is strongly dependent on views of the teachers being the implementers and the learners being the direct beneficiaries. It is important that learners are taught Computer Studies in order for them to acquire a high level of fluency with modes of thinking in which computers act as interactive partners. In one of his state of the union addresses, president Barack Obama said schools need to offer every learner hands-on computer classes to be better prepared for the work force (https://www.npr.org/2016/01/12/462831088/). It is of great importance to state that Computer Studies give learners an opportunity to open up to the world of work as a source of employment and income. The findings in this study are in line with Wosney, Venkatesh and Abrami (2006) who stressed that computer technology is an essential tool in today's school environment as it encourages learners to explore and to learn in a modern way which was not there previously. In addition, Kalila, et al (2012) suggested that when used appropriately, computers can help to expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life. Therefore, Computer Studies has the potential to innovate, accelerate, enrich and deepen skills, to motivate and engage learners, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthen teaching and learning in schools.

Since the introduction of Computer Studies in secondary schools, learners have been motivated into learning Computer Studies. The motivation is as a result of the fact that Computer Studies mainly involves hands on activities. Learners should be encouraged to spend more time working on computers through practical exercises. However, this can only be achieved if each learner is assigned to a computer. The results in Table 4.20 clearly showed that learners were appreciating learning Computer Studies. One of the explanations given by participants as leading to the motivation in learning Computer Studies was that learners wanted to learn in free periods and extra hours. Despite learners showing the zeal to learn computers, some head teachers explained that they seem not to enjoy the subject due lack of computers and qualified and educated teachers in schools. It is worth noting that a good number of teachers who were teaching Computer Studies in

Mufumbwe district had not undergone teacher education to teach learners in computer education. Lack of adequate teacher education leads to poor delivery. This finding agrees with Gimba (2018) who found that the foundation of most science and technology teachers in science and technology was poor hence demotivating learners' interest into learning. Therefore, it is cardinal to state that teachers teaching learners in Computer Studies undergoes regular training to make them competent in preparing the 21st century learners to face global technological advancement and innovation. Failure to have appropriate teacher education, equipment and facilities can lead into learners being demotivated into learning the subject.

In addition, to ensure a successful educational curriculum change, the education system seek out different parties for valuable opinions. Among them, parents are the important feedback providers because their attitudes are influential on children's academic performance. Likewise, their involvement and support are considered the key factor that facilitates an effective implementation of Computer Studies curriculum in schools. In this study, parents held a positive view that the introduction of Computer Studies in secondary schools was a good idea. Some of the reasons they put forward were that the teaching and learning of computers studies in schools would help learners acquire computer literacy and skills necessary for the world of work especially bearing in mind that the world has accelerated to another level in terms of technological development. One of the argument that parent 3 brought about was that *'the usage of computers is now everywhere, in hospitals, education, mines, road transport, aircraft transport, etc.'* It was in this line that parents held a positive views that Computer Studies should be encouraged in schools. Hence, parents have an important role to play in the education provisions of their children. Computer Studies being a subject that involves technological usage, parents should be involved to ensure that children are guided accordingly while learning at home.

5.6. Successes Achieved through the Teaching of Computer Studies

In order to establish whether CSC was effectively implemented in some schools in Mufumbwe district, this study sought to find out whether the introduction of Computer Studies was not successful. Teachers' and learners' responses were presented in Table 4.22 where the findings clearly indicated that the implementation of CSC was not a

success story. Head teachers were as well asked to give their views concerning the success of the implementation of CSC. It was clear from the verbatim that despite implementing Computer Studies in schools, it was not successfully done. Head teachers alluded to the fact that despite the introduction of Computer Studies in schools being a good thing, its implementation had a lot of challenges. During practical examination for instance, teachers and learners were knocking off after midnight due to insufficient computers. Furthermore, learners were being assessed on work that they had never learnt in class due to lack of facilities and equipment, teachers and use of inappropriate methods. For instance, in one of the schools where this study was conducted, the researcher observed that there were no computers at all to be used by learners, that situation simply meant that learners were just taught theoretically. However, during summative assessment teachers expected learners to be assessed practically. One would ask how possible such a thing was going to be. The implementation of CSC in Mufumbwe district will only be a success when the government through MoGE provides computers and other equipment, computer laboratories, qualified teachers of Computer Studies, enough teaching and learning resources and reliable supply of power. The findings agree with Macharia (2013), Mulenga (2016) and Chaamwe (2017) who established that factors that hampered the implementation of Computer Studies in schools were inadequate funds to procure computers, lack of trained teachers of Computer Studies, lack of equipment such as scanners, photocopiers, internet connectivity and computer laboratories. It is not until the aforementioned are provided in schools when the implementation of CSC will be a success story.

Similarly, parents alluded to the fact that children had acquired knowledge on how to cope with the modern technology and were able to advance their academic journey. Some of the successes evident are that children were able to do among other things, type and print documents, use computers for communication purpose, research school work. However, despite the positive views exhibited by parents, the teaching and learning of Computer Studies cannot be guaranteed to be a success story due to the challenges faced during its implementation. As stated earlier, parents being the indirect beneficiaries held positive views looking at what learners were able to perform without considering the challenges that teachers and learners faced while teaching and learning Computer Studies.

5.7. Challenges Faced in the Process of Implementing Computer Studies

From the previous section, it is evident that the introduction of Computer Studies in secondary schools was a good idea though not successful. However, most of the participants indicated that there has been challenges faced in the process of implementing Computer Studies in secondary schools in Mufumbwe district. All the head teachers interviewed explained that they did not have enough computers in some cases while others said they did not have any computers at all to be used by learners. Apart from computers, head teachers, teachers and learners also explained that they did not have essential equipment such as printers, photocopiers, scanners and internet connectivity for use by learners in schools.

Computer laboratories also was a challenge in three (3) out of four (4) schools sampled in this study. Teachers who are the direct implementers of a curriculum were not qualified to teach Computer Studies apart from one (1) out of twelve (12) who had attained a diploma in Computer Studies. Due to lack of teacher education in Computer Studies, learners were being taught using inappropriate methods such as lecture, question and answer and group discussion methods. These methods are inappropriate in Computer Studies because the subject requires much of hands on experience than abstract learning. In an ideal situation, teaching and learning of Computer Studies should be more practical than theory. Hence, learners must be practically oriented in order to prepare them for practical assessments. Learners can only be assessed in what they learnt in class to ensure validity and reliability. So, when learners are given much time to do practical, they are exposed to self-assessment. Self-assessment allows learners to have self confidence among themselves and be responsible for their successes and failures so that they can participate actively in their learning. Learners should not only be evaluated and granted points or grades during summative assessment but should also be hooked up in their learning. So, self-assessment provides the opportunity for learners to have a dialogue with the teacher which can reveal to learners what they should do to make their learning more effective. The findings of this study are consistent with those for Makunja (2016) who found that there were a variety of challenges which impeded the successful implementation of a curriculum during the teaching and learning process. In addition,

Nganga (2012) asserted that equipment in the institution were in obsolete state mainly as a result of lack of funds to rehabilitate and replace them. In the light of the challenges, it is likely that the implementation of CSC was bound to fail deliver the desired outcomes. Furthermore, Gloss (1971) stressed the need to have resources in place in order to effectively implement a new or existing curriculum. Computer Studies curriculum is not an exception in this case.

5.8. Theoretical Framework with Implications to the Study

The findings of this research could not be detached from the theoretical framework employed in this study. This study utilised Gross' theory of curriculum implementation. Curriculum implementation theoretical approach calls for the provision of four basic elements which includes the clarity of the innovation to the implementer, availability of resources, capacity of the implementer, management support of facilities (Gross 1971). To effectively implement a curriculum innovation in a new or revised curriculum, there is need to ensure that the implementers who are teachers in this case are provided with the necessary information on how to go about with the innovation. Teachers of Computer Studies need to be equipped with the necessary knowledge on how to guide learners in Computer Studies. Apart from clarity of the innovation to the implementer, for any educational programme to be effectively implemented there is need to put in place the required facilities, equipment, resources and materials. Computer Studies being a practically oriented subject requires that computers to be used by learners are available, textbooks, scanners, photocopiers and computer laboratories are put in place.

In addition, head teachers and teachers of Computer Studies needs to be capacity built if a curriculum innovation is to be effectively implemented. When the implementers are capacity built, they can be able to teach learners with confidence as they could have the subject matter at their fingertips. Similarly, having been capacity built, head teachers could be able to support the running of the programme. Failure to put in place the aforementioned elements as proposed by Gross, the implementation of Computer Studies may not be a success. However, when applied appropriately, Computer Studies curriculum shall be implemented effectively. Having used this theory in the context of the current study, the researcher is of the view that this could work towards addressing the issue of

Computer Studies curriculum implementation in that facilities and equipment, as well as teachers are provided before rolling up a curriculum innovation. The researcher in the next section will give a summary of the discussion of the research findings.

5.9. Summary

As stated by several scholars, (Adekunle, 2016; Gross, 1971; Gimba, 2018; Makunja, 2016, Mwalongo, 2011, Chaamwe, 2017, Mulenga, 2016) Computer Studies curriculum requires facilities, equipment, materials and teachers qualified and educated to teach, use of appropriate teaching methods in order for it to be a success story. It was observed that due to lack of skills by teachers and lack of facilities and equipment, learners mainly learnt theoretically thereby failing to achieve the objectives of the 2013 revised competency-based curriculum. Furthermore, teachers, learners and parents viewed the introduction of Computer Studies as a good thing that should be encouraged to continue. The researcher in the following chapter will now give the conclusions and recommendations based on this study.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1. Overview

In this chapter, a summary of the main research findings has been presented. Furthermore, a conclusion of the study, recommendations of the study and some suggestions on areas for future research have been presented too.

6.2. Summary of the Main Research Findings

Being the final chapter of this study, it is cardinal to recap that the researcher investigated the Computer Studies Curriculum implementation in rural secondary schools of Zambia's Mufumbwe district. The researcher in the sub-sections that follow presents the main findings.

6.2.1. Availability of Facilities and Equipment

The study established that computer laboratories are not adequate for effective implementation of Computer Studies curriculum in schools. There is also insufficient equipment and resources such as computers, printers, scanners, internet connectivity, textbooks, photocopiers and overhead projectors.

6.2.2. Availability of Qualified Teachers

It was revealed that number of qualified teachers to teach learners in Computer Studies is not enough. Moreover, the majority of teachers teaching learners in Computer Studies have not undergone teacher education in Computer Studies.

6.2.3. Appropriateness of the Teaching Methods

Due to the fact that the majority of teachers have not undergone teacher education and facilities, equipment and resources are inadequate in schools, teachers are using inappropriate teaching methods in class. As a result of the use of inappropriate methods, learners' acquisition of skills and knowledge seems to be hindered. Teaching and learning of Computer Studies should be more practical than theoretical. This would allow more hands-on activities a thing that can lead to learners' innovation and advance their technological mind.

6.2.4. View of Head Teachers, Teachers, Learners and Parents

It can further be concluded that the schools had implemented the programme in the midst of so many challenges. The programme has run with insufficient facilities, equipment and resources, inadequate teachers, and inappropriate methods used by teachers. Therefore, the programme cannot be said to be successful until the necessary facilities, equipment and resources are provided in their adequacy in all the schools. However, Computer Studies is a good subject and schools should be supported and encouraged for effective implementation.

6.3.Conclusion

Based on the findings from the study, it can be concluded that Computer Studies curriculum has not been effectively implemented in rural secondary schools in Mufumbwe district due to a number of challenges that the schools have been facing. The findings show clearly that Computer Studies is an important subject to learners in Zambia and Mufumbwe district in particular as they are likely to be equipped with the necessary skills, knowledge and competencies in order to have learners who are ready to face global technological advancements and innovations. However, Computer Studies can be done better if computers and other equipment, computer laboratories and qualified teachers were provided in schools.

6.4. Recommendations

In view of the results of this study, discussions and the conclusion drawn, the following recommendations were made;

i. The Ministry of General Education should consider setting up a conducive environment for the effective teaching and learning of Computer Studies.
ii. Government through the Ministry of General Education in collaboration with its cooperating partners should devise measures aimed to finding a long-term solution to solve the inadequate facilities and equipment in schools by constructing more computer laboratories, procuring and distributing computers, printers, scanners, photocopiers, overhead projectors and internet gadgets in schools.

iii. Schools should partner with the local community lobby for donations and funds to purchase equipments for Computer Studies.

iv. The Ministry of General Education should ensure that qualified teachers to teach learners in Computer Studies are deployed in schools.

v. Schools should intensify in-service training of teachers through the existing structures such as CPDs and seminars. When teachers are in-serviced, they shall be able to employ appropriate methods when teaching Computer Studies.

6.5. Proposed areas for future research

This study was investigating the extent to which computers studies curriculum was being effectively implemented in rural secondary schools in Mufumbwe district of Zambia and find out the successes and challenges. This study was confined to Mufumbwe district of North Western Province. A similar study can be extended to other provinces to ascertain how Computer Studies was being implemented in secondary schools. Further research could be conducted to establish the levels of skills acquisition in Computer Studies in secondary schools in line with a competency-based curriculum.

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APPENDICES

Appendix 1: Consent Form for Individual Participants

Dear Respondent,

This serves to inform you about the purpose of this study and what will be followed in the process of conducting it. You will be requested to sign this form to indicate that you have willingly volunteered to participate in this exercise.

1. **Description of the Study:** This is purely an academic education research where all respondents will not be identified in person for their participation. The researcher is a University of Zambia student pursuing a Master of Education degree in Curriculum Studies.
2. **Purpose:** It is the wish of the researcher to investigate the extent to which the Computer Studies curriculum is being effectively implemented in rural secondary schools in Mufumbwe district of Zambia: Successes and Challenges.
3. **Consent:** Participation in this study is voluntary.
4. **Confidentiality:** Every information that will be collected in this study shall be treated with high level of confidentiality. Names or identity of respondents in this study shall not be revealed to anyone. In the case where the conversation is recorded, information will be kept under key and lock and shall be destroyed after data has been analysed.
5. **Rights of Respondents:** The rights of every respondent shall be respected and protected and the researcher will ensure that no respondent shall suffer any harm as a result of their participation in this study.
6. **Declaration of Consent by the Respondent**

   I have clearly read and understood every detail of this document and I therefore willingly and freely agree to participate in this study.

   Signature: _____ Date: _____

Appendix 2: Interview Schedule for Head Teachers

Brief introduction

I am a Masters of Education student in Curriculum Studies at the University of Zambia carrying out an academic study in which your participation is important. This interview is meant to find out your opinions concerning the '*Computer Studies Curriculum Implementation in Selected Secondary Schools in Mufumbwe district: Successes and Challenges'*. You are therefore requested to be as objective as you can in view of what you know about Computer Studies curriculum implementation at your school. The information you will give will be treated with utmost confidence and will only be used for academic purposes.

1. How many classes are taking Computer Studies at your school?
2. How many computer laboratories do you have at your school?
3. Apart from computer laboratories, what other facilities do you have?
4. How many pupils take Computer Studies at this school?
5. How many computers do you have at this school?
6. Apart from computers, what other equipment do you have in place?
7. What is the ratio of pupils to computers at your school?
8. When learning Computer Studies, where do computer lessons and practical take place?
9. What is the main source of power generation at this school?
10. Who are teaching Computer Studies in this school?
11. Are the teachers who teach learners in Computer Studies qualified in computers?

12. Apart from teachers teaching Computer Studies, do you have technicians employed to install and upgrade the computer software?

13. In your view, do you think learners enjoy learning Computer Studies at this school?

14. Do you think the Ministry of General Education did well to have Computer Studies to be taught in all secondary schools?

15. How did the grade nine (9) learners perform in the previous (last year's) examination?

16. According to last year's results performance, can you say your teachers are competent enough to teach Computer Studies?

17. Could you attribute the performance learners' efforts or teachers' effort?

18. Is there any change in behaviour among learners in line with computer literacy?

19. What could be some of the difficulties that you face in the process of implementing Computer Studies at this school?

20. In your view, can you say the introduction is a successful story? Why do you think so?

Thank You for your Responses and Time.

God richly bless You!

Appendix 3: Interview Schedule for Parents

I am a Masters of Education student in Curriculum Studies at the University of Zambia carrying out an academic study in which your participation is important. This interview is meant to find out your opinions concerning the '*Computer Studies Curriculum Implementation in Selected Secondary Schools in Mufumbwe district: Successes and Challenges'.* You are therefore requested to be as objective as you can in view of what you know about Computer Studies curriculum implementation at the school where your child learns from. The information you will give will be treated with utmost confidence and will only be used for academic purposes.

1. The Ministry of General Education has introduced Computer Studies to be taught in secondary schools. Do you think it is a good move? Explain why.

2. Since your child started learning Computer Studies as a subject at school, have you observed any change in terms of computer literacy?

3. How do you compare the current behaviour of your child to that of the past before Computer Studies was introduced in secondary schools?

4. How is the response by your child towards school compared to that of the past? Has that been affected by the introduction of Computer Studies?

5. In your view, would you say the introduction of Computer Studies is a good idea?

6. Would you then say the introduction of Computer Studies is a success? Explain why you think so.

Thank You for your Responses and Time.

God richly bless You!

Appendix 4: Questionnaire for Learners

I am a Master of Education student at the University of Zambia carrying out an academic study in which your participation is important. The study is titled *'Computer Studies Curriculum Implementation in selected Secondary Schools in Mufumbwe district: Successes and Challenges.'* Please kindly respond as truthful as possible to the items in the instrument by **a tick (√) or a brief explanation in the spaces provided.** The information you will give will be treated with utmost confidence and will only be used for the purpose of this particular study.

Instructions

a. Do not write your names on this questionnaire.
b. Do not mention any name of any person in this questionnaire.
c. Read the questionnaire items carefully before you answer them.

Section A: Demographic Information

1. Gender: Male [ ] Female [ ]

2. Age group: 10 – 12 [ ] 13 – 15 [ ] 16 – 18 [ ] Above 19 [ ]

3. Grade/Class …….

Section B:

A. Availability of Facilities and equipment

4. Do you have textbooks for Computer Studies in your school? Yes [ ] No [ ]

5. (a) Are the textbooks for Computer Studies enough for all learners in your class? Yes [ ] No [ ]

   (b) If your answer in 5a is yes, are the textbooks up-to date in terms of information?

   Yes [ ] No [ ]

(c) If your answer in 5a is no, explain how you learn Computer Studies without textbooks.

……..……

……

6. Do you have computers at this school? Yes [ ] No [ ]

7. How many computers do you have in your class?

   Between 5 – 10 [ ] Between 11 – 15 [ ] Between 16 – 20 [ ]

   Between 21 – 25 [ ] Between 26 – 30 [ ] Between 31 – 35 [ ]

   Between 36 – 40 [ ] 40 and above [ ]

8. Do you know how to operate a computer? Yes [ ] No [ ]

9. (a) Do you have a computer laboratory in your school? Yes [ ] No [ ]

   (b) If your answer in 9a is no, where do you learn computer lessons from? Explain

   ……..

   (c) If your answer in 9a is yes, tick (√) in the appropriate space to your right hand side to show availability of the following equipment in the laboratory.

Facilities and equipment	**Available**	**Not available**
Computers		
Charts		
Printers		
Scanners		
Overhead projectors		
Internet connectivity		
Others (Specify)		

B. Availability of Teachers of Computer Studies

10. How many teachers of Computer Studies do you have in your school? ……..

11. (a) Do you enjoy learning computers studies lessons presented by your teacher? Yes [ ] No [ ]

    (b) If your answer in 11a is no, explain why you do not enjoy the lessons ……

12. Indicate with a tick (√) whether you Strongly Agree, Agree, Undecided, Disagree or Strongly Disagree with the statements in the table below.

Items	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
The teachers who teach us Computer Studies know how to teach.					
I enjoy learning Computer Studies in our school.					
I have learnt a lot of things (skills) in Computer Studies in our school.					
Learning Computer Studies in our class has helped me know how to operate a computer.					
I enjoy the way my teacher explains when presenting computer lessons in class.					
I understand concepts explained by my teacher during Computer Studies lessons.					
Computer Studies is my best subject.					

I understand Computer Studies easily.					
Computer Studies is an interesting subject to study.					
The introduction of Computer Studies by the Ministry of General Education is a thing in a right direction.					

C. Appropriateness of teaching methods used by teachers

13. Indicate with a tick (√) whether you Strongly Agree, Agree, Undecided, Disagree or Strongly Disagree with the statements in the table below.

Items	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
We visit many places to see different works that a computer can do, e.g. a bank					
Our teacher stands in front while explaining to us					
Our teacher shows us how to open a computer, type, play games and practice					
Our teacher asks us to show/demonstrate to others what we have learnt					
We are always put in groups and asked to share idea with others					
Our teacher teaches us how to use games, songs, art work, from the computer					
During Computer Studies lessons our teacher asks us questions which we answer					

Sometimes we learn how to type using different computer programmes					

14. How do you compare Computer Studies with the other subjects?

Excellent [ ] Very Good [ ] Good [ ] Poor [ ] Very Poor [ ]

15. How do you rate your skills in the following areas as a result of the knowledge and skills acquired during computer lessons? Indicate with a tick in the space to your right-hand side.

S/n	Activity	Excellent	Very Good	Good	Poor	Very Poor
1	Use of a word processor					
2	Use of a spreadsheet					
3	Use database software					
4	Use the internet					
5	Use of email					
6	Use of presentation software (PowerPoint)					

D. Learner's Views

16. (a) In your opinion, is the introduction of Computer Studies a good idea?

(b) Explain why you think so. ……..

17. (a) Is the introduction of Computer Studies a success story? Yes [ ] No [ ]

(b) Explain why you think so……..

……

Thank You for your Responses and Time.

God richly bless You!

Appendix 5: Questionnaire for Teachers

I am a postgraduate student at the University of Zambia carrying out an academic study in which your participation is important. The study is titled 'Computer Studies *Curriculum Implementation in selected Secondary Schools in Mufumbwe district: Successes and Challenges'*. Please kindly respond as truthful as possible to the items in the instrument by **a tick (√) or a brief explanation in the spaces provided.** The information you will give will be treated with utmost confidence and will only be used for the purpose of this particular study.

Instructions

a. Do not write your names on this questionnaire.
b. Do not mention any name of any person in this questionnaire.
c. Read the questionnaire items carefully before you answer them.

Section A: Demographic Information

1. Gender: Male [ ] Female [ ]
2. Age: 20 – 30 years [ ] 31 – 40 years [ ] 41 years and above [ ]
3. Highest professional qualification:
   Diploma in Education [ ]
   Advanced Diploma [ ]
   Bachelor's degree [ ]
   Master's degree [ ]
   Others (specify) …….
4. What is your subject combination/specialisation? ……..
5. Years of teaching experience:
   0 – 5 years [ ] 6 – 10 years [ ] 11 – 15 years [ ] 16 years and above [ ]
6. Years of teaching Computer Studies:
   0 – 5 years [ ] 6 – 10 years [ ] 11 – 15 years [ ] 16 years and above [ ]

Section B:

A. Availability of facilities and equipment

7. (a) Does your school have computers for use by learners? Yes [ ] No [ ]

   (b) If your answer in 7a is yes, how many computers do you have? ……

   ……..

   (c) Out of the total number of computers mentioned in 7b, how many are in good working condition? ……

   (d) If your answer in 7a is no, how do you teach Computer Studies? Explain

   ……

   ……

8. How many learners take Computer Studies in your class?……..
9. What is the ratio of pupils to computers in your class? ……
10. Tick (√) in the appropriate space to your right hand side to show the facilities where computer lessons and practical take place from at your school.

Facility	**Computer lessons**	**Computer practical**
Classroom		
Laboratory		
Open space		
Others (specify) …….....		

11. What are the main sources of power generation at this school?
    (a) Zambia Electricity Supply Cooperation (ZESCO) [ ]
    (b) Solar Power [ ]
    (c) Diesel generator [ ]
    (d) Petrol generator [ ]
    (e) Others. Specify……
12. (a) Has your school got facilities and equipment for use in the implementation of Computer Studies curriculum? Yes [ ] No [ ]

(b) If your answer in 12a is yes, tick (√) in the appropriate space to your right-hand side to show the availability of facilities and equipment in your school.

Facilities and equipment	Available	Not available
Computers for learners		
Pupil's textbooks in Computer Studies		
Teacher's guides in Computer Studies		
Computer Studies syllabus		
Scanners		
Computer laboratories		
Internet services		
Printers		
Photocopiers		
Backup generator(s)		
Overhead projector(s)		
Others (specify) ……		

(b) If your answer in 12b is no, kindly explain how you teach Computer Studies.

……

……

13. Tick (√) in the appropriate space to your right hand side to show the adequacy of the following facilities and equipment in your school.

Facilities and equipment	Very adequate	Adequate	Fairly adequate	Inadequate
Computers for learners				
Textbooks in Computer Studies				
Scanners				
Computer laboratories				
Internet services				
Printers				
Electricity				
Backup generator(s)				
Overhead projector(s)				
Photocopiers				
Others (specify) ……				

B. Availability of Teachers Qualified to teach Computer Studies

14. (a) Have you undergone teacher education on how to teach Computer Studies?
Yes [ ]No [ ]

(b) If your answer in 14a is yes, where did you receive the teacher education from?

……

(c) How long was your teacher education programme in Computer Studies?

……

(d) What qualifications did you obtain from this institution?

……

(e) If your answer in 14a is no, explain why you teach Computer Studies when you are not qualified? ……..

……..

C. Appropriateness of Teaching Methods Used

15. Tick (√) in the appropriate space to your right hand side to show how you rate the use of the following teaching methods in your Computer Studies lessons.

Teaching Method	**Very often**	**Often**	**Not often**	**Not at all**
Educational visits				
Lectures				
Practical				
Demonstrations				
Discussions				
Simulations software e.g. downloaded websites, games				
Questions and answers				
Computer aided learning software e.g. typing tutor, training tutors				
Others (specify)				

16. Tick (√) in the appropriate space to your right hand side to show the appropriateness of the following teaching methods in your Computer Studies lessons.

Teaching Method	**Excellent**	**Very well**	**Well**	**Fairly well**	**Not well**
Educational visits					
Lectures					
Practical					
Demonstrations					
Discussions					
Simulations software e.g. downloaded websites, games					
Questions and answers					
Computer aided learning software e.g. typing tutor, training tutors					

17. (a) Among the methods in question 16, which one is the most effective method that you have used in teaching Computer Studies? …….

……

(b) Explain your answer in 17a…….

……

D. Teacher's Views

18. (a) In your view, is the introduction of Computer Studies in the school of any benefit to the learners? Yes [ ] No [ ]

(b) Please give reasons why.

(i) …..……

(ii) ……

(iii) ……..

19. (a) Do learners enjoy learning Computer Studies in your class? Yes [ ] No [ ]

(b) If your answer in 19a is yes, explain how ……

……..

(c) If your answer in 19a is no, explain why too……..

……

20. (a) Since the introduction of Computer Studies, have you observed any change in terms of behaviour among your learners? Yes [ ] No [ ]

(b) If your answer in 20a is yes, explain what type of behaviour change you have observed.……

……

21. (a) In your opinion, do you think the introduction of Computer Studies is a good thing?

Yes [ ] No [ ]

(b) Give an explanation to your answer in 21a.

……

……

22. (a) Is the introduction of Computer Studies a success story?

Yes [ ] No [ ]

(b) Give an explanation to your answer in 22a.

……

……

Thank You for your Responses and Time.

God richly bless You!

Appendix 6: Observation Schedule

Yes and No will be used to indicate their availability and the scale of 1-3 for their conditions where applicable. 1 stands for good, 2 for average and 3 for poor.

	Yes	**No**	**1**	**2**	**3**	**Comments**
1. **Administration**						
a) Syllabi						
b) Time table						
2. **Physical facilities**						
a) Computer laboratories						
3. Materials and equipment						
a) Computers						
b) Pupil's textbooks						
c) Teacher's guides						
d) Printers						
e) Scanners						
f) Internet						
g) Generators						
h) Overhead projectors						
i) Electricity						
j) Photocopiers						
k) Storage devices (e.g. USB)						

Appendix 7: Lesson Observation Schedule for Teachers in Secondary Schools

School:_____ Grade:_____Subject:_____Time:_

Teacher:_____ Date:_____ Observer: _____

CATEGORY	RATING				
I. CONTEXT/GOAL SETTING	**5**	**4**	**3**	**2**	**1**
Established clear learning goals (knowledge, understanding, skills).					
Most learners appear aware of and understand the learning goals.					
Provided rubrics or other guides to focus learners on goals.					
Closed the class with a focus on goals/meaning of lesson.					
II. LEARNER ASSESSMENT					
Implemented assessment during lesson to gauge understanding.					
Implemented assessment at end of lesson to gauge learner learning.					
III. LESSON INTRODUCTION					
Capturing learners' attention					
Linked new subject matter to prior learning and/or experience.					
IV. LESSON DEVELOPMENT					
Use of multiple modes of instruction, with emphasis on active learning.					
Use of relevant and quality examples					
Engaged learners in practical activity					
Pace of the lesson					
Level and clarity of speech					
Learners' participation in the lesson					
Knowledge of subject matter					

Variety of class activity/technique					
Learners' active practical competence					
Knowledge and skills attained by learners					
Variety of teaching resources					
V. QUESTIONING TECHNIQUES					
Attention to learner questions/comments during lesson.					
Distribution of questions to the class (various groups of learners)					
Quality of questions					
Varied learner groupings: individual; pairs; small groups.					
VI. RESOURCES					
Use of chalkboard					
Use of teaching aids (Computers and other equipment)					
VII. RESPONSE TO LEARNER NEEDS					
Showed proactive preparation for a variety of learners' needs.					
Attended appropriately to learners who struggle with learning (LD; ELL; reading; etc.).					
Attended appropriately to learners with physical/behavioral challenges.					
Attended appropriately to advanced learners.					
VII. **SUPPORTIVE LEARNING ENVIRONMENT**					
Practical lesson conducted in a computer laboratory					
Demonstrated respectful behaviour toward learners.					
Demonstrated sensitivity to different cultures/ethnicities.					
Acknowledged/celebrated learner strengths/successes.					
Active participation by a broad range of learners.					

Learners comfortable asking questions/requesting assistance.						
Emphasis on competition against self, not other learners.						
VII. LESSON CONCLUSION						
Summary of main of the lesson						
VIII. EVALUATION						
Managed the class very well.						
Lesson targeted one or more stated learning standards.						
Lesson focused on important ideas, issues, or problems.						
Tasks emphasized thought/meaning vs. drill & practice.						
VIII. EVIDENCE OF DIFFERENTIATION						
1) **Content:** e.g. materials of varied readability and/or interest; multiple ways to access ideas/information; etc.						
2) **Process:** e.g., readiness-based small group instruction; different homework; choices about how to work (alone, pair, small group); tasks in multiple modes; variety of scaffolding; etc.						
3) **Products:** e.g., product assignments with multiple modes of expression; with choices about how to work (alone, pairs, small group); opportunity to connect learning with individual interests; variety of assessment tasks; etc.						
IX. PERSONALITY						
Teacher-learner relationship						
Appearance						
TOTAL						

COMMENTS

GRADE: _____

SIGNATURE OF THE OBSERVER: _____

KEY TO UNDERSTANDING OF RATING

Rating	5	4	3	2	1
Meaning	Excellent	Very good	Good	Satisfactory	Unsatisfactory