

**Understanding the Sources, Application and Enhancement of
Information Communication and Technology (ICT) Application in the
Management of Selected Secondary Schools in Lusaka District**

By

Moirra Mbambino Chilufya

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

**The University of Zambia
Lusaka**

2020

COPYRIGHT DECLARATION

All rights reserved. No part of this dissertation may be reproduced, stored in any retrieval system or transmitted in any form or any means, electronic, mechanical, photocopying or otherwise without prior written permission of the author or the University of Zambia.

© Moira Mbambino Chilufya, 2020.

AUTHOR'S DECLARATION

I, Moira Mbambino Chilufya, do hereby solemnly declare that this dissertation represents my work, except where otherwise acknowledged and that it has never been previously submitted for the award of a degree at the University of Zambia, Zimbabwe Open University or any other university.

Signature: **Date:**

APPROVAL

This dissertation of Moira Mbambino Chilufya is approved as fulfilling the partial requirements for the award of the degree of Master of Education in Education Management by the University of Zambia in collaboration with Zimbabwe Open University.

Supervisor

_____ **Signature:** _____ **Date:** _____

Programme Coordinator

_____ **Signature:** _____ **Date:** _____

ABSTRACT

This study attempted to understand the sources, application and enhancement of ICT in the management of selected secondary schools in Lusaka District, to establish the Information Communication and Technology (ICT) tools that have been adopted by school administrators in the performance of their day to day responsibilities. The study employed an exploratory mixed-method design in which qualitative and quantitative data was analysed. In this approach, interview guides and questionnaires were used to collect data from the sample population of two hundred and four (204) respondents, comprising Six (6) Head Teachers, six (6) Deputy Head Teachers, six (6) Careers and Guidance Teachers, six (6) Stores Officers and six (6) Accounts Officers; one (1) from each of the selected schools. Others were twenty-four (24) Heads of Department; that is six (6) from each of the selected schools and one hundred and fifty (150) teachers randomly sampled from the selected schools. This comprised twenty-five (25) teachers from each of the six selected secondary schools. The findings seemed to suggest that ICT was being applied and was well integrated into schools and particularly for school management purposes. The study also established that the prominently used sources of ICT in secondary schools were cell phones, the internet, laptops, photocopying machines and printers. The study also found that ICT was mostly used for planning purposes, typing tests, pupil record management, communication and writing reports. The study further established that the enhancement of ICT application in the management of secondary schools was being achieved through the procurement of more computers to add on to what schools already had and the provision of free WIFI to members of staff. With the increase in the number of computers, more teachers would have easy access to ICT tools in secondary schools which would, in turn, increase ICT application. The study, among other recommendations, implored all school administrators and teachers to increase their knowledge in the application of ICT so that they could fully utilise it when executing their duties.

KEYWORDS

Information; Communication; Technology; Management; School

DEDICATION

This work is dedicated to my parents Mr Abel Chama Chilufya; my father, and Mrs. Morgah Lupasa Chilufya; my mother, for their unfailing support in ensuring that I got the best education thus establish my strong education foundation despite all the challenges they faced. My siblings for their encouragement. To my dear husband, Newton Isaiah Mulungu-Chitebula Ng'uni for believing in me and encouraging me to further my studies as well as the financial support that has made this dream a reality. To my children, especially Malumbo Atupela Chitebula-Mulungu Ng'uni, you forfeited so much bonding time so that I could achieve my dream. I could never ask for a better family than you, you all are simply the best and I thank God for each one of you.

ACKNOWLEDGEMENTS

My sincere gratitude goes to my supervisor Dr. Gift Masaiti who has been my inspiration throughout my study. During his lectures, he always made it sound very easy and never forgot to state that one needed to work hard and present high standard and not substandard work. Despite my shortcomings, he was able to give me the professional guidance that I needed to perfect my work. It is, therefore, through his professional guidance as my lecturer and supervisor that I have been able to come thus far in my studies and for this, I shall forever be grateful.

I will be failing as a student if I do not acknowledge the knowledge and skills that I have acquired from the various lecturers that were always available to provide professional guidance and some of them even became my role models in the academic field.

I would also like to thank all the administrators of the schools I visited when I was conducting my research, for facilitating the distribution of questionnaires and conducting interviews with the various personnel in their respective schools. In addition, I would also like to express my gratitude to all the respondents and informants such as headteachers, deputy headteachers, careers and guidance teachers, accounts officers, stores officers and subject teachers for taking time off their busy schedules to be interviewed and filling in the questionnaires.

Last but not least, I would also like to take this opportunity to express my gratitude to Mr Misheck Daka for assisting me in translating and coding data for analysis.

I wish to extend my sincere gratitude to all my colleagues for the words of encouragement and support that they were rendering to me throughout my study and most especially during my research.

To you all, I cannot thank you enough for everything that you did for me no matter how small it has been of great help to the completion of my studies. I shall forever be grateful to you, and may God richly bless you all.

TABLE OF CONTENTS

COPYRIGHT DECLARATION.....	ii
AUTHOR’S DECLARATION	iii
APPROVAL	iv
ABSTRACT	v
KEY WORDS	v
DEDICATION	vi
ACKNOWLEDGEMENTS	vii
TABLE OF CONTENTS	viii
LIST OF FIGURES.....	xi
LIST OF TABLES	xii
LIST OF APPENDICES	xiii
ACRONYMS AND ABBREVIATIONS	xiv
CHAPTER ONE: INTRODUCTION	1
1.0 Overview.....	1
1.1 Background.....	1
1.2 Statement of the Problem.....	6
1.3 Purpose.....	7
1.4 Objectives	7
1.5 Research Questions	7
1.6 Significance.....	7
1.7 Delimitation	8
1.8 Conceptual Framework.....	8
1.9 The Theoretical Framework	10
1.10 Operational Definition of Terms	13
1.11 Summary.....	13
CHAPTER TWO: LITERATURE REVIEW	15
2.0 Overview.....	15
2.1 What is Information Communication and Technology (ICT)	15
2.2. The Concept of ICT in Education Management.....	16

2.3. Sources of ICT in Education Management.....	18
2.4 Application and Integration of ICT in Education Management	19
2.5 ICT Enhancement and Information Management in Education Management	27
2.6 Other Studies in ICT and Education Management	32
2.7 Summary.....	34
CHAPTER THREE: METHODOLOGY.....	35
3.0 Overview.....	35
3.1 Research Design	35
3.2 Data Source.....	36
3.3 Target Population.....	36
3.4 The Sampling Procedure.....	37
3.4.1 Characteristics of the Sample.....	39
3.4.2 Sample size	39
3.5 Data Collection Process and Research Instruments.....	40
3.5.1 Data Processing and Analysis	40
3.6 Validity and Reliability.....	41
3.7 Trustworthiness.....	42
3.8 Ethical Considerations	43
3.9 Summary.....	43
CHAPTER FOUR: PRESENTATION OF FINDINGS	44
4.0 Overview.....	44
4.1 Sources of ICT Used by School Administrators and Teachers	44
4.1.1 Source of ICT Use by School Administrators	44
4.1.2 Sources of ICT for Teachers	48
4.2 ICT Integration in the Management of Secondary Schools.....	49
4.2.1 ICT Integration in Secondary School Management by School Administrators	49
4.3 Enhancement of ICT in the Management of Secondary Schools.	52
4.3.1 Acquiring Gadgets	52
4.4.2 Improved and Free to the Internet and ICT Tools.	53
4.6 Summary.....	56

CHAPTER FIVE: DISCUSSION OF FINDINGS	57
5.0 Overview.....	57
5.1 Source of ICT Used By School Managers.....	57
5.1.1 High Usage of ICT Gadgets	57
5.1.2 Very High Internet Application	60
5.2 ICT Integration in the Management of Secondary Schools.....	61
5.2.1 Low Application of ICT in Planning and Preparation of Reports	61
5.2.2 High Application of ICT in Record Management and Communication.	63
5.3 Enhancement of ICT in the Management of Secondary Schools	65
5.3.1 Procurement of Computers	65
5.3.2 Improved and Free Access to Internet and ICT Tools	67
5.4 Summary.....	70
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS	71
6.0 Overview.....	71
6.1 Summary of the Dissertation	71
6.2 Conclusions.....	71
6.2.1 Sources of Information Communication and Technology in Secondary School	72
6.3 Recommendations.....	73
6.4 Suggestion for Future Research.....	73
REFERENCES	74
APPENDICES.....	82

LIST OF FIGURES

Figure1: Conceptual Framework	9
Figure 2: Sources of ICT for and School Administrators.....	46
Figure 3: Sources of ICT for Teachers	48
Figure 4: Purpose of ICT Integration in Secondary Schools” Teachers.....	51
Figure 5: Presentation of Participants’ Views on Emerging Themes on ICT Enhancement in School Management	53
Figure 6: Enhancement of ICT Application in Management of Secondary School....	54

LIST OF TABLES

Table 1: Sample Distribution	39
Table 2: Reasons for Preference of Certain Sources by School Managers	47
Table 3: Cross-Tabulation of Emerging Themes for ICT Integration in School Management by School Administrators	50
Table 4: Perceptions of School Managers and Teachers on How ICT Enhancement in the Management of Secondary Schools is Beneficial	55

LIST OF APPENDICES

Appendix I:	Interview Guide for Head Teacher	82
Appendix II:	Interview Guide for Deputy Head Teacher	84
Appendix III:	Interview Guide for Heads of Department	86
Appendix IV:	Interview Guide for Careers and Guidance Teacher	88
Appendix V:	Interview Guide for Accounts Officer	90
Appendix VI:	Interview Guide for Stores Officer	92
Appendix VII:	Questionnaire for Teachers	94
Appendix VIII:	Ethical Clearance Letter	98
Appendix IX:	Permission Letter To Collect Data	99

ACRONYMS AND ABBREVIATIONS

DBMS	-	Data Base Management System
ECZ	-	Examinations Council of Zambia
EMIS	-	Education Management Information System
GRZ	-	Government of the Republic of Zambia
ICT	-	Information Communication and Technology
MIS	-	Management Information System
MoE	-	Ministry of Education
MoGE	-	Ministry of General Education
SMS	-	School Management Software

CHAPTER ONE: INTRODUCTION

1.0 OVERVIEW

This chapter presents the background of the study by looking at the problem statement, objectives, research questions and the significance of its scope. It also presents definitions of key terms that have been used in the study. In the background, the chapter brings to light some of the global, regional and Zambian contexts of the sources, application and enhancement of Information Communication and Technology (ICT) application, especially in the education sector. The chapter further outlines the Conceptual Framework of the study and leads to discussing the Theoretical Framework, which shows how the study is guided or by what it is inspired.

1.1 Background

Various researches have investigated the roles that ICT plays in making the teaching and learning process more effective in institutions of learning, as well as the problems that are faced in its successful integration. On the other hand, quite a few researches have been carried out to investigate the roles of ICT and its application in educational administration.

This study's main focus is on understanding the sources of ICT, its application and enhancement in the management of secondary schools, taking into consideration the fact that the world has now become so high-tech that even the day to day activities of ordinary people are affected to a larger extent. The frequency and scope of the changes in the technological know-how as Makewa et al. (2013) explains, has been exceedingly immense to a point where the whole world has had to make a paradigm shift in the way that many things are done. Use of ICT has taken over organisational management in a good way. Oyedemi (2015) quoting Okebukola (1996) talks of the complexity of administrative functions in schools in terms of enrolments, population mobility and social problems as well as the need to use powerful administrative tools such as computers for better communication, efficient operations and better personal services. This is an indication that ICT application is a requirement in school management. Therefore, its introduction in this field means that even the work of school administrators has changed from manual and mechanical to electronic data processing, storage, output and communication. This has led

to a rise in the importance of ICT application in school management. Quoting Taylor and Hogenbirk (2001), Makewa et al. (2013) points out that, countries need to integrate policies of technology with education; otherwise, professionals may become outdated in their profession. In the same wake, Zambia being a developing nation has high chances of benefiting in various sectors, including the education sector from the improvements that are related to technology. This is an indication that embracing ICT and the changes that come with the application of technology is a must for Zambia, as a developing nation (Masaiti, 2018).

Aina (2013) quoting Adebayo (2013) defines Information Communication and Technology (ICT) as the technology that supports activities involving the collection retrieval, use, storage manipulation and communication of information through the use of computers and microelectronic systems. The application and use of ICT have led to the emergence of different forms of microelectronic and telecommunication tools such as laptops, computers, computer networks, the internet, digital printers and mobile technology, all of which enable administrators to record, store, process, retrieve, and transmit information (Kokt and Koelane, 2013).

Secondary schools comprise departments appropriately premised on suitable subject areas. These departments form the school's subsystem. In achieving its objectives, the school as an organisation affects and is affected by its subsystem or departments as well as the environment. Therefore, all of them need to be functioning in harmony. For instance, availability of teaching materials from local sources (environmental factor) and allocation of resources to various departments during budgeting (internal factor) will affect the extent to which a secondary school may achieve its objective of effective teaching by the teachers and effective learning by the learners. This calls for innovative ways of departments harmoniously and simultaneously performing several tasks such as management of the teaching and learning process, the management of personnel, finance and physical resources, and the school's community relationships. Ziroba (2012) explains that, if ICTs were integrated into schools which are made up of subsystems, they would coordinate the subsystems' inputs and lead to the schools' realisation of their goals. This entails simultaneous management of multi-tasks which requires replacing manual systems with

those based on modern ICTs such as Database Management Systems (DBMSs) and School Information Management Systems (SMIS) to store, retrieve, process data and provide access to management information produced.

The desire to have an education system that meets its national human capital development needs has been the Zambian Government's quest since independence. To realise this objective, education policies have been drawn over time. For instance, in 1977, the first policy, called "Education Reform" was formulated and adopted. This was followed by another policy in 1992 called "Focus on Learning". In 1996, yet another policy called "Educating Our Future" was formulated and adopted. In the area of legislation, Zambia has had two Acts of Parliament; namely, the Education Act of 1966 and the Education Act of 2011 which is a repeal of the former. Masaiti (2018) looks at these and other related factors to be the factors that are driving demand for more and better education in Zambia.

Both the three policies and the two Education Acts hitherto adopted and enacted respectively were heavily influenced by the ideological persuasion of the Government of the day. The Education Act of 1966 was influenced by the then government's socialist ideology under a one-party State. Under that regime, everything, including the management of educational institutions such as schools, was decided by the Government and even the law was in line with the political standing of the state.

In 1991, Zambia adopted multiparty democracy and a free-market economy. This ideological shift is reflected in the 1992 and 1996 education policy documents; "Focus on Learning" and "Educating Our Future" respectively and their contents have been made law through the 2011 Education Act. One of the major policy shifts post-1991 has been the encouragement of the establishment of for-profit private schools and the devolution of the day-to-day management of public schools, including financial management within given limits, to local management boards constituted for the purpose. All public primary schools in a district came under a district education board headed by the District Education Officer reclassified as the District Education Board Secretary (DEBS), while separate boards were constituted for each public or grant-aided secondary school, reporting to the Provincial Education Officer (PEO). As a result, schools, both public and private, have since been run

like businesses based on value for money with headmasters and headmistresses renamed as school managers.

The running of schools as businesses providing a service has resulted in school managers being more accountable in the way that they run schools. In order to be highly accountable, school managers require reliable sources of information for them to make informed decisions, and a reliable record-keeping system is needed, as a way of showing accountability especially in the wake of effective financial management. The need for reliable record keeping is equally needed as a means of showing the progress being made by schools especially in line with the performance of the pupils in the national examinations; these results are a reflection of the effectiveness of the core business of schools which is teaching and learning. (Matimbe. 2014)

Benwari and Dambo (2014) observe that storing, retrieving, manipulating and disseminating information manually tend to be slow and tedious with chances of misplacing and even losing information, thereby reducing the efficiency and effectiveness in carrying out responsibilities by school managers. This, in turn, reduces the schools' chances of achieving the set goals. Taking into consideration the demands of the internal and external environment, Draft and Marcic (2009) define effectiveness as the extent to which the desired goals of an organisation are achieved. In another definition by Johnes et al. (2017), effectiveness in education is the reference to the use of resources so that society's desired consequences of education are achieved. Therefore, a school can be said to be effective once it is able to meet society's desires from education as well as achieve the objectives that have been set by the school administration using the strategies that it has put in place. Efficiency in a school set up as Johnes et al. (2017) explains, takes place when the yields from education which include students' examination results are realised at the lowest level of resources such as financial resources.

Complexities of secondary school management have become even more challenging in Zambia due to over-enrolment, especially in public schools. This has been brought about by the call for education for all under the 1990 Jomtien Declaration. Hence, most public secondary schools in Lusaka have double streams; the morning and afternoon sessions which are both filled to capacity. This situation in itself brings new management information

challenges such as; the need for close supervision by the school managers to ensure that effective teaching and learning is taking place, a reliable record management system to monitor the academic and non-academic performance and the attendance of the large numbers of learners, and infrastructure management and resource management allocations.

The Zambian government recognises the strategic role ICT can play in improving the quality of education. To this end, the Ministry of General Education has over the years been seeking ways to improve the quality of teaching and learning in schools in Zambia through the application of ICT. The research conducted by the Policy and Operations Evaluation Department [IOB], (2008) in Primary Education in Zambia revealed that children who completed the lower and middle basic school were not exhibiting the expected fundamental reading, writing and numeracy skills. School managers also had a hard time keeping a record of the performance of such pupils over time, because the information was stored manually, instead of using modern methods which called for the application of ICT. Another research by Education Management Information System, (EMIS), (2007) on basic schools in Zambia, confirmed that whereas Zambia was successful in improving access to education, the quality of education in basic schools, as measured by test and examination results, was still low. The evaluation pointed to several weaknesses among them lack of effective management capacity at the school level. Other factors which hindered effective management was that most of the school administrators and other senior teachers had little or no knowledge of the use of computers and other technological devices which are aimed at helping in easy storage of school records and pupils' performances records.

Therefore, the policy provisions and practical measures taken by the Zambian Government are aimed at harvesting the potential of ICTS to improve the quality of education. For instance, the Ministry of Education envisions ICTs to contribute towards reaching innovative and lifelong education and training through the provision of ICT infrastructure to education institutions, content development, curriculum integration, teacher training, distance education, administration and support services as well as finance management (Isaac, 2007). In addition, several initiatives aimed at promoting the use of ICTs in schools have been implemented in collaboration with various partners, such as the Computers for Zambian Schools Trust, SchoolNet Zambia, UNESCO Distance Learning Tele-centres,

eBrain Forum and One World Africa. However, Mtanga et al. (2012) have observed that while much measures and initiatives have been done to encourage the use of ICT in education in Zambia, it is still unclear what impact this has had on education and what benefits this has brought to teaching, learning and school administration.

1.2 Statement of the Problem

Good management of any secondary school is anchored on the availability and good flow of reliable information which enhances timely decision making by school managers, thereby creating an enabling environment for the school's goals to be achieved. As ably put by Oyedemi (2015), the day to day activities of school administrators who are instructional leaders revolves around the organisation, maintenance and manipulation of certain pieces of data in order to generate requisite information. At each point in time, accessing information concerning any of these can be done at very short notice and within a few minutes rather than hours or days. This is time-efficient and less prone to errors, thereby making it easier for basic decisions to be made easily (Benwari and Dambo. 2014). Principally secondary school education is an important stage in the Zambian education system because it is the stepping stone to higher education. To this effect, secondary schools require even more effective management so that a lot of learners can attain higher education and contribute to the country, the much-needed human capital.

A research conducted by Mtanga (2012) revealed that most secondary schools in Lusaka use computers for teaching and learning activities while the use of computers on the part of administration is confined to correspondence and preparing reports (or as superior typewriters and calculators) only. Therefore, the extent to which ICTs are used as tools in the effective management of secondary schools in order to achieve the school's ultimate objective (s) needs to be researched further. It is for this purpose that this study focused on understanding the sources, application and enhancement of ICT application in the management of selected secondary schools in Lusaka District in order to ascertain the availability of information which is an important aspect of decision making. Clearly, the lack of usage of ICT in the management of these Schools can lead to less efficiency and effectiveness in school management and administration.

1.3 Purpose

The purpose of this study was to understand the sources, the application and the enhancement of ICT application in the management of secondary schools in Lusaka District. The principle behind this was to establish the sources of ICT in secondary schools, how they were being applied and enhanced by school administrators in order to benefit their day to day responsibilities.

1.4 Objectives

1.4.1. The Specific objectives of the study were to:

1. Establish the source(s) of ICT used by school managers in secondary schools in Lusaka.
2. Assess the level of integration of ICT application in the management of Secondary Schools in Lusaka District so as to understand the quality and reliability of information used in decision making.
3. Determine ICT enhancement in the management of secondary schools in Lusaka District. validate

1.5 Research Questions

1.5.1. Supplementary Research Questions

1. What is the common source of information used by secondary school managers in Lusaka District in performing their functions?
2. To what extent has the application of ICTs been integrated into the management of secondary schools in Lusaka District?
3. How is the application of ICT in the management of secondary schools in Lusaka District being enhanced?

1.6 Significance

Secondary schools have been granted semi-autonomy in the day-to-day management of their activities. The extent to which management functions are executed by school managers to enhance the smooth running of secondary schools is highly dependent on the information available to school managers to support decision-making. This calls for the application of

appropriate management information systems which is adjudged by Amanchukwu and Ololube (2015) to be the most appropriate way of managing records for effective school management. It is hoped that the results of this study will help secondary school managers to increase their effectiveness in the performance of their functions as well as assist policymakers in providing an appropriate environment for secondary school management boards to achieve the set objectives through the application of ICT.

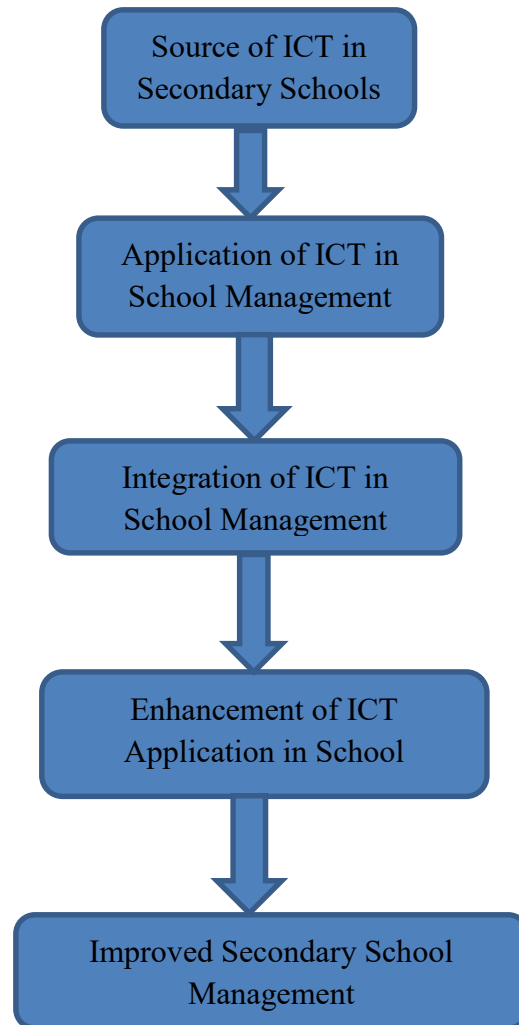
1.7 Delimitation

The study covered six purposively selected secondary schools comprising two private, two grant-aided and two public secondary schools in Lusaka District.

1.8 Conceptual Framework

According to the definition provided by Orodho (2009), a conceptual framework is a model of presentation where a researcher presents the relationship between variables in the study. This relationship is shown in the form of a diagram.

Figure 1: Conceptual Framework



The Conceptual Framework in figure 1 is a representation of how the source of ICT, its application and integration in school management can lead to improved secondary school management. Application of ICT in secondary school management leads to the timely flow of information, accurate record-keeping as well as the optimal utilisation of resources which are all recipes for good school management. This indicates that ICT knowledge enables a secondary school manager to have quick access to information. This enables such a manager to communicate efficiently, thereby proving to be effective in his or her line of duty. (Makewa et al., 2013). In addition, the smooth flow of information stimulates awareness in school administrators. In so doing, the level of decision making on prudent issues of concern

both within and outside the school is augmented. Record keeping in schools also contributes to the efficiency and effectiveness of school management; hence ICT application assists in comprehensive record keeping. Resultantly, records of students, teachers, finance, physical facilities, teaching and learning materials, learning achievements and outcomes, extra-curricular and co-curricular activities as well as school and community interactions are effectively managed as they are an indispensable aspect of school management (Prabhjot and Sharma, 2017). The importance of accurate record-keeping lays in helping to improve the quality of managing educational delivery activities, operations and monitoring provided by the school. Yet another sign of ICT application is that its appropriate usage results into the optimal use of resources due to the availability of accurate and updated information on all levels and in all aspects (Lin et al., 2011). With limited resources available for use in most schools, having accurate information helps school managers in the allocation of those resources in a way that can truly benefit their institution in realising the set objectives. It is for this reason that this study considered the use of ICT in secondary schools in order to have a timely flow of information, accurate record-keeping and optimal use of resources which in turn results in improved management of schools.

1.9 The Theoretical Framework

This study is guided by the Systems Theory of Organisational Management or the Systems' Approach of Organisation Management. Teeboom (2018) shows that the theory is useful in management because it aims at achieving organisational objectives, and it views any organisation as an open system. Effective management of such systems depends on the quality of information available to management. Likewise, this study considers how ICT helps in the school management for the attainment of its objectives and goals. An organisation is viewed as an organic and open system, which is composed of interacting, interrelated and interdependent parts, called subsystems. These are integrated into a unit or orderly totality. This shows that communication and smooth flow of information is important if unity is to prevail, and ICT helps in that aspect. It is also worth noting that the Systems Approach Theory focuses on the arrangement and relationships which connect parts into a harmonious thriving whole, thereby providing a framework by which one can investigate or describe groups of objects which work together to produce some

predetermined outcome. ICT application assists in this regard by ensuring that there is the management of delivery activities as well as monitoring them (Teeboom 2018).

The basis of the Systems Theory is depicted in Henri Fayol's five basic functions performed by managers to effectively and efficiently achieve their organisations desired goals. These five basic functions are planning, organising, commanding, coordinating and controlling (Krenn, 2017). Planning can be defined as the means of scheduling every process and ensuring timely availability of necessary resources. With the use of ICT, planning can be done accurately and timely to help the organisation attain its goals. Other functions are directing and controlling. To direct refers to the process of encouraging and directing personnel to perform their duties, while controlling refers to the process of managing and preventing deviations from the plans caused by impediments. It also involves taking into account new opportunities which might be presented or encountered in the process. ICT can assist in this regard by enabling managers to monitor the utilisation of resources through records that can easily be stored retrieved and manipulated. Another important function is coordinating. This is simply the process of ensuring that departments, as well as personnel in these departments, work cooperatively. ICT usage can also prove to be helpful as it supports the timely flow of information in different departments and among all members of staff.

Applied to an educational institution such as a secondary school, the Systems Theory of Organisational Management or Systems' Approach of Organisation would view the school as an organism comprising several parts or subsystems, which in this case are departments. These departments interact with each other, and the environment as well (such as sources of teaching materials, staffing of the school by the Ministry of General Education). These interactions must be such that they result in the school harmoniously performing its functions of effective teaching by teachers and effective learning by pupils. The teachers and pupils in a class form a subsystem that must function harmoniously with each other and with other classes, for instance, in sharing facilities like classrooms and laboratory time. Classes are subsystems to departments which are in turn subsystems of the school as a whole. ICT is, therefore, an effective tool that can be used to help in the harmonious performance of different players who have one goal. It can be used in planning by the school management as it helps them have necessary and timely information at their disposal, due

to accurate record-keeping which in turn can translate into optimal utilisation of resources for the benefit of the learners.

Such harmonious interactions in the performance of functions by departments as subsystems and the school as a whole are what leads to the effective management of schools. Thus, from the Systems Theory of Organisational Management's perspective, Zambia's education system is an assemblage or combination of dynamic interrelated and interdependent subsystems or parts comprising levels of education, from pre-school, through primary school to secondary and tertiary education linked to the national policy with various management systems such as education management boards; all forming a complex whole. Underlying the harmonious performance of individual activities and functions by the subsystems is good quality information generated through the use of ICT tools and appropriate Management Information Systems (MIS) which as defined by Karim (2011) citing Adeoti-Adekeye, (2010) are a modern phenomenon concerned with the use of appropriate information that leads to better planning, better decision making and better results. It actually remains among the most popular in the management of educational institutions. From this point, the study considers how enhanced ICT application can help in improved school management.

The rationale for applying the Systems Theory or Systems Approach to Organisational Management and the Management Information Systems Theory in this study is threefold. Firstly, the Zambian Government has decentralised the management of educational institutions, thereby according to school managers, the latitude in the day to day management of the operations and finances of their schools. Secondly, a school is an organisation or system which comprises interrelated and interdependent parts with each other and with the environment in the performance of its functions. Unless the departments perform their varied functions and the school interacts with its departments and the external environment in harmony, its objectives cannot be achieved efficiently. Thirdly, the effectiveness and efficiency in performing functions by the school and its subsystems (departments) like in any other organisation depend on the availability and access to appropriate information about internal activities and operations and the impact of the external environment, (such as generated through the use of ICT), to aid in making

appropriate decisions to keep a balance between conflicting forces and events in order to achieve the desired objectives.

1.10 Operational Definition of Terms

In the study, the following terms shall mean:

Information Communication and Technology (ICT) in this study refers to all devices networking components, applications and systems that when combined, allow people and organisations such as schools to interact in a digital manner.

The database is a structured set of related data stored and accessed electronically from a computer system. This data is accessible in various ways and depending on the information management system adopted by respective secondary schools.

Management Information System (MIS) is an integrated user-machine system for providing information to support operations, management and decision making functions in an organisation. The system exploits computer hardware and software, manual procedures, models for analysis, planning, control and decision making and a database.

Private School refers to a school which does not receive any support from the government in terms of human resource. It also does not receive any funding from the government. Instead, it relies wholly on fees paid by learners.

Public School is a school owned and totally supported by the government in terms of the provision of human resource and funds.

Grant Aided School refers to a school which though privately-owned receives a certain percentage of grants from the government to supplement its running costs and provision of human resource.

School Managers refers to Administrator(s) entrusted with the responsibility of running a school such as Head Teacher, Deputy Head Teacher and Heads of Department.

1.11 Summary

The chapter has offered the background of the problem. It has focused on the need for ICT application in secondary school management, showing that this supports good management as it stimulates the availability and good flow of reliable information, which in turn enhances timely decision making thereby creating an enabling environment for the realisation of the desired objectives. The chapter further looks at the scope and the conceptual and theoretical

frameworks which will guide the study. It has also offered clarification of the key terms that have been used in the study. The subsequent chapter makes available an appraisal of literature in line with the application of ICT in the management of educational institutions and in particular secondary schools in order to determine its significance in the context of knowledge as well as determine gaps thereby establishing justification for the study.

CHAPTER TWO: LITERATURE REVIEW

2.0 OVERVIEW

This chapter reviews the relevant literature on the application of ICTs in the management of secondary schools. It discusses a number of different sources in line with the application and enhancement and integration of the application of ICT in the management of educational institutions in general and secondary schools in particular. The chapter will also bring to light some of the studies that have been taken concerning the application of ICT in the management of secondary schools at national and regional levels in order to establish the gaps which this study is trying to address.

2.1 What is Information Communication and Technology (ICT)

(Opara and Onyije, 2014) explain that Information and Communication Technology (ICT) refers to facilities, tools, gadgets or resources such as laptops, smartphones, televisions, printers and photocopying machines, that could be used to process, store, preserve, access, retrieve, and disseminate information with ease. ICT devices can be classified into two categories which are hardware and software. Hardware is the physical equipment used for processing information in a number of ways. These include desktop computers, laptop computers, tablets, projectors, smartphones, radios and television sets. While software refers to the instructions or programmes that determine tasks to be performed by the hardware and the way in which these tasks are to be performed. Examples of software are operating systems such as Microsoft Word, Management Software like Information Management Systems (IMS) and Educational Software like Educational Management Information System (EMIS) (Gedwar. 2016).

Tamilselvan (2012) explains that Information Communication and Technology (ICT) stresses the role of the unified communication and integration of telecommunications (telephone lines and wireless signals) computers, hardware and necessary software as well as storage and audiovisual systems which enable users to create, access, store, transmit and manipulate information. Ratheeswari (2018) suggests that the centre of ICT is predominantly communication technologies which include wireless networks, cellphones and other communication avenues. Therefore, ICT is the technology that supports the

gathering, processing and presentation of data for the purpose of realising information that can be used for communication. This entails that the output should be useful to the user. ICT, therefore, refers to a technology which involves the application of technological devices such as computers and their peripherals, smartphones, television sets and the radio as well as relevant operating systems and the internet in order to collect data, store and retrieve it when needed and manipulate it when need be with the sole purpose of providing information to the user.

2.2. The Concept of ICT in Education Management

The world has witnessed a rapid spread of the application of ICT at various levels including at personal level in form of mobile phones, at household level in form of televisions, at institutional and organisational levels in the form of computers and many other ICT tools. Therefore, Information Communication and Technology could be seen as the engine for growth and a tool for empowerment, with profound implications for education, change, and socio-economic development. The education sector has not been left out in this rapid growth of ICT application both in the teaching and learning process and in educational management. Mue (2006) explains that due to the rapid growth of Information Technology and Communication (ICT) in the management of various sectors, the way in which schools are managed has also been influenced, leading to the rapid growth of computer application in school administration. Consequently, the standards of schools have, to a larger extent, improved. This is an indication that school management equally requires ICT application in order to be at par with the global technological advancement as well as meet the ever-increasing demands and the quest for delivery of quality goods and services.

In administration and management, the application of ICT enables organisations to efficiently and effectively perform their duties of planning, organising and supervising. By so doing, administrators and managers are able to achieve their organisations' or institution's set objectives. It is, therefore, the effectiveness of the application of ICT in the management of organisations that have influenced the introduction of ICT application in the management of education. ICT application has also found its place in the management of schools; in particular secondary schools. This has seen an improvement in the way that secondary schools are managed, leading to the realisation of their core objectives.

Mwalongo (2011) explains that management has adopted the application of ICT tools in institutions in order to help prepare for meetings and facilitate learner enrollment and registration as well as staff recruitment. Afzaal (2012) points out that through the application of ICT tools, administrators have information readily available. Hence they are able to make informed decisions efficiently.

The dream of any institution is to have an effective and efficient managerial process to accomplish its needs and goals. In order to make this a reality, knowledge of computer application software such as word, spreadsheet, computer-aided design, and databases is an important skill that is required in institutional administration. Undoubtedly, the complexity of institutional systems requires more demand from institutional administrators in the area of processing relevant data as they attempt to provide information to the governing bodies, the institution itself and other institutional agencies and stakeholders for decision making towards quality assurance and transformational development. In the same light, educational administrators need to have adequate information on students and teachers, institutional supplies, and how much the system is spending on various inputs, in order to make the most basic resource allocation decisions (Iwu and Olke, 2009).

In the day to day management of schools, ICT application cannot be underestimated, and this is directly connected to the most important key in school management; the school managers. The school managers' contribution to the success of any given school is based on their ability to perform their responsibilities efficiently and effectively. Their efficiency is highly dependent on their ability to execute diligently the many responsibilities that they are tasked with by virtue of their position. Ordinarily, it is practically impossible to meet these tasks such as ensuring that resources are allocated, effective teaching and learning is taking place, financial records are up to date, and pupils' records and reports are in place on a daily basis. However, through the application of ICT, as stated by Adeyemi and Olaleye (2010) daily school routine programmes such as updating the evaluation of the school programmes, solving individual and group challenges and problems as well as staff development are enhanced as school administrators are able to meet tasks of school management. This is also achieved in areas of curriculum, instruction, and school-community relationships.

2.3. Sources of ICT in Education Management

Based on the various definitions of Information Communication Technology (ICT), it is clear that the existence of ICT is in the availability of certain technological devices which when applied individually or in combination with another can receive data, store it, provide easy access to it and allow for its manipulation as well as translate the data into information that can be beneficial to the user. Meenakshi (2013) understands ICT as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. These technologies he points out as including computers, the Internet, broadcasting technologies (radio and television) and the telephone.

In a secondary school set up, the school administrator has a mammoth task of ensuring that departmental, human resource, students, results and financial records as well as records of other resources in the school are well-kept and are easily accessible. This can be achieved through the application of ICT. All the school needs are to be in possession of a computer and the right data management software which would facilitate the input and storage of data as well as its retrieval for the manipulation of information or its use for the benefit of the school administrator in line with the performance of his or her duties. In another situation, there may need to communicate with parents over the welfare of a child, a telephone may easily be used to communicate with them, and the message relayed instantly. The internet is yet another way that reports such as monthly staff returns to the District Board Secretary's (DEBS) office from schools are easily sent via email by using computers and the internet. It is also through the internet that important information such as the results of school-based practical national examinations results are transmitted to the Examinations of Zambia (ECZ). All this is able to be realised through the application of the various ICT tools. If none of these devices were available in a secondary school, then the school administrator would not be able to apply ICT in his or her daily activities, thereby making him or her less effective. This is, therefore, a clear indication that the sources of ICT are the many ICT tools that make the application of ICT possible. From this indication, it means that the application of ICT in any situation is, by all means, achievable through the use of ICT tools and these ICT tools are the electronic devices used such as laptop computers, desktop computers,

smartphones, and printers, photocopying machines, television sets, projectors, radios and internet.

In her study, Mtanga et al. (2012) reveal that the computer is the most used ICT tool in high schools in Zambia as a source of ICT. Dabas (2018) explains that the use of a computer and its related technologies has expanded in the education system in order to realise some of its purposes such as enhancing communication through the Internet and other communication means and as a productivity tool through the application of spreadsheet, databases and word processor among others.

2.4 Application and Integration of ICT in Education Management

Application of ICT in schools promotes efficiency and effectiveness on the part of school managers and in the process enables the realisation of the schools' set goals. A school in its own right is an organisation where its constituent parts include; the various departments form a complex whole. In performing its functions and activities to achieve its objectives, a school affects and is affected by the functioning of its parts as well as its interaction with its external environment, thereby causing it to acquire qualitatively new properties in the process of its continuous evolution. In order to manage its operations efficiently and effectively, school managers depend on access to quality information on the operations of its parts and the environment as well as on its operation as a whole. Thus, two factors are important in evaluating the management of a school. The first factor is that a school is an organisation whose effectiveness and efficiency depend on the harmonious interactions among its parts and with its environment. Secondly, the success in achieving its objectives depends on access to information through the use of ICT tools and programmes to enable school managers to make effective decisions. A study was done by Ziroba (2010) in Uganda showed that despite most school administrators lacking enough computer skill to effectively use ICT in financial management, ICT proved to be helpful in managing teachers payrolls, allowances and salaries thus making an impact in record-keeping, monitoring of school fees. It also contributed to the improvement of efficiency in tracking students' academic progress. Oyedemi (2015) states that effective school administrators provide the link between the schools' various parts and ensure the smooth communication and transmission of information from part to part. This is also in support of the fact that data management

systems tools bring about effectiveness into school administration by solving the problem of poor communication and helps a great deal in planning effectively, thereby helping school administrators achieve the set goals. This simply shows how important ICT application is in the education system.

Prabhjot and Sharma (2017) explain that DBMS allows large amounts of data to be stored in the most efficient manner possible and provide facilities for controlling data access, enforcing data integrity, managing concurrency, control, database recovery after failures and restoring it from backup files as well as maintaining database security. Therefore, through the use of ICTs and its relevant data management programmes, the secondary school management is able to generate information which comprises basic features including, students' records, resource management, financial management, personnel management, admission management, communication & social features, the interaction between the school and parents, transport management, attendance management, examination management, hostel management (for boarding schools), library management, staff management, report management, notification system, extra-curriculum activities, infrastructure management or maintenance and alumni as well as fundraising management.

Mutisya (2017) explains that accessing information which otherwise would require an insurmountable effort, such as registration for examinations, accessing results and acquiring any piece of information about institutions and programmes required, online operations can be engaged for efficiency access and retrieval of information. Citing the Organization for Economic Cooperation and Development (2005), Mutisya (2017) further points out that ICT application has played an important role in improving data collection in educational systems and has also made these data more widely available to school personnel, parents, and the public at large through central school management web and in some countries through direct access to central or district databases by school personnel.

Application of ICT in education management is vital in the sense that it supports powerful, efficient management and administration in the education sector. It is specified that technology can be used right from student administration to various resource administration

in an education institution (Maki, 2008). Clarke-okah et al. (2009) identified multiple uses of ICT application for the university administration as follows:

First, ICT technology can process voluminous records quickly, meticulously and impeccably; Second, technology can generate reliable and consistent records; Third, records and data produced are searchable and quickly retrievable; Fourth, digital records save space, a premium cost to institutions; Fifth, technology saves human resources for data entry and servicing student admission and registration. With advanced scanning technology, completed application forms can be read into the databases in a matter of seconds. Other software such as Learning Management Systems (LMS) which include the open-source model, allows students to register for courses, pay fees and get course information directly online; sixth, technology can expand the geographical boundary for student intake and facilitate cross-border higher education. Using ICT in education administration is fundamentally about harnessing technology for better planning, setting standards, effecting change and monitoring results of the core functions of universities (Krishnaveni & Meenakumari, 2010). Therefore, ICT application plays a major role in the enhancement of administrative efficiency and effectiveness in many ways.

There are several other uses of ICT in the administration of institutions of learning: ICT can increase efficiency and reduce unnecessary bureaucracy in school administration. With ICT, the administrators can discharge their duties by using computers and the internet in solving school problems at hand and in carrying out their day-to-day assignments, especially as it relates to having a reliable information system. ICT can play a major role in reducing the workload of the administrators and staff, especially when it comes to analysing information such as analysing student academic performance. In this regard, much time is saved. ICT also helps in managing student admission, student records, examination records, monitoring and evaluation of members of staff, planning school activities, curriculum implementation, financial management, information dissemination and promoting communication between school units, parents, and the principal administration (Oboegbulem and Ugwu, 2013). Therefore, these factors will increase efficiency in the management of institutions of learning so long as ICT facilities are properly implemented and utilised.

With the view that ICT has now become an essential part in the performance of the day to day activities, its integration in the education system is inevitable, because through its application in education management as Ghavifekr et al. (2013) puts it, has become one of the most effective factors in improved management not only for teaching and learning but for administrative purposes as well. This has led to changes in the way educational institutions carry out a number of activities such as the process of teaching and learning as well as monitoring students' progress. It equally has had an undeniably big impact on administrative processes and management of educational institutions. This impact can be seen in the manner in which at a click of a button on the computer and in the confines of his or her office, the school manager can access information such as the performance of learners and teachers without having to turn the place upside down looking for files manually. The compiled results under the pupils' records would help him have a clear view of the pupils' performance, and for the teachers, their accomplished tasks would also give the school manager a good picture of their performance. In this manner, a lot of good work will be covered within a short period of time; a sign of being efficient and effective on the part of the school manager.

Looking at how complex managing secondary schools have become and the amount of work that is involved, school administrators need to ensure that an information system is put in place to encourage the easy flow of information for effective and efficient management and ultimately improved schools. Brannigan (2010), in line with the modern times, observes that the use of computers in schools has erupted globally as an instructional, communicative and informational resource tool through the usage of databases, spreadsheets, multimedia, email, and network search engines. These rapid changes, as he explains, are attributed to the mounting demand for the integration of ICT in the management of educational institutions. While Tagalou et al (2013) explain that the education system at central, regional, local and school levels produces an enormous amount of information that can only be handled through the application of ICT if efficiency and effectiveness are to be recorded in the education sector of the country. Therefore, what is required in such a situation is the transformation of the huge amount of information into digital data. And to store, such an amount of information efficient and effective storage and processing system is needed. To have such a system in place, ICT needs to be an integral part of the school management system because

its application helps speed up the integration of administrative functions while ensuring that the modern method of administration is adhered to. In the process, faster administrative transactions are performed. This results in efficient and effective secondary school management.

There is a growing consensus that the application of ICTs leads to the effective management of schools. Ghavifekr S. et al. (2013) observes that application of ICTs in education has become one of the most effective factors in school improvement, not only for the purpose of teaching but for administrative purposes as well. In line with the amount of work that school managers have to do, Fedena (2017) states that School Management Software (SMS) will reduce work, enhance efficiency, eliminate errors in data, monitor progress, analyse data, identify trends and formulate new paths for success as well as achieve balance and optimal use of resources. With the increase of demand for education, Oyedemi (2015) points out that, administrative functions in schools are becoming increasingly complex in terms of enrolments, population mobility and social problems. This requires the use of powerful administrative tools such as computers for better communication, efficient operations and better personal services. This is supported by Makewa (2013) who points out that ICT knowledge empowers a secondary school principal to have quick access to information which in turn facilitates efficient communication and proves his or her efficiency and effectiveness in the way he or she performs his or her duties.

Maki (2008) insists that the integration of ICT in the management of schools plays an important role in supporting efficient and effective school management in the education sector. In relation to a study which was conducted in Cyprus secondary schools, the observation was that ICT integration is necessary for personnel management, student management, resource management, financial management as well as the general management of schools. Maki (2008), concerning yet another study which was conducted by the European Commission in Cyprus explains that it reveals that secondary schools in Cyprus integrated ICT as a teaching tool as well as a tool for school management for improved schools.

Nduati and Bowman (2005) point out that the integration of ICT in educational management can improve or enhance the management duties of school principals. This is in the wake of

most African countries which have recently begun to show the microeconomic stability needed for education development through the application of ICT in the management of the school. Through the application of ICT, using appropriate programmes in secondary schools, school managers are able to monitor all the various activities in their school such as the enrollment of students, availability of educational resources and human labour as well as the availability of financial resources needed to weather the day to day activities of the school. The integration of ICT in secondary school management lessens the workload of school managers by reducing it to a simple click of a button on the computer and the monitoring of various activities in the school is done.

Secondary schools and what goes on in them are of public concern. It is for this reason that administrators in these schools have a duty to report to various stakeholders starting from the Ministry of Education to parents. To the various offices under the Ministry of Education, school administrators need to report on issues of national policy implementations at school level and resource allocation and to the parents; reports on their children's performances among others. Fredriksson and Gajek, (2009) illustrate how through the integration of ICT in storing records of students work teachers are able to share information with parents electronically, which has led to clearer target settings and improvement in reporting to parents.

Etudor-Eyo et al. (2012) carried out a study on the use of ICT and effective communication among Secondary School Administrators. The findings of the study reveal that the application by school administrators of ICT for communication purposes increases their communication effectiveness. This leads to the conclusion that the effectiveness of secondary school administrators in communication is significantly improved through the application of ICT.

In line with ICT integration and Personnel Management, Mutisya (2017) referring to the findings of the study by Raby (2004) on ICT integration in public secondary schools in Uganda explains that ICT application could encourage instructional supervision in schools by facilitating the decision making process, planning, organising, communicating, coordinating and evaluating. She further explains that the study observes that for a principal running a big school or institution, running various human resource areas like curriculum

development, instructional supervision, staff and student, personnel administration, guidance and counselling, finance, community relations, construction and maintenance of facilities and special services could be strenuous and time-consuming. Mutisya (2017) concludes by pointing out that in his study, Raby's (2004) stresses that for the principal to function efficiently and effectively in the present computer age, he/she must rise to the challenge by embracing new technological resources and services in the management of the school.

Countries in Africa have embraced the application of ICT and have sought to integrate it into their respective Information Communication Technology (ICT) National Policies. Waema and Bowman-Ngaruiya (2006) explain that Kenya has deliberately made a number of attempts to develop a national ICT policy in the education sector and the policy document that guides ICT integration in education in that country. This is driven by the Kenyan government's recognition of ICT's positive influence on turning the country into a middle economy. In the same vein, the *Zambian ICT Policy* provides an overview of goals, objectives, and government commitment in key programme areas of ICT infrastructure to educational institutions, content development, curriculum integration, teacher training, distance education, administration and support services, and finance. It also outlines the ministry's commitment to establishing appropriate structures to facilitate the integration of ICTs in the education system. (Isaac. 2007). This is a clear indication of the country's commitment and the importance attached to ICT integration in the education sector based on what its application stands to contribute towards the improvement of education in the country.

The desire to resolve challenges being faced in school management through the application of ICT in school administration is being encouraged by various governments in order to enhance efficiency and effectiveness in schools so that set objectives could easily be achieved. In the same vein, one of the objectives of the *Zambian National Information and Communication Technology Policy* states that ICT is meant to strengthen the administration and decision making capacity in the education system through the deployment of Education Management Information System (EMIS) within the public and private educational

institutions to improve the quality of management being deployed in educational delivery activities, operations and monitoring. (GRZ. 2006)

Therefore, to effectively run an educational institution, management requires an information generating system which should comprise basic features that support general management and teaching (operational) functions, including storage of students' records (student demographic, course history, grades and transcripts, health records), management of resources, financial management, personnel management, admission management, communication and social features, the interaction between the school and parents, transport management, attendance management, examination management, hostel management (for boarding schools), library management, report management, notification system, extra-curriculum activities, infrastructure management and maintenance, alumni and fundraising management. According to Probhjot and Sharma (2017), these features should provide complete records on students, teachers, finance, physical facilities, teaching and learning materials, learning achievements and outcomes, extra-curricular and co-curricular activities, including school and community interactions for the effective management of schools. Subsequently, the capturing, maintenance and manipulation of school-related data to generate information related to these features requires the application of effective ICTs such as Information Management Systems. In the same line, Lin et al. (2011) point out that it is important that schools maintain accurate and updated information on all its levels and aspects and this is greatly aided through the use of appropriate ICTs.

A school which has a good record management system would never run out of essential resources for the day to day management of the school because planning would be based on the information what has been stored and is easily accessible from the database. This means that decisions made in line with the resources in question would not be baseless but informed. This would, in turn, lead to the appropriate use of resources, thereby avoiding misappropriation of public resources which in most cases is the source of inefficiency in the management of schools by school managers in Zambia. Shah (2014) explains that Management Information System provides school managers better accessibility to information and this leads to appropriate distribution of resources, reduced workload, and

better time management and making informed decisions, all of which contribute to success in organisations.

In line with ICT integration and Management of Organizational Resources Olukunle and Ojo (2008) carried out a study on the supposed effect of Information and Communication Technology (ICT) adoption in organisations in Botswana. The study reveals that the application of ICT improved record keeping as well as information security, confidentiality and the way that records are retrieved. The study further revealed that ICT application in organisations also necessitated organisational restructuring, and brought flexibility and adaptability in activities.

Secondary school managers have to perform management functions of planning, organising, commanding, controlling and decision-making in order to achieve both the school and national educational objectives, such as putting to effective use the scarce resources allocated to schools in order to achieve effective teaching by teachers and effective learning by pupils. Therefore, each school manager has to make effective decisions when performing management functions. For instance, decisions have to be made on future plans and present activities, in addition to monitoring of such plans and activities. In fact, the performance of management functions constitutes a series of decision-making activities and requires adequate, timely and reliable information and data. However, to effectively and efficiently perform the management tasks, availability of information is a very critical aspect. In line with the thoughts of Markovic and Vucekovic (2015), the purpose of secondary schools is to achieve particular desired goals and objectives just like any organisation. But for this to happen, school managers need reliable and easily accessible management information at their disposal in order to make effective decisions in their performance of the day to day activities.

2.5 ICT Enhancement and Information Management in Education Management

In view of the positive attributes associated with the application of ICT in school management, the promotion of its use in secondary school management should never be underestimated. Although there have been reports of availability and application of ICT in secondary schools in Zambia the limited numbers and quality of computers leaves much to

be desired more so in conducting management related activities. Mtanga et al. (2012) explain that despite much being done to promote ICT application in education in Zambia, its impact and how it has benefited teaching, learning and school administration is indistinguishable.

In her study, Mtanga et al. (2012) reveal the computer is the most used ICT tool used in high schools in Zambia and its usage generally is very low such that its usage for administrative purposes is limited to report writing and correspondence as there is no evidence of any other usage such as financial and human resource management. The study also reveals that although schools have some formal ICT training program, in some cases these are not regularly conducted and evidently, they are poorly advertised. Therefore, ICT skills are low among members of staff besides computers being inadequate and time allocated for their use insufficient. To this effect Mtanga et al. (2012) recommended that other types of ICTs such as television, radio, and video be employed in teaching and learning instead of concentrating on the computer and Internet resources and the government should make ICT tools available in all secondary schools for the administrators; workshops on the use of ICT should be organised from time to time by the government and NGOs for school administrators who are not yet ICT literate; a constant power supply should be made available to schools so that administrators would be able to make use of ICT for communication.

In a study conducted by Mbatia (2014) regarding the influence that principals have on the integration of Information Communication Technology (ICT) in the management of human resources in Nyamira County, Kenya, the study sought to establish the principals' exposure to ICT training, their level of education as well as to determine the influence that the principals' age and gender have on ICT integration. The findings of the study indicate that majority of principals do not use any form of ICT in their schools. In terms of human resource management, most principals do not have any formal training in human resource management and reported that they do not use ICT to monitor human resource in their schools. Majority of them also reported that they had not had any form of ICT in-service training. Those who underwent any such form of training only did so once in a year. Concerning the recruitment and selection of human resource, the majority of the principals

revealed that they do not use ICT in recruiting and selecting the human resource. Based on the findings of the study which reveal an extremely low if any application by principals of ICT in school management the study suggests that certain approaches should be put in place in order to enhance ICT applications in the concerned schools. Among the suggested approaches were to: increase the number of computers in the concerned schools and train principals in ICT application, have in place a variety of ICT tools and request the government to donate to public schools ICT tools which would facilitate human resource management in public secondary schools.

Furthermore, the researcher points out that the challenges of ICT integration in the management of the human resource in public secondary schools can be attributed to inadequate facilities and inadequate funds, negative attitude towards ICT application by principals, lack of trained personnel, high cost of installation and maintenance of computers and computer failure. From this study, only a limited number of respondents said that they faced no challenges in integrating ICT in the management of the human resource in public secondary schools. These challenges are almost identical in most African countries and it requires strong willpower by respective governments to facilitate the enhancement of ICT application in secondary school management so that the benefits that come with its integration and application in school management may be realised.

The use of ICTs in education as a teaching and learning tool, as well as an important tool in the administrative organisation, has undeniably proven to contribute to improved school management. According to Tagalou et al. (2013), ICT helps speed up the integration of administrative functions, while ensuring a modern method of administration and giving faster administrative transactions. Through the use of programmes such as School Management Information Systems (SMIS), the school management has seen a positive change in the areas of leadership, decision making, workload, human resource management, communication, responsibility and planning (Shah M. 2014). Strategically SMIS helps the manager in determining the aims of the school, making long term plans, distributing resources, and forming educational methods for the future, determining performances of teachers and the success of the school (Tagalou, 2013). In this way, school biased management systems such as School Management Information Systems (SMIS) can be

used as a tool to initiate efficient and effective educational leadership in the school managers.

According to Saeed (2015), using ICT tools such as computers has resulted in certain information management systems software like DBMSs to be used in the management of educational institutions as they provide most of the required features that add value to the management of; students' records, resources, finances, personnel, admission, communication and social features, the interaction between the school and parents, transport, attendance, examinations, hostels (for boarding schools), libraries, staff, various reports, notification systems, extra-curriculum activities, infrastructure and maintenance and alumni, as well as coordinating fundraising activities.

School managers can make decisions more efficiently when they are exposed to correct and up-to-date information through the use of School Management Information Systems (Saeed, 2015). Decision making is the heart of educational management. Daily, problematic conditions that require decision making are based on the complicated and unexpected nature of the school environment. It is for this reason that, as a problem solver, the educational administrator has to gather and analyse information continuously.

In addition, school managers have been required to make more decisions in short periods of time because of the increasing expectations from them by the education system (Demir 2006). Consequently, decision making has been faster, more frequent and more complicated in schools today. In order to make decisions under these conditions, continuously gathering and storing up-to-date data that can easily be accessed, analysing and using this data for the benefit of the school is an obligation on the part of school management. This is due to the fact that the success of schools is mostly based on the decisions made based on the available information.

Education institution administrators need to have basic information on students and to teach relevant to the smooth running of the institution. Such information could be in the form of categorized data on student or staff by sex, class, state of origin, performance in schools or any other relevant data. Through the application of appropriate ICT tools, this data is organised in such a way that it is easily accessible and can be easily stored and retrieved

from the computer. Alabi (2017) observes that record keeping is crucial in the effective and efficient management of secondary schools as it affects all the aspects of school administration. He concludes that the absence of appropriate, adequate and relevant school records leads to ineffective and inefficient administration of secondary schools. Hence, the manner in which school records are stored, accessed and manipulated is one of the most important yardsticks used to measure the effectiveness and efficiency in the way that secondary schools are managed. To this effect, an appropriate and reliable system for storing, updating, retrieving and processing data and the easy access to the management of information generated is indispensable for successful management of every secondary school.

The Government of the Republic of Zambia recognises the critical role that ICTs have to play in enhancing the administrative and decision-making capacities in the management of the educational institution. GRZ (2006) in the *Zambian National Information and Communication Technology Policy* states that ICT is meant to strengthen the administration and decision making capacity in the education system through the deployment of Education Management Information System (EMIS) within the public and private educational institutions to improve the quality of managing educational delivery activities, operations and monitoring. However, few studies have been conducted in Zambia in the area of the application of ICTs in the management of educational institutions. Apart from the study conducted by Mtanga et al (2012), we have not come across any such studies.

One of the principal factors for the smooth running and achievement of institutional goals is effective and realistic administration. The administration is the process of planning activities and utilising human and imperial resources with an aim to accomplishing the goals and objectives of a particular organisation or institution. It calls for the ability of the administrators to make the right decisions at the right time to fulfil the predetermined goals. Therefore, in the setting of educational institutions, the administration has been extended as a service activity or tool through which the fundamental objectives of the institutional process may be optimised more efficiently when allocating human and material resources as well as making the best use of existing resources (Opara & Onyije, 2013). Thus within the educational administration, ICT is implemented for the development of electronic

applications for the management of administrative transactions and records, as well as for rendering well-organized and prompt information services (i.e., electronic register, electronic curriculum, digital lesson material, electronic monitoring of school progress.

One of the principal factors for the smooth running and achievement of institutional goals is effective and realistic administration. The administration is the process of planning activities and utilising human and imperial resources with an aim to accomplishing the goals and objectives of a particular organisation or institution. It calls for the ability of the administrators to make the right decisions at the right time to fulfil the predetermined goals. Therefore, in the setting of educational institutions, the administration has been extended as a service activity or tool through which the fundamental objectives of the institutional process may be optimised more efficiently when allocating human and material resources as well as making the best use of existing resources (Opara & Onyije, 2013). Thus within the educational administration, ICT is implemented for the development of electronic applications for the management of administrative transactions and records, as well as for rendering well-organized and prompt information services (i.e., electronic register, electronic curriculum, digital lesson material, electronic monitoring of school progress.

2.6 Other Studies in ICT and Education Management

Mtanga et al. (2012) investigated the use of ICTs in learning activities by pupils, the integration of different ICTs by teachers into the various teaching activities, and the use of ICTs in the operations of schools to improve administrative efficiency. The main objective of the study was to investigate how urban-based high schools were utilising ICTs in teaching, learning and administration. This included an examination of the attitudes and perceptions of the school administrators towards ICTs as a teaching, learning and administrative aid and how ICTs are utilised in their day-to-day activities; teachers' attitudes, competence levels and actual usage of ICT as a teaching tool; and pupils' attitudes and perceptions of ICTs as a learning aid as well as how they actually use ICT in their learning process and how ICTs are utilised in their day-to-day activities.

The study done by Singh and Mishra (2018) showed that ICT plays a fundamental role in the teaching and learning processes which in turn have the potential of improving the quality

of education. Wakil et al. (2017) found that ICT increases learning among learners when exposed to ICT in their classrooms, thereby improving their performance compared to learners who were not exposed to ICT. In addition, ICT has helped school managers to have accurate school records that can be used for planning purposes and tracking down the academic progress of students. Yusuf (2005) observes that the field of education is one of the sectors which have been affected by the application of ICTs by improving the quality of teaching, learning, and research. They state that ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, to create economic viability for tomorrow's workers, as well as to strengthen teaching and to help schools change for the better. The Study acknowledges the Federal Government of Nigeria's National Policy on Education (2004) which recognizes the prominent role of ICTs in the modern world and has integrated ICTs into education in Nigeria providing basic infrastructure and training at the primary school and junior and senior secondary school levels.

To actualise the objective, the Government has launched various initiatives including the "School Net" to equip all schools in Nigeria with computers and communication technologies and firmly link Nigeria to the New Partnership for African Development (NEPAD)'s e-Schools Initiative. The aim of the NEPAD initiative is to impart ICT skills to young Africans in primary and secondary schools and to harness ICT to improve, enrich, and expand education in African countries by equipping all African high schools with ICT equipment including computers, radios and television sets, phones and other communication equipment, scanners, digital cameras, and copiers, among other things and connect African students to the internet.

The study observes that the adoption and use of ICTs have had a positive impact on teaching, learning, and research but that even though ICTs are available and used in Nigerian secondary schools, the level of uptake is still low because both private and government schools do not offer ICT training programmes. Thus, despite the roles ICTs can play in education, secondary schools in Nigeria have yet to adopt them for teaching and learning extensively and the efforts geared towards the integration of ICTs into the secondary school system, have not had the desired impact. They attribute this to the problems of poor policy

and project implementation strategies; and limited or poor information infrastructure. But like Mtanga et al. (2012), this study does not elaborate on the application of ICTs as a source of information that can be used in the management of secondary schools.

2.7 Summary

The chapter has reviewed literature in line with the concept of ICT, including its sources, application integration and enhancement in the management of schools. Additionally, the chapter has also reviewed the literature on the empirical and theoretical studies on ICT and education management and other literature in relation to ICT and school management and organisation of information in the management of secondary schools from different studies from the national, regional and global perspectives.

CHAPTER THREE: METHODOLOGY

3.0 OVERVIEW

The previous chapter provided the literature review in relation to the sources, application, integration and enhancement of ICT application in school management. This chapter presents the research procedure undertaken in conducting the research and will look at the various subdivisions of the methodology that was applied in the study. It will begin by looking at the research design of the study, followed by the data sources before presenting the target population, the sample size and the sampling technique used in the study. The next step will look at the research instruments that were used followed by the data collection procedures that were ensued before proceeding to look at the data analysis method that was used as well as the limitations and delimitations of the study. The chapter will also look at the trustworthiness of the research and the ethical considerations that were made during the study. It will finally conclude with the summary of what will be discussed in the chapter.

3.1 Research Design

According to Creswell (2012), a research design is a specific procedure which is employed in carrying out a research process. Furthermore, Kasonde-Ng'andu (2018) defines research design as a planned guideline upon which the researcher draws his/her roadmap to conduct a particular research project. It spells out the type of data that will be yielded as well as indicate the source and the nature of the data; whether it is primary or secondary.

In this research, the research design that has been adopted is the exploratory mixed-method research design. In this design, both quantitative and qualitative analyses were used in answering the research questions. Bhat (2020) defines an exploratory study as a type of research which is used to investigate a problem which is not clearly defined, and it is conducted in order to have a better understanding of the existing problem but will not provide conclusive results. He also goes on to state that an exploratory study is done in order to get information on the immediate conditions of a certain phenomenon or presentation of crucial issues in our society. Kasonde –Ng'andu (2018) explains that a quantitative approach is objective and statistical, while the qualitative approach is in many instances subjective and uses language and description rather than numerals and figures. This approach has been adopted because of the time limitations and delimitations of the study.

This is in line with the notion of McMillan and Schumacher's (2006) that a qualitative research design is concerned with understanding the social phenomena from the participants' perspectives.

The research was conducted with the intention of understanding the sources, application and enhancement of Information Communication and Technology (ICT) in the management of secondary schools in Lusaka. In order to carry out this research, the quantitative and qualitative approaches were the most relevant designs. Quantitatively the researcher asked specific and leading questions in order to collect quantifiable data from participants through the use of questionnaires. This enabled the researcher to carry out the inquiry in an unbiased and objective manner. While qualitatively, the researcher collected data from the respondents in their familiar environment by interviewing them using broad and general questions in order to realise a broader and deeper understanding of the issues that were being explored. This enabled the researcher to conduct an inquiry in a subjective manner.

3.2 Data Source

Gay et al. (2006) assumed an operational approach to the definition by demonstrating that data are the pieces of information which are collected and used in order to examine a topic, hypotheses, or observations. While Leedy and Ormrod (2010) used a more functional approach as they defined data. To them, data are those pieces of information that any particular situation gives to an observer. In this study, the source of data was identified secondary schools in Zambia. However, the sampling was confined to Lusaka Urban only. It would require more financial resources and time to undertake research on a bigger and more stratified representative sample which would include other geographical areas in order to ascertain the sources of ICT in secondary schools for management purposes as well as the application and enhancement of ICT in the management of secondary schools in the country.

3.3 Target Population

A population, as defined by Phiri (2006) is a group of individuals, objects or items from which samples are taken for measurements hence it refers to an entire group of persons or elements that have at least one thing in common. Mason and Lind (2015) define a population

as a collection of all possible individuals, objects, or measurements of interest. Since the study was conducted in the Lusaka district and the issue under investigation borders on establishing how ICT can be fully applied in the management of secondary schools, the researcher saw it imperative to have the target population which consisted of six (6) school Head Teachers, six (6) Deputy Head Teachers, twenty-four (24) Heads of Departments, one hundred and fifty (150) Subject Teachers, six (6) Careers and Guidance Teachers, six (6) Stores Managers and six (6) Accounts Officers who are the ones most likely to utilise ICTs in the performance of their functions. Selection of the above target population was based on the fact that the selected groups comprised of the key sectors involved in the enhancement of ICT in the management of secondary schools. The researcher believed that this target population would inform the study adequately and accurately.

3.4 The Sampling Procedure

The sampling method used is purposive. Kasonde-Ng'andu (2018) defines purposive sampling as the method where the researcher non-randomly targets a group of people believed to be reliable for the study. This procedure has been adopted because the premise of this study is that both general school management functions exercised by Head Teachers, Deputy Head Teachers, Heads of Department, Careers and Guidance Teachers, Stores Officers and Accounts Officers and operational (instructional) management functions exercised by Heads of Department and subject teachers require information which is derived from the school's management information system to efficiently and effectively achieve the set goals and objectives.

The general management functions provide an environment that is conducive for learning while instructional functions directly impart knowledge of a subject resulting in effective learning by the learners. Furthermore, the overriding goal is to achieve effective teaching by teachers and effective learning by the learners while the overriding objective is to achieve a 100% pass rate in the junior and senior secondary school final examinations. Therefore, the quality of information derived by both the general management staff and the teaching staff has a bearing on the achievement of a school's goals and objectives such as to achieve effective teaching by teachers and effective learning by learners.

The sample size was two hundred and four (204) respondents, comprising six (6) Head Teachers, six (6) Deputy Head Teachers, twenty-four (24) Heads of Departments, six (6) Careers and Guidance Teachers, six (6) Stores Officers, six (6) Accounts Officers and one hundred and fifty (150) teachers of compulsory subjects at both senior and junior secondary levels, selected from six (6) secondary schools in Lusaka Urban. The sampling procedure to be employed includes Six (6) secondary schools, comprising two (2) public, two (2) grant-aided and (2) two private secondary schools were purposively chosen from Lusaka Urban, Six (6) Head Teachers, six (6) Deputy Head Teachers, six (6) Careers and Guidance Teachers, six (6) Stores Officers and six (6) Accounts Officers, one (1) from each of the selected secondary schools purposively chosen. These are the ones who routinely are expected to apply ICTs in the general management of secondary schools. It also includes twenty-four (24) Heads of Department; four (4) from any six (6) Departments teaching the nine (9) compulsory subjects, namely, English Language, Mathematics, Integrated Science, Social Studies, Religious Education, Biology, Physics, Chemistry, and Science (Physics and Chemistry) purposively selected. The four (4) departments are Literature and Languages, Mathematics, Natural Sciences and Social Studies. These heads of the department also perform administrative duties; hence they are also expected to apply ICTs in the general management of their departments.

Additionally, the sampling procedure includes one hundred and fifty (150) teachers purposively chosen, comprising twenty-five (25) from each of the six (6) selected secondary schools teaching compulsory subjects. The final number of teachers to be included in the sample may vary depending on the configuration of departments and the distribution of subjects among teachers. Where one teacher teaches more than one compulsory subject, for instance, Mathematics and Physics, the number of teachers to be included will be lower than where one teacher teaches only one compulsory subject.

3.4.1 Characteristics of the Sample

Table 1 below provides information showing the distribution of the sample.

Table 1: Sample Distribution

Respondent Type	Frequency			Sub-Totals
	Public Schools	Grant Aided Schools	Private Schools	
Head Teacher	2	2	2	6
Deputy Head Teacher	2	2	2	6
Head of Departments	8	8	8	24
Teachers **	25	25	25	150
Careers and Guidance Teacher	2	2	2	6
Stores Officer	2	2	2	6
Accounts Officers	2	2	2	6
TOTAL				204

Teachers:** The numbers of teachers per school may vary as stated in item (IV) above.

3.4.2 Sample size

Sidhu (2014) defines a sample as a small proportion of a population selected for observation and analysis, and it comprises the elements of the population considered for actual inclusion in the study. Therefore, the sample size is defined as a subset of elements taken from a population which is considered to be the representative of the population (Sidhu. 2014). The research sample comprised of six (6) school Head Teachers, six (6) Deputy Head Teachers, twenty-four (24) Heads of Departments, hundred and fifty (150) Subject Teachers, six (6) Careers and Guidance Teachers, six (6) Stores Managers and six (6) Accounts Officers who are the ones most likely to utilise ICTs in the performance of their functions. The Head Teachers, Deputy Head Teachers, Careers and Guidance Teachers and Accounts Officers perform cross-cutting general administration functions while Heads of Department combine both general administration and teaching functions. Teachers perform teaching and class

management functions. The sample size was two hundred and four (204) stratified as shown in Table 1 above.

3.5 Data Collection Process and Research Instruments

The instruments used for data collection in this study were questionnaires and structured interview guides. The Research instruments were prepared and using one secondary school, a pilot study was conducted to test them. Once it was observed that certain parts needed to be adjusted, the instruments were fine-tuned in readiness for the actual research data collection exercise. According to Wiersma and Jur (2005) “it is necessary that research instruments to be used are piloted as a way of determining their validity and reliability”. The remaining five (5) schools were then visited to seek permission from the school authorities in order for the researcher to collect data from those schools. With permission granted at all the five (5) schools, questionnaires were distributed and appointed for interviews were made. The importance of the study was explained to the respondents before completing the items contained in the research instruments so that they could understand the study and their role in it.

In-depth structured interviews were conducted with the school Head Teachers, Deputy Head Teachers, Heads of Departments, Careers and Guidance Teachers, Stores Officers and Accounts Officers while the teachers who were given questionnaires to complete handed them over to the Head Teachers or Deputy Head Teachers.

3.5.1 Data Processing and Analysis

Kasonde-Ng’andu (2018) states that data analysis refers to the process of examining what has been collected in a surveyor experiment and making deduction and inferences from it. She further explains that it is a manipulation of the collected data for the purpose of drawing conclusions that reflect on the interests, ideas and theories that initiated the study. Sidhu (2014) explains that data analysis is the process of systematically searching and arranging the raw data with the aim of interpreting it so as to increase ones understanding of the data. In the study, both qualitative and quantitative approaches to data analysis were used. Qualitative data was collected through in-depth interviews which were later analysed

according to various themes, and this involved putting common items together to produce a text report.

The themes which were used were derived from the study objectives that included nature, cause and management strategy. Quantitative data was collected from the questionnaire and was analysed using descriptive statistics by means of the Statistical Package for the Social Sciences (SPSS) software. Hence, the processing of quantitative data analysis will include a generation of various statistics such as the means, frequencies and percentages and the hypothesis testing of significance of the difference between two means of the group schools using ICTs and that of those not using ICTs for management and teaching. The data was then presented in the form of texts, tables and figures.

3.6 Validity and Reliability

The main purpose of any tool is to obtain data which is reliable and valid, so the researcher can read the prevalent situation accurately and arrive at some conclusions to offer some suggestions. However, no tool is perfectly reliable or valid hence the need for the study to be accompanied by a statement of its reliability and validity.

Heale and Twycross (2015) define validity as the extent to which a concept is accurately measured in a quantitative study and that the instrument should adequately cover all the content that it should with respect to the variable, while reliability is defined as a measure of quality in a quantitative study and it also refers to the accuracy of an instrument. In a further definition of reliability, Heale and Twycross (2015) explain that it is the extent to which a research instrument consistently has the same results if it is used in the same situation or repeated occasions. From the definitions of validity and reliability, the aim is to simply prove that with the instruments used in the qualitative approach the results are replicable hence they are reliable and the means of measurement applied accurately measured what they were actually intended to measure. Hence the results are valid.

A questionnaire is one of the common tools used when it comes to collecting research data, and its main objective is to obtain relevant information in the most reliable and valid manner. Hence the accuracy and consistency of a questionnaire is an important aspect of research methodology which is referred to as validity and reliability (Taherdoost. 2016).

To ensure validity and reliability in this research, the questionnaire which was used was first subjected to pilot research so that modifications could be made in areas where questions were ambiguous. By so doing participants were able to clearly understand the questions they were responding to. Hence they provided the answers in line with what the questionnaire intended to find out.

3.7 Trustworthiness

Credibility in qualitative studies refers to the extent to which findings and analyses of the study are realistic (McMillan & Schumacher, 2010). Rule and John (2011) explain that trustworthiness in qualitative research is often explored in terms of credibility, dependability and transferability. Blaxter et al. (2006) point out that trustworthiness for qualitative research can be enhanced by using a combination of strategies: fieldwork, multi-method strategies, participant verbatim language, multiple researchers and member checking, to mention a few.

Transferability in a study must be enhanced by comparing the similarities and differences of the findings different contexts, meaning situations, participants, groups and institutions with a likelihood that similar findings would be obtained if the study were repeated in the same context or replicated to other areas (Rule and John, 2011). The data collection period provides an opportunity for thematic analysis, preliminary comparisons and corroborations to refine ideas and to ensure the match between evidence-based categories and participant reality, which increases credibility and promotes trustworthiness in a study (Rule and John, 2011).

This study involved the researcher conducting fieldwork which involved going to the various identified secondary schools in Lusaka District over a period of three (3) weeks. During this period, in-depth one on one interviews were conducted in environments that were familiar to the participants; the secondary schools where they actually worked. The interviews were mostly conducted in the participants' offices. This also reflected the lived experiences of the participants in relation to the application, sources, allocation and enhancement of ICT in secondary schools in Lusaka District. The responses that the participants were giving resonated very well with some of the observations that were made by the researcher.

3.8 Ethical Considerations

Mcmillan and Schumacher (2006) categorically state that ethics is associated with right and wrong, appropriate and inappropriate and the acceptable and unacceptable in the field of research. In order to conduct research, certain research etiquettes must be adhered to in the study, and it is the responsibility of the researcher to ensure that these research norms are adhered to. Among the ethics which were followed in this study were that the researcher ensured that permission to conduct the research was obtained from the University of Zambia. The participants voluntarily consented to participate in this research after the researcher explained to them what the research was all about and what would be expected of participants. Therefore, participants were provided with sufficient information so as to enable them to make informed decisions on their participation in the research. The instruments that were used were structured in such a way that participants were not subjected to inappropriate or demeaning questions.

3.9 Summary

This chapter has presented in detail the research processes and methods undertaken in this study. It has methodically looked at the research design, the target population, the sampling procedure and the sample size. It has also focused on the data collection process, the research instruments used and data processing and analysis. Issues of validity and reliability, credibility and trustworthy and research ethics in this study were also resented in this chapter.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.0 Overview

Chapter four of this study presents the findings of the study under investigation. Data presented in this chapter was obtained using research instruments that included interviews and questionnaires. The data collected using these instruments and in line with the objectives of the study were presented in accordance with the generated theme(s), for data collected through interviews and in the form of charts and diagrams, for data collected through questionnaires. The objectives of the study were to: establish the source(s) of information used by school managers in the management of secondary schools in Lusaka District; investigate the level of integration in the application of ICTs in the management of Secondary Schools in Lusaka District and; ascertain how ICT can be enhanced in the management of secondary schools in Lusaka District. The chapter presents data both qualitatively and quantitatively. For qualitative data, the researcher has ensured that the actual words said by respondents (verbatim) are used while other words have been paraphrased. The results have also been presented in figures for quantitative data.

4.1 Sources of ICT Used by School Administrators and Teachers

The first objective of the study was to establish the source(s) of ICT used by school managers of secondary schools in Lusaka. The following are the findings:

4.1.1 Source of ICT Use by School Administrators

Forty- eight (48) participants were interviewed to find out the sources of ICT that are used by school administrators in secondary schools. 46 out of 48 (95%) participants reported that internet and technological devices like the phone, television, radios and computers were common sources of information for school managers in secondary schools.

Some of the views given by the participants, for example, (P3) included the following as indicated in transcribed verbatim:

The source of information commonly used to help me make certain decisions or generally find out what is happening around the school is my cell phone, the internet and the CC television system.

Another participant (P5) stated;

Internet, radios, television and computers are the most widely used tools to access information especially for school administrators like myself.

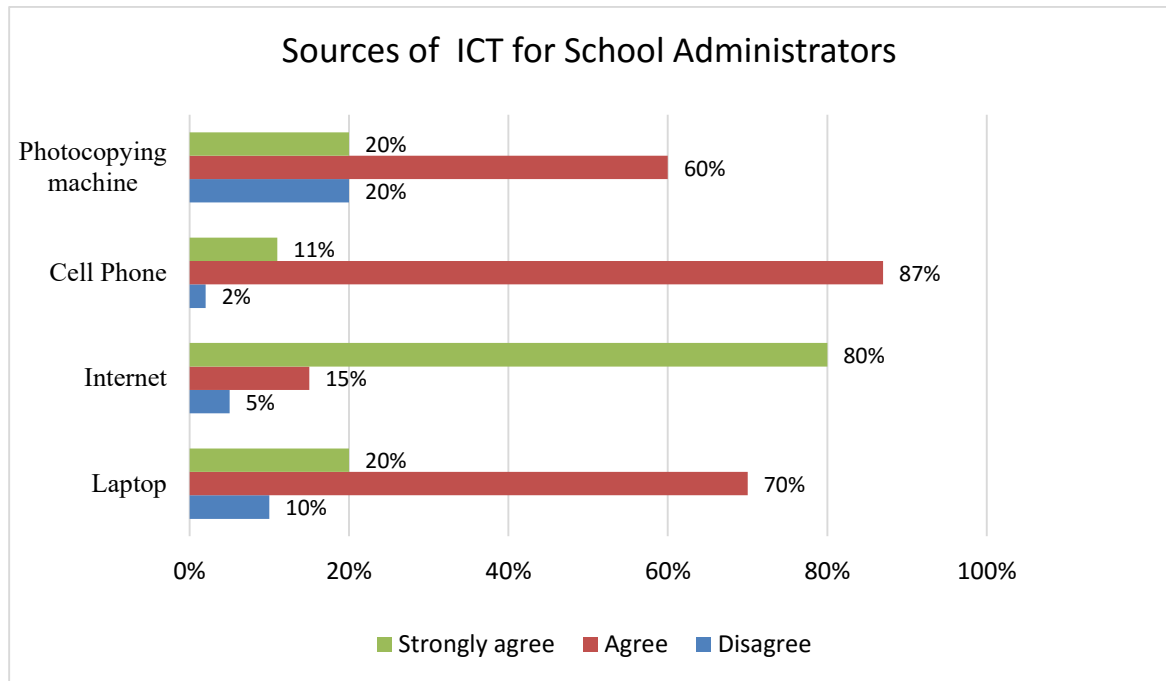
Another participant (P7) asserted;

Through news on television sets and on radio, we are able to get updates on some policies that need to be implemented in schools from the Ministry of General Education. In the school setup, I rely on reports sent to me through emails and I also do use the internet to access those emails.

Another participant (P4) said:

Without a computer, it would be hard for this office to keep track of pupils that had paid in full, those with balances and those who had not paid anything at all. But thanks to the use of computers and accounting programmes such as Pastel, which I use, pupils' accounts are accessed at a click of a button, and I am able to share information with members of the administration.

Figure 2: Sources of ICT for School Administrators



The findings from school administrators indicate that 37 out of 48, which translate into 70% of them are in agreement with laptops being a source of information in secondary schools. 10 (20%) strongly agree with this accession while only 5 (10%) are in disagreement with the use of laptops as a source of information. On the use of the internet as a source of information in secondary school management, 7 (15%) agree, 38 (80%) strongly agree and only 2 (5%) disagree. 42 (87%), 5 (11%) and 1 (2%) respectively, agree, strongly agree and disagree with the use of cell phones as a source of information. On the use of photocopying machines and printers as sources of information in the management of secondary schools, the findings showed that 29 (60%) agree, 10 (20%) strongly agree and another 10 (20%) does not agree at all.

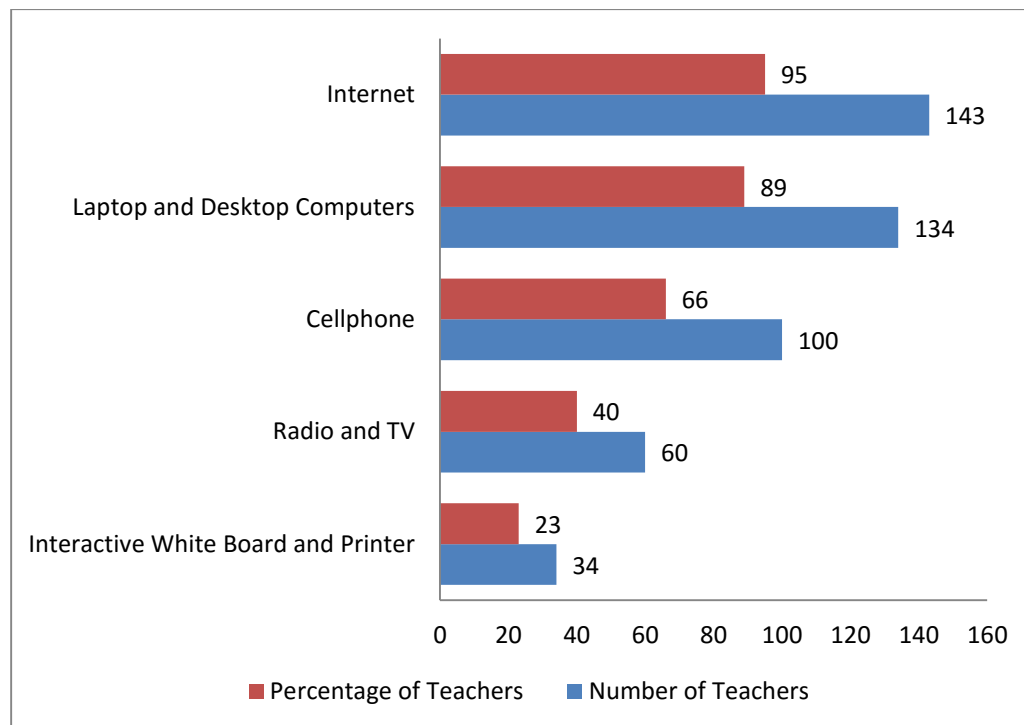
Table 2: Reasons Given for Preference of Certain Sources of ICT by School Administrator

SOURCE OF ICT	REASONS FOR REFERENCE	NO. OF SCHOOL ADMINISTRATORS	PERCENTAGE (%)
Internet	Assists in connectivity through websites to source and share information	46	96
Cellphone	Aids in communication and exchanging information anywhere at any time.	45	94
Photocopying machines	Help in creating more copies as a means of sharing information	40	83
Laptop	Aids in typing, storing and sharing information and is portable	39	81

The findings of the study revealed the reasons behind the preference of certain sources of ICT in the management of secondary schools, as shown in figure 3. It indicates that 83 per cent (40) of the interviewed school managers acknowledged the use of photocopying machines to help create more copies so that more people could access the intended information. 94 per cent (45) acknowledged that cellphones aided in communication and sharing of information anywhere and at any time, 96 per cent (46) acknowledged that the internet aids connectivity through websites and 81 per cent (39) acknowledged laptop's aid in typing, storing and sharing of information and its portability.

4.1.2 Sources of ICT for Teachers

Figure: 3 Sources of ICT for Teachers



With regard to the sources of information for teachers, the study found that 89 per cent (134) relied on laptops and desktops, 95 per cent (143) on the internet, 66 per cent (100) on cell phones, 40 per cent (60) on radios and televisions and 23 per cent (34) on interactive whiteboards and printers.

In summary, the findings established that ICT was being used as a source of information, and a number of ICT tools were being used as sources of information in secondary schools. These tools are laptops, phones, the internet, photocopying machines and printers. The said tools were used for distributing, receiving and or sharing information. However, from the findings on the sources of ICT used by school administrators and teachers, two themes emerged;

Theme 1: High usage of ICT gadgets

Theme 2: Very High Internet Application

4.2 ICT Integration in the Management of Secondary Schools

The second objective of the study was to investigate the level of integration in the application of ICTs in the management of Secondary Schools in Lusaka District. The findings are presented in themes and verbatim.

4.2.1 ICT Integration in Secondary School Management by School Administrators

Forty- eight (48) participants were interviewed to investigate the level of integration in the application of ICTs in the management of Secondary Schools in Lusaka District. 11 out of the 48 (25%) participants agreed having used ICT in planning and preparation of reports.

Some of the views given by the participants, for example, (P8) included the following as indicated in the transcribed verbatim:

ICT is used in the preparation of the schemes of work, work plans, records of work and any other document and later on such information helps for planning purposes at our school.

Another participant (P9) said:

We also use ICT when it comes to typing end of terms tests as well as recording the pupils' results on report forms which are now computer-generated.

Another participant stated:

Reports are easily prepared and accessible because of ICT, and they can be kept for a long time unlike preparing and accessing reports manually which was somewhat cumbersome.

From the interviews where forty- eight (48) participants were interviewed to investigate the level of ITC integration in the application of ICTs in the management of Secondary Schools in Lusaka District; 37 out of 48 (75%) participants agreed to have used ICT in record management and communication. Thus, record management and communication emerged as a theme in this study.

Some of the views given by the participants, for example, (P11) included the following as indicated in transcribed verbatim:

We have introduced the issue of keeping the records of pupils in a database and class teachers, and the accounts officer are expected to update the information as frequently as necessary.

Another participant (P16) added:

The filing system has moved from only having hard copies to having information on softcopy as well for the pupils' records and that of members of staff and support staff members. Hard copies are kept in individual files and soft copies on the computer.

Another participant (P20) said:

The use of WhatsApp as the channel of communication between administration and teachers has proved to be useful as information can reach everyone in a short time.

Yet another participant (21) said:

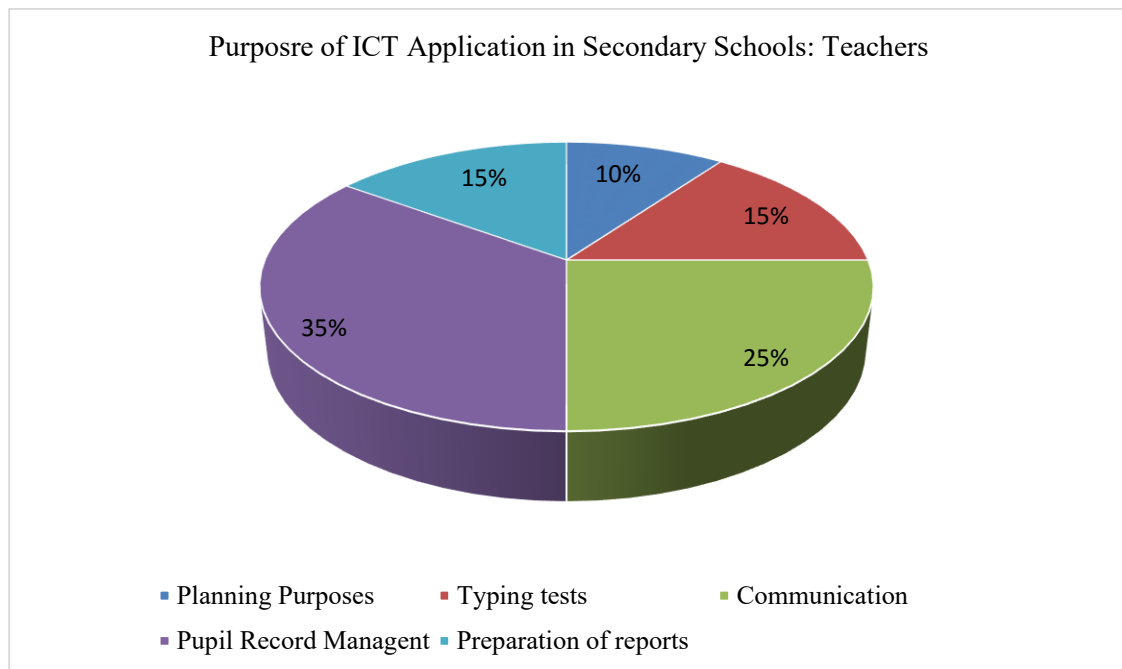
ICT helps us to be well informed before making decisions, and this is done through nicely stored reports that are kept in the school database.

Table 3: Cross-tabulation of Emerging Themes from ICT Integration in School Management by School Administrators

Emerging Themes	ICT Integration In Management of Secondary Schools					Total
	Strongly Disagree	Disagree	Neutral or No Opinion	Agree	Strongly Agree	
Planning And Preparation Of Reports	0	37	0	11	0	48
Record management and communication	0	11	0	37	0	48
Total	0	48	0	48	0	

This cross-tabulation shows that among school administrators, there is a low application of ICT in planning and preparation of reports and high application in record management and communication.

Figure 4: Purpose of ICT Integration in Secondary Schools: Teachers



The findings in Figure 3 from respondents who were teachers indicated that 10% (15) have used or have seen others use ICT for planning purposes at their schools, 15% (22) indicated that ICT was used in typing of tests for the end of term assessments, 25% (37) agreed of ICT being used for communication with management in the school, 35% (52) agreed of ICT being used in the pupil record management, and 15% (22) agreed that ICT was being used to prepare various reports in school which included reports to HODs and other relevant members of staff in the school and these reports were in most cases submitted to the headteachers.

The study established that ICT was commonly used in secondary schools. The findings revealed that among teachers, ICT application was higher in record management and communication compared to its application for planning purposes and preparation of reports and typing tests.

Therefore, in line with the integration of ICT in secondary school management, two themes emerged.

Theme 1: Low Application of ICT in Planning and Preparation of Reports and

Theme 2: High Application of ICT in Record Keeping and Communication.

It is worth noting that the majority of the respondents used ICT for record management and communication as compared to the planning and preparation of reports. To this end, school management should consider allocating more funds towards the procurement of ICT tools and installing fast internet WIFI to boost this development.

4.3 Enhancement of ICT in the Management of Secondary Schools.

The second objective of the study was to ascertain how ICT can be enhanced in the management of secondary schools in Lusaka District. The findings are presented in themes and verbatim. The results showed that two themes emerged from this objective.

4.3.1 Acquiring Gadgets

Forty- eight (48) participants were interviewed to ascertain how ICT can be enhanced in the management of secondary schools in Lusaka District. 14 out of 48 (30%) participants agreed that acquiring computers could enhance the use of ICT. Thus, acquiring computers emerged as a theme in this study.

Some of the views given by the participants, for example, (P18) included the following as indicated in transcribed verbatim:

We are trying to increase on the number of desktop computers we have in the computer laboratory so that during practical exercises we don't take a long time to finish as has been the case in the past. We have also ensured that we have back up the filing of soft copies which is easily accessible and our ICT personnel and teachers have done a very good job though we are still upgrading.

Another participant (P24) said;

We procure desktop computers at this school at least once in a year to replace those that no longer function. We also have internet access at this school in selected areas, and teachers do have access to these facilities so that they can use them to carry out their duties more efficiently.

4.4.2 Improved and Free to the Internet and ICT Tools.

Forty- eight (48) participants were interviewed to ascertain how ICT can be enhanced in the management of secondary schools in Lusaka District. 33 out of 48 (70%) participants agreed that free internet access and granting use of ICT tools could enhance the use of ICT. Thus, free internet access and granting use of ICT tools emerged as a theme in this study.

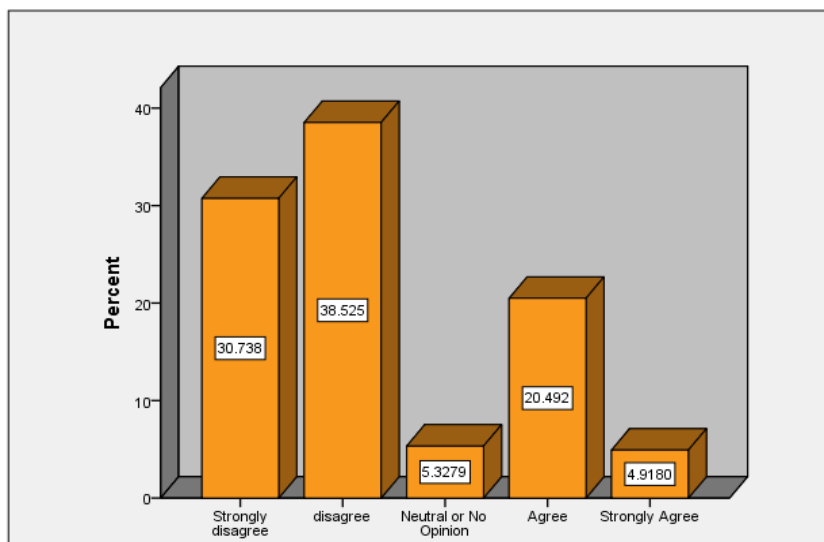
Some of the views given by the participants, for example, (P26) included the following as indicated in transcribed verbatim:

Having free WIFI helps members of staff to access information easily within the school premises, and our teachers can use the computers in the laboratory at any time they feel like for research purposes and preparation of reports.

Another participant (P25) said;

Departments have computers so that teachers can use them for various purposes aimed at helping learners. We also have free WIFI in designated areas so that all teachers have access to the internet.

Figure 5: Presentation of Participants Views on the Emerging Themes on ICT Enhancing in School Management.



Under figure 4, the study attempted to determine the participants' views on how identified themes such as procurement of computers and granting free access to the internet and ICT tools can enhance ICT application in the management of secondary schools. The findings showed that 31 per cent (15) of the participants strongly disagree, 39 per cent (19) disagreed, 5 per cent (2) were neutral, 20 per cent (10) agreed and 5 per cent (2) strongly agreed. This simply shows that there is more than can be done to enhance the usage of ICT in the management of secondary schools other than the procurement of computers and granting free access to the internet and ICT tools.

Figure 6: Efforts Noted by Teachers on the Schools' Efforts in the Enhancement of ICT Application in the Management of Secondary Schools

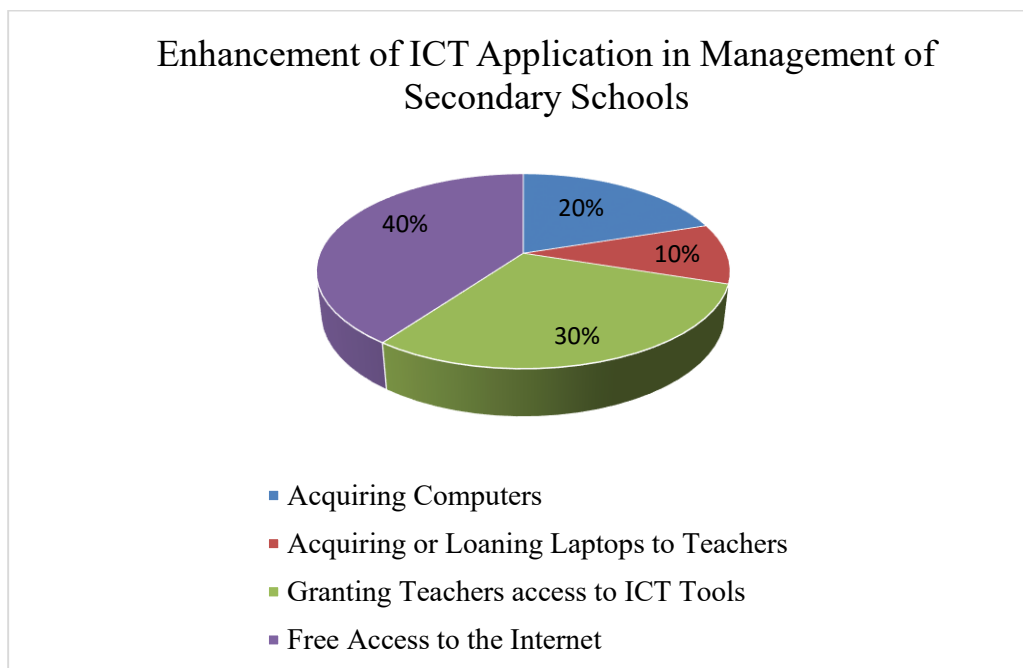


Figure 5 above shows the teachers' views on how the application of ICTs in particular secondary schools is being enhanced. The findings from teachers showed that 20 % (30) of them were revealed that the enhancement of ICT was being achieved by acquiring more computers at their schools in addition to what was already available, 10% (15) said that as a means of enhancing ICT application in their schools, the school administration had

embarked on a project of procuring laptops for teachers or loaning them out to teachers so that they could easily access and disseminate information, 30% (45) stated that at their schools, to enhance ICT application among teachers to help them source information, school administrations had deemed it fit to allow teachers to do their work using ICT tools at their school and 40% (60) of the respondents pointed out that teachers needed to have free internet access when they were at school so that they could easily source information.

Table 4: Perceptions of School Managers and Teachers on How ICT Enhancement in the Management of Secondary Schools is Beneficial.

Benefits from ICT	Respondent	Percentage
ICT assists in fast communication on urgent issues within the school.	159 (198)	80 %
ICT simplifies data storage and sharing.	140 (198)	70 %
ICT helps in lesson planning and improves learning outcomes.	126 (198)	64 %
ICT eases access to information for planning purposes by the school management	110 (198)	55 %
ICT aids in the research of information by both teachers and school managers.	70 (198)	35 %

The table above shows the perspectives of teachers and school managers on how the enhancement of ICT in the management of secondary schools can be beneficial. The findings show that 70 per cent (140) of the respondents were of the view that ICT simplifies data storage and sharing, 55 per cent (110) thought that ICT eases access to information for planning purposes by the school management, 64 per cent (126) believe that ICT helps in lesson planning and improves learning outcomes, 80 per cent (159) were of the view that ICT assists in fast communication on urgent issues within the school and 35 per cent (70)

said that ICT aids in the research of information by both teachers and school managers. These findings justify why respondents were also in support of acquiring of computers and granting free internet access among other strategies aimed at improving the application of ICT as they acknowledged the significant impact of using ICT in the management of secondary schools.

The study established that ICT can be enhanced by acquiring computers, procuring or loaning laptops to teachers, granting teachers easy access to ICT while they were at school as well as according to them access to free internet through wireless connection or any other type of internet connection when they are at school.

From the study, two themes emerged;

Theme 1: Improved and Free Access to the Internet and ICT Tools

Theme 2: Acquiring ICT Gargets

4.6 Summary

Chapter Four has offered the findings of the study. These findings have been presented in conformity to the themes that emerged in line with the specific objectives of the study. The succeeding chapter offers a discussion on the findings of the study.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 Overview

The preceding chapter presented the findings of the study on ‘understanding the sources, application and enhancement of ICT application in the management of selected secondary schools in Lusaka District. This chapter presents an in-depth discussion of the research findings based on the data collected, analysed and interpreted with the help of the objectives of the study which were to: establish the sources of information used by school managers in secondary schools in Lusaka District so as to understand the reliability and quality of information used in decision making; assess the level of integration of the application of ICTs in the management of secondary schools in Lusaka District, and ascertain how ICT can be enhanced in the management of secondary schools in Lusaka District. This is in relation to both the literature review and the findings of the study as presented in the tables and figures.

5.1 Source of ICT Used By School Managers

The first research question focused on the sources of ICT that are used to source information used by school managers as they performed their day to day duties in secondary schools in Lusaka District. This question’s quest was to understand the sources of ICT school administrators and teachers were using to access and source information in secondary school management as they executed their respective daily responsibilities.

5.1.1 High Usage of ICT Gadgets

The research findings under this theme indicated that a number of technological devices were used as sources of ICT in secondary schools. Among these ICT tools were the internet and other technological gadgets such as cell phones, radios, television sets, printers and photocopying machines. These tools were commonly used by school managers in line with the performance of their daily and respective duties in secondary schools, in Lusaka District. In line with the above, it was also indicated that the sources of ICT used by school managers to source information in their schools when it came to school management were cellphones, the internet, laptops, printers and photocopying machines as the leading sources of information among them. In reference to the findings, 70% of the school managers were in

agreement pertaining to laptops being a source of information in secondary schools. On the use of the internet as a source of information in secondary school management, 80% of the school managers strongly agreed to that assertion. In comparison, 87% were in agreement with the use of cell phones as a source of information. On the use of photocopying machines and printers as sources of information in the management of secondary schools 60% of the school managers were in agreement.

The findings of the study are in agreement with UNESCO (2020) which outlines the many records that need to be generated, stored, accessed and manipulated on a regular basis in order for the school managers to perform their duties and achieve the goals of their respective schools.

With the many tasks needed to be performed, it is no wonder that there is a preference by school managers to employ ICT gadgets. This reflects the support of using ICT tools such as computers which have resulted in the application of information management systems software such as DBMSs. When used in the management of educational institutions, DBMSs provide most of the required features for generating, storing, accessing and manipulating records beneficial to secondary school management. For instance, a student database management system will enable better and easier communication where the school can easily communicate with the pupils or their parents or guardians; a simplified admission process where new students can easily apply online instead of lining up at the head teacher's office looking for school places, a faster attendance management system where pupils' and teachers' attendance is easily monitored and if the frequency of absenteeism goes beyond the norm then alarm is immediately raised by management before waiting for termly reports; a report management system where reports from various departments and individuals are accessed at a click of a button through the report centre in the school database management system and an automatic timetable generator which is used to generate school master timetables to be placed in the headteachers and deputy headteachers' offices, departmental timetables placed in departmental offices and individual timetables which teachers place in their individual teaching files. Having this in place lessens the time spent on manually generating reports such as drawing the school timetable, among others (Fedena (2019). There are several models of DBMSs that are used in school management, but the most

popular is the Relational Database Management System (RDBMS), Hierarchical Database Management System (HDBMS) and Network Database Management System (NWDBMS) (Aljarallah 2014).

Furthermore, Kawade (2012) said that it is important that schools maintain accurate and up to date information at all the levels of institutions and this can be adequately achieved through the application of ICT. ICT application in learning institutions helps to keep records such as pupils' records and members of staff records as well as other important records relevant to school management. It also aids in results analysis to ascertain the level at which the school is achieving its core objectives of effective teaching and learning. This process is done effectively and without wasting too much time. In addition, we saw from the findings that Headteachers and Deputy Headteachers relied on ICT tools like emails, internet and cell phones to carry out their duties and this makes the school managers able to make efficient decisions when they get correct and up-to-date information through the school management information systems. Decision making is the heart of educational management. Daily, problematic conditions that require decision making are based on the complicated and unexpected nature of school environments.

For this reason, as a problem solver, the educational administrator has to gather and analyse information continuously (Makewa et al. 2013). In addition, managers have been required to make more decisions in short periods of times because of the increasing expectations from the educational system. Through the application of ICTs, the decision-making process has been made easier. Therefore, crucial decisions are made within a short space of time. This is indeed time-saving on the part of school managers, looking at the frequency at such decisions have to be made in the present day's complex schools. In order to make decisions under these conditions, continuously gathering up-to-date data that can be stored, accessed and analysed timely is an obligation on the part of school managers.

The researcher is of the view that there's more that needs to be done other than simply utilising ICT sources like cellphones, printers, radio and television sets. School managements should also consider putting in place specific Information Management Systems in their respective schools to enable school managers to become even more efficient and effective in school management. It is also prudent that all the members of staff

are educated on the importance of ICT application in their line of duty, as well as give them guidance on how technological devices can be used in their line of duty as a means of professional development. This would help them exhibit their full potential including the attainment of the full utilisation of ICT tools for the benefit of their respective schools. In addition, the findings showed that most respondents relied on the internet, the use of laptops and desktops to access information. This should make school managers be more prudent towards the acquisition of computers in their respective schools. Sadly, it was noted that very few teachers or school managers used interactive whiteboards; the kind of ICT tool that can undoubtedly improve the teaching and learning process in schools. Based on the findings of this study, only 23% of the teachers used an interactive whiteboard. This anomaly should compel the Government through the Ministry of General Education (MoGE) to consider installing these technological devices in schools looking at their potential to improve learning outcomes and help managers make rational decisions.

5.1.2 Very High Internet Application

Under this theme, the findings of this research indicate that both the school administrators 80 per cent of them and the teachers; 95% viewed the internet as a source of information as well as a means through which information is shared. Information is the biggest advantage which the internet is offering. There is a huge amount of information available for every subject. It keeps us up to date with the latest information regarding the subjects in which we are interested. Due to the rich content of information that can be accessed on the internet, it has come to be used as an appreciated additional planning and teaching resource, it was found that the teachers think that the Internet is a valuable source of information and an important additional teaching tool.

In an article on by the Asian School (2019) on the role of the internet in education, it is explained that teachers use the internet to plan lessons and teach and this motivates pupils to learn. The learning process becomes interesting and diverse with the use of the internet as teachers can teach with the use of animation, PowerPoint slides, and images to capture the students' attention. Apart from teaching the internet is also used in schools as a means of communication. Correspondence and report forms to communicate the pupils' progress to parents can easily and efficiently be sent via e-mail. This gives an opportunity for parents

to interact as well as communicate with teachers and school authorities about their children's performance in the school. The internet has allowed students to be in constant touch with their teachers or with other fellow classmates with the help of social media, messaging apps and chat forums as has been witnessed during the closure of schools due to the coronavirus outbreak. During this period, pupils have been able to learn or access school work through the use of the internet. The Internet has become a major tool for effective teaching as well as a learning tool. Teachers can use it as a teaching tool by posting their teaching materials on the school website or forum (The Asian School, 2019). Considering that the school administrator is expected to play an important role in integrating and coordinating the efforts of teachers, in achieving the core objective of the school which is effective teaching and learning (UNESCO, 2005), he or she is also able to use the internet to observe and monitor all the online activities pertaining to the delivery of lessons and other school-related activities.

5.2 ICT Integration in the Management of Secondary Schools

The second objective of this study was to assess the level of integration of the application of ICT in the management of secondary schools in Lusaka District. In order to realize this objective, the research question which was posed and was answered was the extent to which the application of ICTs was integrated into the management of secondary schools in Lusaka District.

5.2.1 Low Application of ICT in Planning and Preparation of Reports.

From the study, one theme that emerged was the application of ICT for the planning and preparation of reports. Participants were asked to what extent the application of ICTs was integrated into the management of secondary schools in their respective school, and it was reported that their response was that ICT was mostly used for planning and preparing reports. However, this was on the lower side as, from the findings, 25 per cent of the school administrators agreed that they used ICT in planning and preparing reports. In contrast, for teachers, 10 per cent agreed that they used ICT for planning, 15% used it for typing, while another 15% used it for preparing reports. Despite the low application of ICT in planning and preparation of reports, in line with their duty, school administrators and teachers need

to plan ahead and make reports to their immediate supervisors based on their achievements, on a regular basis and ICT has become a common tool used to have this done efficiently and on time. This is one of the ways in which information in secondary schools flows easily and timely and based on that same information, informed decisions are made in secondary schools in Lusaka District.

This finding is in agreement with Ndiku et al. (2014), who stated that data management in schools is essential for effective planning. He also states that data management in schools plays a vital role in the teaching and learning process leading to student success in the national examinations which in itself is an attained set goal. In such a setup, information flow enables both teachers and school administrators to have accurate information on students. It equally helps them to analyse results efficiently and within record time. In the same vein, they are able to generate timely reports and most importantly, teachers are able to teach the pupils using up-to-date information as they were able to research on the internet. Yusuf (2005), cited by Adomi and Kpangban (2010) observes that the field of education is one of the sectors which has been positively affected by the application of ICTs as it has led to the improvement of the quality of teaching, learning, and research. They state that ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students as well as to help them relate school experience to work practices, create economic viability for future workers and in addition strengthen the teaching and learning process, thereby helping schools change for the better especially where providing quality education is concerned. The said study acknowledges the Federal Government of Nigeria's National Policy on Education which recognizes the prominent role that ICTs play in the modern world, and has thus integrated ICTs in the education sector in Nigeria and is committed to providing basic infrastructure and training at primary school, junior secondary and senior secondary school levels.

The researcher noted with deep concern that ICT was not being applied extensively as compared to the next theme, which is record management and communication as shown on the cross-regulation in the discussion of the findings. Regarding the vital role that ICT application plays in improving school management, it should lay upon the school management to consider full utilisation of ICT in the area of planning and preparation of

reports. In addition, training of teachers and school managers by organising workshops on how to apply ICT in planning and report preparation and its importance in school management must be considered in schools where members of staff expressed lack of interest in ICT application. This will provide such school managers and teachers the required knowledge and skills in using technological devices and would also enable them to become more efficient and effective in the performance of their day to day duties with ease.

5.2.2 High Application of ICT in Record Management and Communication.

Another theme that emerged from the findings was that ICT was used by school administrators and teachers for record management and communication in the management of secondary schools in Lusaka District. The study shows that 75% of school administrators were in agreement to the application of ICT for record management and communication while 35% of teachers used ICT for record management and another 25% used it for communication. In the findings of this study, participants expressed that records stored using ICT tools were easily accessed. The findings also showed that accessing, receiving and sending information using ICT was immediate, thereby saving on time where communication was concerned.

Chidobi (2015) defines record management in schools as the ability to arrange and maintain all the important school records for the purpose of retrieving information when need be. Ensuring that school records are well kept and are updated on a regular basis was a mammoth task before the introduction of ICT in school management. Thanks to the fast-growing world of technology as Chidobi (2015) points out, effective management of records can be achieved through the application of ICT. Through the application of ICT, information (in-put) is recorded, stored and retrieved (output) to be used for the purpose of activities such as planning. Therefore, this change in information management has also affected the management of schools. Effective school management which heavily relies on the availability of information has greatly benefited from the application of ICT in school record management (Chidobi 2015). ICT through the application of information systems such as School Management Information Systems (SMIS) has changed school management in the areas of leadership, decision making, workload, human resource management,

communication, responsibility and planning (Ghavifekr et al. 2013). Strategically, School Management Information Systems (SMIS) helps school managers in determining the aims of the school, making long term plans, distributing resources, and forming educational methods for the future, determining performances of teachers and the success of the school (Shah 2014). In this way, school biased management systems such as Management Information Systems (SMIS) can also be used as a tool to initiate or awaken educational leadership skills in the school manager.

School managers and Heads of Department in secondary schools are required to write a lot of reports about the progress of their work, and as Condie and Munro (2007) put it the introduction of ICT application in school management in secondary schools has resulted in school administrators being relieved of the burden of a heavy workload. The ease of the workload on school managers is due to the fact that they can generate reports in a short period of time as well as send them in no time to respective offices in the Ministry of General Education or related government offices, unlike in the situation where they are generated and disseminated manually. The process of generating and disseminating reports manually generally tends to be cumbersome and in certain cases may give inaccurate information as the message may have been distorted, or data misinterpreted as the manual generation of data is highly subject to this kind of mishaps, compared to when the automated process is used through the application of ICT.

Communication has also been made easy with the use of social media platforms and chats sites, emails, websites and many other platforms (Froment et al. 2017). The use of interactive whiteboards and projectors makes lesson delivery highly interactive and helps learners to easily understand what they are learning. This, in turn, makes teaching relatively easy on the part of the teacher. Abdallah (2016) explains that through the use of technology in lesson delivery, interactive teaching and learning is promoted, and this results in improved performance on the part of learners and effective teaching on the part of the teacher. The researcher observed that results from the cross-tabulation showed that ICT was widely used in record management and communication. Based on the findings of this study, Forty- eight (48) participants were interviewed to investigate the level of integration in the application of ICTs in the management of Secondary Schools in Lusaka District. 37 out of

48 (75%) participants agreed to have used ICT in record management and communication. The study, in line with the illustration from the cross-tabulation, shows that majority of the respondents used ICT in record management and communication as compared to planning and preparation of reports. To this end, school management should consider allocating more funds towards the procurement of computers and installing fast internet WIFI to boost this development. This observation is very encouraging and schools that had embraced the application of ICT in school management must be encouraged to continue as it positively contributed to the improvement of the learning process.

The findings of the study are that ICT was used for planning purposes, typing, communication, writing reports and pupil record management by the school management.

5.3 Enhancement of ICT in the Management of Secondary Schools

The third objective of this study was to ascertain how ICT could be enhanced in the management of secondary schools in Lusaka District. In the quest to address this objective the research question sought to find an answer to how the application of ICT in the management of secondary schools in Lusaka District could be enhanced, and through the research findings this question was answered and two themes evidently emerged; free access the internet and procurement of computers.

5.3.1 Procurement of Computers

Another theme that emerged from the study was the procurement of computers in secondary schools as a way of enhancing access to ICT. Computers, as Mtanga (2012) points out, is the most used ICT too in Zambian high schools for both teaching and learning and administrative purposes. The call for the procurement of more computers reflects the importance that is attached to it as a source of ICT by school managers. With the computer as an ICT tool, planning, preparation of tests, typing of reports and accessing the internet, among other activities that can lessen the workload to some extent, is easily achieved. This complies with most school managers whose knowledge in ITC application is basic; hence the said activities are the most they can do and on computers. This is in line with Mtanga et al. (2012) who in her research observed that in administration, the computer was being used as an advanced typewriter because it was mostly used for typing reports and

correspondence. In the same vein, the computer uses the most common and cheap software applications. For administrative purposes, school managers use Office tools such as Microsoft Office (Word, Excel and PowerPoint). (Mwalongo, 2011).

The rate at which technology is advancing means that every latest manufactured ICT tool comes with new technology and is a better version than the previous production in terms of functionalities. According to Ghavifekr et al. (2013), computers and other ICT hardware evolve. Hence new computers create new opportunities especially in education administration to make performing management duties easier, faster and cheaper.

Most secondary schools in Zambia do not have enough financial resources to put in place sophisticated data management systems such as the Database Management System to effectively manage information and be even more effective. However, the closest they can get is through the use of computers which are used to store various documents to replace the manual files. Ghavifekr et al. (2013) explain that DBMS is very expensive and the alternative when it comes to information management, are computers which are cheaper. He further explains that computers can be used for the storage of documents. This results in replacing physical files with electronic ones and in the process space are created.

Makewa et al. (2013) point out that living in the information and technology age, it is important that school educators must be conversant with ICT application and for that reason they must also possess computing capabilities. Leading by example, calls for the leader to encourage others to do what he or she is doing. Procuring computers is one such way that school administrators can enhance ICT application in the management of their schools. Citing studies in the United Kingdom, the Netherlands, Malaysia and South Africa done by Visscher et al. (2003) and Tearle (2004), Makewa et al. (2012) explain that school educators need to equip their schools with appropriate computer facilities and related infrastructure to optimise the application of ICT in their teaching and administrative engagements. The efficiency and effectiveness in school management that is associated with ICT application should be reason enough for school managers to take full advantage and make available in their schools basic ICT tools as they are a fundamental requirement for effective school management. Qureshi (2016) argues that if the education system is incapable of satisfying the schools' need for ICT tools then such a system should be viewed as being ineffective. He

goes on to justify his argument by stating that user satisfaction is the most widely used variable for measuring an organisation's success because there exists a strong correlation between this variable and the organisation's performance.

Procurement of computers as a means of enhancing ICT application is also in agreement with The Inspectorate (2008) where it is expressed that in order to develop ICT skills the level of infrastructure need to be improved and schools and classrooms need to be equipped with computers, broadband internet, fixed data projectors and screens and this would reduce student computer ratio. The use of the PowerPoint when teaching is to make lessons more interesting hence the teaching and learning process is more effective (Mwalongo 2011).

From the findings, it was found that most schools did not have enough computers in their computer laboratories to be shared between teachers and pupils, and some teachers did not even have a laptop of their own. Maintenance of computers was also very poor in most schools and this led to the hindrance in the application of ICT in the management of schools. In this study, we saw that only 20% of the interviewed teachers agreed of having heard that their school was procuring computers for the school so that they could have access to them while they are at school. This hinders ICT improvement in that teachers are restricted to using computers only in computer laboratories.

5.3.2 Improved and Free Access to Internet and ICT Tools

In relation to the enhancement of ICT application in the management of secondary schools in Lusaka, one of the themes that emerged was the provision to school managers and teachers free access to the internet and other ICT tools while they are in school. Although this is the popular desire among school managers, financial and other restraints such as load shedding and other challenges like inadequate infrastructure in most schools in Zambia has hindered them from making this a reality. For example, one of the participants explained that:

Free access to the internet can enhance the ICT application. Like at one of the schools free internet and access to ICT tools were available, but this access could not be relied upon because sometimes the school did not pay the internet providers due to lack

of funds and when it was paid school managers still could not access them regularly due to load shedding.

In line with the findings of this study, schools in Lusaka are doing their best to use ICT. However, one of the hindrances to the application of ICT in secondary schools that were commonly observed was the lack of a reliable supply of electricity. The available literature confirms the well-known fact that the East African countries face a shortage of electrical energy supply. In Tanzania, the national electricity grid is limited to commercially viable areas missing out most of the schools in the rural areas. This, together with frequent power outages and power cuts, has increased the cost of owning ICT infrastructure (Farrell, 2007) and made it almost impossible for schools in the rural areas to access and use ICT in education.

In Uganda, where a number of schools have computers and internet access; though some are not connected to the internet, and some schools lack electricity. “The computers are normally set up in one-room laboratories with 10 to 20 machines. A television receiver with a VCR may be included depending on the reception capability. Use of the facilities is scheduled two or three times per week per class but congestion is frequent because of large class sizes” (Farrell, 2007, pp.7-8) following the policy’s emphasis on the importance of ICT. Likewise, from the respondents in the schools that were interviewed, we saw that they mostly procured second-hand computers, and once in a while or only depended on donor aid which made these computers not very reliable in most cases. These computers tend to be insufficient in most schools due to high enrollment levels at secondary school level and the fact that ICT as a subject has been made compulsory for all the pupils especially at the junior level. In most cases the available machines were not well maintained, hence they tended to stop working or breakdown when they were most needed.

Kenya and Uganda equally face similar electrification challenges. In these countries, hydro-power constitutes the bulk of energy supply. Other major sources of commercial energy include petroleum and biomass energy resource such as fuel-wood and charcoal, causing a sharp rise in deforestation in the region. Alternate sources such as wind and solar energy options have not been exploited to their full capacity. However, small-scale funded projects are currently exploring alternate power supply options for the schools in East African

countries. Erratic electricity supply with occasionally lengthy blackouts limits the use of ICT in schools. Likewise, areas like Kaunda Square and Mumana complained that electricity was affecting the use of ICT because of long hours of blackout due to load shedding.

Mbatia (2014), in his study, found that the majority of principals do not use any form of ICT in their schools and do not have any formal training in human resource management. Similarly, the application of ICT to monitor human resource in their schools was never done. His study also revealed that a number of principals have not had any form of ICT in-service training. Those who underwent any such form of training only did so once in a year. The same high number of principals was recorded as not using ICT in recruiting and selecting the human resource. Based on the findings of the study which reveal an extremely low if any application by principals of ICT in school management the study suggests that certain approaches should be put in place in order to enhance ICT applications in the concerned schools. Among the suggested approaches were to: increase the number of ICT tools and train principals in ICT application, have in place a variety of ICT tools and request the government to donate to public schools ICT tools which would facilitate human resource management in public secondary schools.

Furthermore, the researcher points out that the challenges of ICT integration in the management of the human resource in public secondary schools can be attributed to inadequate facilities and inadequate funds, negative attitude towards ICT application by principals, lack of trained personnel, high cost of installation and maintenance of computers and computer failure. From this study, only a limited number of respondents said that they faced no challenges in integrating ICT in the management of the human resource in public secondary schools. These challenges are almost identical in most African countries and it requires strong willpower by respective governments to facilitate the enhancement of ICT application in secondary school management so that the benefits that come with its integration and application in school management may be realised.

The study revealed that ICT application in secondary school management could be enhanced by schools procuring computers and ensuring that members of staff had access to ICT tools and free WIFI if not for the challenges faced.

5.4 Summary

The chapter discussed the findings of the study and exposed their connection to understanding the sources, application and enhancement of ICT application in the management of secondary schools in Lusaka District. This chapter also established that the objectives of the study were addressed. The subsequent chapter will provide the conclusion and remarks to the major findings, recommendations as well as suggest future research.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.0 Overview

The previous chapter discussed the findings of the study. This chapter presents the conclusions and recommendations which were made based on the research findings and discussions of the study. The conclusions were presented in line with the objectives which were to: establish the source(s) of information used by school managers in secondary schools in Lusaka, investigate the level of integration in the application of ICTs in the management of Secondary Schools in Lusaka District and ascertain how ICT application can be enhanced in the management of secondary schools in Lusaka District.

6.1 Summary of the Dissertation

In chapter one, the study presented a background of literature on why the application of ICT in the management of secondary schools is important. This was followed by presentations of the statement of the problem, the purpose of the study, the research objectives and research questions, the significance of the study, the conceptual and theoretical frameworks and finally the clarification of terms. In chapter two, the study reviewed relevant literature on the concept of ICT application and its role in educational management, the source and integration of ICT in education and related studies that have been done on the application of ICT in educational management. Chapter three offered the research methodology, the research design, target population, research sample, research procedure and the analysis of the study. In Chapter four, the study presented the study's findings on sources of information, how ICT is being applied in educational management and how it can be enhanced. In chapter five, the study offered a discussion on the themes which emerged in chapter four.

6.2 Conclusions

The purpose of this study was to understand the sources, application and enhancement of Information Communication and Technology (ICT) application in the management of selected secondary schools in Lusaka District. In so doing the study focused on establishing the sources of ICT in secondary schools, how they were being applied and enhanced by

school administrators in order to benefit their day to day responsibilities. From the findings which were in line with the objectives of the study, a number of conclusions were made.

6.2.1 Sources of Information Communication and Technology in Secondary School

Regarding the first objective which sought to establish the sources of information used by school managers in secondary schools, the findings indicate that ICT was being used as a source of information, and a number of ICT tools were being used for that purpose in secondary schools. Most school managers used cell phones, emails, the internet, and social media platforms as a means of sourcing information. Through the application of ICTs school managers said that they were able to get updates concerning educational policies as well as monitor both teachers and pupils. While the information that was accessed from ICT tools helped school managers to make informed decisions. Furthermore, accessing information using old methods or ways of sourcing information was still viewed as functional and important.

With regard to investigating the level of integration in the application of ICTs in the management of Secondary Schools in Lusaka District, it was found that school managers were using ICT in carrying out their day to day responsibilities. Their expression was that they were applying ICT in the management of pupils' records, typing local assessments such as the end of term tests, for communication between teachers and administrators and for typing and sending reports and correspondence to respective offices at the Ministry of General Education on the part of administrators. The Internet was also being used by teachers for researching as they prepared their lessons.

Lastly, on the Objective which seeks to ascertain how ICT can be enhanced in the management of secondary schools in Lusaka District, it was found that management in most schools had planned to procure more computers to add to what the schools already had, although the said gesture was still short of the ever-growing need for ICT application. It was viewed that procuring more computers would increase accessibility ICT tools, thereby enhance its application. Coming to free access to the internet and other ICT tools, school managers were of the view that having free access to the internet would encourage the application of ICT among them thereby enhancing its application in school management. The study also found that in schools, though it was only in selected areas, not all teachers

had knowledge or any interest in ICT application. Despite the availability of ICT tools in all the schools visited as evidenced by the presence of laptops, desktops and internet control boxes in some of the offices where interviews were conducted, not all the teachers had adequate knowledge if any at all to effectively use ICT for the purpose of school management.

6.3 Recommendations

The application of ICT in secondary schools is very important for school administrators and teachers in order to carry out their duties smoothly. In this regard, and based on the findings of the study as well as the discussions thereof, the following recommendations were made:

1. Teachers and school administrators should increase their knowledge of ICT so that they can fully utilise it when executing their duties.
2. Schools should be proactive when it comes to the maintenance of available institutional ICT devices.
3. School managers should lead by example by being seen to be using ICT in the line of their duties.
4. Schools should consider investing in other sources of electricity, such as generators and solar power as a way of enhancing the application of ICT in secondary schools.
5. Schools can also initiate projects of course after getting clearance from the Ministry of General Education (MoGE) to procure generators as an alternative source of electricity to avoid interruptions of ICT application which in certain cases affect the smooth flow of information, thereby interrupting the smooth running of schools.

6.4 Suggestion for Future Research

Regarding the major findings of this study, we would like to make a proposal for future research in the following areas:

1. Establishing value addition to secondary schools through the application of ICT in school management.

REFERENCES

- Abdallah A. (2016). *The Effects of the Interactive Whiteboard and Power-Point*
- Adeyemi, T.O. & Olaleye, F. O. (2010). *Information Communication and Technology (ICT) for the Effective Management of Secondary Schools for Sustainable Development in Ekiti State, Nigeria*. American-Eurasian Journal of Scientific Research. 5 (2), 106-113.
- Adomi, E., & Kapangban, E. (2010). *Application of ICTs in Nigeria Secondary School*. Library Philosophy and Practice. 28(3), 24-35.
- Afzaal, H. (2012). *A Preliminary Study of School Administrators' Use of Information and Communication Technologies; Bruncian Perspective*. International Journal of Education and Development using Information and Communication Technology. 8(1), 29-45.
- Aina J. K. (2013). *Effective Teaching and Learning in Science Education through Information and Communication Technology*. Journal of Research and Methodology in Education. 2(5), 43-47.
- Alabi A. O. (2017). *Record Keeping For Effective Administration of Secondary Schools, Nevada*. Journal of Public Administration and Governance. 7(2). SSN 2161-7104.
- Aljarallah, M. (2014). *Comparative Study of Database Modeling Approaches*. Ontario: Algoma University.
- Amanchukwu R.N. and Ololube N. P. (2015). *Excellent School Records Behaviour for Effective Management of Educational System*, Port Harcourt: Ignatius Ajuru University of Education.
- Benwari N. N. and Dambo I. (2014). *Improving Secondary School Management through Transformational leadership Approach and Management Information Systems*, Rome Journal of Educational and Social Research. 4(6). ISSN 2240-0524.

- Bhat, A. (2020). *Exploratory Research: Definition, Methods Types and Examples*, QuestionPro.
- Blaxter L. Huges C. and Tight M. (2006). *How to Research*. Berkshire: Open University Press.
- Brannigan, N. (2010). *Enhancing Leadership Capacity in ICTs in Education through technology Enabled collaboration, Pedagogy for Technology Enhanced Learning*. The Turkish Journal of Educational Technology. 7 (4), 89-112.
- Chidobi R. U. (2015). *The Extent of ICT Application in the Management of Administrative and Student Personnel Records in the Public Universities in Enugu State*. Enugu State: Enugu State University of Science and Technology.
- Clarke-okah. S, et al. (2009). *Effectiveness of ICT in Education Administration*. Paris.
- Condie, R. Munro, R. K. (2007). *The Impact of ICT in Schools – A Landscape Review*. Glasgow: University of Strathclyde.
- Creswell. J.W. (2012) *Education Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research*. New York: Pearson Education, Inc.
- Dabas N. (2018). *Role of Computer and Information Technology in Education System*. International Journal of Engineering and Techniques. 4(1), 5-9.
- Demir K. (2006). *Management of Information Systems in Primary Schools*. Turkish Journal of Educational Technology. Vol.5, 2(6), 32-45.
- Draft R.L. and Marcic D. (2009). *Understanding Management*. London: Cengage Learning.
- Education Management Information System [EMIS]. (2007) *Review of Health and Education Progress in Selected African Countries*, Lusaka.
- Etudor-Eyo E., Emah, I. E. Ante H. A. (2012). *The Use of ICT and Communication Effectiveness among Secondary School Administrators*. International Journal for Educational Studies. 4(2), 45-47.

- Farrell G. (2007). *Survey of ICT and Education in Africa: Kenya Country Report*. InfoDev ICT and Education Series. Washington, D.C: World Bank Group.
- Fedena (2017). *Future of Administration with School MIS*, Bangaluru: Fedena.
- Fedena (2019). *Top 10 Advantages of Student Data Management System*, Bangaluru: Fedena.
- Forment F. et al. (2017). *The Use of Social Networks as a Communication Tool between Teachers and Students: A Literature Review*, Seville. The Turkish Online Journal of Educational Technology.
- Fredrikson R and Gajek F (2009). *Harnessing Technology in the classroom*. <http://www.nsba.org/site/page>.
- Gay L., Mills G. and Airasian P. (2006). *Educational Research Competencies for Analysis and Application*. New Jersey: Pearson.
- Gedwar S. (2016). *Use of ICT for Administration and Management: A Case Study*, EMU. North Cyprus: Eastern Mediterranean University.
- Ghavifekr S. Afshari, M. Siraj, S. and Seger, K. (2013). *ICT Application for Administration and Management: A Conceptual Review*. Kuala Lumpur: University of Malay.
- GRZ. (2006). *Zambia National Information and Communication Technology Policy*. Lusaka: Ministry of Information and Communication.
- Heale R. and Twycross A. (2015). *Validity and Reliability in Qualitative Research*. Evid Based Nurs. Vol. 18. No. 3.
- Isaac S. (2007). *ICT Education in Zambia. Survey of ICT and Education in Africa*. Zambia Country Report. <https://openknowledge.worldbank.org/handle/10986/9415>.
- Iwu. E and Oike. M. (2009). *Application of ICT and its effect on the economy*, Nairobi.
- Johnes, J. Portela M. & Thanassoulis, E. (2017). *Efficiency in Education*. Journal of the Operational Research Society. 68, 331–338.

- Karim A. J. (2011). *The Significance of Management Information Systems for Enhancing Strategic and Tactical Planning*. Journal of Information Systems and Technology Management. 8(2), 459-470.
- Karishnavini R. and Meenakumari J. (2010). *Usage of ICT for Information Administration in Higher Education Institutions*. Bangalore: International Association of Computer Science and Information Technology.
- Kasonde-Ng'andu S. (2018). *Writing a Research Proposal in Educational Research*. Lusaka: University of Zambia.
- Kawade D. R. (2012). Use of ICT in Primary School, *Pioneer Journal*.
- Kort D. and Koelane T. (2013). *Reflecting on Information and Communication Technology (ICT) in Marketing from a Marketer's and Student's Perspective*, Bloemfontein. African Journal of Business Management. (2013)
- Krenn J. (2017). *Organizational theory of management*, St. Petersburg: Business Basics.
- Leedy P. D. and Ormrod J. E. (2010). *Practical Research Planning and Design*. Boston: Pearson.
- Lin R., Xie J., Jeng, Y. & Wang, Z. (2011). *The Relationship between Job Involvement and School Administrative Effectiveness as Perceived by Administration teachers*. Management in Education: SAGE.
- Makewa L. Meremo J., Role E. and Role J. (2013). *ICT in Secondary School administration in Rural Southern Kenya: An Educator's Eye on Its Importance and Use*. Baraton: University of Eastern Africa.
- Maki. N. (2008). *Information and Communication Technology for Administration and Management for Secondary Schools in Cyprus*, Journal of Online Learning and Teaching. Vol.4 No.3.

- Markovic R. & Vucekovic M. (2015). *the Role of Information Management in Decision Making and Business Success*, Belgrade. Faculty of Business Economics and Entrepreneurship.
- Masaiti G. (2018). *Education in Zambia at Fifty Years of Independence and Beyond*, Lusaka: UNZA Press.
- Mason R.D. and Lind D.A. (2015). *Statistical Techniques in Business and Economics*. Boston: Von Hoffmann Press.
- Matimbe R. T. (2014). *Financial Management in Education: Module*. Harare: The Zimbabwe Open University Press.
- Mbatia M. G. (2014). *Factors Influencing School Principals' Integration of ICT in Administration of Public Secondary Schools in Githunguri Sub County, Kiambu County, Kenya*. Nairobi: University of Nairobi.
- McMillan, J. H., and Schumacher, S. (2006). *Research in Education: Evidence-based Inquiry*. Cape Town: Pearson.
- Meenakshi (2013). *Importance of ICT in Education*. Journal of Research and Method in Education. Volume 1, Issue 4, PP 03-08.
- Mtanga. N. et al (2012), *Use of ICT in education: A case study of selected urban-based high school in Lusaka, Zambia*. Lusaka: University of Zambia.
- Mue J. S. (2006). *Application of Information Communication Technology in School Administration in Public Secondary Schools in Lang'ata Division, Nairobi County, Kenya*. Nairobi: Kenyatta University.
- Mutisya A. M. and Mwanja J. M. (2017). *The Extent of ICT Integration in the Management of Public Secondary Schools in Kitui County, Kenya*. International Journal of Education and Research. Vol. 5 No. 11.
- Mwalongo, A. (2011). *Teachers' Perception about ICT for Teaching, Professional Development, Administration and Personal Use*. International Journal of Education

and Development using Information and Communication Technology. Vol. 7, Issue 3, pp. 36-49

Ndiku J. M. et al (2014). *Student Data Management and School Decision Making in Kenya. Kakamenga*. International Journal of Education and Research. Vol. 2 No. 6

Nduati, C. and Bowman, W. (2005). *Working from the sidelines: The Kenya private Sector foundation ICT board story: ICT Policy-making in East Africa*. Nairobi: East African Educational Publishers Ltd.

Oboegbulem A. and Ugwu R. (2013). *The Place of ICT in The Administration of Secondary Schools in the South-Eastern state of Nigeria*. Nsukka: University of Nigeria.

Olukunle I. and Ojo S. (2008). *Motivation, Influences and Perceived Effect of ICT Adaptation in Botswana Organisations*. International Journal of Emerging Markets. Vol. 3, No. 3: 311-322.

Opara L. E. and Onyije J. (2013). *Information and Communication Technologies (ICT): A Panacea to Achieving Effective Goals in Institutional Administration*. Mediterranean Journal of Social Sciences. Vol. 4, No 13

Orodho. E (2009). *Understanding Conceptual Framework*. London.

Oyedemi A. O. (2015). *ICT and Effective School Management: Administrators' Perspective*. Osun State: Osun State College of Education.

Phiri J. T. (2006). *Research Methods in Guidance*: Lusaka. Zambian Open University.

Policy and Operations Evaluation Department [IOB]. (2008). *Impact Evaluation of Primary Education*. The Hague. Ministry of Foreign Affairs.

Presentation on the Writings and Attitudes of EFL. Lebanese: University of Rovira I Virgili.

Probhjot P. and Sharma N. (2017). *An Overview of the Database Management System*. New Delhi. International Journal of Advanced Research in Computer Science. Vol.28. No. 4.

- Qureshi Z. H. (2016). *Efficient Use of ICT in Administration: A Case Study from Mehran University of Engineering and Technology*. Jamshore. International Journal of Economics, Commerce and Management. Vol. 4, Issue 10.
- Ratheeswari K. (2018). *Information Communication Technology in Education*. Journal of Applied and Advanced Research. Tamil Nadu: Phoenix Research Publishers.
- Rule, P. and John, V. (2011). *You're Guide to Case Study Research*. Pretoria: Van Schaik Publishers.
- Saeed A. (2015). *Role of Database Management Systems in Supporting Information Technology in Sector Education in Bagdad*. Bagdad. Al-Rafidain University College.
- Shah M. (2014). *Impact of Management Information System on School Administration: What the Literature Says*. Kuala Lumpur: Elsevier.
- Sidhu K. S. (2014) *Methodology of Research in Education*. New Delhi: Sterling Publishers Ltd.
- Singh S. and Mishra S. ((2018). *Identify the Impact of ICT in Secondary School Education Students in Government and Private Schools, Uttar Pradesh*. International Journal of Trend in Scientific Research and Development. Vol.2. No. 4.
- Tagalou A. et al (2013). *ICT in Education Management*. Athens: National University of Athens.
- Taherdoost H. (2016). *Validity and Reliability of Research Instruments; How to Test the Validity of a Questionnaire / Survey in Research*. International Journal in Management. Vol. 5, No. 3, 2016, Page: 28-36, ISSN: 2296-1747
- Tamilselvan N. et al (2012). *Information and Communication Technologies (ICT)*. International Journal of Library and Information Science. Vol.14, 2015.
- Teeboom L. (2018). *Application of Systems Theory in Business Organisations*, California: Siskiyou Office of Education.

- The Asian School, (2019). *The Role of the Internet in Education*. New Delhi: The Asian School.
- The Inspectorate, (2008). *ICT in Schools*. Dublin: Brunswick Press.
- UNESCO (2020). *Module A1. School Records Management*, UNESCO.
- UNESCO, (2005) *School Management: A Training Manual for Educational Management*. UNESCO International Institute for Capacity Building.
- Waema T. M. and Bowman-Ngaruiya W. (2006). *The Institutional Structures and Models for Implementing the Kenyan National ICT Plan*. Nairobi: Mvule Africa Publishers.
- Wakil K. et al. (2017). *Enriching Classrooms with Technology in Basic Schools*, Sulaimani. European Journal of Open Education and E. Learning Studies. Vol. 2, No. 1.
- Wiersma. B and Jur. G (2005). *Data collection methods in scientific research*, New Delhi: New Delhi Press.
- Yusuf M.O. (2005). *Information and Communication Education: Analysing the Nigerian National Policy for Information Technology*, International Education Journal. Vol. 3 No. 3, 340-347.
- Yusuf. J (2005). *Application of ICT in School Administration*. New Delhi: New Delhi Press.
- Ziroba A. (2012). *The Role of Information and Communication Technology in the Management of Selected Secondary Schools in Central Uganda*. Mbale: Islamic University of Uganda.

APPENDICES

APPENDIX I: INTERVIEW GUIDE FOR HEAD TEACHERS

UNIVERSITY OF ZAMBIA IN COLLABORATION WITH ZIMBABWE

OPEN UNIVERSITY POSTGRADUATE PROGRAMMES

Research Topic: Understanding the sources, application and enhancement of ICT application in the management of selected Secondary Schools in Lusaka.

[INTERVIEW GUIDE FOR THE HEAD TEACHERS]

Interview Date: **Interview Duration:**

Venue of

Interview:.....

Opening Remarks

In the opening remarks, the interviewer

- Thanks the participant for accepting to be interviewed and seek consent to record the interview.
- Introduces herself
- States the purpose of the interview

Begin the Interview

The interviewer to use the following interview Questions

1. Kindly tell me about yourself, however, for the sake of anonymity, you may not say your name.

PART 2: SOURCES OF ICT

1. What are the ICT sources do you use to help you perform your day to day responsibilities as Head Teacher of the School?
2. Of the sources of ICT that you have mentioned, which ones do you prefer and why?

PART 2: APPLICATION OF ICT IN SCHOOL MANAGEMENT

1. In which areas of school management has the application of ICT been integrated at your school?

2. From your observation how has this integration of ICT application in school management affected the management of your school?

PART 4: ENHANCEMENT OF ICT APPLICATION IN THE MANAGEMENT OF SECONDARY SCHOOLS.

1. Based on the call by the government to incorporate ICT in school management, what efforts are you making or have you made in enhancing ICT application in the management of your school?
2. Is there anything that you can do or that you have done differently in your quest to enhance the application of ICT in the management of your school?

Thank You.

APPENDIX II: INTERVIEW GUIDE FOR DEPUTY HEAD TEACHER

UNIVERSITY OF ZAMBIA IN COLLABORATION WITH ZIMBABWE

OPEN UNIVERSITY POSTGRADUATE PROGRAMMES

Research Topic: Understanding the sources, application and enhancement of ICT application in the management of selected Secondary Schools in Lusaka.

[INTERVIEW GUIDE FOR THE DEPUTY HEAD TEACHER]

Interview Date: **Interview Duration:**

Venue of

Interview:.....

Opening Remarks

In the opening remarks, the interviewer

- Thanks the participant for accepting to be interviewed and seek consent to record the interview.
- Introduces herself
- States the purpose of the interview

Begin the Interview

The interviewer to use the following interview Questions

2. Kindly tell me about yourself, however, for the sake of anonymity, you may not say your name.

PART 2: SOURCES OF ICT

3. What are the ICT sources do you use to help you perform your day to day responsibilities as the Deputy Head Teacher of the School?
4. Of the sources of ICT that you have mentioned, which ones do you prefer and why?

PART 2: APPLICATION OF ICT IN SCHOOL MANAGEMENT

3. In which areas of school management has the application of ICT been integrated at your school?

4. From your observation how has this integration of ICT application in school management affected the management of your school?

PART 4: ENHANCEMENT OF ICT APPLICATION IN THE MANAGEMENT OF SECONDARY SCHOOLS.

3. Based on the call by the government to incorporate ICT in school management, what efforts are you making or have you made in enhancing ICT application in the management of your school?
4. Is there anything that you can do or that you have done differently in your quest to enhance the application of ICT in the management of your school?

Thank You.

**APPENDIX III: INTERVIEW GUIDE FOR HEADS OF DEPARTMENT
UNIVERSITY OF ZAMBIA IN COLLABORATION WITH
ZIMBABWE**

OPEN UNIVERSITY POSTGRADUATE PROGRAMMES

Research Topic: Understanding the sources, application and enhancement of ICT application in the management of selected Secondary Schools in Lusaka.

[INTERVIEW GUIDE FOR THE HEADS OF DEPARTMENT]

Interview Date: **Interview Duration:**.....

Venue of Interview:

Opening Remarks

In the opening remarks, the interviewer

- Thanks the participant for accepting to be interviewed and seek consent to record the interview.
- Introduces herself
- States the purpose of the interview

Begin the Interview

The interviewer to use the following interview Questions

3. Kindly tell me about yourself, however, for the sake of anonymity, you may not say your name.

PART 2: SOURCES OF ICT

5. Do you use ICT in the management of your department? If so, what sources of ICT do you use to help you perform your day to day responsibilities as Head of Department?
6. Of the ICT sources that you have mentioned, which one/s do you prefer and why?

PART 2: APPLICATION OF ICT IN SCHOOL MANAGEMENT

5. In which areas of the management of your department has the application of ICT been integrated?
6. From your observation how has this integration of ICT application in school management affected the management of your department?

PART 4: ENHANCEMENT OF ICT APPLICATION IN THE MANAGEMENT OF SECONDARY SCHOOLS.

5. Based on the call by the government to incorporate ICT in school management, what efforts are being made in enhancing ICT application in the management of your department?
6. Is there anything that can be done differently in your school's or department's quest to enhancing the application of ICT in the management of your department or school as a whole?

Thank you very much for taking time off your busy schedule.

**APPENDIX IV: INTERVIEW GUIDE FOR CAREERS AND GUIDANCE
TEACHER**

**UNIVERSITY OF ZAMBIA IN COLLABORATION WITH
ZIMBABWE
OPEN UNIVERSITY POSTGRADUATE PROGRAMMES**

RESEARCH TOPIC: Understanding the sources, application and enhancement of ICT
application in the management of selected Secondary Schools in
Lusaka.

[INTERVIEW GUIDE FOR THE CAREERS AND GUIDANCE TEACHER]

Interview Date: **Interview Duration:**.....

Venue of Interview:.....

Opening Remarks

- Thank the participant for accepting to be interviewed and seek consent to record the interview.
- Introduce both the interviewer and the interviewee (without mentioning the name of the interviewee but the office he/she holds)
- State the purpose of the interview
- Begin the interview

Interview Questions

4. Kindly tell me about yourself; in line with your duties as a holder of this office, however, for the sake of anonymity, do not say your name.

PART 2: SOURCES OF ICT

7. What are the ICT sources that you use to help you perform your day to day responsibilities as the Careers and Guidance Teacher?
8. Of the ICT sources that you have mentioned which one/s do you prefer and why?

PART 2: APPLICATION OF ICT IN SCHOOL MANAGEMENT

7. In which areas of the management of your office has the application of ICT been integrated?
8. From your observation how has this integration of ICT application in school management affected the management of the Careers and Guidance Office?

PART 4: ENHANCEMENT OF ICT APPLICATION IN THE MANAGEMENT OF SECONDARY SCHOOLS.

7. Based on the call by the government to incorporate ICT in school management, what efforts are being made in enhancing ICT application in the management of the Careers and Guidance Office?
8. Is there anything that you would like to be done differently in the School Administration's quest to enhancing the application of ICT in the management of your school as a whole and the Career's and Guidance Office in particular?

THANK YOU.

APPENDIX V: INTERVIEW GUIDE FOR THE ACCOUNTS OFFICERS
UNIVERSITY OF ZAMBIA IN COLLABORATION WITH
ZIMBABWE
OPEN UNIVERSITY POSTGRADUATE PROGRAMMES

RESEARCH TOPIC: Understanding the sources, application and enhancement of ICT
application in the management of selected Secondary Schools in
Lusaka.

[INTERVIEW GUIDE FOR THE ACCOUNTS OFFICERS]

Interview Date: **Interview Duration:**.....

Venue of Interview:.....

Opening Remarks

- Thank the participant for accepting to be interviewed and seek consent to record the interview.
- Introduce both the interviewer and the interviewee (without mentioning the name of the interviewee but the office he/she holds)
- State the purpose of the interview
- Begin the interview

Interview Questions

5. Kindly tell me about yourself; in line with your duties as a holder of this office, however, for the sake of anonymity, do not say your name.

PART 2: SOURCES OF ICT

9. What are the ICT sources that you use to help you perform your day to day responsibilities as the Accounts officer of this school?
10. Of the ICT sources that you have mentioned which one do you prefer and why?

PART 2: APPLICATION OF ICT IN SCHOOL MANAGEMENT

9. In which areas of the management of your office has the application of ICT been integrated?
10. From your observation how has this integration of ICT application in school management affected the management of the Careers and Guidance Office?

PART 4: ENHANCEMENT OF ICT APPLICATION IN THE MANAGEMENT OF SECONDARY SCHOOLS.

9. Based on the call by the government to incorporate ICT in school management, what efforts are being made in enhancing ICT application in the management of the Careers and Guidance Office?
10. Is there anything that you would like to be done differently in the School Administration's quest to enhancing the application of ICT in the management of your school as a whole and the Accounts Officer in particular?

THANK YOU.

APPENDIX VI: INTERVIEW GUIDE FOR THE STORES OFFICER

UNIVERSITY OF ZAMBIA IN COLLABORATION WITH ZIMBABWE OPEN UNIVERSITY POSTGRADUATE PROGRAMMES

RESEARCH TOPIC: Understanding the sources, application and enhancement of ICT
application in the management of selected secondary schools in Lusaka.

[INTERVIEW GUIDE FOR THE STORES OFFICER]

Interview Date: **Interview Duration:**

Venue of Interview:.....

Opening Remarks

- Thank the participant for accepting to be interviewed and seek consent to record the interview.
- Introduce both the interviewer and the interviewee (without mentioning the name of the interviewee but the office he/she holds)
- State the purpose of the interview
- Begin the interview

Interview Questions

6. Kindly tell me about yourself; in line with your duties as a holder of this office, however, for the sake of anonymity, do not say your name.

PART 2: SOURCES OF ICT

11. What ICT sources do you use to perform your day to day responsibilities as the Stores Officer of this school?
12. Of the ICT sources that you have mentioned which one do you prefer and why?

PART 2: APPLICATION OF ICT IN SCHOOL MANAGEMENT

11. In which areas of the management of your office has the application of ICT been integrated?
12. From your observation how has this integration of ICT application in school management affected the management of the Stores Officer's Office?

PART 4: ENHANCEMENT OF ICT APPLICATION IN THE MANAGEMENT OF SECONDARY SCHOOLS.

11. Based on the call by the government to incorporate ICT in school management, what efforts are being made in enhancing ICT application in the management of the Careers and Guidance Office?
12. Is there anything that you would like to be done differently in the School Administration's quest to enhancing the application of ICT in the management of your school as a whole and the Career's and Guidance Office in particular?

THANK YOU.

APPENDIX VII: QUESTIONNAIRE FOR TEACHERS

UNIVERSITY OF ZAMBIA IN COLLABORATION WITH ZIMBABWE

OPEN UNIVERSITY POSTGRADUATE PROGRAMMES

[Questionnaire for Teachers]

QUESTIONNAIRE ON THE APPLICATION OF ICT IN THE MANAGEMENT OF SECONDARY SCHOOLS.

Research Topic: Understanding the sources, application and enhancement of ICT application in the management of selected secondary schools in Lusaka.

Dear Participant,

I am a postgraduate student at the University of Zambia (UNZA) pursuing a Master of Education Management. I am now at the stage in my programme of conducting research on the application of Information and Communication Technologies (ICT) in the Management of Secondary Schools in Lusaka.

You are kindly requested to provide responses to the questions and statements in this questionnaire truthfully and honestly. You should rest assured that the information that you will provide will be treated with absolute confidentiality and will only be used for academic purposes. Please do not write your name on the questionnaire.

PART 1: DEMOGRAPHIC INFORMATION (Provide the answers by placing a tick in the box against what is applicable to you.)

In which age group do you fall?

AGE GROUP: i. 20 – 25 Years ☐ ii. 25-34 Years ☐
iii. 35 – 44 Years ☐ iv. 45 Years and above ☐

Could you kindly state your gender? (Tick in the box provided)

GENDER: i. Male ☐ ii. Female ☐

Which of the following is your highest level of education? (Tick in the box provided)

EDUCATION QUALIFICATION: i) Diploma ☐ ii) Degree ☐
ii) Master ☐ iv) Doctorate ☐

For how long have you served in your current position?

YEARS IN CURRENT POSITION: i) 0 – 5 Years ☐ ii) 6 – 10 Years ☐
iii) 11 – 15 Years ☐ iv) Above 15 Years ☐

What type of school do you work at?

TYPE OF SCHOOL: i) Private School ☐ ii) Government School ☐
iii) Grant Aided ☐

COMPUTER LITERACY:

Are you computer literate? (If so what is your level of qualification?)

Basic ☐

Intermediate ☐

Advanced ☐

Proficient ☐

PART 2: SOURCES OF ICT. (Where applicable, tick in the appropriate box)

Which ICT tools are used at your school and how much do you agree with the application of these tools in line with performing your duties as a teacher?

S/N	SOURCES OF ICT	DISAGREE	AGREE	STRONGLY AGREE
1	Laptop			
2	Desktop Computers			
3	Internet			
4	Cell Phones			
5	Projector			
6	Photocopying Machine			
7	Website			
8	Interactive White Board			
9	Radio			

10	TV			
11	Printer			

PART 3: APPLICATION OF ICT IN SCHOOL MANAGEMENT

How much do you agree as a teacher to the application of ICT in the areas listed below?

SN	TASKS	DISAGREE	AGREE	STRONGLY AGREE
1	Planning purposes			
2	Pupil Management (Keeping pupils' results in subjects of concern)			
3	Typing tests, lesson plans and other work-related documents			
4	Pupil Management (Keeping pupil records such as results)			
5	Communication with management			
6	Preparation of various reports			
7	Preparation of Class Lists, Schemes and Records of Work			
8	Analysis of tests and examinations			
9	Lesson Delivery			

PART 4: ENHANCEMENT OF ICT APPLICATION IN THE MANAGEMENT OF SECONDARY SCHOOLS.

Has the enhancement of ICT application at your school been enhanced through any or all of the activities as shown in the table below? If so, how much do you agree with the steps taken?

S/N	ACTION BY SCHOOL ADMINISTRATION	DISAGREE	AGREE	STRONGLY AGREE
1	Procurement of Computers for the school			
2	Procurement or loaning of laptops to teachers			
3	Granting teachers access to ICT tools in school			
4	Free access to internet services in school			

Thank you

APPENDIX VIII: PERMISSION LETTER TO COLLECT DATA

APPENDIX IX: ETHICAL CLEARANCE LETTER