AN ANALYSIS OF THE IMPLEMENTATION OF THE JUNIOR SECONDARY SCHOOL COMPUTER STUDIES IN SELECTED PUBLIC SCHOOLS IN LUSAKA DISTRICT, ZAMBIA

BY

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

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AUTHOR'S DECLARATION

I, **Audrey Kazhila**, do hereby declare that this dissertation is my own work and that all the works of other persons used in this dissertation have been duly acknowledged; and that this work has never been presented to the University of Zambia or any other university for an academic award.

Signed: ……..…….

Date: ……...…….

APPROVAL

The dissertation of **Audrey Kazhila** has been approved as a partial fulfillment of the requirements for the award of the degree of Master of Education in Educational Management of the University of Zambia in collaboration with Zimbabwe Open University.

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ABSTRACT

The study was an evaluation of the junior secondary school computer studies syllabus: a case of selected public schools in Lusaka district, Zambia. The study sought to; evaluate the suitability of computer studies syllabus content as regards the topics to the learners' experiences; explore the suitability of teaching and learning methods and time used in computer studies syllabus; assess time allocated to computer studies; assess the assessment strategies used in the computer syllabus at Junior Secondary School level. A descriptive design was adopted for the study. The sample size comprised 6 (six) computer studies teachers and 36 (thirty-six) learners. Participants were selected through judgmental purposive sampling as well as Homogeneous purposive sampling method for the learners. The data collection instruments used was semi structured interview guides as. The data collected through interview was transcribed, sorted, coded and interpreted. The study findings revealed that regarding the suitability of the computer studies syllabus, i the content was prepared appropriately for the learners' level; theory matched with practicals; was progressive from Grade 8 to 9; was examined according to syllabus; textbooks content was in harmony with the syllabus. Further, it was found that the content taught in class was according to the syllabus. However the shortage of computers made learning the content difficult. Regarding the suitability of teaching and learning methods in computer studies, it was found that the methods were similar to other subjects; and were as recommended in the syllabus. However, certain recommended methods were above the level of the learners and not correlated with use of computer technology. Regarding the allocation of time to Computer Studies at Junior Secondary School Level, it was found that the syllabus has dictated teaching time for computer studies; time allocated for practicals was not sufficient; learning time did not cater for slow learners and that time allocation was a major challenge while various technical disruptions such as power outages wasted more time. On the assessment strategies, the study found that there was both continuous and summative assessment. Much was limited to common application packages. The assessment conformed to Bloom's Taxonomy of Objectives and was considered important. The study recommends that time allocation towards practical periods should be increased to allow an enabling environment for more practice; teaching and learning methods should be more of learner centered; and the government should invest in green energy such as solar to provide power to rural schools.

Key words: *Evaluation, Junior Secondary, Syllabus.*

DEDICATION

This dissertation is dedicated to my husband whose moral, financial support and meaningful encouragements have made it possible for me to complete this research work and most importantly to undertake this degree program.

Finally, I would like to dedicate this publication to my children, family and friends for their support and encouragement rendered to me during the course of my studies.

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ACRONYMS AND ABBREVIATIONS

CDC	Curriculum Development Centre
DEBS	District Education Board Secretary
HCI	human computer interaction
ICT	Information Communication Technology
MDGs	Millennium Development Goals
MoE	Ministry of Education
MOGE	Ministry of General Education
NEPAD	New Partnership for Africa's Development
OBE	Outcome Based Education
UNEB	Uganda National Examinations Board
ZIPAR	Zambia Institute for Policy Analysis and Research

CHAPTER ONE: INTRODUCTION

1.1. Overview

This study is aimed at evaluating the Zambian secondary school computer studies syllabus. The chapter presents background to the study, statement of the problem, purpose of the study, research objectives, and research questions, significance of the study, delimitation, limitations, conceptual framework theoretical framework and definitions of operational terms.

1.2. Background

An increase in the global recognition and efforts of teaching and learning computer studies through the role played by the new innovation of ICTs in the recent past has led to rapid development and changes in adaptation to educate the masses with the technological skills of computers. In order to have a new face of education system, teachers and learners need to experience its importance differently at various levels of education (Moon, 2004).

ICT in education adds value in teaching and learning, by enhancing the effectiveness of learning, or by adding a dimension to learning that was not previously available. ICT may also be a significant motivational factor in students' learning, and can support students' engagement with collaborative learning. ICT has become an integral part of everyday life for many people. It increases its importance in people's lives and it is expected that this trend will continue, to the extent that ICT literacy will become a functional requirement for people's work, social, and personal lives.

The Vision 2030 initiative was established in 2012 as a policy framework for overall development in Zambia. Among its primary goals is the creation of a knowledge-based society. The key outcomes of this ambitious plan include economic diversification and job creation, reduction of poverty and vulnerability, reduced developmental inequalities, enhanced human development and the creation of a conducive governance environment. The Vision 2030 also calls for a strong general education base in science and technology, delivery of a flexible curriculum that takes into account new teaching methodologies. Information and Communication Technology (ICT) is an important part of this process of national development (Ministry of Finance and National Planning, 2012).

Zambia has long identified the importance of Information and Communication Technology (ICT) in the economic and social development of the country. Development of ICT has since been firmly set in the country's short and long-term development plans. The Ministry of General Education has been directing a lot of resources and expertise into establishing effective systems and policies that will have a positive impact on students and learning outcomes.

In 2006, the National Science and Technology Policy envisaged that ICTs could aid in the eradication of poverty, achieve universal primary education and promote gender equality and empowerment of women in line with Zambia's commitment to the Millennium Development Goals (MDGs) at that time (Ministry of Communication and Transport, 2006). The main goal of the National Science and Technology Policy was to set out the framework for Zambia's participation in the global economy and global village by bridging the information and communication technology gap that appeared to exist among many places in Zambia. The embedding of ICT development in national plans follows the realization that ICT infrastructure, both public and private, was inadequate and fragmented, resulting in poor connectivity and communication. In 2007 Zambia launched its first ICT policy to ensure the integration of ICT in all development activities (MoE, 2014).

The Curriculum Framework of 2013 introduced aimed to incorporate areas of social, economic and technological developments in the school curriculum to ensure that the education system produced a learner who could among other things, be technically literate. To achieve that goal, the Government introduced Computer Studies as a compulsory subject at primary school level. This entails that, teaching and learning of computer studies is now compulsory in secondary schools both government and private schools (MoE, 2013).

It is also imperative to note that the national curriculum framework of 2013 which saw the introduction of Computer Studies at junior secondary school was done in order to have a clear and focused direction of the education curriculum in the country. The Government was trying to respond to the internal and external requirements of the country by imparting the necessary knowledge, skills, attitudes and values in the learners for them to cope and respond to the new world order and in the long run contribute to national development.

The adoption of a national Information Communication Technology (ICT) policy as well as the development of a draft ICT policy for education; and an associated implementation framework provides an enabling policy environment to promote far greater access and use of ICTs across all sectors of Zambia's education system, including a system for enhancing education management, administration, and teaching and learning (Ministry of Education, 2013). Mulima (2014) views that, while the goals and targets set in these policy documents seem realistic, realizing them within the established time frames remains a challenge. Additionally, the penetration levels of Information Communication Technology (ICT) in Zambia's education institutions remains low, with schools that are equipped mostly utilizing second-hand and refurbished computers. This means that the integration of ICTs in learning and teaching practice has limitations in the way the computer studies syllabus is revised.

However, performance in computer studies has continued to show a downward spiral. Various researchers have identified factors that are believed to cause poor performance. This include: teachers not using student- centered approaches, lack of experiments and practical modeling activities, and lack of professional exposures that could have articulated issues related to teaching of computer studies in secondary schools. Many teachers attributed this performance to negative attitudes by the students as well as a missing link between primary and secondary school computer studies. Lack of application of technology including computer use, lack of parental support, and lack of motivation by both teachers and students were also noted. MOE (2001), points out that poor performance in Zambia is due to poor teaching methods, and an acute shortage of computers. The fact that as many as six students would share one computer in some schools makes it impossible for them to complete their work. As such, the follow up teaching is not built on the students' practical experiences. This was a reason enough for evaluating the Zambian junior secondary school computer studies syllabus.

Many studies have been conducted in Zambia pertaining Information Communication and Technology (ICT) and Computer Education in schools. Nchimunya (2009) looked at a review on the challenges that hinder sustainable implementation of ICT as a subject in rural Zambia. She attempted to bring out the challenges that hinder sustainable implementation of information communication technology (ICT) as a subject in rural Zambian schools; Mambwe (2016) also looked at barriers to effective teaching of computer studies in selected government junior

secondary schools of Mwansabombwe District in Luapula province. He endeavored to establish the availability of ICT infrastructure and equipment; the effects of teacher training and exposure to ICT on the implementation of computer studies curriculum and to explore the measures that could be put in place to enhance the implementation of computer studies curriculum in the selected schools in junior secondary schools.

Felesia, (2019) conducted a study on Introduction of computer education in the curriculum of Zambian primary and secondary schools: benefits and challenges whose purpose of this study was to establish the benefits and challenges in the teaching and learning of Computer Studies in Mwandi District, Western Province of Zambia. The findings revealed that there is insufficient ICT infrastructure in schools and there was inadequate ICT facilities/equipment, lack of time to adequately teach computer studies, large teacher/pupil ratio, unreliable or inadequate power supply, lack of trained teachers in ICTs, lack of technical support to maintain and upgrade computing equipment, limited financial resources and lack of Internet connectivity were the main challenges faced towards effective teaching of the subject in schools.

Similarly, Walubita and Mulauzi (2016) conducted a study on In-service teachers' perceptions towards classroom technology integration in Zambia. The study explored the perceptions towards integrating information and communication technologies (ICTs) in teaching and learning programs among in-service primary school teachers in Zambia. The results indicate that there was a strong, positive correlation between attitude and belief towards using ICTs in the teaching and learning process

Consequently, Mtanga et al (2012) studied the Use of ICTS in education. This paper was based on a research that was conducted in seven high schools in Lusaka, Zambia on the utilization of ICTs in education. The results revealed that ICTs have a significant impact on all areas of human activity and the education sector is no exception. ICT has affected teaching, learning and research with the potential to improve the quality of education.

Though not enough, William and Richard (2016) investigated the impact of emerging technologies on female and male pupils' academic performance in Mathematics. The study noted that differences in academic performance are not innately caused but largely as a result of cultural, social and economic facets. Adejumobi, And and Adeniran (2017) studied the significance of

Information and Communication Technologies (ICTs) in providing Good Information Services to the Society in Nigeria. They concluded that when considering the use of ICT for development, conventional wisdom is that even if the hardware is free, Communication, software and training make ICT expensive. The studies conducted in Zambia addressed the benefits and challenges; attitudes and beliefs in teaching ICT; Uses of IC; differences in performance in ICT by gender, however none of the studies have critically analyzed the syllabus content and its suitability to the level of learners, a research gap this study endeavored to fill.

However, the key related studies conducted in Zambia did not analyze the content of the computer studies syllabus which the current study hopes to investigate. In this regard there is little known on the suitability of computer studies syllabus content to the learners' experiences at junior secondary school level including the suitability of the teaching and learning methods; time allocated to teach the subject; as well as the methods of assessment used.

The content and learning experiences in computer studies syllabus in secondary needs to be checked as there has been fewer studies of the evaluation of computer studies syllabus since 2013. Therefore, it was imperative to conduct an investigation of the Zambian junior education secondary school computer studies syllabus.

1.3. Statement of the Problem

Many studies have been done on computer studies in Zambia since its inception in 2013. Many of these studies focus on the challenges in ICT (Mambwe, 2016; Nchimunya, 2009); benefits of ICT; review of quality of computer studies (Zambia Institute for Policy Analysis and Research, (ZIPAR) 2018); benefits and challenges of ICT (Felecia, Gabriel and Judith, 2019); In-service teachers' perceptions towards classroom technology integration in Zambia (Walubita and Mulauzi, 2016); Information and Communication Technologies (ICTs) and Development Information for Professional Women in Zambia (Mulauzi and Albright, 2009); Integration of ICTs in education: the level at which ICT training should be introduced in Zambian education (Chisunka et al, 2011). However, none of the studies have critically analyzed the syllabus content and its suitability to the level of learners.

1.4. Purpose

The purpose of the study was to evaluate computer studies syllabus at junior secondary school level in selected schools in Lusaka District.

1.5. Objectives

1. To evaluate the suitability of computer studies syllabus content as regards the topics to the learners' experiences at junior secondary school level.

2. To explore the suitability of teaching and learning methods.

3. To assess time allocated to computer studies at Junior Secondary School level.

4. To assess the assessment strategies used in the computer syllabus at Junior Secondary School level.

1.6. Research Questions

1. How is the suitability of computer studies syllabus content as regards the topics to the learners' experiences at junior secondary school level?

2. How is the suitability of teaching and learning methods?

3. How is the time allocated to computer studies at Junior Secondary School level?

4. What assessment strategies are used in the computer syllabus at Junior Secondary School level?

1.7. Theoretical Framework

The study was focused on the area of curriculum implementation, taking the component of Junior Secondary School Computer Studies. In line with this, the Curriculum Implementation Theory by Gross, (1971) was the theoretical basis for the research. The Curriculum Implementation Theory states that, any curriculum implementation should be considerate of the elements of: teacher ability (innovation of the implementer); availability of resources; capacity of the implementer and management support facilities. These are outlined in turn.

I. **Clarity of the Innovation to the Implementer:** The first element of curriculum implementation as conceived by Gross, (1971) is clarity of the innovation to the

implementer. The changes in the curriculum are considered to be innovations that the implementer must clearly understand. Teachers, as implementers have no option but to adapt to the changes. This requires innovativeness of the part of the teacher, requiring him to find the best ways of knowing and doing what is expected.

II. **Availability of Resources:** Gross considered that successful curriculum implementation relied on availability of resources. The resources are those that would make both teaching and learning unconstrained and more effective. The resources should be made available in time before teaching occurs and during the teaching process.

III. **Capacity of the Implementer:** Gross established that the implementer should be appropriately qualified to teach the specific curriculum subject. For teachers, a college qualification was a prerequisite. A teacher should not be allowed to teach a level above that which he is trained. In this regard, Gross advocated for having different levels of teacher education and let teachers teach according to their level.

IV. **Management Support:** Gross, (1971) posits that school managers need to play their supervisory roles to ensure that curriculum implementation is in accordance with the set nation-wide outcomes. In this regard, managers provide policy documents, guidance, motivation, advise, finances, materials, human and other resources. Resources should be made available to the end-users in the appropriate quantities and time.

Application of the Theory to the Study

The curriculum implementation theory was appropriately linked to the study in the sense that it provided a framework within which the study objectives could be addressed. Gross (1971), required that that the teacher, as implementer should be well aware of the changes in the curriculum. Without appropriate awareness of the content, outcomes, methods and approaches in the curriculum, then implementation is weak. This aspect was assessed by evaluating how the teachers found the computer studies syllabus content suitable. This could only be addressed if the teachers had studied the new content and related it to the learners' levels.

According to Gross, the implementer should be innovative. The aspect of implementer innovativeness was assessed by exploring the teaching and learning methods adopted by the

teachers in computer studies under the revised syllabus. This aspect of innovativeness has been articulated in the Revised Curriculum which focuses on teachers who are innovative enough to produce learners who can adapt to change in the dynamic world (MoGE, 2013).

According to Gross, there should be availability of resources for teaching and learning. For computer studies, resources include suitable infrastructure, computers, furniture, internet connectivity, books, software and others.

The computer studies curriculum requires teachers who are well versed in teaching the subject. This comes with qualification in the subject matter and teaching methodology. Gross' theory provided a good framework for selecting a sample of teachers who were appropriately qualified, not only in computer knowledge, but also in teaching methodology.

Successful implementation of the computer studies syllabus requires the support of school management by providing school related, teacher related, learner related and other factors. These could be in terms of personal managerial support, finances, human resources, materials, rooms and time. Resources are available both internally and externally.

The theory is therefore well linked to the study as it addresses the very variables that were studied. The effective implementation of the computer studies syllabus is therefore a function of: teacher ability to teach computer studies (teaching and assessment methods used in computer studies); availability of resources (computer studies can best be taught if support resources are available); capacity of the implementer (how well the teachers of computer studies understand and teach the new content); and management support (time allocated to computer studies and other managerial strategies).

1.8. Conceptual Framework

Basing on the Theoretical Framework, a conceptual Framework was derived to describe the study variables.

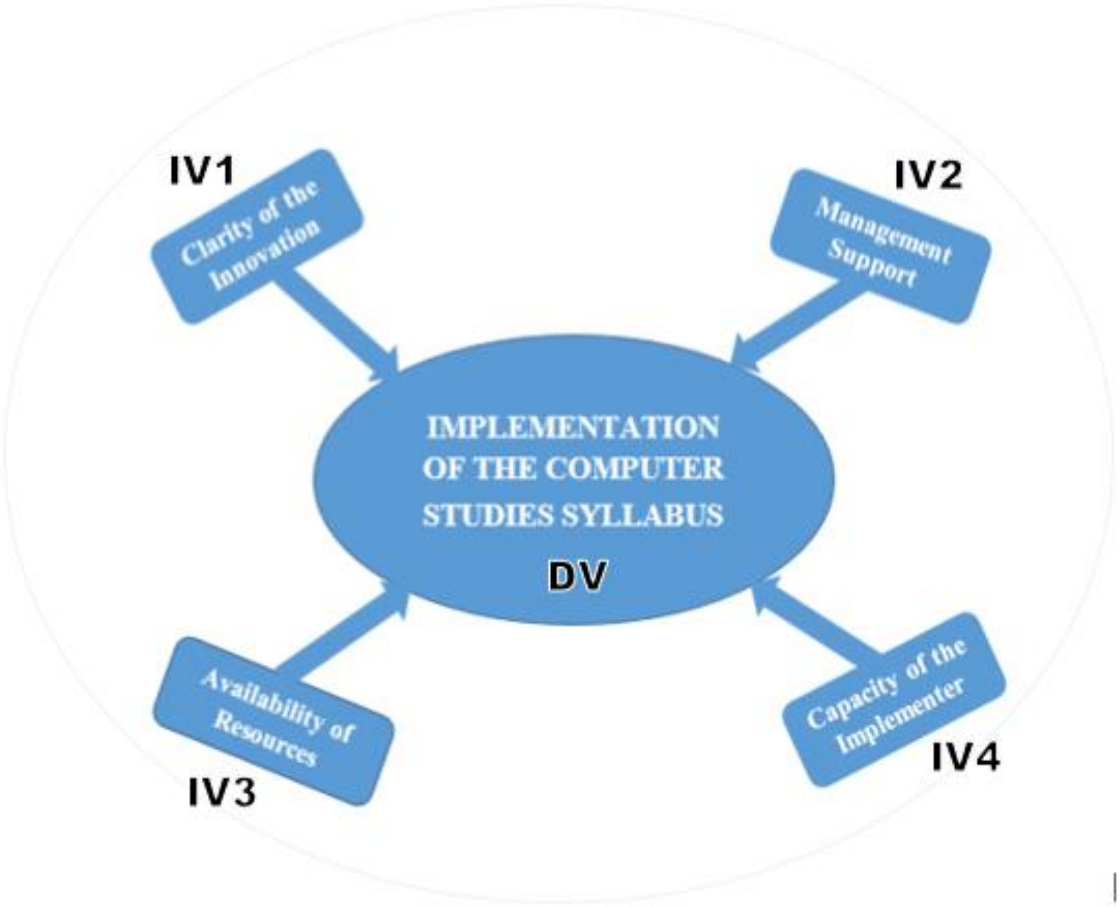


Figure 2. 1. Conceptual Framework

Adapted from Gross, (1971)

Figure 2.1. shows the conceptual framework. It is that the dependent variable (DV), implementation of the Computer Studies syllabus, depends on the impact of the independent variables (IV 1 to IV4); that is clarity of the innovation (IV1) management support (IV2); availability of resources (IV3) and capacity of the implementer (IV4)

1.9. Significance

The findings of the study provide a huge benefit to the policy makers and curriculum planners of computer studies as the findings may be adopted and used in the modifications which may be needed to meet contextual demands in computer studies syllabus. The study uncovered critical impediment in the educational delivery of the computer Studies syllabus that many researchers probably may have and suggest ways of implementing computer syllabus. The findings also

enabled the researcher enumerate and understand the challenges faced in implementing computer studies syllabus in secondary schools. The study also enabled the researcher to have an insight on how a well implemented computer studies can translate into a successful improvement process of a school performance as a whole. The findings of the study added to the existing body of knowledge.

1.10. Delimitations

The study was conducted in Lusaka District of Lusaka province and was confined to selected public schools with junior secondary school. This means, therefore, that the results were generalized to any other schools in Zambia.

1.11. Limitations

Borg and Gall (1983) describe limitations to mean those conditions which are beyond the control of the researcher and may also place restrictions on the conclusions of the study. It is possible that responses may not reflected the accurate perception of teacher's attitudes in the implementing computer studies syllabus in secondary schools and responses may be strongly impacted by the respondent's personal bias. The results that were generated by this study can only be directly generalized to individuals and schools with similar demographics to those that will be used in the study.

1.12. Definition of Operational Terms

Information Communication and Technology: Forms of technology that are used to transmit

> Process, store, create, and display share or exchange information by electronic means (Mambwe, 2016). The currents study refers Information Communications Technology (ICT) to a broad term that encompasses any communication device which includes phones, computer and networks.

Syllabus: an outline and summary of topics to be covered in an education or training course.

Computer: A machine that manipulates data according to a list of instructions (Mambwe, 2016).

Computer: This study refers a computer to an electronic device that stores, retrieves, and processes data, and can be programmed with instructions and composed of hardware and software, and can exist in a variety of sizes and configurations.

Computer Studies: The study refers computer studies to a subject offered under the school Curriculum from grade 8-12 in Secondary Schools that explains about computers and their application to education and equips learners with relevant survival skills

1.13. Summary

Chapter One, the introductory chapter covered the aspects that led to the undertaking of this study. The background described the global, regional and local dynamics in the provision of education with the introduction of new subjects such as Computer Studies in Zambia. The Statement of the Problem outlines major studies and gaps in research on implementation of curriculum in Computer Studies. Further, the chapter outlined the purpose, objectives and research questions that guided the study. Drawing from the Curriculum Implementation Theory (Gross, 1971) the theoretical framework and conceptual framework have been included to show the theoretical underpinnings of the study and the related study variables. The later parts of Chapter One are the significance of the study, delimitations and definitions of terms.

CHAPTER TWO: LITERATURE REVIEW

2.1. Overview

The purpose of review of a literature in this study is to provide an insight summary and analysis of the related already done research works and publications to this study. This chapter presents a critical analysis of computers studies in institutions of learning.

2.2. Junior Secondary School Syllabus Content

Curriculum Development Centre (2014) outlines that the syllabus was produced as a result of the Curriculum review process carried out by the Ministry of Education, Science, Vocational Training and Early Education under the auspices of the Curriculum Development Centre (CDC). The curriculum reform process started way back in 1999 when the Ministry of Education commissioned five (5) curriculum studies, which were conducted by the University of Zambia (MoE, 2014). The syllabus has been reviewed in line with the Outcome Based Education principles which seek to link education to real life experiences that give learners skills to access, criticize analyze and practically apply knowledge that help them gain life skills. Its competences and general outcomes are the expected outcomes to be attained by the learners through the acquisition of knowledge, skills, techniques and values which are very important for the total development of the individual and the nation as a whole. Effective implementation of Outcome Based Education (OBE) requires that the following principles be observed: clarity of focus, Reflective designing, setting high expectations for all learners and appropriate opportunities.

The Curriculum development Centre (2013) pine that the major focus of Computer Studies is the development of productivity tools skills, which are important for success in future postsecondary studies. Computer Studies is relevant for all students because it incorporates a broad range of transferable skills and techniques, including logical thinking, creative design, synthesis, and evaluation. It also teaches generically useful skills in such areas as communication, time management, organization, and teamwork. Content of Computer Studies syllabus will provide students with the knowledge and skills to understand the underpinnings of current computer technology and prepare them for emerging technologies. A foundation in this discipline will introduce learners to the excitement and opportunities afforded by this dynamic field and will begin to prepare them for a range of rewarding careers. The subject will build a strong foundation

for those who wish to move on to further study and training in specialized areas such as; computer science, education, computer engineering, software engineering, information technology, database analysis, and game development.

Curriculum Development Centre (2014) explains that computer Studies syllabus content offers a wide perspective of the subject. It is not restricted to computers but rather usage and application of a variety of technologies and its impact on society. The nature of the computer Studies syllabus subject is such that it will best be learnt within the context of application. As such, activities that replicate real life should form an integral part of the teaching and learning methodologies. Computer Studies syllabus is meant to prepare learners for the world of work, further education within the discipline and simply lifelong application of technology. Since computer Studies syllabus is extremely dynamic and also significantly always impacting on the way we live, learners should be encouraged to grapple with its complexities if they are to become competitive citizens in today's globalized world. It is suggested that individual and/or group work/ or homework be given to learners to do during their spare time or prep.

The indicator of the achievement of these General outcomes will be based on acquisition of the skills through Assessment of the learner's competence on both theory and practical outcomes. The sequence of the syllabus does not necessarily dictate the order in which topics are to be taught. Principles and procedures Learners need to develop skills to help them learn. Skills development should happen as a part of learners' learning experiences and the learning and practicing of skills needs to occur in the context of units being taught.

Principles and procedures Learners need to develop skills to help them learn. Skills development should happen as a part of learners' learning experiences and the learning and practicing of skills needs to occur in the context of units being taught. Learning of Skills tends to be most effective when: • learners go from the known to the unknown Computer Studies Syllabus Grades 8 and 9 Page ix • learners understand why it is necessary to gain mastery of specific skills • skills are developed sequentially at increasing levels of difficulty • learners identify and analyze the components of the skill • there are frequent opportunities for practice and immediate feedback possibly frequent use of computer or computer embedded gadgets or tools. • the skills being taught are varied in terms of amount and type, according to the needs and ability of learners To teach skills effectively, a teacher needs to include learning activities that span from teacher-directed to

student-centered learning, use groups of different sizes ranging from the whole class to small groups and use a range of teaching strategies which use higher-order skills as learners' progress. Teaching and Learning Strategies for Computer Studies Teaching and learning strategies for Computer Studies shall include: Brainstorming - to stimulate creative thinking, Consequence charts - Cause and effect approach, Classroom displays (focuses on the current unit), Charts, Diagrams, Evaluation, Discussion, Guest speaker or visitor, educational tours and visits, Models, Photographs and pictures, Presentations, Problem solving - Learners are involved in identifying and working towards solutions, Reflective learning - thinking about what has been learnt, Research - to think of the questions you want learners to answer. Software Throughout the course the minimum recommended Operating System (OS) is Microsoft Windows 7®. Microsoft Office 2007® or later versions will also be assumed for use to demonstrate Word processing (Word), Spread sheets (Excel), Presentation (PowerPoint), Desktop Publishing (Publisher) and Multimedia. Time and Period Allocation: This syllabus covers a two-year course in Computer Studies and will require at least four 40-minute periods per week to complete (One double for practical and two single periods for theory).

Assessment Scheme The assessment framework utilizes various types of continuous assessment strategies. This is meant to determine learners' competences in the CS outcomes presented here. It is desired that the teacher as much as possible utilize assessment strategies that promote active learning by the learner. The case in point includes portfolios, observation sheets (to gauge certain competences), written assignments and reports, presentations, projects and experiments. Computer Studies is a practical subject and as such this syllabus places a lot of emphasis on the use of common application packages. Object oriented programming languages will not be examined at this level. It is therefore the schools' responsibility to ensure that relevant equipment and software needed by learners to meet the minimum requirements for assessment purposes are acquired. The final assessment of Computer Studies is divided into two sections. 1. Theory (Paper 1) - (External assessment by the examination board): 60% 2. Practical (Paper 2) - (External assessment by the examination board): 40% Computer Studies assessment at junior secondary school level covers the six categories of Bloom's Taxonomy with their respective weightings on Assessment Objectives (AOs) as shown below: The weightings of the subject will be done against Assessment Objectives (AOs) and these are drawn from the whole junior secondary school syllabus. It is

therefore important that the teacher well balances the teaching of the content of the subject accordingly.

2.3. ICT Teaching Methods, Learning Methods

Globally, in schools today, both teachers and learners carry with them different technological devices such as the iPad, mobile phones and computers to complement the efforts of teaching and learning computer studies. This entails that computer studies is making dynamic changes in society that influence all aspects of life experiences and are felt more and more at schools because it provides both learners and teachers with more opportunities in adapting learning and teaching to individual, society and schools' needs.

Hilbert and López (2011) observed that the advent of digital Information and Communication Technologies (ICTs) through the teaching and learning of computer studies has changed the lives of all people around the globe. This implies that the current generation is privileged because they are trying to link up and get connected through the experience of interacting with computers hence, have the responsibility to live through and shape an era in which information and communication has become the driving force of human progress as it is the most powerful and tangible tool to exploit the resultant opportunities of teaching and learning.

Studies reveal a number of strategies that can be used to teach subjects to do with computers or technology. For instance, Muchombu (2012) conducted a study in Namibia on how the ICT subject is taught at Mawane School. It was established that most strategies used included storytelling, audiovisual materials, textbooks, overhead projector, computer, etc. The strategies according the Muchombu proved to be very effective in teaching and learning. A study conducted in India by Muhamed (2010) on teaching strategies applied in colleges for computer lessons is similar to Muchombu's findings that many studies involve classroom discussion, role play, recitation, etc. Most strategies proved to be very effective. The studies by Muhamed (2010) and Muchombu (2012) brought out different strategies used in the teaching of ICT in and Namibia respectively, nevertheless it is imperative to note that the two studies were conducted in two geographical settings which are different from that of Zambia. Additionally, this study sought to analyse the syllabus of computer studies at junior secondary school which is different from the study by Muhamed (2010) whose study concentrated on computer lessons in colleges.

Mikre (2011) conducted a study on the role of information communication technologies in Ethiopian education on the use of computers and internet. The findings were that Information communication technologies (ICT) play salient roles in work places, business, education, and entertainment. Moreover, many people recognize ICTs as catalysts for change; change in working conditions, handling and exchanging information, teaching methods, learning approaches, scientific research, and in accessing information. In the case of Ethiopia's education system, ICT use, particularly the computer coordinates improve the teaching and learning process not just in schools but also in other government departments for effective and efficiency working culture. The study by Mikre (2011) revealed the significance of ICTs in the society today, the study did not bring out the importance of time in the teaching of ICTs which this study sought to establish.

Furthermore, the use of ICTs in education also shifts the learning approaches. As put by (Bransford, Brown, and Cocking, 1999) cited in Volman (2005), there is a common belief that the use of ICTs in education contributes to a more constructivist learning and an increase in activity and greater responsibility of students. This limits the role of the teacher to supporting, advising, and coaching students rather than merely transmitting knowledge. The gradual progress in using computers changes from learning about computers, to learning computers, and finally to learning with computers (Volman, 2005).

Nonetheless, the most challenging condition to implement ICTs and computer studies strategy in Ethiopian schools is inadequacy of existing infrastructures, policy, planning, infrastructure, learning content, language, capacity building and financing. Even though integrating ICT use in the teaching-learning process was given due recognition in the implementation strategy, only about 40 percent of schools in the country have computers, and most of which are in Addis Ababa, causing a rural-urban divide to equity and access for quality education. Moreover, those schools, which have computers, experience limited or low access to internet connections.

From the study above, it had been observed that in Ethiopia the implementation of Information communication and technology through the teaching and learning of computer studies were being recognized and their importance was being realized. As such, some intervention strategies were being considered and areas in which ICTs benefited them such as work places, business, education, and entertainment. Furthermore, it highlighted challenges affecting the implementation of ICT and computer studies strategy as stated above. In Zambia, similar trends of recognizing and realizing

the importance of teaching and learning of computer studies were taking place in schools. Volman (2005) brought out the important aspects of ICT education in Ethiopia as well as some of the challenges that were encountered in the implementation of ICTs but did not reveal strategies are used in the teaching and learning process which this endeavored to explore. Furthermore, what was not clear is whether or not the challenges faced in Ethiopian education system were the same in Zambia.

2.4. Duration of Teaching Computer Subject

Another study conducted by Aduwa-Ogiegbaen and Iyamu (2005) on using ICT in secondary schools of Nigeria investing its problems and prospects revealed that in Nigeria; the cost of computers is expensive; there is unstable and unreliable electricity supply; lack of information infrastructure and fewer Internet connections. The study also revealed a number of benefits such as enhancement of educational efficiency, problem-solving skills especially in subject such as mathematics.

Similarly, Smith (1989) also added by stating that computers serve administrative functions such as use for expenditure, writing correspondences and reports, assigning students to classes, reporting students' progress and testing students and scoring tests which help to reduce paper work, used for individualized learning, change pedagogical practices, which depended heavily on the traditional lecture method and improvement in the techniques of research. However, what was not known was whether or not the same benefits and constraints were evident in Zambian secondary schools.

Aduwa-Ogiegbaen and Iyamu (2005) examined Nigeria secondary school teachers' uses of ICTs and its implications for further development of ICTs use in Nigerian secondary schools. The results showed that teachers generally have access to ICTs in their various schools except e-mail and Internet because their schools are not connected. Technical support are lacking in the schools and teachers lack of expertise in using ICT was indicated as being the prominent factors hindering teachers readiness and confidence of using ICTs during lesson. Furthermore, the results show that teachers perceived ICT as being easier and very useful in teaching and learning.

Eme, Emmanuel and Ernest (2015) carried out a study on computer studies and its impact in secondary schools of Nigeria. The study exploited 40 students and 80 teachers as respondents. The purpose of study was to examine the impact of computer studies among teachers and students in secondary schools. They used one method of data collection which was questionnaire under the descriptive survey design which made the study quantitative. The results of the study indicated that computer studies had positive impact in the teaching and learning process and increased pupils' computer literacy level in schools. The results of the study also showed that equipment and infrastructure such as computers and other information and communication technology (ICT) facilities were lacking in schools to facilitate the acquisition of basic computer skills among teachers and students to increase their computer literacy level.

Opira (2010) conducted a study on the effects of information and communication technology on students' learning: a case of Gulu University. The study was conducted through cross-sectional survey design; data was collected during the month of March 2009 using questionnaires, interview techniques from a sample of 275 respondents out of parent population of 1173. In verifying the hypotheses, the researcher used Pearson correlation analysis method to find out whether students" learning was linearly correlated with ICT. The study established that the availability of ICT resources in the University is still very much wanting and very inadequate for the students to use. Because of the limited number of functional computers and the computer laboratory, accessibility is timetabled. It was found out that training was mainly limited to introduction to basic concepts of information technology, some application programs notably MS office suit and internet; contextual training of students on how to use ICT in learning was not in practice.

The current study had a lot to learn from the aforementioned study in that similar studies involved teachers and learners experiencing the impacts of computer studies in schools. Some constraints that teachers and learners encountered in the teaching and learning process have been clearly brought out. This implied that the constraints faced by teachers and learners in the aforesaid study might be the same. However, this study is different in that it employed several methods of data collection such as interviews, focus group discussion and non-participant observation under the descriptive phenomenological design making it qualitative in nature as opposed to the Nigerian study which was more of quantitative.

A study by Tayo, Ajibade and Ojidokun (2009) on the use of computers and their relevance to teaching and learning in Nigerian educational system revealed that in using computer for instructions, teachers' role was hypothesized as changed from informer to learning facilitator. It further indicated that computer helps students to learn at their own pace, control over the rate and sequence of their learning, raised student motivation and provides appropriate record-keeping to monitor student progress. However, this could have not been without challenges such as problems of exorbitant price of computers and epileptic power supply which was the primary source of computers in Nigeria.

Madzima, Dube and Mashwama (2013) carried out a study in which they investigated ICT Education in Swaziland secondary schools: Opportunities and Challenges faced in its implementation. The results were that ICT as a tool promoted socioeconomic, political, and sustainable development. Furthermore, there were challenges in the implementation of ICT delivery. Which included lack of adequate planning, adoption and integrating of ICTs in schools, inadequate expertise and lack of technical support and inadequate infrastructure. While Madzima, Dube and Mashwama (2013)'s study outlined the above constraints in ICT Education in Swaziland's secondary schools, the challenges teachers and learners face in Zambian education system of teaching and learning of computer studies were not established.

The US Internet Council comments that compared to global trends, African education lags behind in many aspects such as computer education delivery, curriculum design, teaching pedagogies, teaching and learning tools and resource libraries. This is noted in that; the level of technology penetration in Africa is low compared to developed countries. However, most of the African countries have identified the education sector as a priority area for the deployment and the exploitation of computers to broaden access to education, improve quality of educational delivery, promote efficiency in the administration of the educational system and reduce costs of education delivery (Dzidonu, 2010). In Zambia however, it is not known how the exploitation of computers to broaden access to education through the teaching and learning of computer studies was done in schools in secondary schools.

Garegae (2012) conducted a study on issues and concerns about integration of ICT into the teaching and learning of mathematics in Africa: A case of Botswana. The study revealed that ICT

in teaching and learning of school subjects, particularly mathematics, is critical for improving the quality of performance and classroom experiences of teachers and learners. It is for this reason that both developed and developing countries aim at harnessing the potential in ICT to improve mathematics performance. African countries including Botswana subscribed to this journey of teaching and learning computer studies at senior secondary school level.

However, there are constraints that counteract the realization of the envisaged ICT subject integration in schools, resulting into some issues and concerns in the implementation of ICT integration in the teaching and learning of mathematics in Botswana schools such as having only one computer laboratory in each school. Moreover, 20 PCs are not enough for classes of over 40 students and are required to share a computer.

The outcome of the above study has shown the significance of ICT in the teaching and learning of other school based subjects like mathematics and the importance other countries like Botswana also attach to it**.** However, Garegae (2012)'s study differs from the current study in that it focused on the role of ICT in the teaching and learning of mathematics while the current study explored the experiences of teachers and learners in the teaching and learning of computer studies in Zambia.

Farrell (2007) carried out a survey on the implementation of ICT education in Kenyan schools. It revealed that Kenya recognizes the importance of ICT in which learners appreciate the computer system. However, a majority of the schools in Kenya were without internet, computer access, frequent power breakdowns, increased cost of owning ICT infrastructure and high student-computer ratio to access and use ICT in education. In Zambia on the other hand, it was not known whether the same constraints established in Farrell (2007)'s report were encountered in the teaching and learning of computer studies in secondary schools.

UNEB (2005) further states that computer information and communication technology was introduced in Ugandan secondary schools in order to enhance one's productivity and development of creative skills for problem solving and efficiency. The subject's benefits include; equipping learners with knowledge and skills in the use of ICT, which they can apply in other subjects, ability to use different computer technologies to access, analyze, interpret process and disseminate information. In Zambia however, despite having introduced computer studies in schools, no

empirical evidence in literature has been documented on the Junior Secondary School Computer studies Syllabus.

Bukaliya and Mubika (2012) conducted a study on factors militating against the introduction of computer education in Zimbabwean secondary schools. The study adopted the descriptive survey design and 40 secondary schools were involved. Data were gathered through the use of questionnaires and interviews. The study revealed that there were no budgets for computer procurement in schools. Funds were inadequate for computer procurement. However, stakeholders were willing to contribute towards the purchase of computers for computer education. This study was in contrast with the current study which investigated the experiences of teachers and learners by involving only three secondary schools.

The Zambian Government through the Curriculum Development Centre (2011) designed a junior secondary school Computer Studies syllabus from grades 8 through 9 and at senior secondary school from grades 10 through grade 12 which acknowledged computers as becoming part and parcel of peoples' lives and work. Furthermore, the revised school curriculum of 2013 also encourages and advocates for the teaching and learning of computer studies. Since computer technology is extremely dynamic and significantly impact on the way people live, learners should be made to appreciate the constantly changing computer technology and its complexities.

2.5. Assessment Strategies for Computer Studies

A study by Hadlee and Tamilenthi (2013) on an overview of ICT and computer education: Challenges and Opportunities in Chipata established that there was lack of national policy on ICTs and weak stakeholder base. The study also provided information on basic requirements of computer studies and implementation of Zambian government to develop the computer education in schools. Also, Toyama (2010) study has shown the importance of human computer interaction with respect to global development. It also noted that human computer interactions were important not only to the local population but also to teachers, learners, parents and school administrators in forming different social participatory structures in the education system. Similarly, human computer interactions were also being exhibited in Zambia by its general populace in the area of social structures as the way of appreciating this appropriate computer technology. However, one weakness of the aforesaid study was that it had ignored to clarify and give out the most cardinal

information on the kind of people involved in the human computer interactions. Therefore, the current study differs from Toyama's study as it specifically focused on perceptions of teachers on computer studies as a subject in secondary schools.

Zambia has participated in a number of global and regional events that are focusing on ICTs as a tool for sustainable growth and development. Among the notable ones are the Declaration of Principles and Plan of Action from the World Summit on the Information Society and the New Partnership for Africa's Development (NEPAD) E-Africa Commission. This policy sets the framework for Zambians' participation in the global economy through the adoption of ICT and the teaching and learning of computer studies (MoT, 2006). However, the cradle of computer studies in Zambia dates back to 1998 the period when computer studies was introduced as a subject in schools and produced ICT literate students (Habeenzu, 2010). Since then, the penetration levels of ICTs in Zambia's education institutions remain thin. The integration of ICTs in learning and teaching practice has been limited but the introduction of computer studies as a school subject has begun to change this (MoE, 2013

Mulima **(**2014**)** conducted a study on perceptions of teachers and learners on the role of ICTs in the teaching and learning of Religious Education in Kabwe District. It involved the head teachers, teachers and learners and employed three methods of data collection which included; interview guide, focus group discussion and a simple observation checklist. Additionally, a qualitative approach and case study design were employed for the study. Results revealed that the schools had computer programs like Bible Pro, the levels of ICTs usage varied. Mulima (2014)'s study is insightful and vital to this study in that it brought out the role of ICT in the teaching and learning of RE in schools and its constraints. However, the current study looked at the experiences of teachers and learners in the teaching and learning of computer studies. It also departed from Mulima's study as it only involved teachers and learners not head teachers as participants and non-participant observation under qualitative and interpretive phenomenological design which was not treated in Mulima's study.

Similarly, a recent study by Phiri (2016) on Pupils' and teachers' perception toward the use of ICT in the teaching and learning of Mathematics in schools of Central Province revealed that, both pupils and teachers showed a positive perception towards the use of ICTs in the learning and

teaching of mathematics. The current study deviated from Phiri (2016)'s study in that it did not focus on perceptions of teachers and learners in the teaching and learning of mathematics. Although many studies world over have clearly shown the role of ICT in education, no clear documentation of literature has been done on teachers attitudes in implementing computer studies syllabus in secondary schools. The current study thus will investigate the perception of teacher's attitudes in implementing computer studies syllabus in secondary schools.

Volman (2005) further comments that computer studies as a subject is making dynamic changes in society that influence all aspects of life and these are felt more and more in schools because they provide both learners and teachers with opportunities in adapting learning and teaching to individuals, society and schools' needs. However, Castells (2001) contends that many studies have been conducted in the area of ICTs and education in general and very few in the teaching and learning of computer studies in schools.

Acikalin and Duru (2005) conducted a study titled the use of computer technology in social studies classrooms in the United State of America and its purpose was to review computer and internet supported instructional strategies. It also analyzed the degree of application of those strategies in the social studies classroom. The findings indicated that there were: lack of skills and knowledge in using computer-based instructional strategies among social studies teachers; the use of computers in schools foster students' critical thinking, creative thinking, problem solving and decision making skills; reinforced the constructivist classroom environment and that teachers used the computers and internet facilities basically for personal purposes rather than teaching and learning activities in the classroom.

The above study is insightful in that it has demonstrated how computer technology improves the teaching and learning of school based subject like social studies. Furthermore, the study highlighted some vital trends and benefits of using computers in the teaching and learning of social studies. However, while the reviewed study focused on the use of computer technology in social studies classrooms in the United State of America, the current study focused on the experiences of teachers and learners on the teaching and learning of computer studies in Zambian secondary schools. Another important aspect from Acikalin and Duru (2005)'s study is the finding that teachers used computers and internet facilities for personal purposes rather than teaching and

learning activities in the classroom which begs the question as to whether this was correct for Zambian teachers as well.

Similarly, Toyama (2010) carried out a study on human computer interaction (HCI) and global development. The results revealed that computers were an appropriate technology, sometimes also called “intermediate technology,” the name given to a concept that was popularized in the 1970s and 1980s that focused on designing technology that met the constraints of the local populations it was meant for. It was concerned with “the social structures, human interactive processes, and motivation techniques for social participation and action by individuals and groups in analyzing situations, making choices and engaging in choice-implementing behaviors that bring about change in a classroom.

Furthermore, as a subject computer literacy is intended to give students opportunities to play around with computers and gain some hands-on experience in using computers and develop computer literacy with an understanding of fundamental concepts of computers; appreciate the contemporary development of information technology; develop problem solving skills and cultivate positive attitudes towards the ever changing society with widespread utilization of computers.

In this case, computer literacy is intended to give students opportunities to play around with computers and gain some hands-on experience in using computers. The computer as a teaching and learning tool aims at providing an opportunity for students to understand fundamental concepts of computers. These activities may help motivate students and enliven the learning atmosphere in the classroom without ruling out certain constraints. It is therefore essential for teachers to provide their students with an environment which allow them to explore and discover.

The benefits that the above computer curriculum design report has revealed can be of great help to teachers and learners in the teaching and learning of computer studies in schools. Benefits such as development of information technology skills, problem solving skills, creates an interactive atmosphere and cultivates positive attitudes towards the ever-changing society. The above computer curriculum report is not only applicable and prominent in Europe but in Zambia as well. For instance, Zambia curriculum development center revised the curriculum and came up with a

new approach to teaching and learning computer studies in schools, a scenario that interest the researcher to evaluate the junior secondary school computer studies syllabus.

2.6. Summary

The literature review was undertaken to establish what other scholars had documented on the study topic. It covered the junior secondary school syllabus content; teaching and learning methods; duration of teaching Computer Studies and assessment strategies for computer studies. The literature was drawn from studies and publications across the globe.

CHAPTER THREE: METHODOLOGY

3.1. Overview

This chapter is devoted to specifying the steps and the methodology that will be taken in carrying out the research. It spells out the research design, study population, sample size, sampling procedure, data collection instruments, data analysis and ethical issues that that was used followed in this study.

3.2. Research Design

This study was conducted using the case study design. Kothari (2004) argues that, research design is the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. The criteria for selecting a research design depend upon the appropriateness of the techniques for the objectives of the study (Keith et al, 2000). The main reason for choosing a research case study design was that the researcher wants to get factual evidence on the computer studies syllabus in secondary schools. Also, a qualitative approach was considered for this study. Qualitative research approach enabled the researcher to enter into the field with an open mind. Qualitative research offered the researcher a more in-depth understanding of computer studies syllabus coverage in secondary schools.

3.3. Study Site

Study site refers to the place where the research project will be carried out from. It is a place where a problem to be studied is identified from (Brown, 2005). The study was conducted in selected public schools with junior secondary in Lusaka district in Zambia.

3.4. Study Population

Study population refers to the categories of participants selected for a particular study the researcher believes can provide the needed information for the research study (Neuman, 2007). Therefore, population means the totality of individuals from which some sample is drawn (Kombo and Tromp, 2005). The population for this study comprised all Computer Studies teachers and learners in selected public schools in Lusaka district. The researcher targeted this population because they were a source of rich information on the subject under investigation and bearing the fact that computer studies is a compulsory subject at junior secondary school hence it was taken by all the learners in public junior secondary school.

3.5. Sample Size

Sample size refers to the number of participants the researcher seeks to include in the research study who are selected basing on some characteristics and are reliably believed to provide the researcher with appropriate information applicable to the study. The sample size of this study comprised 42 respondents consisting of six (6) computer studies teachers and thirty-six (36) pupils from six (6) selected schools of Lusaka districts. The sample size was determined by the researchers' judgment with the prospect that the sample adopted would give valuable information to the subject under investigation.

3.6. Sampling Procedure

Purposive sampling method was used to sample six (6) computer studies teachers; that is, one computer studies teacher from each of the six (6) selected public secondary schools. The researcher targeted respondents based on the Job title in secondary schools. Komb and Tromp (2006:82) stated that "Purposive sampling is when the researcher purposely targets a group of people believed to be reliable for the study." Schools were sampled using Purposive sampling method.

Homogenous purposive sampling was used to select the thirty-six (36) learners from the six (6) selected secondary schools in Lusaka district due to their similar characteristics of being computer studies learners. That is 6 pupils from each of the selected secondary schools of Lusaka district which are Kaunda Square secondary, Nelson Mandela school, Ndeke secondary school, Kabulonga basic school, Kamanga Basic school, Kabulonga girls' school.

3.7. Data Collection instruments and Procedures

According to Kombo and Tromp (2006), data collection refers to the gathering of specific information aimed at proving or refuting some facts. The purpose of collecting data in this data was to help the researcher clarify the facts. This study used qualitative data collecting instruments. The data collection methods that were used are in-depth interviews for teachers of Computer Studies, Focus Group Discussion for learners and document analysis to analyse documents like the Computer Studies syllabus, the Zambia National Curriculum Framework (2013) and the curriculum implementation guide. The researcher used Interview guides containing semi structured question items to engage participants into interviews. The interview guide contained semi-structured questions items that accorded the participants chance to clarify and expand on

their views. Kombo and Tromp (2006) argue that semi-structured questions are flexible and enable the researcher to get a complete understanding of the issue under investigation. Therefore, the computer studies teachers were subjected to in-depth interviews at separate convenient times and Focus Group Discussions for learners were conducted separately in different schools.

3.8. Validity, Reliability and Trustworthiness

3.8.1. Validity

According to Wilson, (2014) validity tests show how accurate the means of measurement is and whether they are actually measuring what they are intended to measure. The research instruments were tested for their validity to ensure they appropriately measured the variables necessary to analyse the implementation of the computer studies syllabus. By face validity, both the interview guide and questions tabulated for focus group discussion were given to three teachers of computer studies who were not part of the study. These helped to analyze the question items to ensure they were valid. Any ambiguities were rectified and some questions removed or rephrased accordingly.

3.8.2. Reliability

According to Wilson (2014), reliability tests show whether the result is replicable. In this context, the researcher conducted preliminary interviews with three teachers who were not part of the study and focus group discussions with six learners who were not part of the study. This was to confirm if the instruments provided a relatively good measurement tool to be used on actual respondents.

3.8.3. Trustworthiness

To ensure trustworthiness, the researcher used more than one method to collect data. Thus teachers and learners were assessed separately on the same variables. Teachers were interviewed while learners attended focus group discussions. Thus the assessment items were found credible, transferable and dependable. This implies that the findings of the study and associated instruments can be used in similar settings. The study was successfully completed depending significantly on the data provided by the respondents.

3.9. Data Analysis

Thematic method of qualitative data analysis was used in the study. Qualitative data collected from In-Depth Interviews were analyzed using thematic analysis approach. Data was transcribed from audio into scripts then sorted and coded into themes and analyzed.

3.10. Ethical Considerations

Ethical issues were considered in this study. Ethics are simply moral principles that guide our behavior and based on shared values and beliefs about what is good or bad. To ensure that the study was conducted in an ethical manner, the following were considered.

i. Both teachers and learners were included to be respondents purely on voluntary basis and had the right to withdraw from the study at any stage if they wished to do so.

ii. The respondents participated on informed consent basis. In this regard, the researcher provided sufficient information and assurances about taking part to allow individuals to understand the implications of participation and to reach a fully informed, considered and freely given decision about whether or not to do so, without the exercise of any pressure or coercion. For learners, where appropriate parental consent was sought. Unless the school granted express permission.

iii. The researcher and all written information does not include any offensive, discriminatory, or other unacceptable language, directly or indirectly, considering the sensitive nature of the study which has implications on national educational curriculum and policy.

iv. The researcher ensured total privacy and anonymity of respondents during and after the study. Thus no names, pictures or marks of identity have been kept or shared.

v. The writing of the research was with adherence to the accepted standards and rules. Other works cited in the report have been acknowledged as works of other authors and referenced using the American Psychology Association (APA) referencing style with in-text citations. The paper does not fall under plagiarism.

vi. The researcher maintained the highest level of objectivity in the discussions and analyses throughout the research to avoid biases and personal opinions overriding the findings.

3.11. Summary

Chapter three was of the research methodology. The research design adopted was case study. The study site was Lusaka district, among public secondary schools for whom the target population was computer studies teachers and learners. The sample was 42 respondents selected using purposive sampling. Data collection was by means of interviews with teachers and focus group discussions with learners. Validity, reliability and trustworthiness was undertaken to ensure efficacy of the research instruments. Analysis of qualitative data was done using the thematic method. The later part of the chapter outlines the ethical issues that were considered in conducting the study.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

4.1. Overview

The preceding chapter contained the methodology that was employed in this study. This chapter presents the study findings based on an evaluation of the junior secondary school computer studies syllabus in selected public schools. The research questions used to generate answers to help achieve the research objectives are given below.

1. How is the suitability of computer studies syllabus content as regards the topics to the learners' experiences at junior secondary school level?
2. How is the suitability of teaching and learning methods?
3. How is the time allocated to computer studies at Junior Secondary School level?
4. What assessment strategies are used in the computer syllabus at Junior Secondary School level?

The findings from interviews were transcribed, sorted and coded into themes then analyzed. The narrations supported by relevant quotes and paraphrasing of participants' conversations and clearly identified themes in which key findings were identified and summarized. The results of analyzed data from interviews are presented under sub-headings.

4.2. Demographic Characteristics of the Respondents

Respondents who had taken part in this study had to indicate their brief background information for the purpose of analysis regarding their gender. As shown in Figure 4.1, the study indicates that 4 teachers were males and 2 teachers were female. The findings indicate that there were more male computer studies teacher participants than female computer studies teacher participants in the participating secondary schools. The findings on participants' gender are shown in Figure 4.1.

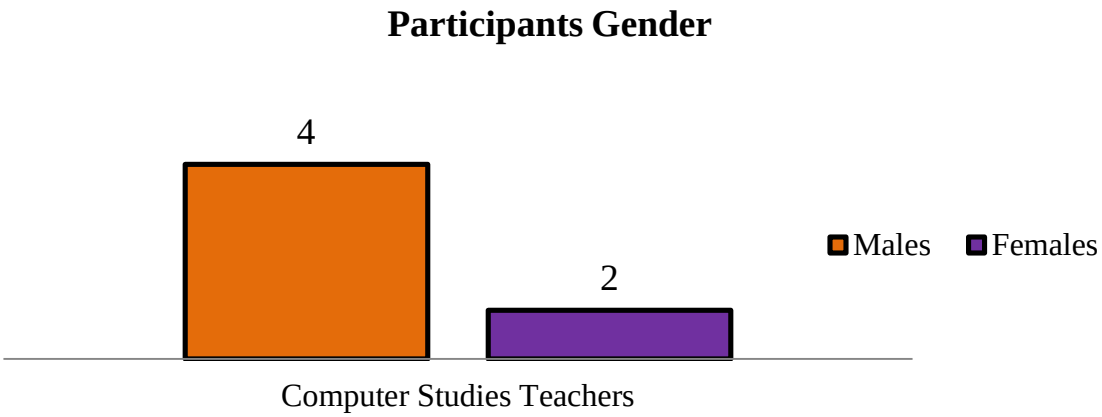
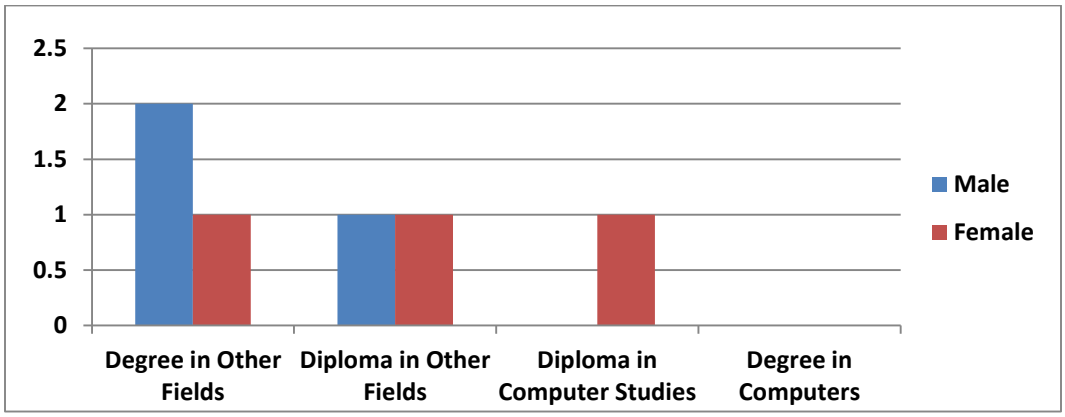


Figure 4. 1. Participants' Gender

Source: Field Data (2019)

The study established respondents' professional qualifications and the following presented were the findings.



Source: Field Data (2019)

Figure 4. 2. Respondents Professional Qualifications

As shown in figure 4. 2, the study findings reveal that there were two males and one female with degree qualifications in other fields; one female and one male with Diploma qualifications in other fields; and one female with diploma qualifications in computer studies; and none male and none female with degree qualifications in computer studies.

4.3. Suitability of Computer Studies Syllabus Content at Junior Secondary School Level

The first objective of the study was to establish the suitability of the Junior Secondary School computer studies syllabus. This was based on the learners' experiences with Computer Studies at grade 8 and 9. The central finding was that the content was suitable for the learners' level. Nine themes emerged to substantiate this variable. A learner from school 'A' also stated that;

Generally, topics are ok and suit the demands of the modern world.

The following were the key themes derived from the interviews and focus group discussions.

I. The Content was prepared with a focus on learners' level

Document review revealed that computer studies syllabus at grades 8 and 9 level was produced as a result of the Curriculum review process carried out by the Ministry of Education, Science, Vocational Training and Early Education under the auspices of the Curriculum Development Centre (CDC). The curriculum reform process started way back in 1999 when the Ministry of Education commissioned five (5) curriculum studies, which were conducted by the University of Zambia. The document review further revealed that, reforms were followed by a review of the lower and middle basic and primary teacher education curriculum.

Document review also indicated that in 2005 at upper basic education, the National survey was conducted and information from learners, parents, teachers, school managers, educational administrators, tertiary institutions traditional leader, civic leaders and various stakeholders in education was collected to help design a relevant topics to be included in the social studies syllabus. The recommendations provided by various stakeholders during the Upper Basic Education National survey of 2005 and National symposium on curriculum held in June 2009 guided the review process in the consideration of topics in computer studies syllabus. The study further revealed that the review was necessitated by the need to provide an education system that would not only incorporate latest social, economic, technological and political developments but also equip learners with vital knowledge, skills and values that are necessary to contribute to the attainment of Vision 2030.

The document review found that topics in the computer syllabus were designed to link the outcome-based education principles to real life experiences that give learners skills to access,

criticize analyze and practically apply knowledge that help them gain life skills. The syllabus showed that topics were based on competences and general outcomes that expected outcomes to be attained by the learners through the acquisition of knowledge, skills, techniques and values which are very important for the total development of the individual and the nation as a whole. One teacher interviewed from school 'F' said that:

> *Computer studies topics are designed in a way that makes the effective implementation of outcome-based learning. It requires that the following principles be observed such as clarity, focus, reflective designing and setting high appropriate opportunities and expectations for all learners.*

The study found that the suggested infrastructure in the syllabus for teaching computers was not adhered to in some schools. This was attributed to inadequate infrastructure in schools. As shown in Figure 3, the study reveals that, out of the ten schools that were selected for the study, seven schools were without computers laboratories and three schools had computer laboratories. This shows that the implementation of learner's experiences as suggested in the computer studies for grades 8 – 9 did not match the suggestions of the computer studies syllabus ideal teaching and teaching implementation.

II. Theory learned matched with practicals conducted

Under this theme, the respondents indicated that whatever they learnt as theory in computer Studies was exactly applied in the practicals. Thus theory led to better application. On this aspect one learner said that:

> *The computer studies to me is okay because most of the things we learn as theory are the same things found on the computers and we do them as practical. Some of the other things we learn we also apply them on other gadgets such as phones, iPad and computers games.*

The study found that topics in the computer studies syllabus were both theoretical and practical. Therefore, the study revealed practical aspect of the syllabus was being implemented without matching the syllabus content in line with the learning experiences suggested in the syllabus. This was attributed to the majority of the schools not having well furbished computer laboratories and enough computers for conducting practical lessons. Participants indicated that schools were teaching computer studies in the ordinary classrooms.

On the other hand, the teachers elaborated that some topics do not require computers as per se to conduct learning and teaching. The general observation by teachers was on the topic 'Introduction of Computers' were pupils only identify and labels parts of the computer. The general comment was that:

> *Introduction to computers can be taught even without computers but using picture or chart showing parts of a computer because here learners on describe the main parts of a computer; state the three basic operations in a computer system; relate computer parts to the basic operations; identify a computer as a general purpose machine that operates under different sets of instructions for various uses; differentiate between data and information; components of a computer system.*

III. The Computer Studies syllabus content matched the learners' level

On this theme, both learners and teachers indicated that the learners expressed confidence that the syllabus content was prepared to suit their level. This was found true across both levels as the grade 8s affirmed that there was a systematic way of progressing with the computer knowledge and practical skills. A learner from school 'D' commented that:

> *I cannot say the content is beyond our level. That is why we are here to learn. If the people who prepared thought that what they have put in the computer syllabus is worthy learning we just have to learn.*

IV. Grade 8 Content was related to Grade Nine

The learners discussed with the conviction that there was a relationship between what they learnt in grade 8 and what they learnt or would learn in grade 9. Those who were in grade 9 actually noted that some grade 8 topics were repeated in grade 9 but with more advanced and additional content. This made them understand deeper, recollect and improve their performance. On this theme, a learner from school 'F' added that:

> *The syllabus is good as the content we learnt in grade 8 is somehow repeated and now that we are in grade nine, we are able to understand what we couldn't understand in grade eight. Moreover, the topics we learn during practical lessons are very beneficial as they enable us to gain full knowledge on the use of computers.*

V. The content examined was according to the syllabus

On this theme, the respondents held that the content that was examined at both school and national level was in accord with the Computer Studies syllabus. It was taken that a review of past paper questions by teachers proved that the examination items for all the years since 2014 pointed to specific areas of the syllabus. The learners also claimed that their teachers and past papers did not examine them on content they were not familiar with. Any times they failed a question, they could refer to the approved text books and find the answers.

VI. The content in approved textbooks was in harmony with the syllabus

This theme points to the finding that both teachers and learners found the approved materials to be largely according to the syllabus. The teachers claimed that certain books had errors but these were largely typographic in nature. Otherwise the books used were written according to the syllabus. There was just need to improve future editions so that some books can be made more user friendly.

On the above two themes, a learner from school 'G' acknowledged that:

> *The topics in the syllabus are okay because when you read the examinations past papers they are exactly the same things we learn and those found in the text books are there in the syllabus.*

VII. The content taught in class was according to the syllabus

Basing on the interviews with the teachers, it was found that the syllabus was a reliable blueprint for teaching computer studies. The study found that computer studies syllabus for grade eight and nine has topics designed to suit learner's experiences. Participant 3 from school 'D' said the following:

> *The grade 8&9 computer syllabus has nine major topics that include: Introduction to computers; Basic Operations; Computers in everyday life; Productivity tools (Word Processing); Productivity tools (Spread Sheet); Productivity tools (Power Point); Productivity tools (Desktop Publishing); Networks and the Internet; and Media files.*

The study on the other hand found that grade nine computer studies syllabus has nine major topics. It was further established that the grade nine computer studies syllabus has similar topics as those found in the grade 8 computer studies syllabus except for one topic.

A computer studies teacher from school ‘C’ commented that:

> *The grade nine computer studies syllabus is not different from the grade eight computer studies syllabus. The only difference is on one topic which is found in grade nine computer studies syllabus and not found in grade eight computer studies syllabus. This topic is ‘information technology in everyday life’.*

The study found that the topics in the computer studies syllabuses for grades 8 and 9 suited the learner’s experiences. Participants described the topics as relevant to the education system but not relevant to some school settings especially schools in rural setting. A teacher of computer studies from school ‘D’ lamented that:

> *Generally, topics are okay and suit the education system and the demands on the modern world. Now the problem is how to implement some topic to suit learners’ experiences especially learners in rural setting. Take foe example a topic on ‘ Networking and the Internet’ the learning outcomes requires a learners to analyze the rationale of networking computers in different locations; differentiate between wired and wireless networks; describe how to access information using a local area network and a Wide area network; upload and download text, image, audio and video files; illustrate ability to search the web for specific information; identify web browsers as a tool to accessing web pages on the internet; demonstrate how to open a web browser and go to specific Universal Resource Locator (URL); define a search engine and what it is used for; use a search engine to look for information on the internet but there is poor network and completely none in some areas.*

In a similar vein, another teacher from school ‘A’ noted that:

> *Topics like word processing can only be delivered effectively if at all there are computers available. Now most of the schools especially those in rural areas have none to inadequate computers. Now how can a learner demonstrate how to operate Windows; demonstrate how to start and quit a program; demonstrate text input, type over, insertion of words and symbols, deletion and reformatting; demonstrate copying, deleting and moving blocks of text within a document; illustrate the use of a clipboard; use the undo command to reverse the effect of the last action.*

VIII. Shortage of Computers made learning the content difficult

It was found that all schools did not have a pupil: computer ratio of 1: 1. Learners were compelled to share the available computers and furniture. On this aspect, it was found that if learners had challenges understanding the content, it was not because it was of a difficult level but because the computers were few. In this regard, one of the learners in focus group discussion in school 'B' explained that:

> *We are about 65 pupils and the computer lab does not accommodate all of us at once. We always fight for sits and computers, as a result the teacher ends up splitting the class in three groups. After we are split, it is ok for us to understand the content than before.*

IX. There were aspects of general knowledge related to computer studies

Even though the study established significant dependence on syllabus content, it was found that learners had general knowledge of certain computer studies aspects. The participants described suggested learner experiences in computer studies like; determine how to shut down an unresponsive computer; determine why usernames and passwords are used on computers; identify and apply safety procedures. However, practical experiences especially on learning how to shut down unresponsive computer system; installation and launching of antivirus software, inserting memory cards in computers, digital cameras, cell phones were taught theoretically because schools lacked computers.

4.4. Suitability of Teaching and Learning Methods in Computer Studies

The second objective assessed the methods employed in teaching computer studies and how suitable they were. Teaching and learning methods are very important in the implementation of any syllabus. Teachers of computer studies from the sampled schools were asked to evaluate the suitability of teaching and learning methods used in computer studies syllabus. Four themes emerged on this variable.

I. Computer studies teaching methods were similar to other subjects

It was found that Computer Studies was both a theory and application subject. The documents reviewed showed that teaching and learning methods suggested in computer studies syllabus was

not far away from the methods suggested in other syllabi. The study findings revealed that computer studies teaching and learning methods included: Brainstorming to stimulate creative thinking, Consequence charts -cause and effect approach, Classroom displays (focuses on the current unit), Charts, Diagrams, Evaluation, Discussion, Guest speaker or visitor, educational tours and visits, Models, Photographs and pictures, Presentations, Problem solving involving learners in identifying and working towards solutions; reflective learning involving thinking about what has been learnt; research to think of the questions you want learners to answer. The other part of the teaching and learning methods was application involving the use of computer software.

II. Methods used to teach Computer studies were as recommended in the syllabus

On this theme, the teachers indicated that they endeavored, with success to apply the teaching methods recommended in the syllabus as outlined above. However, the challenge was when the equipment was not enough or materials were in short supply. This made the use of audio-visual devices more difficulty. Some illustrations were best done using video projectors which most schools did not have. The participants interviewed gave their experiences with the teaching and learning strategies and time in the teaching and learning of computer studies. The participants elaborated that computer studies were a practical subject and its syllabus placed a lot of emphasis on the use of common application packages.

III. Certain recommended methods were above the level of the learners

On this theme, the participants revealed that teaching and learning strategies such as brainstorming; evaluation; discussion; research and reflective learning were above the learner's ability levels. Participants echoed that teaching and learning strategies such as research were advanced to suit the learning abilities and learning experiences of learners. On the other hand, participants indicated that teaching and learning strategies such as charts, diagrams; photographs and pictures were too basic for grades 8 and 9.

One teacher from school B said that:

> *The way I look at the teaching and learning strategies for computer studies is that it must involve more of application and manipulative skills such as problem solving and reflective learning. This involves learning to make use of computer skills practically and not engaging the learners in drawing diagrams, pictures and making models.*

One of the participants from school D indicated that:

> *Teaching and learning strategies such as practical teaching and learning on the use of Word processing (Word), spread sheets (Excel), Presentation (PowerPoint), Desktop Publishing (Publisher) and Multimedia was valuable in computer syllabus because they were meant to expose learners to computer applications.*

IV. Certain teaching methods not correlated with use of computer technology

The study found that some of the suggested teaching and learning strategies were not correlating with the equipment's such as computer in supporting the syllabus delivery. This was because teachers testified of delivering computer practical lessons without the use of computer. In the light of this finding, teacher interviewed revealed that school 'A' indicated to have 22 computers against 66 pupils per class; participant from school 'D' indicated the school to have 30computers against 60 pupils per class, and participant 'B' indicated the school to have 40 computers against 60 pupils per class. The study further found that school 'G' has 27 computers against 50 pupils per class, school 'E' had 18 computers against 46 pupils; school 'J' had 20 computers against 57 pupils per class. A teacher from school 'B' echoed that:

> *The number of computers in good condition in schools is not enough to accomplish what the computer syllabus aims to achieve. Each learner is supposed to have his or her own computer in order to learn well and not sharing. This has made us split a class into 2 groups.1 group takes half a lesson and the other group takes the other half. This deprives slow learners from really grasping some tasks as time is not enough.*

The study in this section found that the number of computers in schools were not in line with the suggested number of computers against the learner ratio in class. The teachers interviewed echoed that computer syllabus suggests that each learner is supposed to have his/her own computer in the teaching and learning process to learn well and acquire the concepts but not the case in majority schools.

4.5. Allocation of Time to Computer Studies at Junior Secondary School Level

The third study objective was on the allocation of time to computer studies at Junior Secondary School level. Time and period allocation are some of the very important components of a syllabus and computer studies syllabus not exceptional. This gave rise six themes.

I. The syllabus has dictated teaching time for computer studies

Documents review revealed that the computer studies syllabus for grades 8 and 9 (junior secondary Level) covers a two-year course and will require at least four 40-minute periods per week to complete (One double for practical and two single periods for theory). In such a scenario, the teachers of computer studies are not able to successfully lobby for more teaching time as in most schools the timetable was loaded. This left them with finding extra time after regular learning hours to conduct more practicals.

II. Time allocated for practicals was not sufficient

The teachers interviewed echoed that the time allocation to computer studies practical period was not sufficient especially that in most schools' computers were limited in number and learners were sharing or using computers as a group. They further suggested that the practical subjects needed two double periods of 60 minutes each so as to accord more time for practical periods. One participant from school 'E' lamented the following:

> *Time allocated for a theory lesson is enough. The only challenge is during a practical lesson when time is limited to allow each learner a chance to practice a skill on the computer.*

Similarly, another participant from school "A" lamented that:

> *Practical subjects require more time allocation to a period. Teachers need more time to explain to each individual especially were there is no projector. More time is needed especially when introducing a topic. Some learners do get the concept very quickly were as with others there is a struggle. Pupils need to practice what they learn thereafter but when I look at the 40 minutes though it is a double period for a practical session the time is still limited. The computer syllabus in my view*

would have allocated at least 60 minutes of double period for practical and the same 40 minutes for a single period. This is because practical is very important in the teaching and learning of computer skills.

III. Computer Studies practicals needed more time

The study found that computer studies were more practical oriented and needed more time on the time table. The teachers proposed that computer studies teachers should have at least four 40-minute periods per week (One double for practical and two single periods for theory). The participants viewed that the practical needed to have at least 120 minutes per week (3 periods of 40 minutes each) and one 40 minutes period for theory. This shows that time allocation per period was a factor in computer studies syllabus for grades 8 and 9 especially. Participants cited that some topics needed more time such as word processing needed more time and practice. A teacher from school 'D' commented that:

There are limited computers in schools so when it comes to the aspect of learners practicing the content learnt the time becomes so inadequate that most of the things to be done as practical are not done. For example a topic on spread sheet; it take more time on entering data, numbers and applying simple formula with a range not more than ten cell addresses (i.e. addition, subtraction, multiplication and division); designing, creating and modifying a spread sheet for a specific purpose (using functions like sum, product, average and quotient) with a maximum of five cell addresses; saving to specified folder and print a spread sheet; changing magnification to appropriate percentage to print a given spread sheet formulae. Now when you look at this content of work and time it is problematic to manage.

The learners that were engaged in a focus group discussion to discuss how suitability of time allocated to computer studies had the following to say: Learner 5 said that:

Time allocated to computer studies is enough for theory classes because the learning is just as normal time as other subject as compared to tike allocated to practical classes.

In a similar vein, Learner 1 commented that:

Computer practical is too involving and needed more time compared

to the time they have allocated it because whenever we are learning we always don't finish especially that our school 'C' has limited number of computers

In another vein Learner 4 also commented that:

The time allocated to computer studies is just okay the problem is that we share computers when doing practical so the time appears to be small because you have to wait for a friend now when you are five against one computer.

IV. Learning time did not cater for slow learners

The focus group discussions brought up the debate that certain lerners had not used a computer before and needed more time than was available. Many did not have access to computers outside school and extra computer lessons, just like utilizing internet cafes were expensive. Even those who had been using computers for long, indicated that the classroom scenario was different as they did not need to use most of the shortcuts and underhand methods they had learnt over the years. Learning to use computers the normal way made learning slower as they needed to undo the wrong methods or risk failing.

This section of the study revealed that the two double period allocated to practical in computer studies syllabus was not enough because computer studies was a practical oriented and needed more time allocation to practical sessions as compared the theory sessions. The participants proposed that theory only needed a single period of 40 minutes per week and more time allocated to practical since most of the topic in computer syllabus for grade 8 and 9 were more of practical than theory.

V. Time allocation was a major challenge

The study found that time allocation was a major challenge in teaching and learning of Computer Studies.

VI. Technical Disruptions wasted time

Under this theme, it was found by all respondents that there were unavoidable disruptions that made it difficult to observe teaching time. For example, power failures made it impossible to teach. Other time wasters included system failures, set-up time, electrical faults and others. Teachers testified that they spent a lot of time attending to learners whose computers were faulty and required the expert attention of technicians who would not easily

come by. Some computers became too slow for the pace of teaching and learning. This was also established during the focus group discussion in school 'E' where a learner reiterated that;

> *When it comes to practical work the time allocated to the subject is not enough. There is need for more practice but before we even finish our work its either time for the next period or the other group needs to come in or power going due to load shedding.*

4.6. Assessment Strategies used in the Computer Studies Syllabus at Junior Secondary School Level

The fourth objective was about assessment strategies used in the Computer Studies syllabus at Junior Secondary School Level. There were five themes on this objective. The participants found that assessment in computer studies was very important.

I. Types of Assessment strategies used in computer studies

Document review revealed that assessment strategies used in computer studies were in various types. The computer studies syllabus showed that assessment in computer studies was both continuous and summative. The participants elaborated that the two assessment strategies were very important because computer studies embraced hands on and continuous learning for the concepts to be mastered. This is an excerpt of one of the participants:

> *The computer studies syllabus at junior level suggests assessment framework that utilizes various types of continuous assessment strategies. This is meant to determine learners' competences in the application of computer skills. It is therefore desired that the teacher as much as possible utilize assessment strategies that promote active learning by the learner in order to gauge certain competences.*

II. Assessment was limited to common application packages

The study findings showed that since computer studies was a practical subject it placed a lot of emphasis on the use of common application packages. Teachers attributed this to a fact that object-oriented programming languages where not examined at this level. Therefore, it was the schools' responsibility to ensure that relevant equipment and software needed by learners to meet the minimum requirements for assessment purposes were acquired.

III. Computer Studies Final examination structure

The study found that the final assessment of Computer Studies was divided into two sections. The following was the explanation of the participants.

> *Computer studies syllabus prescribes the assessment of teaching and learning in two areas divided as computer studies paper one and computer studies paper two. Paper one is Theory which covers 60%. Paper two is practical which also covers 40%*

IV. Coverage of Bloom's Taxonomy Six categories of assessment

The document review also revealed that Computer Studies assessment at junior secondary school level covers the six categories of Bloom's Taxonomy with their respective weightings on Assessment Objectives (AOs) as shown below:

Table 4. 1. Level of Assessment

Paper	Level of Assessment	Weighting on Assessment Objectives (AO)	Total Marks
Paper 1	Knowledge and Comprehension	25%	60
	Analysis (Analytical Skills)	11%	
Paper 2	Application (Hands on Skills)	57%	40
	Synthesis and Evaluation	7%	
Total marks of Paper 1 and Paper 2			100

The findings of the study further revealed that the weightings in computer studies syllabus were done against Assessment Objectives and these were drawn from the whole junior secondary school syllabus. Therefore, it was the mandate of every computer studies teachers to make sure to balance the teaching of the content of the subject accordingly.

The study found that the 40 marks allocated to synthesis and application skills were inadequate in the suggested national assessment. Teachers viewed that learners needed to be assessed most in the areas of application than in knowledge. Participants viewed that the 60% allocated to knowledge and comprehension was too much for a practical oriented subject like computer studies. Although application covered 57% from the 40 marks, participant feel it should have covered the 57% from the 60 marks.

The following excerpt came from a teacher from school 'I':

> *Computer studies are more of application then knowledge and comprehension but one would wonder why the computer studies tilt more assessment to knowledge than application.*

V. Importance of continuous assessment in Computer Studies

The study found that continuous assessment was key to computer studies as it enables learners to hands on skills and these skills were considered to be useful to the learner's learning experiences. The study revealed that though continuous assessment was useful, the practical assessment strategy was hardly implemented because of limited time and computers in most schools.

4.7. Summary

This chapter presented the findings of the study in line with the study questions. The study found that on one hand the content in the topics in computer studies syllabus were in line with the needs of the education system in Zambia while on the other side the topics in the computer were not in line school settings as majority of the schools did not have enough computers while other were in areas where internet network and electricity was problematic.

The study found that teaching and learning methods were twofold. Those including charts, diagrams, and pictures were considered too basic to the level of grades 8 and 9; and those that included research were considered too technical to the ability levels of learners at grade 8 and 9.

Time allocation of four 40 minutes per week divided into two (practical double 40minutes period and two single periods) were inadequate for a practical subject like computer studies.

Assessment strategies were continuous and summative. Continuous assessment was hindered by time and available computers hence assessment strategies in summative tilt more to knowledge and comprehension when computer studies as a practical subject needed assessment to tilt to application and analytical skills.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1. Overview

This chapter discusses the findings of the study in view of literature and analysis of research findings. To this effect, findings of the study were discussed as they came out in all the three objectives which were mirrored by the three research questions as follows:

1. How is the suitability of computer studies syllabus content as regards the topics to the learners' experiences at junior secondary school level?
2. How is the suitability of teaching and learning methods?
3. How is the time allocated to computer studies at Junior Secondary School level?
4. What assessment strategies are used in the computer syllabus at Junior Secondary School level?

The findings are discussed with special reference to the results obtained from interviews. Effort has been made to reflect, validate and broaden current knowledge on an evaluation of the Zambian junior secondary school computer studies syllabus in selected secondary schools in Lusaka district, Zambia. Discussion of the research findings are discussed under subheading generated from the findings presented in chapter four of this study.

5.2. Suitability of Computer Studies Syllabus Content to the Learner Experiences.

The findings of the study revealed that a computer study is a practical subject and as such this syllabus places a lot of emphasis on the use of common application packages. The content of the computer studies syllabus is packaged in such a way that the topics suit the learning experiences of learners. The study found that the content of the computer studies syllabus at junior secondary level includes the following categories of topics: Word processing (Word), spread sheets (Excel), Presentation (PowerPoint), Desktop Publishing (Publisher) and Multimedia were okay and the problem was the materials and equipment to use in supporting the implementation of such teaching and learning strategies. One of the materials that are suggested in the computer studies syllabus is the computer.

5.3. Suitability of Teaching and Learning Methods in Computer Studies Syllabus

The study found that teaching and learning methods such as brainstorming; consequence charts; classroom displays; charts; diagrams; evaluation; discussion; guest speaker or visitor, educational tours and visits; models; photographs and pictures; presentations; problem solving; as well as reflective learning some were above the learner's ability levels. Participants suggested teaching and learning strategies such as research to be advanced and charts, diagrams; photographs and pictures to be too basic for grades 8 and 9.

The study established that most of the teaching and learning methods prescribed in the computer studies syllabus needed the use of power supply as practical implementation of methods as presentation on power point; word, excel publisher processing could only be done with computers connected to power supply. This means that some teaching and learning methods only favors institutions of learning in areas with good power supply. Therefore, the study found that the insufficient power supply in most of the junior secondary schools had contributed to the ineffective implementation of some methods suggested by the computer studies. This was because most of the junior secondary schools were in the rural areas where there was inadequate electricity supply coupled with inadequate power backup. This is in line with what Conradie (2003) observed that many rural areas in Africa did not yet form part of the national electricity grid. This is particularly an acute problem since technology and internet can only be effective if it is generated by electricity. Therefore, this study found that the insufficient power supply in most of the junior secondary schools in had affected the effective implementation of the methods suggested in the computer studies syllabus.

The study also found that for some suggested teaching and learning methods to be implemented needed favorable infrastructure. The effective implementation of teaching and learning needed the use of a computer laboratory because an ordinary classroom setting was a hindrance to effective implementation of computer studies teaching and learning methods. The finding is in line with Aduwa-Ogiegbaen and Iyam (2005) who in their study argued that "a formidable obstacle to the use of information and communication technology is infrastructure deficiencies. Computer equipment was made to function with other infrastructure such as electricity under controlled conditions". They further 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.

The study further found that teaching and learning methods in computer studies needed the use of particular teaching and learning materials such as computer software and hardware and other equipment. It was established that teaching and learning materials were a hindrance to some of the teaching and learning material suggested in the computer studies syllabus for junior secondary. This finding is in tandem with Aduwa-Ogiegbaen and Iyamu (2005) who identified lack of enough teaching materials and other reference materials such as enough text books for ICT as one of the challenges to the successful and sustainable implementation of ICT as a subject in rural public schools. This is because the majority of these schools do not have the capacity to buy necessary learning and teaching materials to carter for everyone. Additionally, Bukaliya and Mubika (2012) also identified the high pupil-computer ratio as a serious challenge worth noting as many pupils will share one computer which is not supposed to be the case. This may lead to high tear and wear including short life span of the computers. The ideal scenario is supposed to one computer per pupil but this is not the case on the ground.

The teaching and learning methods such as models; photographs and pictures; presentations; charts, diagrams; photographs and pictures were found to be less effective though suggested in the computer studies syllabus for junior secondary. This is because the study found that many schools were found to use a limited range of ICT peripherals, mainly printers, scanners, and digital cameras. Digital projectors were found in secondary schools. At primary level, interactive whiteboards were present in a small number of schools in urban areas. Schools that made dedicated computer facilities available to teachers reported that it led to the use of more high-quality and creative teaching resources in classrooms.

A computer study is a subject that requires a dedicated room for delivery an appropriate teaching and learning methods. The study found that the provision teaching and learning method in computer studies at junior secondary requires a schedule of accommodation of a dedicated computer room, now often referred to as the multimedia learning laboratory, is a relatively new initiative. Up to 1999 most schools were provided with a room for “commerce or business machines” in their schedules of accommodation. These rooms were generally equipped with

typewriters. From 1999 onwards, however, computer rooms were formally provided, though before that many schools had converted existing classrooms to serve as computer rooms. The computer room is generally used for teaching computer skills to full class groups. The computer room in a new school is generally equipped with seating for up to thirty computer users, with computer hardware being allocated while the total number of computers in the computer rooms of the case-study schools visited varied significantly, the number found was not always in proportion to the school's enrolment. The ordinary classroom setting was not suitable for suggested teaching and learning methods in the junior secondary school computer studies syllabus. Studies indicate that new technologies in the classroom provide opportunities for students to learn to live in the information age as the twenty-first century was a century of the information era. The finding is supported by Yelland (2001) who points out that the traditional educational environments did not prepare learners to be productive in today's workplaces in society. Grimus (2000) adds that the relevance of teaching environment of ICT in schools, especially at the basic school level cannot be overemphasized as it prepares learners to cope with the demands of the current century. This agrees with Stallard (1998) who says that the computer laboratory is the heart of effective teaching of computer in schools. Therefore, the important thing to deal with at the planning stage is to see the possibility of getting both the building together with the facilities that will make the teaching and learning computers meaningful.

5.4. Time Allocated to Computer Studies at Junior Secondary School Level

The time allocated for instructional time is one among the many major factors that a computer class in a computer teaching subject considers necessary. Instructional time must be different from tests and quizzes, assignments, group works and homework. Instructional time should enable teacher to interact with his or her students in the process of habit formation and behavioral changes. This finding is in line with Drury (1995) who observed that when the students are given longer time to study the subject, theoretically and practically it helps them better develop their inquisitiveness in the learning environment.

The study found that basing on the nature of the infrastructure, attitude and the readiness of the teachers in schools; it was difficult for some schools to provide more time for the students to learn. It is a routine like schedule that all the teachers in the government schools spend shorter time for

their employer but longer time for their personal businesses. This was revealed by the teachers of computer studies who were giving their responses that there is only 80 minutes for practical and 40 minutes for theory for computer studies per week because of the numbers of classes available which did not correspond with the computer teachers in schools and the available infrastructure. This inadequacy in time hindered the practice of skills learnt by learners. The finding is in line with the findings of Gudu, (2015).

Academy that revealed that indicated that schools usually have a computer class once a week and they do not have any other opportunity for practice. This shows that there is no enough time for them to go for practices and their teachers are ready for such students.

Findings of the study suggest that teaching and learning process of the computer studies subject is guided by the reviewed syllabus (Information and communication technology), and this is student centered and activity oriented. To simplify the act of teaching and learning depend on the teaching methods that are relevant to the subject in question. According to the Tanzania syllabus the methods suggested to teach this subject effectively are; demonstration, hands-on, discussions, brainstorming, debate and internet searches. Computer subject teaching demands the methods that make it possible for teacher and students interact meaningfully.

Furthermore, the finding show that, time allocated for instructional time is one among the many major factors that a computer class in a computer teaching subject considers necessary. Instructional time should enable teacher to interact with his or her students in the process of habit formation and behavioral changes. But this study has revealed that instructional time in most schools where they teach computer subjects is not enough

5.5. Assessment Strategies Used in the Computer Syllabus

The assessment framework utilizes various types of continuous assessment strategies. This is meant to determine learners' competences. It is desired that the teacher as much as possible utilize assessment strategies that promote active learning by the learner. The case in point includes portfolios, observation sheets (to gauge certain competences), written assignments and reports, presentations, projects and experiments. The study found that computer studies is a practical subject and as such computer studies syllabus places a lot of emphasis on the use of common application packages hence object-oriented programming languages was not examined at Junior

secondary level. This therefore made the schools' responsibility to ensure that relevant equipment and software needed by learners to meet the minimum requirements for assessment purposes are acquired and balances the teaching of the content of the subject accordingly. The study findings are in line with survey by Garegae (2012) which similarly showed that teachers were more likely to use ICT for writing purposes and referencing, research or investigation skills, while teachers of junior classes were more likely to use ICT to develop reading skills. It is clear from this examination that the use of ICT is somewhat limited in primary schools, and that the potential for using ICT to develop critical life skills, such as communication, problem-solving and independent working skills, is not being realized.

The study also revealed that some assessment strategies that involve the use of electricity and internet were not possible especially to schools found in rural settings. This was buttressed by Boit and Kipkoech, (2012) study in Kenya confirms that developing countries lack reliable internet connectivity. On the other hand, Lufungulo (2015) found that schools in Zambia lacked access to internet and its usage was time consuming. This greatly discouraged both the teachers and pupils to an extent of looking at ICT as a burden. Pupils also complained that they had no access to computers on their own while at school as the computer rooms were under lock resulting into no time for pupils to practice on the computers.

The study found some teacher were facing challenges in continuous assessment as they were not conversant with computer applications. This finding was similar to Levin and Gordon (1989), who suggests that teachers having received formal computer training can be more positive about computer than teachers with knowledge acquired primarily by trial and error cannot be certain to the same degree. Furthermore, computer studies teachers need to use teaching methods that require meaningful teacher and student interaction. the teacher's competence; the facilities and the instructional time given to the students have a strong influence on the successful computer subject teaching.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1. Overview

This chapter is a synthesis of the entire study and contains summary of research findings, exposition of findings, commensurate with the objectives, conclusions and recommendations based thereon. The research questions were; how is the suitability of computer studies syllabus content as regards the topics to the learners' experiences at junior secondary school level? How is the suitability of teaching and learning methods and time used in computer studies syllabus at Junior Secondary School level? How is the time allocated to computer studies at Junior Secondary School level? What assessment strategies are used in the computer syllabus at Junior Secondary School level? The conclusions to the research are reported here as a set of key answers provided to the research topic and research questions through interpretation of data and the generation of the assertions provide in the conclusions.

6.2. Conclusion

The research sought to evaluate the Zambian junior secondary school computer studies syllabus: a case of selected secondary schools in Lusaka district, Zambia. The study was guided by research objectives and research questions that were formulated from the research objectives.

The first objective of the study was to establish the suitability of computer studies syllabus content as regards the topics to the learners' experiences at junior secondary school level The study found that topics in the computer syllabus linked the outcome based education principles to real life experiences that give learners skills to access, criticize analyze and practically apply knowledge that help them gain life skills. The study also found that topics were based on competences and general outcomes that expected outcomes to be attained by the learners through the acquisition of knowledge, skills, techniques and values which are very important for the total development of the individual and the nation as a whole.

The study revealed that schools were implementing computer studies syllabus without matching the syllabus content with learner's experiences suggested in the syllabus. This is because, as indicated by the study some schools were implementing the computer syllabus without practical part which is suggested by the syllabus so as to enable the learners to gain practical experience. The study revealed that majority of the schools that participated in the study did have well

furbished computer laboratories and enough computers for conducting practical lessons. Schools were teaching computer studies in the ordinary classrooms.

The study findings revealed that computer studies syllabus for grade eight and nine has topics designed to suit learner's experiences. The grade computer syllabus has nine major topics that include: Introduction to computers; Basic Operations; Computers in everyday life; Productivity tools (Word Processing); Productivity tools (Spread Sheet); Productivity tools (Power Point); Productivity tools (Desktop Publishing); Networks and the Internet; and Media files.

The study on the other hand found that grade nine computer studies syllabus has nine major topics. It was further established that the grade nine computer studies syllabus has similar topics as those found in the grade computer studies syllabus except for one topic. The grade nine computer studies syllabus is not different from the grade eight computer studies syllabus. The only difference is on one topic which is found in grade nine computer studies syllabus and not found in grade eight computer studies syllabus. This topic is 'information technology in everyday life'.

On contrary, some teachers indicated that some topics in computer studies syllabus for grade 8 and 9 suits all the school setting regardless of the availability of computers in schools. The teachers further indicated that some topics do not require computers as per se. The general observation by teachers was on the topic 'Introduction of Computers' were pupils only identify and labels parts of the computer. The study found that the topics in the computer studies syllabuses for grades 8 and 9 suited the learner's experiences. Participants described the topics as relevant to the education system but not relevant to some school settings especially schools in rural setting.

The second objective of the study was to find out the suitability of teaching and learning methods and time used in computer studies syllabus at Junior Secondary School level. the study findings revealed that computer studies teaching and learning strategies that included: Brainstorming to stimulate creative thinking, Consequence charts -cause and effect approach, Classroom displays (focuses on the current unit), Charts, Diagrams, Evaluation, Discussion, Guest speaker or visitor, educational tours and visits, Models, Photographs and pictures, Presentations, Problem solving involving learners in identifying and working towards solutions; reflective learning involving thinking about what has been learnt; research to think of the questions you want learners to answer. The other part of the teaching and learning strategies involved Software.

The participants interviewed gave their experiences with the teaching and learning strategies and time in the teaching and learning of computer studies.

The findings of the study revealed that a computer study is a practical subject and as such this syllabus places a lot of emphasis on the use of common application packages. Therefore some of the teaching and learning strategies suggested in the computer studies syllabus such as Charts, Diagrams, Evaluation, Discussion, Guest speaker or visitor, educational tours and visits, Models, Photographs and pictures were not very useful because when it comes to assessment object oriented programming languages where not be examined at this level.

The participants also revealed that teaching and learning strategies such as brainstorming; consequence charts; classroom displays; charts; diagrams; evaluation; discussion; guest speaker or visitor, educational tours and visits; models; photographs and pictures; presentations; problem solving; as well as reflective learning some were above the learners ability levels. Participants echoed that teaching and learning strategies such as research were advanced to suit the learning abilities and learning experiences of learners. Teaching and learning strategies such as practical teaching and learning on the use of Word processing (Word), spread sheets (Excel), Presentation (PowerPoint), Desktop Publishing (Publisher) and Multimedia was valuable in computer syllabus because they were meant to expose learners to computer applications. However, the suggested teaching and learning strategies were not correlating with the equipment such as computer in supporting the syllabus delivery.

The third objective of the study was to investigate time allocated to computer studies at Junior Secondary School level. Time and period allocation are some of the very important components of a syllabus and computer studies syllabus not an exception. The study findings revealed that the computer studies syllabus for grades 8 and 9 (junior secondary Level) covers a two-year course and will require at least four 40-minute periods per week to complete (One double for practical and two single periods for theory).

The participants interviewed indicated that the time allocation to computer studies practical period was not sufficient especially that in most schools' computers were limited in number and learners were sharing or using computers as a group. The participants suggested that the practical subjects needed two double periods of 60 minutes each so as to accord more time for practical. Time

allocation to a period for a single class in computer studies syllabus is not enough because classes especially in rural place are big against the number of computers in schools. This makes time for practical become limited to allow each learner a chance to practice a skill on the computer.

Practical subjects require more time allocation to a period. But when I look at the 40 minutes though it is a double period for a practical session the time is still limited. The computer syllabus in my view would have allocated at least 60 minutes of double period for practical and the same 40 minutes for a single period. This is because practical is very important in the teaching and learning of computer skills.

The study in this section found that time allocation was a factor in computer studies syllabus for grades 8 and 9 especially. The study found that computer studies were more practical oriented and needed more time on the time table. The study found that the syllabus indicated that computer studies shall have at least four 40-minute periods per week (One double for practical and two single periods for theory). The participants viewed that the practical needed to have at least 120 minutes per week (3 periods of 40 minutes each) and one 40 minutes period for theory. This is because such as word processing needed more time and practice.

The fourth objective of the sought was to assess the assessment strategies used in the computer syllabus at Junior Secondary School Level The findings of the study revealed that assessment strategies used in computer studies were in various types. The participants indicated that assessment in computer studies was both continuous and summative. The computer studies syllabus at junior level suggests assessment framework that utilizes various types of continuous assessment strategies. This is meant to determine learners' competences in the application of computer skills. It is therefore desired that the teacher as much as possible utilize assessment strategies that promote active learning by the learner in order to gauge certain competences.

The study findings also revealed that a computer study is a practical subject and as such this syllabus places a lot of emphasis on the use of common application packages. Object oriented programming languages where not examined at this level. Therefore, it was the schools' responsibility to ensure that relevant equipment and software needed by learners to meet the minimum requirements for assessment purposes are acquired.

The final assessment of Computer Studies was divided into two sections. The following was the explanation of the participants. Computer studies syllabus prescribes the assessment of teaching and learning in two areas divided as computer studies paper one and computer studies paper two. Paper one is Theory which covers 60%. Paper two is practical which also covers 40%.

6.3. Recommendations

From the findings and discussion from chapters four and five respectively, this study recommends the following;

1. Consideration should be given to equipping all classrooms with a computer for use by the teacher, broadband internet access with adequate bandwidth, and a fixed data projector and screen for use by the teacher in presentations.

2. The pedagogical dimension of the computer studies advisors' role in the Ministry of General Education and Curriculum development center should consider increasing more time on practical in the syllabus to allow more practice by learners.

3. Teachers should exploit the potential of computer studies to develop as wide a range of students' skills as possible, including the higher-order skills of problem-solving, synthesis, analysis, and evaluation.

4. Staff members and learners should be provided with adequate access to the internet.

5. The government should provide an enabling environment through the national Policy on computer studies syllabus by understanding its implementation adequately.

6. The government also through the ministry responsible for education should work with the Zambia Electricity Company and the Rural Electrification Authority (R.E.A) to expedite connection of electrical power supply to some rural schools. The government should also invest in green energy such as solar to provide power to rural schools.

6.4. Proposed Areas for Further Research

The study was done on an evaluation of computer studies syllabus at junior secondary level. A study can be done on learner performance in computer studies based on the topics in computer studies syllabus at junior secondary level and the suggested learning outcomes in the syllabus.

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APPENDICES

APPENDIX I: INFORMED CONSENT FORM

Dear Respondent.

My names are Audrey Kazhila. I am currently a student at the University of Zambia in collaboration with the Zimbabwe Open University pursuing a Master of Education degree in Educational Management. This research is a major requirement for me to complete my program. Thus, this exercise is pure academic.

The researcher intends to investigate the attitudes of teachers towards the revised Social Studies curriculum at Junior Secondary school; ascertain the benefits of teaching and learning computer studies; explore the challenges faced in the teaching and learning of computer studies in secondary schools in Lusaka District. The measures taken to enhance the implementation of computer studies syllabus will be highlighted through the recommendations.

Participation in this exercise is voluntary. You are free to decline to participate in this exercise at any point.

All data collected from this research is treated with utmost confidentiality. Participants are therefore assured that they will remain anonymous and untraceable in this research.

All efforts will be taken to ensure that the rights of participants are protected and respected. Participants are assured that they will suffer no harm as a result of participating in this exercise. Participants are free to seek for any clarification at any point of the exercise and to inform the researcher if they feel uncomfortable about any procedure in this research.

I have read and fully understood this document. I therefore agree/disagree to participate in this exercise.

…….. ……

Signature **Date**

APPENDIX II: SEMI-STRUCTURED INTERVIEW GUIDE FOR TEACHERS

1. Gender of the participants ……
2. What is your age range? 18-24; 25-34; 35-44; 45 & Above
3. What is your highest professional qualification? …….
4. How long have you served in service with Ministry of General Education?
5. How long have you taught computer studies?
6. Would you explain how suitable is computer studies syllabus content as regards the topics to the learners' experiences in your school?
7. What teaching and learning methods are used in teaching computer studies at Junior Secondary School level?
8. How suitable are teaching and learning methods suggested in the computer studies syllabus at Junior Secondary School level?
9. How do you describe the coverage of computer studies syllabus?
10. What is the enrolment for the classes taking computer studies at this school?
11. What teaching and learning materials are available for computer studies in line with the syllabus?
12. How enough is the time allocated to computer studies at Junior Secondary school level for teaching and learning processes?
13. What assessment strategies are useful in the computer studies syllabus at junior secondary school level?
14. Why do you think the assessment strategies suggest are useful in the computer studies syllabus at junior secondary school level?

Thank you very much for your responses!