



To Investigate the Challenges of Adopting Ict in Public Learning Institutions: A Case Study of Four Selected Secondary Schools in Luwingu District of Northern Province of Zambia

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Abstract: This dissertation exploring the difficulties and prospects brought by the adoption of ICT in the selected public day secondary schools: Luena, Kaseya, Luwingu and Shimumbi in Luwingu district of Northern Province of Zambia. The objectives of the research contained within; ascertaining the challenges that learning institutions are facing in the teaching and learning progression of ICT in Luwingu District; instituting the academic enactment of learners taking ICT in their final examinations in Luwingu district; as well as ruling out what procedures will be invented to be put in place so as to promote quality teaching and learning of ICT in schools in Luwingu district. The researcher will basically employ both qualitative and quantitative research techniques in this study. This research is principally predisposed by the Maslow's Hierarchy of Needs theories. The imperative findings of the research would be that schools are facing or related challenges in terms of teaching and learning of ICT. These challenges basically may include scarcity of computers, lack of teaching and learning materials, in addition to shortage of furniture, lack of space in computer laboratories, poor or no internet service, besides poor teacher preparedness to teach. In terms of the elements that are impairing these challenges, the findings of the study would discover that: lack of funds to procure computers, furniture, teaching and learning materials; lack of trained teachers; and inadequate space in computer laboratories. On the question of academic performance, it is revealed that the sampled secondary schools performed better in the 2020 ECZ examinations than in 2021. Thus, there is a gradual decrease in the performance of the learners. On measures to enhance the academic performance of the learners, the study has revealed that there is need to lobby for more funds to procure teaching and learning materials; and building spacious computer rooms. Furthermore, there is a need to recruit trained skilled teaching professionals or build the capacity of existing teachers and also motivating the Learner to take the subject extremely. In the light of the above pretext the research study will by classification be consisted of five chapters. Chapter one provides the introduction of the research problem, background of the problem, objective of the study, research questions and the significance of the study. Chapter two provides literature review. Chapter three gives research methodology and chapter four offers the research finding. Chapter five provide the conclusion and recommendations for a comprehensive research project.

Keywords: Board of Governors, District Commissioner, District Education Officer, Head of Department, Ministry of Education, National Council of Arts and Technology, Statistical Package for Social Arts, Teaching Service Commission, Information and Communication Technology

I. Introduction

This chapter gives the background to the study of the challenges and opportunities of the introduction of ICT in selected public schools in Luwingu District. It begins with the background to the topic under investigation. Then the chapter largess the statement of the problem under investigation, research



objectives, and underlying principle of the research, scope of the study, definition of key terms and the organization of the study.

Background

Education is key in stimulating individual and national ecological development. Governments from place to place across the globe are investing comprehensively in education due to its power in transforming individuals and nations. China, for example, which has the largest education system in the world, has had its investment in education increased in the last ten years at the rate of 19% on average at all levels proportional to the growth of the national economy (OECD, 2016). In Zambia, the government also raises the value of the relevance of education in transforming the country. This can be seen in the goals of the education system as envisioned in the National Policy on Education called educating our Future (1996). Commenting on the goals of the education system, it has been stated that: The Ministry of Education has set for itself the goals of (a) producing a learner who is capable of:

- being animated by a personally held set of civic, moral and spiritual values;
- Developing an analytical, innovative, creative and constructive mind;
- Appreciating the relationship between scientific thought, action and technology on the one hand and sustenance of the quality of life on the other;
- Demonstrating free expression of one's own ideas and exercising tolerance for other people's views.
- Maintaining and observing discipline and hard work as the cornerstones of personal and national development.... (MOE, 1996).

As a result, this shows that education is tangential in promoting individual and national sustainable development. It ought to be noted that realizing these goals on education is not a simple task for Zambia. There is need for the government and other pertinent stakeholders in the provision of education to come on board and put in the much needed resources. To this end, the country is belligerent to finance its education system. Zambia has “a weak budget performance associated with late, erratic, and inadequate funding to the education sector” (UNESCO, 2016:20).

In the 21st century, for that reason, it is generally accepted that ICT as a subject of study is a powerful tool necessary in transforming society through kiss-and-tell the learners to existing technologies and empowering them with capabilities to be the drivers of innovations for prosperity and sustainable development. It has been observed that, “one of the many challenges facing developing countries today is that of preparing their societies and governments for globalization and the information and communication revolution. Policy- makers, educationists, non- governmental organizations, academics, and ordinary citizens are increasingly concerned

with the need to make their societies competitive in the emergent information economy” (Meenakshi, 2013:1



This is largely because it is key in the spread of information and technology. The introduction of ICT in schools offers a firm foundation upon which the learners and citizens in general can prepare themselves to participate and compete in the globalized economy. Consequently, the global fluctuate towards a knowledge- based society has seen the role of ICT necessitated by ICT in education becoming increasingly important (Mandoga et al., 2013). The term ICT as applied to education, are technologies such as computers, the Internet, broadcasting technologies which includes radio and television, and telephony that can expedite not only delivery of teaching, but also learning the techniques. These technologies have been well-known as important tools for realizing a new paradigm of learner-centered education that better supports learners’ needs through differentiated and personalized instruction (Khan; 2009). Thus, governments around the world and particularly in least developed countries are expected to take the teaching of ICT in schools very serious as the subject is key in transforming society and promoting sustainable development.

As a result, it is undisputable that increasing funding to the provision of education in general, and the teaching and learning of ICT in particular, is a worthwhile goal. Commenting on financing of education, it has been stated that, “running of education depends on real resources such as staffing, buildings, and equipment; and monetary resources, which are funds needed to be used to obtain real resources” (Kelly, 1999:297). Consequently, the government and other stakeholders need to see to it that the teaching and learning of ICT in schools as a new subject is given proper attention and urgent support in terms of financing of education.

Largely, in terms of the benefits of teaching ICT in schools and at national level, among many others, these include greater collaboration, improved communication, wider job opportunities on the global market, an acceleration of economic and social development, and

greater inclusion of isolated, particularly rural populations, into the mainstream of society (Kabanda, 2012).

Thus, this study, attempted to investigate the challenges and prospects of the introduction of ICT in selected public schools in Luwingu District. The study focuses on instituting the challenges and prospects in schools.

Statement of the Problem

It is generally agreed that ICT as a subject of study is a force that has changed many aspects of human endeavors and with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important (Adesote and Fatoki, 2013). In the same vein, the Ministry of Education in Zambia has introduced ICT in schools as a subject in an effort to ensure that learners are fitted out in this area of development and are made relevant to society (MESVTEE, 2013). This is also in line with the country’s National Education Policy and Vision 2030. However, it has

been observed that one of the major challenges that the education system faces is the low quality of education as evidenced by low performance results in the National Assessment Surveys (GRZ, 2017).



This has not spared the teaching and learning of ICT in Zambia. Thus, this implies that there is need to establish the challenges and opportunities in the teaching and learning of

ICT in schools. It should be noted that if this question is not addressed, learners' academic performance is likely to remain poor in ICT thereby denying Learner opportunities to excel in life and add value to their world and national development. In the area of ICT, the government in Zambia has stated that priority will also be given to the procurement and supply of learning and teaching materials and upgrading teacher competences (GRZ, 2017). Arising from the facts discussed above, it is not clear whether or not schools in Luwingu district are prepared to teach ICT. However, despite significant support by the government to schools and from other stakeholders in the provision of education, learning outcomes have also been persistently low (World Bank, 2016). This study, therefore, aimed at investigating the challenges and opportunities associated with the introduction of ICT in selected public schools in Luwingu District.

Purpose of the Study

The purpose of the study was to investigate the challenges and opportunities of introducing ICT in selected public schools in Luwingu District.

Objectives of the Study

Arising from the research problem, the following were the objectives of the study:

- Identify the challenges that schools are facing in the teaching and learning process of ICT in Luwingu District.
- Establish the academic performance of learners taking ICT in their final examinations in Luwingu District.
- To determine measures that should be put in place (if any) to promote quality teaching and learning of ICT in schools in Luwingu District.

Significance of the Study

A lot has been written on the importance of ICT in schools as a subject of study. However, the area of challenges and opportunities has not been given the attention and urgency that it deserves especially in Zambia (Bwalya, 2015 and Gregory, 2016). Therefore, it is hoped that this research will:

Provide policy makers and practitioners with data on the challenges and opportunities associated with the introduction of ICT in public in schools. This will help in the formulation of policies and prioritizing implementation of activities associated with the teaching and learning of ICT in schools. The findings will also add value to the body of knowledge and practice pertaining to how the teaching and learning process of ICT in schools can be enhanced. This study will also deepen and widen my knowledge on the understanding of the opportunities and challenges in the teaching of ICT in public schools.

II. Literature Review

Introduction



This chapter reviewed the relevant and related literature. This was contextualized as global, African and Zambian perspectives respectively and related to the research problem and objectives of the study.

Related Studies

The relevant and related studies that were reviewed have been contextualized as global, African and Zambian perspectives respectively.

Global Perspective

It is generally agreed that ICT enhances the quality and accessibility of education (Yusuf, 2005). ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of learning. It has been observed that with the help of ICT, students can now browse through e-books, sample examination papers, and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers- all over the world. This flexibility has further heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002).

The teachers' positive attitude towards the teaching and learning process of ICT plays a key role in the success of ICTs (Al-Zaidiyeen et al, 2010 and Albirini, 2006). In addition, the study attempted to confirm Al-Zaidiyeen et al (2010) and Albirini's (2006) findings that teachers' beliefs, attitudes and practices in teaching ICT were important for understanding and improving educational process by exploring the matter using teachers of ICT in Lusaka district.

Globally, the level of ICT available to education differs from country to country. The important role of ICT in improving education is identified where nations have invested heavily in networking classrooms and increasing the number of computers in schools (Mofarreh, 2016). Furthermore, ICT has become an important requirement for participation in society and the workplace, hence learners need to become competent with ICT skills to fully engage in social activities. This is particularly important as public and other services are increasingly available online. Finally, ICT has the potential to transform pedagogical practices and increase the breadth and richness of teaching and learning.

Pelgrum and Pomp (1993) conducted a study at the University of Twente in Netherlands on the use of Computers in Education in 18 Countries. The study acknowledges that the 1980s saw a rapid increase in the infusion of new information technologies in most societies and that the notion that computers are playing an important role in life of every citizen is no longer debatable. The results of the study, in 1993, showed that in the past few years quite drastic changes have taken place in the number of schools equipped with the computers and in the number of computers available in schools. Despite this fact, in most educational systems computers were still used by a limited number of teachers, and mainly for teaching



children about computers; the integration of computers in existing subjects was increasing quite slowly. The study concluded that the major problems that are experienced in schools deal with teacher time, the lack of sufficient software of high quality, and the training of teachers. These findings, therefore, will help to assess whether or not the situation in Zambia, particularly in Luwingu District, has passed these challenges.

Csizmadia (2017) reviewed the question of computing in the curriculum: challenges and strategies from a teacher's perspective in United Kingdom. The work argues that computing is being introduced into the curriculum in many countries and teachers' perspectives enable us to discover what challenges this presents, and also the strategies teachers claim to be using successfully in teaching the subject across primary and secondary education. From the analysis of the data, extrinsic and intrinsic challenges were identified for both teachers and students. In addition, a variety of pedagogical strategies were recommended by teachers from their own practice. In categorizing approaches taken by teaching to support students five key themes emerged: unplugged type activities, contextualizing of tasks, collaborative learning, developing computational thinking, and scaffolding programming tasks. The usefulness of these findings to the current study lies in the fact that they are key in suggesting potential activities necessary in enhancing the teaching and learning of ICT in schools in Zambia.

This research investigated on whether ICTs integration into junior secondary schools would impact a positive change in people's lives. The research went further to find out and understand the professional training junior secondary school teachers underwent in ICTs usage and how that training influence their attitude towards the subject (Lortie, 1975). Ball (1990) and Lortie (1975) reports that teachers tend to teach the way that they were taught. Hence, if we expect head teachers, ICT teachers and Head of Departments in schools and junior secondary schools in particular to perform in their respective tasks using technology, we need to teach and train them using new technology (Vrasid and McIsaac, 2001). Ball (1990) and Lortie (1975) research was vital to the study because they addressed the issues of teacher training in computer technology which has a very big impact on how the subject is taught in junior secondary schools of Zambia.

The work by Higgins (2000) cannot be ignored. This study was carried out in the United Kingdom and looked at whether or not ICT improves learning and teaching in schools. He acknowledges that in the UK there is heavy investment in ICT for use by teachers and Learner in schools. His study indicates that ICT can make a difference to pupil learning. This is because large studies have shown that there is a positive link between the provision or use of ICT resources and pupil attainment, but this link is weak. Also, the work argues that more substantial gains in pupil attainment are achievable where the use of ICT is planned, structured and integrated effectively.

The work by Manaligod (2012) is relevant to this study. It examined the integration of ICT in selected public secondary education schools in Metro Manila, Philippines. The parameters that were used included (a) availability of ICT resources (b) levels of skills (c) extent of usage (d) problem inhibiting adoption, and (e) perceptions and goals. The major findings of the study included: the lack of



hardware remains to be the most pressing and persistent problem. Relative to student population, the computer – to – student ratio is at 1:63. Access to computers is limited to those taking computer education subjects. Also, almost half of the teachers never attended ICT – related trainings. Trainings conducted were generally on computer literacy like basic operations, word processing, and spreadsheet. Therefore, the work concludes by stating that ICT integration remains to be learning about, rather than learning with ICT tools. A policy review is needed for equitable distribution of sparse ICT resources across all learning areas. This work is relevant to the present study in that it has highlighted some of the key elements relating to the question at hand, challenges and opportunities in introducing ICT in selected schools. Therefore, it will help in providing information on how the situation is in Zambia in relation to other countries especially when it comes to the challenges, if any.

African Perspective

Miima (2014) investigated the topic on integration of information communication technologies in teaching and learning of Kiswahili language in public secondary schools in Kakamega County in Kenya. Her work acknowledges that the integration of technology in education is considered all over the world as a strategy of transforming the quality of education. She further argues that in recent times, considerable investment in computer based Information Communication Technologies (ICT) has been made by many countries with a belief that it will support and transform teaching and learning in the school systems. The findings of the study established that the teachers and learners' skills were low. Teachers needed to be trained in all the ICT skills and on how to integrate ICTs in their teaching and learning activities. The usefulness of this work to the current study lies in the fact that it explored the integration of information communication technologies in teaching and learning. This is the area of focus of the present study although the main subject here is the introduction of ICT in schools in Zambia. Therefore, this work is insightful and helps in terms of providing the background information to the present study.

In a research done by Fashanu (2012) on Adoption of ICT and its Comparative Impact on Private and Public High Schools in Lagos State Nigeria, it is reported that for several decades now, ICT has been progressively infused into the Nigerian educational sector and has undoubtedly affected teaching, learning, and research. In the late nineties, there was paucity of ICTs in Nigerian schools. A federal policy to address the situation resulted only in the distribution of computers to some government secondary schools, which were largely unused due to lack of training for personnel and other limitations. Nigeria's Policy on Education recognizes the need to integrate ICT into all cadres of education and government pledged to "provide necessary infrastructure and training" for same. Yet, Computer Education unlike Introductory Technology is stipulated as an elective rather than a core subject in secondary schools. Researchers later discovered that computers are still lacking in ninety percent of all public schools and that most operations are still done manually. Initially ICT was deployed in high schools just to gain access to information but now it is used for collaborative and self-paced learning, office automation and social communication.



In a study carried out by Farrell and Isaac (2007) on ICT and education in Africa it was noted that some African countries had made efforts to integrate ICT in educational institutions. Waema (2002) observed that several African countries like Egypt, Mauritius, Rwanda and South Africa had developed comprehensive national policies and strategies to fully integrate ICT in various institutions of learning. Studies by Waema (2002) Farrell and Isaac (2007) provided a firm foundation for this research. In 2006, the government of the republic of Zambia through the

Ministry of Communication and Transport (MCT) launched a National ICT Policy which addressed several sections including Human Resource Development, agriculture; education; E-commerce and E-government. There was also need to state that it was the section on promoting ICT in education, Research and Development that had to set out the objective pertaining to ICT and education.

Mndzebele (2013) studied the challenges faced by schools when introducing ICT in Developing countries in Swaziland. The work noted that although ICT has the potential to improve the education system of every country to a great extent but this is not the case in some developing countries because of certain challenges

Ministries of Education setting out on the process of establishing computer education in Third World schools are typically under considerable pressure from various constituencies within their own countries. In seeking to respond to this pressure, they are aware that the resources needed are physical, in the form of appropriate hardware, software, space and reliable electrical power, and human, in the form of trained teachers and other staff. The physical resources can be imported or manufactured, with or without the aid of industrial nations, but the human resource must be trained, even in the few countries where many teachers are expatriates. There is no escape from the fact that putting computers in schools, within a support framework which allows them to be put to effective use, places a very heavy demand on the training system of the country carrying through the innovation (Hawkrige; 1993). He further reports that training needed is complex and the skills required to deliver it are scarce, even in the industrial nations. Those requiring training are not only the teachers who will deliver the revised curriculum. Other groups must be targeted, as points out teacher trainers within the country; principals of schools; those who will revise the curriculum and develop new curriculum materials; those who will evaluate existing software and specify required software; those who will write new software, and those who will commission hardware and ensure that trained personnel are available to maintain it. Technologies allow students to work more productively than in the past, but the teacher's role in technology is more demanding than before. The aim of the study was to present a review of the state of ICT in the school system in a developing country, by evaluating the current use of ICT as well as the challenges encountered when introducing ICT in the classrooms. The study established that lack of resources within the educational sector is a hindrance in the implementation of ICT in developing countries. Because of limited resources then there will be lack of sufficient computer experience for the students and teachers. Therefore, schools needed to be provided with adequate facilities and resources for effective implementation of ICT. Had it not been for the commitment shown by the parents most of the computers in the schools would have long stopped functioning as a result of poor



maintenance by government. Thus, responsible authorities have to try and overcome these barriers so that students can benefit.

The National ICT Policy of Seychelles is cardinal to this study too. It looked at various policy objectives pertaining to the use of ICT in that country. It states that the importance of telecommunication as a service industry in itself as well as a critical support element for other service industries has been for the last few years and continues to be the subject of high level policy formulation in practically every country in the World and Seychelles is no exception. One of the five areas of the National ICT Policy is ICT infrastructure. It calls for the promotion of the provision of accessible, universal, affordable, reliable, modern and high quality levels of ICT facilities. The policy document also encourages the private sector to continue their role as an integral part of the development of ICT infrastructure. The work is important in that it will help with information on the levels of preparedness and commitment of the government of Seychelles in the provision of ICT facilities. Reporting on the challenges in the implementation of ICT in public secondary schools in Kenya Mingaine (2013) says, the government formulated national ICT policy on education in 2006 with a vision “A prosperous ICT-driven Kenya society” and mission “To improve the livelihood of Kenyans by ensuring the availability of efficient, accessible, reliable and affordable ICT services” (GOK, 2006). The policy highlighted that the government will encourage implementation and use of ICT by schools in order to improve quality of teaching and learning. He goes on to say implementation of ICT in schools has remained elusive since most of them are not connected to electricity grid, has no capacity to buy the required infrastructure, and has school leaders and teachers who are either computer illiterate or technology ignorant, though the current global technology changes put emphasis on digitalization and modernization of all sectors including schools. Despite the apparent benefits of the use of ICT in schools, research shows that many schools are not implementing it, thus depriving learners and the school community from accessing the potential of ICT.

Zambian Perspective

The growth of information and communication technologies (ICT) has dramatically reshaped teaching and learning processes in education. ICT for education is more critical today than ever before since its growing power and capabilities are triggering a change in the learning environments available for education. The use of ICT offers powerful learning environments and can transform the learning and teaching process so that students can deal with knowledge in an active, self-directed and constructive way. At present ICT is considered as an important means to promote new methods of instruction (teaching and learning). It should be used to develop students' skills for cooperation, communication, problem solving and lifelong learning. Although computers and technology are prevalent throughout our society, developing countries are far from reaping their benefits because of certain barriers (Khan; 2012). He goes on to say that the use of ICT could improve performance, teaching, and administration, have a positive impact on education as a whole, and develop relevant skills in the disadvantaged communities - helping in liberation and transformation. The government of Zambia through the Ministry of General education should be of high quality effectively and efficiently delivered (Phiri and Mbobola; 2018). This is where e-learning which is one of the forms of



information Communications Technology (ICT) comes into play. One of the modern ways in which education can be made available is through the use and implementation of ICTs and e-learning in the education sector as mentioned earlier. E-learning is a broad term that encompasses many teaching approaches, types of technologies and administrative.

The government of Zambia developed the ICT policy that aims to ensure children learn ICTs from primary to tertiary level. The move saw the introduction of ICT lessons in schools by the Ministry of General Education following the revision of the school curriculum. The initial implementation of the program was characterized by a lot of challenges in many learning institutions across the country. Among them being, not all schools in the country have access to electricity, while others have no computers to facilitate ICT lessons. Three years down the line in the implementation of ICTs in schools, Government is recording steady progress. Ministry of General Education Permanent Secretary Felix Phiri said learners are being taught the theory part of ICTs in all the schools countrywide. However, learners with access to computers and other ICT devices are also able to do the practical part of the subjects. This means that Learner in schools without computers and ICT devices are not able to do the practical part. “The learners who have access to computers are also being examined, while the ones without access to computers and other requirements are not being subjected to examinations,” DrPhiri said. According to the Ministry of General Education, children who master the theory part of ICTs find it easy to do the practical part when they come across computers and other required devices. “If children start

Learning ICTs early, we are sure of developing the country because of the advancement in technology which makes it possible,” DrPhiri said (Zambia Daily Mail Newspaper, September 2018:10). The need for ICT integration in education is crucial, because with the help of technology, teaching and learning is not only happening in the school environment, but also can happen even if teachers and students are physically in distance (Ghavifekr and Athirah; 2015).

From this citation, it shows that those who were framing the National Policy on Education had it in mind that ICT as a subject should be a priority area of study in future. In fact, at that time, it was observed that Zambia as a country did not have any coherent, comprehensive secondary school program in technology. It was clear at that time that everything that was on offer was essentially a general academic program, with some technical, practical or aesthetic areas patched on (MOE, 1996).

With aid from various international organizations such as the commonwealth of Learning (COL), the International Institute for communication and development (IICD), the United States Agency for International Development (USAID), the Ministry of General Education (MOE) together with the Ministry of Communications and Transport developed a National information and communication Policy (MCT, 2006) with a long vision „to enable all schools in Zambia to have access to ICTs by the year 2030“ (UNESCO, 2016).

This aimed at providing lifelong education and training for all, making information easily accessible to all. The policy for ICT was formulated in line with the Firth National Development



Plan. The Zambian government launched the ICT national policy in 2007 under the theme, ICTFor accelerated wealth and job creation.

The permanent secretary of the Ministry of Transport and Communication of Zambia, MisheckLungu, was quote during the official opening of a dissemination meeting of the findings of the 2015 survey on access and usage of ICT among households and individuals at Southern Sun Hotel in Lusaka saying, „ICTs are no longer a luxury in the process of economic progress but are an integral part of development“, (The Post Newspaper, March 2016: 10). Implying that ICT has a key role to play in Zambian development hence it should not be a luxury but accessible to all.

The study by Mbozi (2017) was relevant to this study. His work looked at “Quality Assurance in the teaching of ICT in selected schools in Livingstone District.” The study sought to investigate whether the much needed resources were available and adequate in schools. In this study, it was established that most teachers of ICT were still upgrading themselves in universities and colleges; teaching and learning materials were inadequate; and that financial constraints were a serious challenge hampering effective delivery of teaching and learning process. The relevance of this study lies in the fact that it will be used for comparative purposes with Luwingu District.

Zambia’s education system.

Although Isaacs (2007) stressed that the recent adoption of a national 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, the current research tried to probe on the challenges and opportunities of ICT in junior secondary schools.

In a study conducted by Imasiku et al (2012) on the use of ICTs in education in selected urbanbased secondary schools in Luwingu and the research by Chaamwe (2012) on ICTs for Zambia’s Distance Education, it was concluded that the major challenges of ICTs in the education sector included teachers’ inexperience and negative attitude towards the adoption of ICTs in the teaching and learning of ICT. Besides, the state of ICT infrastructure-computer laboratories was pathetic. Lack of adequate funding, trained experts or lack of infrastructure is the main challenge in implementing ICTs education in junior secondary schools.

Kasanda (2009) observes that the active-innovative learner curriculum that should have harmonized with the intensions of „Educating our Future“ has to-date not materialized. His work is important to this study as it will help to assess the extent to which schools are prepared to handle ICT as a practical subject as well as the challenges and opportunities associated with the same.

As of 2015 pupil/teacher ratio in secondary schools was projected to be 28:1 indicating that Zambia needs to adapt a more efficient education system to cope with increasing cost of secondary education and increasing student and increasing student to teacher ratio A. Betakadu (2006).The incorporation of ICT in schools is expected to bridge achievement gap between rural and urban high schools on national exams which could be done by putting educational material on compact CDs and distributing them to rural schools



which lack the necessary resources. Emphasizing on the importance of ICT the then permanent secretary of the Ministry of Transport and Communication, Misheck Lungu spoke during the official opening of a dissemination meeting of the findings of the 2015 survey on access and usage of ICT among households and individuals at Southern Sun Hotel in Lusaka that, ICTs are no longer a luxury in the process of economic progress but are an integral part of development (The Post Newspaper, March 2016: 10).

Table 1: Research gap

Name of the Researcher Main findings Research Gap	Name of the Researcher Main findings Research Gap	Name of the Researcher Main findings Research Gap	Name of the Researcher Main findings Research Gap
Higgins (2000), Kingdom	United	Heavy investment in ICT	Looked at whether or not ICT improve teaching in schools
Mndzebele Swaziland	(2013),	Lack of the resources within the educational sector.	Responsible opportunities have to try and overcome barriers so that Learner benefit
Mingaine Kenya	(2013),	Qualified teachers with ICT skills should be employed and in- service courses designed.	Limited qualified teachers and high cost of infrastructure.

Mbozi (2017), Zambia	Teaching and learning material were inadequate, coupled with financial constraints.	Investigate whether the much needed resources were available and adequate in schools.
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MY RESEARCH GAP

It is not known whether Public schools are prepared to teach ICT, therefore, the study attempted to establish schools' preparedness in the teaching of ICT as well as challenges and opportunities.

III. METHODOLOGY

Introduction

This chapter gives a description of the procedure that were used in conducting the study. The chapter describes the research design, sources of data, target population, sample size, sampling techniques, research instruments, data analysis and interpretation as well as ethical considerations.

Research Design



The researcher employed the mixed research design using both the descriptive and quantitative methods. It has been argued that the mixed research method enables one methodology to support the other (Cresswell and Clark, 2009). This was important as data which could not be collected qualitatively was collected quantitatively thereby helping to validate the data. Therefore, the qualitative approach allowed the researcher to get in-depth interviews in one to one interviews and questionnaires. Quantitative approach also made the researcher get data presented using frequencies and pie charts to illustrate and supplement data that was derived from qualitative methods.

Source of Data

The sources of data were largely the textbooks, journals, theses on school infrastructure, and various targeted respondents in both the in-depth interviews and questionnaires.

Target Population

The targeted population in this study was four (04) public secondary schools (GRZ) in Luwingu District and the targeted sample included Head teachers, Subject Teachers and Learner.

Sample Size and Sampling Techniques

The sample size for this study was Fifty- Two (52) respondents. These comprised Four (04) head teachers, eight (08) Teachers and Forty (40) Learner drawn from Four (04) public secondary schools (GRZ) in Luwingu District. Purposive sampling was used to collect data from the head teachers and subject teachers of ICT because of the nature of their position in school. There is only one Head teacher in a given school and one or two ICT teachers. The Learner were randomly selected from their respective schools as these were many and this gave each Pupil an equal opportunity to participate in the study.

Instrumentation

The key research instruments in this study were the questionnaires and semi-structured interview guides that were used to collect data from the 52 purposively and randomly selected respondents.

Questionnaires

Twelve (12) self-administered questionnaires were used to collect data from the head teachers and Teachers based on the sample size. Open and closed questions were used to solicit for qualitative and quantitative data.

Semi-Structured Interview Guides

The study used semi-structured interview guides to collect data from the Learner. This was important as it helped the researcher to solicit for more information in areas where head teachers and teacher questionnaires were unable to clarify. Also, interviews were better for the learners as there was need to interpret and expand certain concepts due to their level of understanding in order for them to respond in line with the objectives of the study.



Validation and Reliability Issues

The researcher conducted a pilot study to ascertain the validity and reliability of the questionnaires and interview guide schedule respectively. In the case of the questions on the interview schedule, the researcher measured its validity and reliability by examining individual responses from participants to ascertain their relevance to the objectives of the research. The validity of a test is a measure of how well a test measures what it is supposed to measure (Kombo and Tromp, 2006:97).

Data Collection Procedure

The collection of data was done systematically by first seeking permission from relevant authorities to visit schools. The researcher sought permission from the DEBS office and the University.

Data Analysis

Data was largely analyzed qualitatively. Data obtained through interviews was analyzed by coding and grouping the emerging themes. Then data collected through questionnaires was quantitatively analyzed. Thereafter, the data was presented quantitatively in percentages and in frequency tables using a hand calculator and Microsoft excel where it was necessary as the sample size was small and manageable.

Ethical Considerations

There are a lot of ethical issues that a researcher should be aware of in the course of carrying out this study. Issues to do with confidentiality and consent of the participants were observed. According to Bryman (2004:507) he said, "What is crucial is to be aware of the ethical principles involved and of the nature of concerns about the ethics in social research... it is only if researchers are aware of the issues involved that they can make informed decisions about the implications of certain choices.

Thus, as it has been cited above, one of the ethical issues that arise are those between the researcher and participants in the course of study. The researcher ensured that participants were made fully aware of the objectives of the study and how the findings were going to be used. Also, the researcher kept in confidence the names of participants and participation was voluntary.

IV. RESULTS/ FINDINGS

Introduction

This chapter presents the findings of the study on the challenges and opportunities of the introduction of ICT in Schools: the case of selected public secondary schools in

Luwingu District. The responses and presentation of the findings were based on the research questions related to the objectives of the study and rationale or statement of the problem.

Respondents Characteristics and Classifications



The respondents' characteristics in this study were classified under the headings titled: findings from the Head teachers; findings from the Subject Teachers; and findings from the Learner.

Sex of Respondents

One of the variables of the study that was targeted was gender. The gender of the respondents in this study was both male and female. Table 1 shows the gender of the respondents under study. Table 2: Gender of the Respondents in the Study

Sex	Frequency	Accumulative Frequency	Percentage	Accumulative Percentage
Female	29	29	56%	56%
Male	23	52	44.%	100%

Source: Field Data (2026).

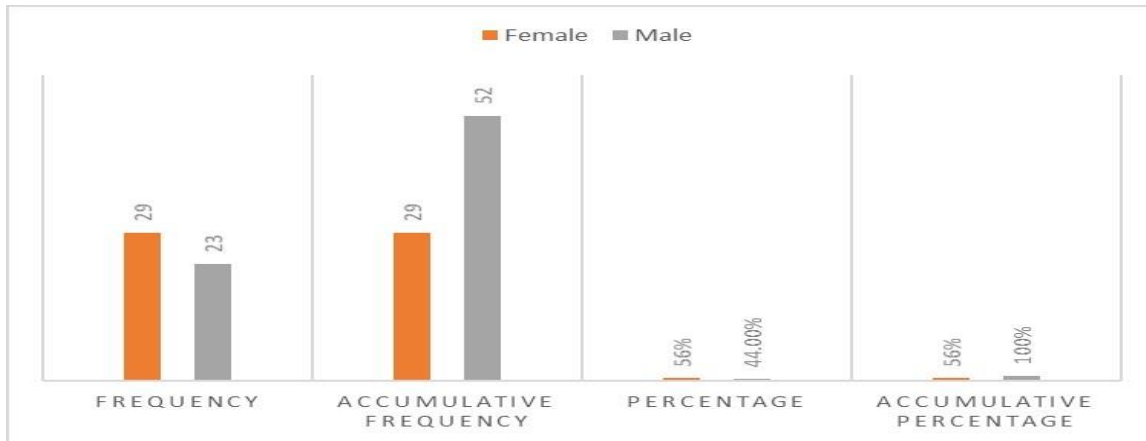


Figure 3: Gender of the respondents in the study.

The results show that there were 29 (56 %) females and 23 (44%) males who participated in the study. This shows that the study was gender sensitive. However, slightly more female respondents participated when compared to their male counter-parts. While the percentage of females who participated in the study was 56%, that of the males was at 44%. This shows that the study was considerate of the views of both the males and females.

Age of Respondents

Another variable of the study that was sampled was the age of the respondents. The study sampled both the elderly and young adults. The findings were as indicated in Table 2 below.



Table 3: Age of the Respondents in the Study

Age Range	Frequency	Accumulative Frequency
10-15	40	40
16-20	0	40
21-40	6	46
41-50	2	48
51-60	3	51
Over 61	1	52

Source: Field Data (2026).

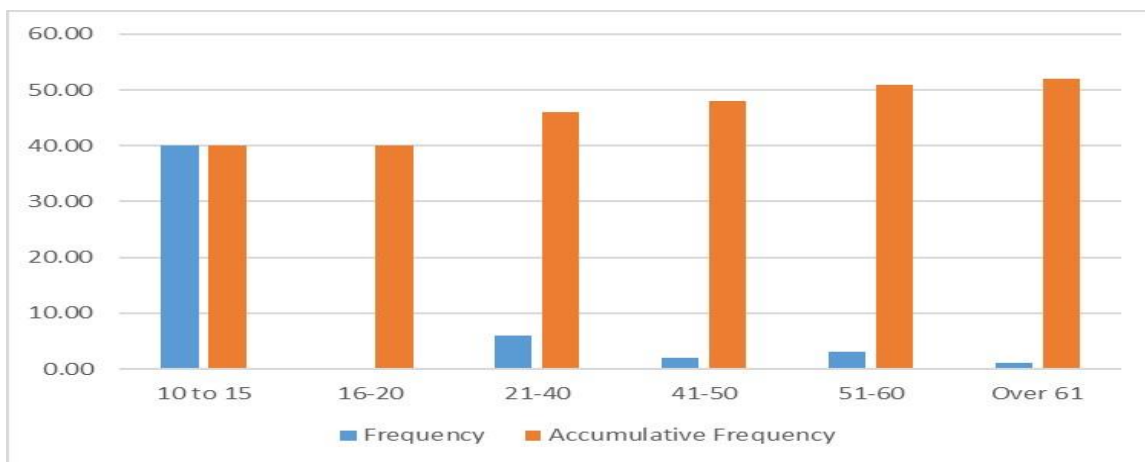


Figure 4: Age of the Respondents in the Study

The results showed that the age of most of the participants was in the range of 10 - 15 years. These represented 76.9% of the participants sampled in the study. Thus, it can be said that most of the participants were young adults.

Findings on the Identification of Challenges affecting the Teaching and Learning of ICT in Schools

In terms of the responses from the Learner on whether or not they were facing challenges in the teaching and learning of ICT, diverse views were expressed. While some Learner were of the idea that they were facing challenges others indicated that there were no challenges. Based on the actual results of the study, 30 % of the respondents were of the view that they were not facing challenges in the teaching and learning of ICT in schools. Then 70 % of the respondents were of the view that they were facing challenges in the teaching and learning of ICT in schools. This implies that there is need to find solutions so as to address the challenges affecting the teaching and learning process of ICT in schools in Luwingu District.

In attempting to identify the challenges that were affecting the teaching and learning of ICT in schools, data was collected from the Learner, Subject Teachers, and Head teachers. The findings of the study were as follows:

Findings from the Learner on challenges affecting the Teaching and Learning of ICT in Schools



On the question of challenges affecting the teaching and learning of ICT in schools, different views were collected from the forty (40) Learner who were sampled in this study. The responses were as shown in Table 3 below:

Table 4: Responses from the Learner on the Challenges affecting the teaching and learning of ICT (TLCS) in Schools

Responses	Frequency	Percentage (%)
Lack of Teaching and learning aids	6	12%
Shortage of Computers	27	52%
Shortage of Chairs	19	37%
Teacher Absenteeism	6	12%
Weak Teacher explanations	8	15%

Source: Field Data (2026).

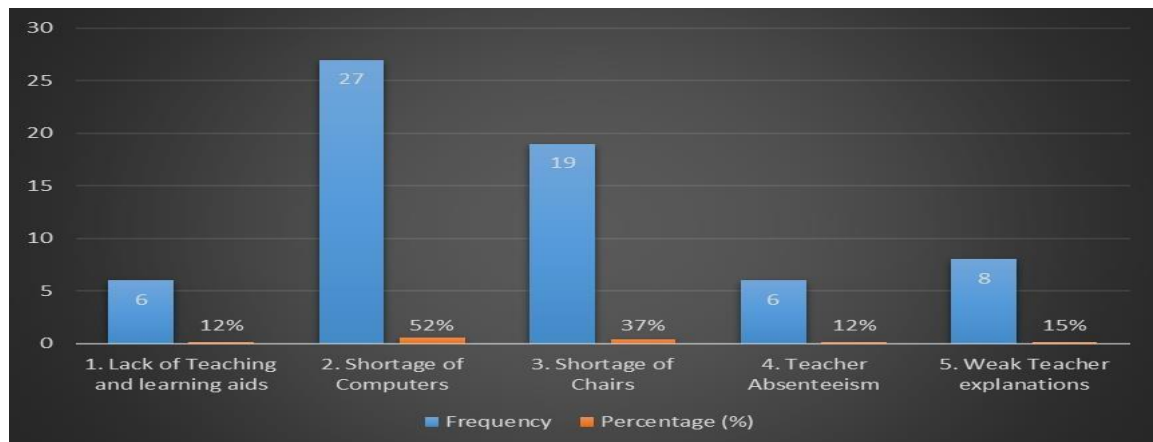


Figure 5: Responses from the Learner on the Challenges affecting the teaching and learning of ICT (TLCS) in Schools.

In terms of the challenges affecting the teaching and learning of ICT in schools, various challenges were provided by the Learner who were sampled in the study. the commonly mentioned challenges included; lack of teaching and learning aids; shortage of computers; shortage of chairs; teacher absenteeism; and weak teacher explanations. In percentage form, the findings were 15%; 67.5; 47.5%; 15%; and 20% respectively.

Findings on Pupil- Computer Ratio in the Schools offering ICT

On the question of Pupil to Computer Ratio, it was revealed that in some cases three (3) to four (4) Learner had to use one (1) Computer. However, in some schools the ratio was better as it was either 1:1 or 2:1. In an interview conducted with Pupil X, it was narrated that:

The Computers were not enough. Furniture is also a problem. Only Learner who reach the Computer Laboratory early have where to sit. This negatively affects the learning of ICT. For example, when it is



time to do practical work, you have to wait for your friends to finish so that you can also have an opportunity to use the computer. But time is limited. Some Learner fail to practice in the end. And one cannot get good results in the final examinations.

Responses from the Head teachers and Subject Teachers on challenges affecting the teaching and learning of ICT in Schools

On the question as to whether or not schools were facing challenges in the teaching and learning of ICT, data was collected from both the Head teachers and Subject Teachers who were sampled in the study. These were twelve (12) all together. All the respondents sampled in the study responded in the affirmative that schools were facing challenges in the teaching and learning of ICT. The response rate in percentage form was 100%. The commonly indicated responses from the Head teachers and Subject Teachers were as indicated in Table 4 below:

Table 5: Responses from the Head teachers (HT) and Subject Teachers (ST) on challenges affecting the teaching and learning of ICT in Schools

Responses	Frequency	Percentage (%)
Insufficient computers	8	67%
Inadequate Chairs	6	50%
Lack of teaching and learning materials	9	75%
Lack of Trained Teachers	5	42%
Poor Network for Internet	3	25%
Lack of Adequate Space in the Computer Lab	6	50%

Source: Field Data (2026).

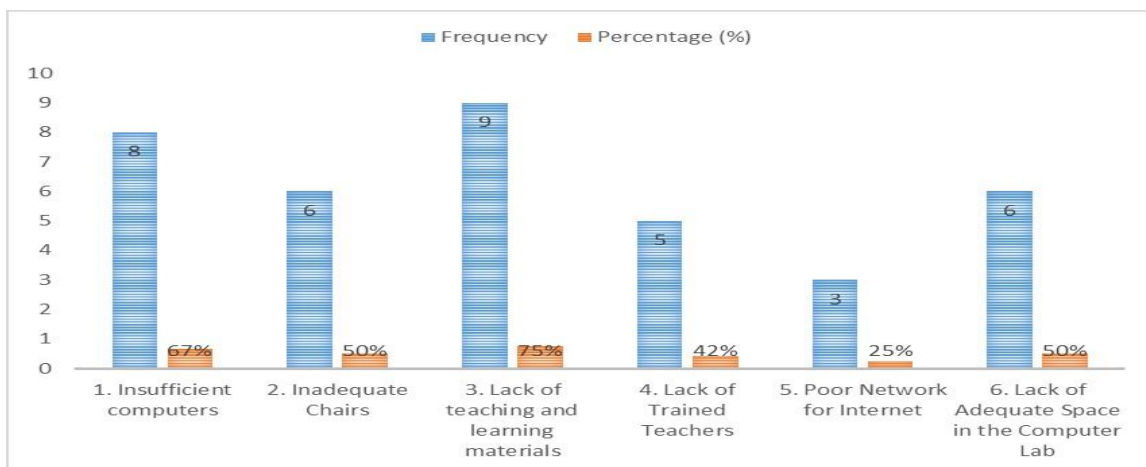


Figure 6: Responses from the Head teachers (HT) and Subject Teachers (ST) on challenges affecting the teaching and learning of ICT in Schools



As shown above, the key challenges that schools were facing in the teaching and learning of ICT were insufficient computers, inadequate chairs, lack of teaching and learning materials, lack of trained teachers, poor internet network, and lack of adequate space in the Computer Laboratory.

The Causes of the Challenges that Schools are facing in the Teaching and Learning of ICT in Schools

In establishing the causes of the challenges that schools were facing in the teaching and learning of ICT, the researcher sought to find out the number of Learner in the classrooms. Data was collected from the forty (40) Learner who were sampled in the study. The findings were as shown in Table 5 below:

Table 5: Findings on the number of Learner in ICT’ Classrooms in the Sampled Schools

Responses	Frequency
SCHOOL A: LUENA DAY SECONDARY	40 Learner/ Class
SCHOOL B:KASEYA DAY COMBINED	60 Learner/ Class
SCHOOL C: LUWINGU DAY SECONDARY	80 Learner/ Class
SCHOOL D: SHIMUMBI DAY SECONDARY	90 Learner/ Class

Source: Field Data (2026).

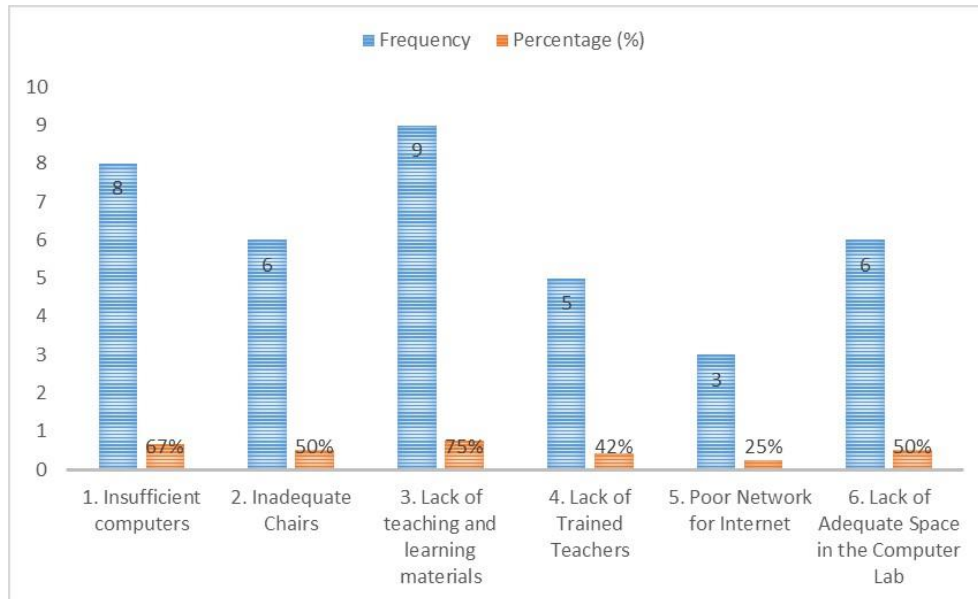


Figure 6: Responses from the Head teachers (HT) and Subject Teachers (ST) on challenges affecting the teaching and learning of ICT in Schools

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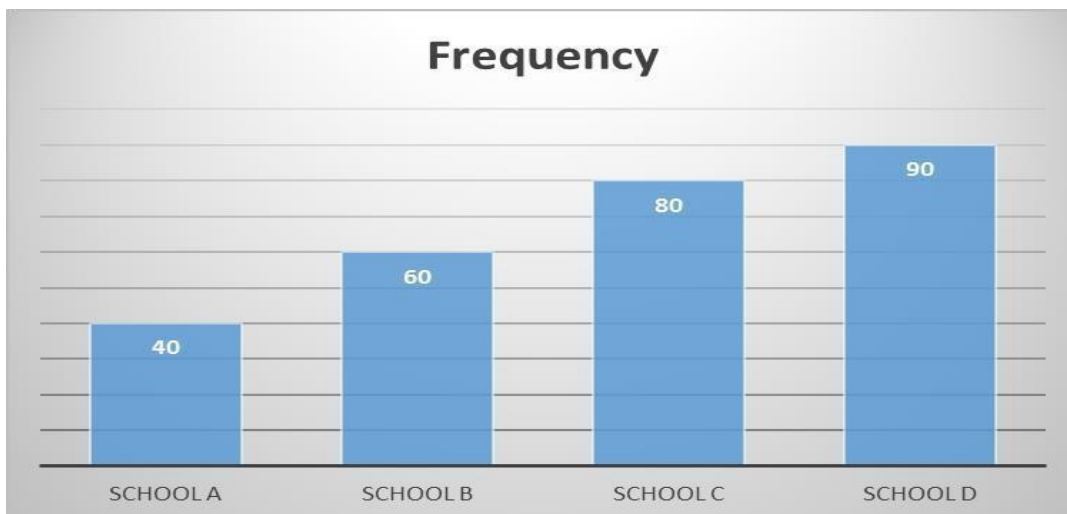


Fig 7: Findings on the number of Learner in ICT' Classrooms in the Sampled Schools.

The results show that School A had 40 Learner per classroom, School B had 60 Learner per classroom, School C had 80 Learner per classroom and School D had 90 Learner per classroom taking ICT Subject respectively.

Commenting on the causes of the challenges that Learner were facing in the teaching and learning of ICT, various responses were provided by the Learner who were sampled. These responses were based on computing several individual responses provided by the Learner sampled in the study and per given question. Thus, the accumulated responses should not be added together. The commonly mentioned causes of the challenges were as shown in Table 6 and included:



Table 7: Causes of the Challenges that they were facing in the teaching and learning of ICT

Responses	Frequency	Percentage
Overcrowded Classrooms	33	83%
Late coming among teachers	18	45%
Absenteeism among teachers	11	28%
Shortage of Computers	29	73%

Source: Field Data (2026).

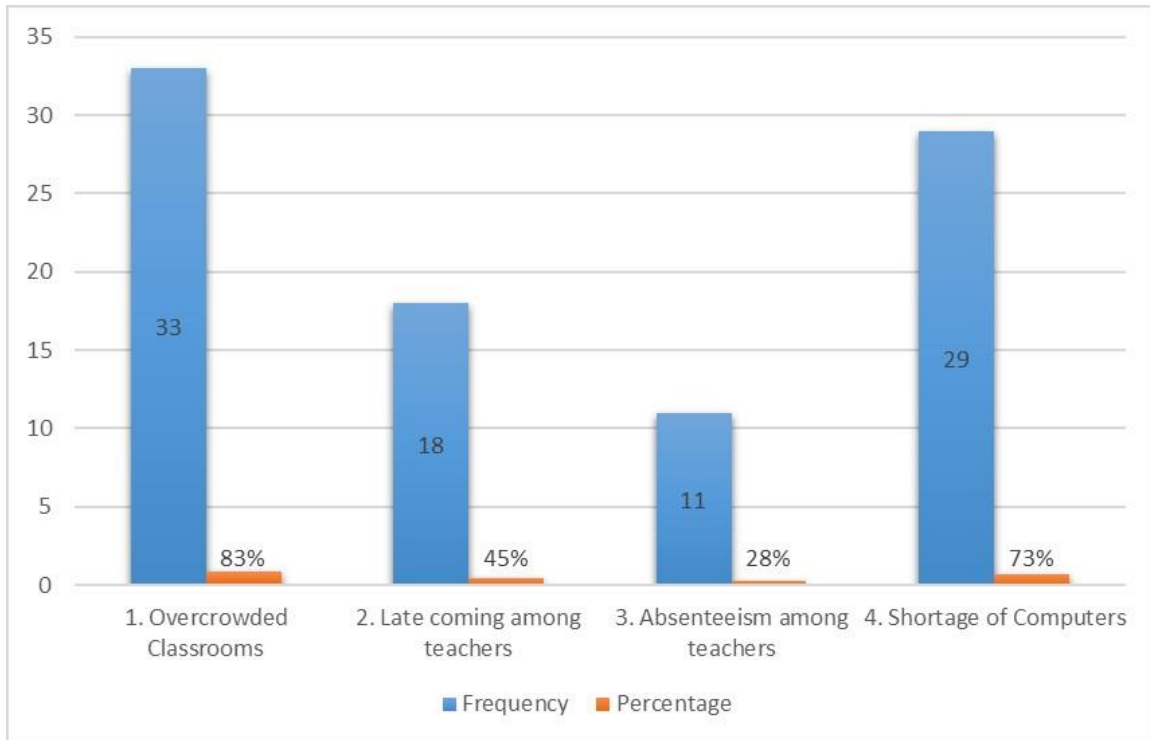


Fig 8: Causes of the Challenges that they were facing in the teaching and learning of ICT

As shown in Table 6 above, the commonly mentioned causes of the challenges that schools were facing in the teaching and learning of ICT included overcrowded classrooms, late coming among the teachers, absenteeism among the teachers, and shortage of computers in schools.

In terms of the responses from the Head teachers and Subject Teachers who were sampled in the study, various views were provided relating to the factors causing the challenges in the teaching and learning of ICT in schools. These were as shown in Table 7 below:



Table 8: Responses from the Head teachers and Subject Teachers on the causes of the challenges affecting the teaching and learning of ICT in schools

Responses	Frequency	Percentage (%)
Lack of funds for books, chairs and computers	9	75%
Untrained teachers	8	67%
Lack of concentration from the Learner	3	25%

Source: Field Data (2018).

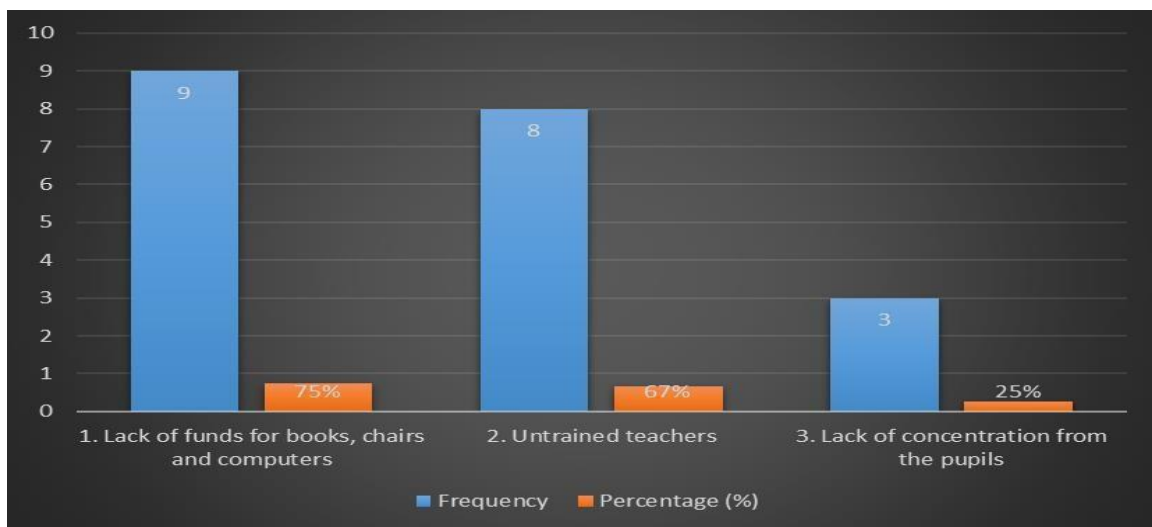


Fig 9: Responses from the Head teachers and Subject Teachers on the causes of the challenges affecting the teaching and learning of ICT in schools.

As shown above, the findings of the study on the causes of the challenges affecting the teaching and learning of ICT in schools were; lack of funds for textbooks, furniture and computers, untrained teachers, and lack of concentration among the Learner.

Academic Performance of Learners in ICT in Schools

In attempting to find out about the academic performance of the Learner in ICT in the final examinations by the Examinations Council of Zambia (ECZ), the question on how Learner were performing in schools was asked. The head teachers and Subject Teachers were the key respondents. Table 8 below presents the findings of the study on how the Learner were performing in the Examination Council of Zambia assessments:



Table 9: Pupil Performance in ICT in Schools

Responses	Year	Percentage (%)
School A :LUENA DAY SECONDARY	2016 2017	98 %
School B :KASEYA DAY SECONDARY	2016 2017	95 %
School C :LUWINGU DAY SECONDARY		99 % 90 %
School D :SHIMUMBI DAY SECONDARY SCHOOL		

Source: Field Data (2026).

On the question of the academic performance of the learners in the final examinations conducted by the Examinations Council of Zambia, different schools performed differently and as shown in Table 8 above. Generally, there was also a decrease in terms of the academic performance of highly performing schools between the years 2016 and 2017 as well as a slight improvement in the poorly performing school as indicated in the Table above.

Measures to enhance the teaching and learning of ICT in Schools

In ascertaining the measures that could be put in place to enhance the teaching and learning of ICT in schools, responses were collected from the Learner, Subject Teachers, and head teachers. Therefore, the findings of the study were under the headings; findings from theLearner, and findings from the Subject Teachers and head teachers.

Measures that could help to enhance the teaching and learning of ICT in Schools by Learner

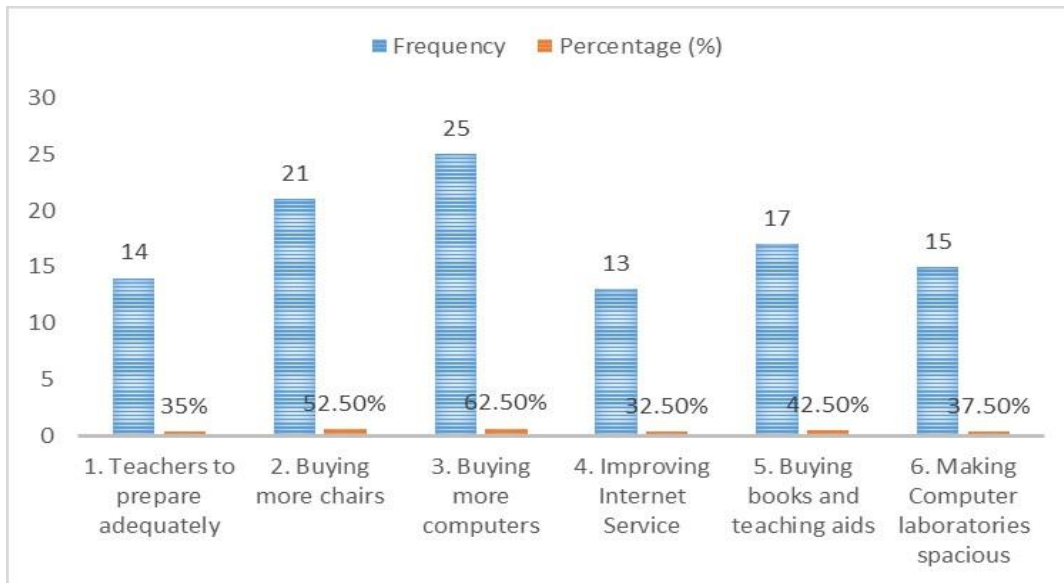
In terms of the findings from the Learner on the measures that could enhance the teaching and learning of ICT in schools, various and numerous responses were provided. The key measures mentioned by the Learner and that could help to enhance the teaching and learning of ICT in schools were as shown in Table 9 below:

Table 10: Measures that should be put in place to enhance the teaching and learning of ICT in Schools

Responses	Frequency	Percentage (%)
Teachers to prepare adequately	14	35%
Buying more chairs	21	52.5%
Buying more computers	25	62.5%
Improving Internet Service	13	32.5%
Buying books and teaching aids	17	42.5%
Making Computer laboratories spacious	15	37.5%

Source: Field Data (2018).

11: Measures that should be put in place to enhance the teaching and learning of ICT in Schools.



In terms of the measures on how to enhance the teaching and learning of ICT in schools, therefore, the commonly mentioned measures by the Learner included; teachers to prepare adequately, buying more chairs, buying more computers, improving internet service, buying books and teaching aids, and making computer laboratories spacious.

Findings from the Head teachers and Subject Teachers on the measures that could help to enhance the teaching and learning of ICT in Schools

In ascertaining what measures should be put in place to enhance the teaching and learning of ICT in Schools, views were collected from the Head teachers and Subject Teachers who were sampled in the study. These represented twelve (12) respondents. The findings of the study were as shown in Table 10 below:

Table 10: Measures by Head teachers and Subject Teachers on what should be put in place to enhance the teaching and learning of ICT in Schools

Responses	Frequency	Percentage (%)
Recruiting trained teacher's/	7	58.3%
Teacher capacity building	5	41.7%
Expanding Computer Laboratories	9	75%
Investing in more Computers, books and furniture	3	25%
Encouraging Learner to take the subject serious	2	16.7%
Improving Internet Service		

Source: Field Data (2026).

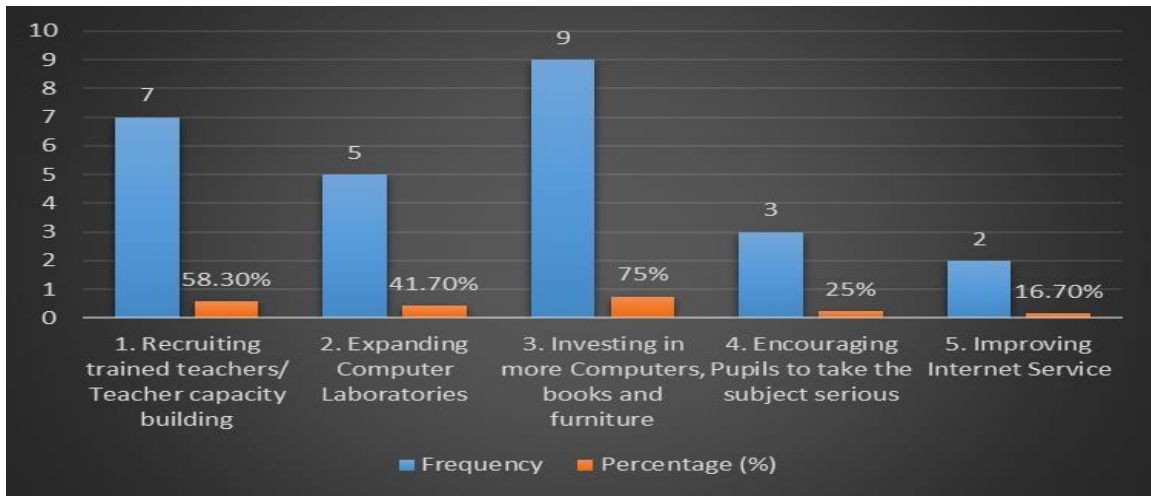


Fig 12: Measures by Head teachers and Subject Teachers on what should be put in place to enhance the teaching and learning of ICT in Schools.

As shown above in Table 10, the commonly mentioned measures by the Head teachers and Subject Teachers largely included; recruiting trained teachers'/teacher capacity building; expanding computer laboratories; investing in more computers, books and furniture; encouraging Learner to take the subject serious; and improving internet service.

Table 11: Presentation of findings

Responses from Learner	Frequency (out of 40 Learner)	Percentage (%)
Teachers to prepare adequately	14	35%
Buying more chairs	21	52.5%
Buying more computers	25	62.5%
Improving internet services	13	32.5%
Buying books and teaching aids	17	42.5%
Making computer laboratories	15	37.5%
Responses from Head-teachers/ Subject teachers	Frequency (out of 12 head-teachers and subject teachers)	Percentage (%)
Recruiting trained teachers/ teacher capacity building	7	58.3
Expanding computer laboratories	5	41.7
Investing in more computers, learning	9	75

V. DISCUSSION

Introduction



This chapter discusses the findings on the challenges and opportunities of the introduction of ICT in schools: the case of selected public secondary schools in Lusaka District. The discussions are based on the statement of the problem, research questions related to the objectives of the study and responses from the respondents sampled in the study.

Discussion of the findings on the Identification of Challenges affecting the Teaching and Learning of ICT in Schools

On the question of challenges affecting the teaching of ICT in Schools, the researcher focused on establishing whether or not Learner were facing challenges as well as the identification of the challenges that the Learner were facing in the teaching and learning of ICT. Emphasis was also placed on establishing the pupil- computer ratio in schools that were sampled in the study. This was important as in order to address the challenges affecting the teaching and learning of ICT in schools, one has to start by identifying the actual challenges so as to devise the necessary strategies or mechanisms that can be put in place so as to address the existing challenges.

Discussion on whether or not Learner were facing challenges in the teaching and learning of ICT in Schools

The results of the study related to the objective on the challenges showed that schools were affected differently. For instance, in terms of the responses from the Learner on whether or not they were facing challenges in the teaching and learning of ICT, diverse views were expressed. The findings of the study revealed that, on one hand, 70 % of the Learner were facing challenges in the teaching and learning process of ICT in schools. On the other hand, 30 % of the Learner indicated that they were not facing challenges in the teaching and learning process of ICT in schools. This, therefore, means that the question of challenges involving the teaching and learning of ICT in schools affects Learner differently. While some Learner have challenges others do not have any challenges as revealed by the Learner who were sampled in the study. The findings are in line with existing research which shows that Learner in public schools especially those in rural areas face a number of challenges in accessing ICTs unlike those in urban areas. However, as the goal of the Ministry of General Education is that all Learner should acquire knowledge, values and skills, this implies that there is need to see to it that various challenges affecting the teaching and learning of ICT in schools are adequately addressed by various stakeholders involved in the provision of education. This is key in promoting quality education and producing learners who will be very relevant to their world. ICT would serve as tool to bridge the achievement gap between urban and rural public schools by enhancing the communication system between the two regions, and by enabling a better distribution of educational resources (Befekadu., 2006).

Discussion on the Kind of Challenges Identified in Schools affecting the Teaching and Learning of ICT



On the kind of challenges that schools were facing in the teaching and learning of ICT, the results of the study showed that there were several challenges. However, the commonly mentioned challenges included; lack of teaching and learning aids; shortage of computers; shortage of chairs; teacher absenteeism; and weak teacher explanations. In percentage form, these findings were 12%; 52; 37%; 12%; and 15% respectively, figure 5 shows the findings. To this end, thus, it was clear that shortage of computers and furniture were the major challenges as these recorded the highest frequency. In percentage form, this was 67.5% and 47.5% respectively. Additional challenges included lack of teaching and learning materials, teacher absenteeism and weaker explanations from the teachers in class. This research further confirms that the language of delivery has a very strong impact on perceived proficiency in using ICT in the classroom, teachers working in the regional medium schools were found to have substantially low perceived proficiency in using ICT in the classroom as compared to English medium schools.

Discussion of the findings on Pupil- Computer Ratio in the Schools offering ICT

On the question of Pupil to Computer Ratio, the results of the study revealed that this was a challenge too. Based on the findings of this study, it was established that one of the schools had a Pupil to Computer ratio of three (3) to four (4) Learner against one (1) Computer. However, in the other school that was sampled in the study, the ratio was better as it was either 1:1 or 2:1. In an interview conducted with Pupil X, for example, it was narrated that, The Computers were not enough. Furniture is also a problem. Only Learner who reach the Computer Laboratory early have where to sit. This negatively affects the learning of ICT. For example, when it is time to do practical work, you have to wait for your friends to finish so that you can also have an opportunity to use the computer. But time is limited. Some Learner fail to practice in the end. And one cannot get good results in the final examinations.

Thus, it can be safely said that the revelations from the narrator clearly gives a gloomy picture in certain schools in as far as the question of Pupil to Computer ratio is concerned. This, thus, is an indicator that the question of pupil- computer ratio deserves an urgent intervention by all well- meaning stakeholders in the provision of education. It should be noted that the Computer-pupil ratio is a very important factor in motivating the learners to practice more and acquire more understanding of the ICT subject thereby enhance the academic performance of the learners. The results of the study reflected the findings of the Department of Education and Science (2008) in Ireland. The study indicated that accessibility to computers was still a challenge in the country as the ratio of Students to computers was 7:1 at post primary level. However, the focus in this study was the total national population. But the current study is basically dealing with the ratio in classrooms in selected schools in Lusaka District. This means that the challenge in Zambia if it is to be analyzed in terms of the population may even be critical.

Discussion of the findings from the Head teachers and Subject Teachers on the challenges affecting the teaching and learning of ICT in Schools

Also, the researcher collected responses from the head teachers and Subject Teachers on the question of challenges affecting the teaching and learning of ICT in schools. The area of focus of the study in this case was to establish whether or not there were challenges affecting the teaching and learning of ICT in schools



and to identify the same challenges if any. As shown by Figure 6 among the challenges reported are; insufficient computers, inadequate chairs, lack of teaching and learning materials, lack of trained teachers, poor network for internet and lack of adequate space in the computer lab. The biggest challenge reported was lack of teaching and learning materials representing 75% followed by insufficient computers at 67% while inadequate chairs and lack of adequate space in the computer labs were at 50%. The findings of the research go with the findings of Isaacs (2012) in which the major challenges reported are; human resource capacity, fiscal resources, collaborating mechanisms, infrastructure and access, gender equity, advocacy leadership, policy framework and implementation.

Discussion of the findings from the Head teachers and Subject Teachers on whether or not there were challenges affecting the teaching and learning of ICT in Schools

On the question as to whether or not schools were facing challenges in the teaching and learning of ICT, the findings of the study from the Head teachers and Teachers revealed that there were challenges. The respondents sampled in the study responded in the affirmative that schools were facing challenges in the teaching and learning of ICT. Therefore, the response rate in percentage form was 100%.

This shows that challenges were common in all schools. However, interestingly, while all the Head teachers and Subject Teachers sampled in the study stated that there were challenges, 30 % of the Learner indicated that there were no challenges. This was probably due to the fact that Learner and administrators as well as teachers' experience different challenges and perceive existing situations differently. Another factor is the age of learners and capability to comprehend matters relating to the provision of the education and ICT in particular. As both the Head teachers and subject teachers indicated that schools were facing challenges, this implies that there is need to address these challenges. Failure to do so may have a significant negative impact on the provision of education and ICT as a subject in particular.

Discussion on the challenges identified in the teaching and learning of ICT in Schools

Zambia is a developing country and thus has a shortage of teachers and the teachers currently in the workforce are burdened with heavy workload. The study revealed that the key challenges were; insufficient computers, inadequate chairs, lack of teaching and learning materials, lack of trained teachers, poor internet network, and lack of adequate space in the computer laboratories. In percentage form, these represented; 66.7%, 50%, 75%, 41.7%, 25%, and 50% respectively and as shown in the previous chapter on data presentation. Therefore, arising from these findings, it can be safely said that insufficient number of computers, lack of teaching and learning materials, inadequate chairs, and lack of adequate space in the computer laboratories were some of the key challenges. This was largely because these challenges scored 50% and above in percentage form from the respondents who were sampled in this study. So changing the negative attitudes teachers is essential for increasing their computer skills.

This raises the need for the Zambian government to invest in the appropriate training of teachers by adequately funding the sector and coming with policies that are going to effectively favor the teaching and learning of ICTs in public schools.



Discussion on the findings on establishing the causes of the challenges that Schools were facing in the teaching and learning of ICT in Schools

The study revealed that many schools sampled in the study were largely overcrowded apart from one school. For example, the study showed that while School A had 40 Learner, other Schools like B, C, and D had 60, 80 and 90 Learner ICT Class respectively (Figure 7). This, thus, was one of the causes of the challenges schools were facing in the teaching and learning of ICT in schools in its own right. It should be noted that over- enrolments imply more pressure on the schools in terms of the need for more computers, more furniture, spacious computer laboratories, and more teaching and learning materials.

On the question of specific causes of challenges being faced in the teaching and learning of ICT in schools, responses from the Head teachers and Subject Teachers as well as the Learner who were sampled in the study revealed that these were numerous. However, key among these causes according to the Learner included; overcrowded classrooms (82.5%), late coming among teachers (45%); and absenteeism among teachers (27.5%), and shortage of computers (72.5%) as shown in Figure 8. Therefore, according to the responses from the Learner, it was clear that some challenges could be cushioned if teachers were committed to their work.

In terms of the responses from the Head teachers and Subject Teachers who were sampled in the study, various views were provided relating to the factors causing the challenges in the teaching and learning of ICT in schools. The study revealed that lack of funds to procure textbooks, chairs and computers (75%); untrained teachers (66.5%); and lack of concentration among the Learner (25%) were the main causes leading to the challenges faced in the teaching and learning of ICT. Learner's complaint about late coming among the teachers may be linked to the fact that the untrained teachers take a lot of time to prepare themselves when going to class. Also, the question of lack of concentration among the Learner, to some extent, may be attributed to the fact the untrained teachers fail to capture and revive Learner's interest in the lessons probably due to lack of mastery of subject- matter and appropriate methodologies.

Discussion of the findings on the academic performance of the Learner in ICT Classes in Schools

Generally, the study revealed that there was a decrease in terms of the academic performance of highly performing schools between the years 2016 and 2017 as well as a slight improvement in the poorly performing school. For instance, high performing Schools labeled as A, B, and C scored 98%, 98.7% and 74.8% in 2016 respectively. However, the performance of these schools slightly went down in 2017. The scores in percentage form were 95%, 89.8% and 56.1 % respectively. In the case of the poorly performing school, which was labeled as School D, it scored 55% in 2016 and 57% in 2017. Therefore, this shows that Learner from School D improved slightly in terms of their academic performance in the final examinations conducted by the Examinations Council of Zambia. The findings have a lot to do with the increasing interest in Learner in public schools to learn ICTs as interest by both Teachers and students is key in teaching and learning ICT.



Discussion on the findings on ascertaining the measures to enhance the teaching and learning of ICT in Schools

In ascertaining the measures that should be put in place to enhance the teaching and learning of ICT in schools, responses were collected from the Learner, Subject Teachers, and Head teachers. The study revealed that there is a lot that can be done in order to enhance the teaching and learning of ICT in schools.

63.

Discussion on the findings from the Learner on the measures that could help to enhance the teaching and learning of ICT in Schools

The study revealed that several measures can be put in place to enhance the teaching and learning of ICT in schools. According to the Learner who were sampled in the study, these included; teachers to prepare adequately before going to teacher and simplify their work, buying more chairs and computers so as to address the challenge of over- enrolments, improving internet service in schools so as not to interrupt certain lessons which may need the use of internet, buying more textbooks and teaching aids, and making computer laboratories spacious so as to comfortably accommodate all the learners and help to promote concentration. In percentage form, these responses were; 35%, 52.5%, 62.5%, 32.5%, 42.5%, and 37.5% respectively.

Discussion on the findings from the Head teachers and Subject Teachers on the measures that could help to enhance the teaching and learning of ICT in Schools

In ascertaining what measures should be put in place to enhance the teaching and learning of ICT in Schools, views were collected from the Head teachers and Subject Teachers who were sampled in the study. However, apart from the measures that were mentioned by the Learner, the Head teachers and Subject Teachers added that; recruiting trained teachers/ Teacher capacity building, expanding Computer laboratories, investing in more computers, books and furniture, encouraging Learner to take the subject serious, and improving internet service in schools was cardinal. In terms of response rate in percentage form, this was 58.3%, 41.7%, 75%, 25%, and 16.7% respectively.

The various stakeholders involved in the provision of education should take these measures more seriously. This is what will improve learner academic performance and the acquisition of the necessary skills. It should be noted that where challenges are left unattended to, these end up inhibiting learner academic performance and even reversing the gains scored in the provision of ICT as a subject in schools.

VI. Conclusion

In conclusion, the study revealed that there were a lot of challenges in schools affecting the teaching and learning of ICT as a Subject. The findings of the study from the head teachers and Teachers revealed that there were challenges. Also, based on the findings from the Learner, it is not all the Learner who were



affected by these challenges. This, therefore, means that the question of challenges involving the teaching and learning of ICT in schools affected Learner differently. But as the goal of the Ministry of Education is to see to it that all Learner acquire knowledge, values and skills, this implies that there is need to see to it that various challenges affecting the teaching and learning of ICT in schools are adequately addressed by various stakeholders involved in the provision of education..

Therefore, it can be argued that there is need by the various players in education provision to look into these challenges and where possible to formulate measures to help cushion the situation in schools.

On the question of Pupil to Computer Ratio, it was revealed that this was a challenge too. Based on the findings of this study, it was established that one of the schools had a Pupil to Computer ratio of three (3) to four (4) Learner against one (1) Computer. However, in the other school that was sampled in the study, the ratio was better as it was either 1:1 or 2:1. This, too, is an indicator that the question of pupil- computer ratio deserves an urgent intervention by all well- meaning stakeholders in the provision of education. On the question of the causes of these challenges, the study revealed that this was partly due to overcrowded classrooms. For example, the study showed that while School A had 40 Learner, other Schools like B, C, and D had 60, 80 and 90 Learner in ICT Classes respectively. It should be noted that over- enrolments imply more pressure on the schools in terms of the need for more computers, more furniture, spacious computer laboratories, and more teaching and learning materials. In terms of specific causes of challenges, these included; overcrowded classrooms, late coming among teachers; and absenteeism among teachers, and shortage of computers, lack of funds to procure textbooks, chairs and computers, untrained teachers, and lack of concentration among the Learner.

In terms of the academic performance of the Learner in ICT in the final examinations by the Examinations Council of Zambia (ECZ), generally, the study revealed that there was a decrease in terms of the academic performance of highly performing schools between the years 2016 and 2017 as well as a slight improvement in the poorly performing school. This general decrease in performance can to some extent be attributed to the increasing challenges the Learner are facing related to the factors discussed above. In ascertaining the measures that should be put in place to enhance the teaching and learning of ICT in schools, the study revealed that teachers preparing adequately before going to teach and simplifying their work, buying more chairs and computers so as to address the challenge of over- enrolments, improving internet service in schools so as not to interrupt certain lessons which may need the use of internet, buying more textbooks and teaching aids, and making computer laboratories spacious so as to comfortably accommodate all the learners and help to promote concentration was paramount. In addition, recruiting more trained teachers and existing teachers' capacity building was cardinal too. The findings from the head teachers and Subject Teachers as well as those from the Learner on this question were not different. These shared similar views on the measures that should be put in place in order to enhance the teaching and learning of ICT

Recommendation



Based on the statement of the problem, research objectives which were related to the objectives of the study and the findings of the study, the following were the recommendations:

Head teachers should prioritize buying the teaching and learning materials for the ICT subject in schools.

Schools should also engage the private sector in what may be term as the Public- Private Partnerships.

Bring a number of companies on board to help cushion the challenges schools are facing in the teaching and learning of ICT in schools.

The target should be especially those companies in the communities where these schools are placed.

Establish technical support systems in schools.

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