

**CONTRIBUTION OF INFORMATION AND COMMUNICATION  
TECHNOLOGY (ICT) ON SERVICE DELIVERY IN  
SECONDARY SCHOOLS IN TANZANIA: A CASE OF KARATU  
DISTRICT COUNCIL**

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SECONDARY SCHOOLS IN TANZANIA: A CASE OF KARATU  
DISTRICT COUNCIL**

**By**

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**A Dissertation Submitted to the School of Public Administration and  
Management in Partial Fulfilment of the Requirements for the Award of the  
Degree of Master of Public Administration (MPA) of Mzumbe University**

**2015**

**CERTIFICATION**

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, the dissertation entitled “*Contribution of ICT on service delivery in secondary schools in Tanzania; A case of Karatu District Council*” in partial fulfilment of the requirements for award of the degree of Master of Public Administration (MPA) of Mzumbe University.

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## **DECLARATION AND COPYRIGHT**

I, Ester S. Minja, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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## **DEDICATION**

This work is dedicated to the Holy Spirit, who has been the source of my inspiration. Also to my beloved parents Mr. & Mrs Sared Minja, and my sister and brother in law Mr. & Mrs. Dawson Gadiel.

## **ABSTRACT**

This study is on contribution of Information and Communication Technology on service delivery in secondary schools in Tanzania: A case study of Karatu District Council. The phenomenon that triggered the researcher to conduct this study is the fact that our world today has changed a great deal with the aid of information and communication technology; activities that were once done manually or by hand have now become computerized by operating systems. Therefore, how the adaptation and application of information and communication technology will contribute to the service delivery in secondary schools was among the aims of this study. The objective of this research work was to make a critical assessment on identifying the contribution of Information and Communication Technology (ICT), on service delivery in secondary schools at Karatu District Council. Also, the study investigated the level of availability of ICT facilities in secondary schools, the exposure of teachers and students to the use of ICT facilities, the perceived benefits of using ICT and the challenges facing the use of ICT in secondary schools. The researcher used a case study research design in conducting the study. Accidental/convenience sampling technique, stratified random sampling technique and purposive sampling technique were used in selecting the sample for the study. Data was obtained from both primary and secondary sources, and also a researcher employed both qualitative and quantitative methods in analysing the collected data.

The findings from the study revealed that there is contribution of ICT on service delivery in secondary schools at Karatu district as it helps in making teaching learning more interesting enhances quality of work of teachers, makes teachers to be updated in various disciplines, and also makes decision making of management concerning education easy and faster. It can be concluded that the majority agreed that ICT contributes to quality service delivery in education sector, therefore it is recommended that there is a need for more studies to be done to see what can help to improve ICT facilities in secondary schools so as to improve contribution of ICT to quality service delivery.

## **ABBREVIATIONS AND ACRONYMS**

ADEM	–	Agency for Development of Educational Management
APIS	–	Automatic Person Identification System
DSS	–	Decision Support System
EIS	–	Executive Information Recording System
DSEO	-	District Secondary Education office
DSEOs	-	District Secondary Education Officers
ESS	–	Executive Support System
FRSS	–	Fast Response Survey System
FTP	–	File Transfer Protocol
HRIS	–	Human Resources Information System
IAE	–	Institute of Adult Education
ICT	–	Information and Communication Technology
IICD	–	International institute for Communication and Development
IRS	–	Information Recording System
IS	–	Information System
IT	–	Information Technology
LAN	–	Local area Network
LCD	–	Liquid Crystal Display
LGA	–	Local Government Authority
MDGS	–	Millennium Development Goals

MERLOT	–	Multimedia Educational Resource for Learning and Online Teaching
MoVET	–	Ministry of Education and Vocational Training
NCES	–	National Centre for Education Statics
NECTA	–	National Examination Council of Tanzania
NPTEC	–	National Program of Technology Enhanced Learning
PC	–	Personal Computer
RFID	–	Radio Frequency Identification
SPSS	–	Statistical Package for Social Sciences
TIE	–	Tanzania Institute of Education
TLSB	–	Tanzania Library Services Board
UNESCO	–	United Nations Educational, Scientific and Cultural Organisation
USAID	–	United States Agency for International Development
VETA	–	Vocational Education and Training Authority
WAN	–	Wide Area Network
WWW	–	World Wide Web

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## **CHAPTER ONE**

### **INTRODUCTION AND PROBLEM SETTING**

#### **1.1 Introduction**

This chapter presents general information on the study and the research problem. It covers the background to the study, a statement of the problem, and states both general and specific objectives of the study and research questions. Moreover, the chapter states the scope of the study, significance of the study and highlights limitations of the study.

#### **1.2 Background to the Study**

Information and Communication Technology is an application that is used in receiving information, forwarding information and receiving feedback by the sender. Also ICT is a revolution that involves the use of Computers, Internet and other Telecommunication technologies in every aspect of human endeavour (Bandeke, 2006). The information technology denotes the use of computers, micro-electronic devices and telecommunication gadgets. Also, devices such as search light, internet services, intranet and telnet are also used to communicate between two or more people/organization.

Application of information technology is the acquisition, production, transformation, storage and transfer of data through electronic means in the form of vocal, pictorial, textural and numerical so as to facilitate interaction between people and machines. In recent decades, there has been a widespread of information and communication Technology (ICTs) into many tiers of business, political processes and structuring of the global economy. ICTs have increased international interconnectivity and speed up the process of globalization. The ICTs, in conjunction with globalization and the information revolution, have reshaped the workforce in various parts of the world. By increasing the speed of international communication, ICTs have enabled corporations to outsource jobs, both in the manufacturing as well as white collar sectors; this has resulted to lowers production costs and detrimental impacts on labour conditions.

In any Local Authority ICT has greatest role which in turns brings about efficiency and effectiveness in service delivery according to Nickel (2005) ICT allows business to deliver goods and services whenever and wherever it is convenient for customer. ICT

has the role to support information processing tasks through using its tools to capture, convey, create, cradle, and communicate information. Also, it can support decision making tasks by enabling online analytical processing, sharing or allows sharing of information through decentralized computing and through organizing all information in one location and provide knowledge workers having tools like computer with networked systems of internet, intranet, extranet to access the information within and outside the organization. The demand for successful and effective Information and Communication Technology at local government authority is continuously increasing.

The field of education has certainly been affected by the penetrating influence of ICT worldwide and in particular developed countries; ICT has made a very profound and remarkable impact on the quality and quantity of teaching, learning research in the educational institutions. Information and community technology has the potentials to accelerate, enrich, and deepen skill; to motivate and engage students in learning to help relate school experiences to work practices; to help create economic viability for tomorrow's workers, contribute to radical changes in school; to strengthen teaching and to provide opportunities for connection between the school and the world (Ajayi & Ekundayo, 2009).

The pervasiveness of ICT has brought about rapid technological, social, political and economic transformation, which has eventuated in a network society organized around ICT (Yusuf, 2005). The findings show that ICT is an indispensable part of educational administration as its application makes institutions more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' pedagogical activities. For instance, e-learning is becoming one of the most common means of using ICT to provide education to students both on and off campus by means of teaching online offered via web-based systems.

Teaching and learning have gone beyond the teacher standing in front of a group of pupils and disseminating information to them without the students' adequate participation (Ajayi, 2008). The study finding show that, with the aid of ICT, teachers can take students beyond traditional limits, ensure their adequate participation in teaching and learning process and create vital environments to experiment and explore.

This new development is a strong indication that the era of teachers without ICT skills is gone. Any classroom teacher with adequate and professional skills in ICT utilization will definitely have his students perform better in classroom learning.

It has been seen that in many of secondary schools in Tanzania the majority of teachers in the system still rely much on the traditional “chalk and talk” method of teaching rather than embracing the use of ICT. According to Okebukola (1997), computer is not part of classroom technology in over 90% of public schools, thus the chalkboard and textbooks continue to dominate classroom activities. This is an indication that the students are still lagging behind in the trend of changes in the world. This presupposes that there is the tendency for the teachers and students to be denied the opportunities which ICT offers in the teaching-learning activities. There is the need to replace the traditional pedagogical practices that still underpin the educational system in Tanzania, hence the need for the adoption and application of ICT in Tanzania Secondary Schools.

Unlike other Secondary schools like some of the private schools in the urban centre which have already started using use the ICT, Public secondary schools lose a lot of benefits due to failing to adopt and use ICT facilities (Hare, 2007). Many of secondary schools in Tanzania fail to use ICT in education due to a number of constraints. That is why this study was aimed at finding out the contribution of ICT on service delivery in secondary education. Different literatures and researches such as Ajayi & Ekundayo (2009) and Ajayi (2008) have generally mentioned the factors hindering application and use of ICT facilities together with its contribution in secondary schools, but this research concentrated only on one LGA, the Karatu District Council.

### **1.3 Statement of the Problem**

Diffusion of ICT through organisations needs to be effectively managed to better prepare for future ICT application adoption (Markus, 1987). The forces that have driven secondary schools to adopt and incorporate ICT in teaching and learning include greater information access; greater communication, synchronous and asynchronous learning, increased cooperation and collaboration, cost-effectiveness and pedagogical improvement (Surry & Ely, 2001). ICT can be integrated into curriculum delivery

through the use of e-learning, video conferencing, electronic platforms, World Wide Web and open source software.

According to IICD (2007) ICT Policy for Education in Tanzania, October 2004, IICD and COSTECH joined forces with stakeholders from the education sector to develop an implementation strategy for the ICT policy in the education sector. In October 2006, the Ministry organised a one day workshop for stakeholders to contribute ideas for a draft of ICT policy for education in which inputs from the white paper and other initiatives within the ministry were integrated. Overall, the Ministry seems to have acknowledged the potential of ICT to have a significant and positive impact on education. It is generally acknowledged that ICT can play an important role in achieving the various Education Sector Development Programme (ESDP) objectives.

According to URT (2010) the Secondary Education Development Programme II (SEDP II), the one of the key area is to improve quality and relevance of secondary education. Increase access and use of ICT in secondary schools and teachers training colleges and ODL centres, is one among the specific objectives of SEDP II with strategy of promoting and incorporate e-learning in secondary education which helps to achieve the key area of improving quality and relevance of secondary education. Also SEDP II under its specific objective of increasing access and use of ICT in secondary schools and teachers training colleges and ODL centres came up with different targets of achieving it as follows: ICT facilities and equipment Maintenance-Plan in place and operational by 2011, Appropriate ICT facilities, equipment and teaching/learning materials availed to 1,500 schools and 21 IAE regional centres by 2014, A total of 5,000 teachers trained in e-learning teaching by 2013 and Information and Computer studies (ICS) subject taught in 1000 secondary by 2013.

Although many of the public secondary schools in Tanzania face many important challenges which impede their abilities to effectively provide education service in line with the key area of SEDP II of improving quality and relevance of secondary education with its specific objective of increasing access and use of ICT in secondary schools, in their role to offer education services, most of schools show that many teachers in the system still rely much on the traditional “chalk and talk” method of teaching rather than embracing the use of ICT (Hare, 2007). According to Ajayi & Ekundayo (2009), the

problems that have been found to exist in the public secondary school and some of the private schools are: lack of computer literate teachers, irregular power supplies that appears to thrive in the schools and there are inadequate facilities to support full application of the information and communication technology. Moreover, it seems the schools could not purchase computers for use because of inadequate funds. Besides, the non-inclusion of the ICT programmes in teachers' training curriculum seems to be another major challenge facing the adoption of ICT in secondary schools. Also, According to Okebukola (1997), computer is not part of classroom technology in over 90% of public schools in Nigeria, thus the chalkboard and textbooks continue to dominate classroom activities. This presupposes that there is a tendency for the teachers and students to be denied the opportunities which ICT offers in the teaching-learning activities or their schools did not have appropriate ICT facilities which support them in teaching –learning activities. This is a serious threat to the education development of the nation. So, it is upon this background that the researcher was motivated to find out the contribution of ICT on service delivery in secondary schools, a case of Karatu District council.

#### **1.4 Objectives of the study**

##### **1.4.1 General Objective**

The main objective of the study was to assess contribution of Information and Communication Technology (ICT) to services delivery in secondary schools at Karatu District Council.

##### **1.4.2 Specific Objectives**

To achieve the main objective of this study, the following four specific objectives were developed to guide data collection.

- (i) To examine availability of appropriate ICT facilities for teaching in secondary education at Karatu District Council.
- (ii) To find out if teachers and students are exposed to the use of ICT facilities in secondary schools at Karatu District council.
- (iii) To identify perceived benefits of ICT facilities in service provision at secondary schools at Karatu District Council.

- (iv) To examine the challenges facing the use of ICT in service provision at secondary schools at Karatu District Council.

### **1.5 Research questions**

The study aimed at answering the following questions:

- (i) To what extent are the ICT facilities available for teaching in secondary schools at Karatu District council?
- (ii) To what extent are teachers and students in secondary schools exposed to ICT facilities at Karatu District Council?
- (iii) What are the perceived benefits of ICT facilities in secondary schools at Karatu District Council?
- (iv) What are the challenges facing the use of ICT in service provision at secondary schools at Karatu District Council?

### **1.6 Scope of the study**

This study was conducted in Tanzania a case of Karatu District council. However, the researcher of this study collected data from District Council office and six (6) secondary schools at Karatu District Council. The selected schools were the representatives of schools from Karatu District Council which showed the contribution of ICT in service delivery. The study focused on contribution of ICT on service delivery in secondary schools at Karatu district Council.

### **1.7 Significance of the study**

Significance of this particular study can be seen in diverse ways. The study will be of much value to a number of people and the management of Karatu District Council at large. First, it will help the management and decision makers of the Council in making wise decisions in relation to their ICT investment, and will help them to suggest appropriate solutions to improve service delivery in education. Secondly, the findings will also be useful to researchers, policy makers, and practitioners on determine what else could be done to improve the use of ICT in education which can assure effective service delivery due to the solutions and recommendations of the finding. Moreover, the study will provide information for future researchers and highlighted any knowledge gap upon which future researchers can research on.

### **1.8 Limitation of the study**

The findings of the study cannot be generalised to other similar studies due to the following reasons; firstly, the nature of the environment of this study is different from other environments in which similar studies can be undertaken, councils vary much so it is difficult to generalise the results. Secondly, Variation in leadership style because one council may be found growing faster than other councils due to the nature of leadership style; for example one council may have good leaders who have development desire while other councils may not have, so the study cannot be generalised. Lastly, variation in community commitment because one council may found growing faster than the other councils due to community's desire to contribute to council development.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviewed various literature and studies on contribution of ICT on service delivery in secondary schools and it presents the theoretical and empirical literatures of other researchers and other writers related to the topic on the study. Theoretical literature review is a text of a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to particular topics while empirical literature review is when the researcher reviews the information and theories currently available concerning the study and based on other studies. The literature helps the researcher to determine scope and specific focus of the concerned study.

#### **2.2 Theoretical Literature Review**

#### **2.3 Definition of key terms**

##### **Information and Communications Technology**

According to Bandele (2006) ICT is a revolution that involves the use of computers, internet and other telecommunication technology in every aspect of human endeavour. The author posited that ICT is simply about sharing and having access to data with ease. It is regarded as the super highway through which formation is transmitted and shared by people all over the world. According to Statistics Canada (2008), ICT is a field of work and study that, includes technologies such as desktop and laptop computers, software, peripherals, and connections to the internet that are intended to fulfill information processing and communication functions. Also, ICT is defined as the combination of informatics technology with other, related technologies, specifically communication technology (UNESCO, 2002).

##### **Information**

According to de Walterville & Gilbert (2000) defines information as any potentially useful fact, quantity or value that can be expressed uniquely with exactness. Information

is whatever is capable of causing a human mind to change its opinion about the current state of the real world.

### **Information technology**

According to O'Brien (1999) information technology is defined as the combination of hardware, software, telecommunications, database management and other information processing technologies used in computer-based information system. According to O'Brien (2006), Information system as a combined organization of people, hardware, software, communication networks and data resources that collect transform and disseminate information in the organization. In this system and its sense people are fundamental source in information system because they are the only ones to operate this system. In early 1960's we associate information system with computers. Many IS and virtually all large IS of the organization use computerized IS today and this was taken as the core issue of this finding.

### **Communication**

According to Bateman & Snell (1995) communication is everywhere around the globe. About 90% of managers' job is to communicate with his subordinates, the customers, and other stakeholders. God does communicate with his creatures in different and anonymous ways. Thus, in the organization, managers do communicate with people in and outside the organization in different ways as well. By definition Communication is the transmission of information and meaning from one part to another through the use of shared meaning, symbols, and signals. This process is very vital to any organization and since it involves the sharing of information, it needs to be systematized and thus the Information System.

### **Technology**

According to de Watterville & Gilbert (2000) technology refers to the use of scientific knowledge in invent tools that assist human beings in their efforts to overcome environmental hazards and impediments to comfort. In this regard, technology refers to the things like the computer, telephone, cell phone, GSM handset, television; radio etc. the acquisition, analysis, manipulation, storage and distribution of information, and the design and provision of equipment and software for these purposes. Thus, ICT and

information technology (IT) are similar concepts that can be used interchangeably. IT implies communications and therefore it becomes obvious that the two terms are synonymous.

### **Service delivery**

Service delivery is a continuous, cyclic process for developing and delivering user focused services. It is further defined in four stages: First is user engagement identifying users and understanding their needs, as well as understanding the role of weather, climate, and water-related information in different sectors; Secondly, service design and development process between users, providers, suppliers, and partners of creating, designing, and developing services, ensuring user needs are met; Thirdly, delivery, producing, disseminating, and communicating data, products and information (services) that is fit for purpose and relevant to user needs; And lastly, evaluation and improvement process to collect user feedback and performance metrics to continuously evaluate and improve upon products and services (World Bank, 2003).

### **2.4 System theory**

Systems theory was originally proposed by biologist Ludwig Von Bertalanffy in 1928 who asserted that a system is an interrelated and interdependent set of elements functioning as a whole. Systems theory was used to guide this study and this theory has had a significant effect on management science and understanding organizations, (Walonick, 1993). This theory was preferred because it considers a school as a system which results in improved academic standards. Such inputs in the school which make up a system include technologies, people, infrastructures and other school departments. These inputs go through a process where they are planned, organized, motivated and controlled, to meet the school's desired standards of which if ICTs were effectively integrated would coordinate these systems inputs.

Systems theory recognizes the various parts of the school, and, in particular, the interrelations of the parts, for example, the coordination of administration with teachers, board members, support staff and students and other resources. Since ICT tools can be used in communications and management, it can help in the integration of the various parts of the school system. This shows the relevancy of this theory to this study.

According to Kuhn (1974) described a system as either controlled or uncontrolled. In controlled systems, information is sensed and changes are effected in response to the information. Kuhn referred to this type of information as the detector and effector functions of the system. In a school setting for example, if information comes from the head teacher's office to the bursar about changes in fees structure, changes will be effected in response to that particular information. The detector according to Kuhn is concerned with the communication of information between systems. This communication can be enhanced by use of ICTs such as emails, SMS, chatroom and discussion boards. The theory suggests the functionalist approach as the best way of examining the role of a subsystem in a larger system (Walonick, 1993). This idea was used to examine the role of ICT as a subsystem in a school (larger system).

## **2.5 The secondary education development programme II (SEDP II)**

According to URT (2010) the Secondary Education Development Programme II (SEDP II) is a continuation of SEDP I, which was implemented between 2004 and 2009, building on the national goals of secondary education provision. The programme vision, as reflected in the Education Sector Development Programme (ESDP) 2008 - 2017 document, is to continue to have upgraded and coherently planned, managed and monitored education sector, secondary education sub-sector inclusive, that will develop human capital in order to boost economic growth and eliminate poverty. The following part is the one of the key areas which relates with this study.

Key area of the SEDP II

Quality and relevance of secondary education improved is one of the key areas of SEDP II.

Specific objective of the key area

To promote and incorporate e-learning in secondary education

Strategy of the key area

Increase access and use of ICT in secondary schools and teacher Training colleges and ODL centres.

Targets of the key area

- ICT facilities and equipment maintenance-plan in place and operational by 2011
- Appropriate ICT facilities, equipment and teaching /learning materials availed to 1,500 schools and 21 IAE regional centres by 2014
- A total of 5,000 teachers trained in learning teaching by 2013
- Information and computer studies (ICS) subjects taught in 1000 secondary by 2013.

## **2.6 ICT policy for basic education**

Tanzania finalized its Information and Communication Technology (ICT) Policy for Basic Education which incorporates the integration of ICTs in pre-primary, primary, secondary and teacher education, as well as non-formal and adult education. The policy has been developed in consultation with stakeholders, including a workshop in October 2006. The policy considers issues of infrastructure; curriculum and content; training and capacity development; planning procurement and administration; management, support and sustainability and monitoring and evaluation.

### **2.6.1 Scope of policy**

According to MoEVT (2007) this policy covers basic education, which includes pre-primary, primary, secondary and teacher education, as well as non-formal and adult education. The Ministry responsible for basic education is currently known as the Ministry of Education and Vocational Training (MoEVT). The MoEVT includes a number of semi-autonomous agencies: Agency for Development of Educational Management (ADEM), Institute of Adult Education (IAE), National Examinations Council of Tanzania (NECTA), Tanzania Institute of Education (TIE), Tanzania Library Services Board (TLSB), and Vocational Education and Training Authority (VETA). Although this policy is limited to basic education, the Ministry recognizes that it is linked to related activities in vocational training, higher education, regional administration and local government, as well as ICT activities in other areas and sectors.

### **2.6.2 Expected outcomes**

The strategic integration of ICT is expected to improve access and equity to, and quality and relevance of basic education. ICT will be used to increase the number and quality of

teachers, through improved pre-service and in-service training and better provision of teaching and learning materials. The use of ICT is also expected to enhance the acquisition and use of knowledge and skills for all learners, including those with special needs. ICT use will improve the efficiency and effectiveness of the management and administration of education, at all levels. This policy is also expected to broaden the basis of education financing, while optimizing the use of education resources, through partnerships and stakeholder participation, (MoEVT, 2007).

### **2.6.3 ICT philosophy for basic education – vision, mission and objectives (MOEVT, 2007).**

#### **Vision**

A well-educated and learning knowledge society

#### **Mission**

Integrate ICT to enhance access, equity, quality and relevance of basic education, while stimulating and improving teaching and lifelong learning.

### **2.6.4 Objectives of ICT policy for basic education**

The objectives of this policy are to:

- a) Integrate the use of ICT to achieve educational policy objectives;
- b) Promote the harmonization of activities, approaches and standards in the educational uses of ICT;
- c) Ensure that there exists equitable access to ICT resources by students, teachers and administrators in all regions and types of educational institutions and offices;
- d) Ensure the proper management and maintenance of ICT resources and tools;
- e) Ensure the organized provision of ICT training to students, teachers and educational administrators;
- f) Facilitate the implementation of communication and information systems for the effective management of the Education Sector;
- g) Facilitate the use of ICT as a tool for assessment and evaluation of education, as well as administration and management;
- h) Encourage partnerships between the various stakeholders in the Education Sector;

- i) Facilitate the use of ICT resources in schools and colleges by the neighbouring community;
- j) Facilitate the development and use of ICT as a pedagogical tool for teaching and learning, and for the professional development of teachers, administrators and managers; and
- k) Promote development of local content for basic education and other stakeholders.

## **2.7 Appropriate ICT facilities in secondary education**

There are various ICT facilities which are used for teaching-learning process according to Bandele (2006) & Ajayi (2007) includes radio, televisions, optical fibres, satellite equipment computers, digital multimedia, Internet, projectors, videos, electronics notice board.

According to Ajayi (2008) the use of these facilities, involves various methods which include systematized feedback system, computer-based operation/network, video conferencing and audio conferencing, internet/ worldwide websites and computer assisted instruction. It must however be stressed that the effective use of the various methods of the ICT in teaching leaning depends on the availability of these facilities and teachers' competence in using them. Also, ICT can be categorized into three major groups as Information Technology (IT) for example computer, as telecommunication Technology such as radio, television, telephone and lastly is Networking Technology for example internet and audio conferencing.

### **2.7.1 Information Technology (IT) for example computer**

According to Kuo (2011) Information technology (IT) is a technology which uses computers to gather, process, store, protect, and transfer information. Today, it is common to use the term Information and communications technology (ICT) because it is unimaginable to work on a computer which is not connected to the network. Information Technology (IT) in its broadest sense encompasses all aspects of computing technology. IT, as an academic discipline, is concerned with issues related to advocating for users and meeting their needs within an organizational and societal context through the selection, creation, application, integration and administration of computing technologies.

### **2.7.2 Advantages of information technology in education**

According to Symonds (2000) stated that technology can be a crucial tool to improve student learning. He pointed out that the quality of public education could be improved by utilizing the Web to individualize instruction, creating learning opportunities for teachers to engage in collegial support via e-mail, and facilitating better home-school communication through e-mail and Website information. He further cites Jonathan Carson, CEO of the K-12 division of Learning Network, who states that the Internet will likely democratize education. Symonds predicts that students in poor communities will have access to the best libraries, to instructors from around the world, and to a far richer menu of courses, many of which will be delivered over the Web.

Technology enhances education and is becoming increasingly essential to learning. Student development of basic academic skills improves with the use of technology, especially for at-risk students. Access to the Internet and distance learning opportunities promote relevant learning experiences irrespective of geographic restrictions and improve student and teacher access to information. Finally, technology, especially through video-conferencing, promotes greater understanding of other cultures.

According to Wango (2009) computers integrated in school operations have advantages which include:

- (i) Presentation: Work is legible and looks presentable. For example, class lists, schemes of work and classroom tests.
- (ii) Easy access: This also allows more copies to be made available, for example, making report cards and newsletters.
- (iii) Extended writing: documents can be easily redrafted to improve structure, expression and accuracy using the cut and paste facility.
- (iv) Storage: Massive amounts of data concerning students, workers, examination results, schemes of work, photographs of school functions and letters can be easily stored on a computer.
- (v) Simplicity: A simple programme can do a large amount of work like typing, editing a document, accounting, analysis of examination results and grouping students by type of class or hostel.

(vi) The Internet: This is the fastest form of communication worldwide where the school community can access information ranging from culture, history, and definition of terms.

## **2.8 Telecommunication Technology**

For example radio, television and telephone. According to Suppes (1981) telecommunications is the science of communicating over a long distance using telephone or radio technology. This involves using microelectronic (small semiconductor chip), computer, and PC technologies to transmit, receive, and switch voice, data, and video communications over different transmission media, including copper, fiber, and electromagnetic transmissions. This definition implies that we are doing more than just voice communications. Further, it does not imply using analog transmission exclusively. Many forms of analog and digital transmission are employed in telecommunications today. Analog communication is like a dimmer switch for light because it has an almost unlimited number of brightness settings. In contrast, digital communication works like a simple light switch that has only on or off.

According to Suppes (1981) Telecommunications is the merging of voice, data WAN, LAN, video, image, and wireless communications technologies with PC and microelectronic technologies to facilitate communications between people or to deliver entertainment, information, and other services to people. Microelectronics is the technology of constructing electronic circuits and devices in very small packages such as computer chips. Telecommunications represents a convergence of these technologies into networks and systems that serve people planet-wide.

According to Suppes (1981) as the quantity of digital information multiplies and moves through ever higher capacity networks information can now travel to all parts of the world, across a city or nation, in basically the same time and at the same cost. Infrastructure investments will now go into information and communication technologies rather than into bricks and mortar, and it is incumbent upon policy makers and educational planners everywhere to become aware of the technologies available. They must be able to select the appropriate mix of affordable technologies to meet the needs of the country and its education system. Dr. Jon Peha of Carnegie-Mellon

University in the United States propose that programmes use a variety of technologies and services to help achieve a variety of functions in the learning process. He identifies the following tools for delivering education:

Broadcast radio, for example all India Radio broadcasts farmer education and teacher training; Nepal and South Africa have hands-on training programmes for caregivers and kindergarten teachers; the Dominican Republic has a radio in-service Associates degree for teachers, including subject matter and pedagogy.

Broadcast television, e.g. British Open University higher education on television is a model for mega universities in the developing world; China's Television University trains science teachers; Thailand's Open University School of Education offers in-service certificates and degree programmes.

Satellite television, especially to select audiences, e.g. Telesecundaria's well-established closed-circuit television to rural schools in Mexico and neighbouring countries; South Africa, Brazil and Zimbabwe's new satellite transmissions to 3,000 higher education sites; Galaxy Latin America's free access to two of 200 direct television satellite channels for teacher education.

Video and audio tape, e.g. Brazil's in-service programme for primary school teachers of mathematics and Portuguese; the USAID (United States Agency for International Development) rural health education programme; and Open University courses in the United Kingdom that use tape cassettes.

### **2.8.1 Advantage of telecommunication in education**

Radio and broadcast television have been used for years to extend the reach and delivery of education to many who wish to learn, particularly those in rural areas, while print has been the basis of distance education in correspondence courses. These one-way technologies can now be combined with two-way, interactive, multimedia systems that bring to learners, on demand, voice, video and data in text and graphics. These computer and network-based systems bring significant differences in both the application and the cost of technologies available for education (suppes, 1981).

## **2.9 Networking technology**

According to online British dictionary (computing), networking is the interconnection of two or more networks in different places, as in working at home with a link to a central computer in an office for example internet. According to Hargiltai (1999) defines the internet technically and functionally as follows: “the internet is a worldwide network of computers, but sociologically it is also important to consider it as a network of people using computers that make vast amounts of information available. The use of internet has revolutionized access to information for the business world, libraries, education and individuals. A few of the most popular include E-mail (electronic mail), World Wide Web (WWW) FTP (File Transfer Protocol) use net and Telnet. The internet and its technology continues to have a profound effect in promoting the sharing of information especially in academic world, making possible rapid transactions among business, and supporting global collaboration among individuals and organizations (Bandeled, 2006).

Audio conferencing by telephone conference calls with high-quality audio conferencing equipment or speakerphones and service provided by national and international carriers, used for discussion seminars, lectures with keypad response, and support sessions for teachers (Suppes, 1981).

### **2.9.1 Advantages of networking technology**

Networking technology for example internet, it is very easy to communicate through a network. Students and teachers can communicate efficiently using a network despite the distance they may have.

They can enjoy the benefit of emails, instant messaging, telephony, video conferencing, chat rooms. Also, ability to Share Files, this is one of the major advantages of networking computers. Teachers and students can share information's and data because of networking. This is beneficial for school to maintain their data in an organized manner and facilitate access for desired people (Bandeled, 2006).

According to Laurillard (1993) video conferencing can be described as "One-to-many medium, making it a sensible way to provide access for many sites to a remote academic expert". It is still matter of discussions, whether a video conferencing should be more

included into the process of education in schools. It has several advantages when compared to a regular teaching method which requires a presence of the lecturer and the students in the same place at the same time.

A possibility of recording the lecture, it rarely happens that an expert does preparations for a lecture keeping in mind that he/she will only use the preparations for that one particular lecture. Usually, a teacher gives students the very same lecture over and over. Either, there are so many students that the same lecture must teach students separately in smaller groups at different times, which forces the teacher to be available making him or her spend twice more time in teaching, or the lecture is so well prepared that it can be reviewed by younger learners who undergo the same seminar next year. In either case, there is an opportunity for students to view the recorded lecture at any time, as long as a teacher does not mind their attendance in the seminar (in our case, the participation in the video conference) (Laurillard, 1993).

## **2.10 Role of Information and Communication Technology (ICT) in Secondary Education**

Information and communications technology simplify the administrative support levels of their academic in various levels of the academic pursuit. Student's services like records, admission / recruitment, class schedules, attendance, registration, time tabling and accessing results can be realized via network of computers and other communication avenues called student portals (Horn & Siew, 2011).

The inventory management, personal records maintenance and library systems are areas that are mostly affected in the field of technical and vocational education and training. This is in essence connected to the peculiar nature of the field and its desire to prepare workers with certain competencies and employability seals. Facilities managements, tools and equipment inventory and workshop schedules make it necessary for school to deploy and fully integrate ICT in its day-to-day operations, students should be able to book for tools and machinery needed to carry out certain experiments online or by using ICT. Therefore, Local Government Authorities should have to embrace the use of technology in both staff and students administrative services (Leung el-d, 2005). ICT

tools such as e-tutor and e-student system could provide significant atmosphere in the preparation of technical education gradually to face the challenges for the world to work in the 21<sup>st</sup> century (Seng, 2007).

Several ICT and computer aided school application packages highly enriched with current and emerging technologies are readily available and can be found to support student's activities in schools. Among these latest ICT tools, radio frequency identification (RFID) system appeared to be one. According to Akpir & Kaptan (2010) RFID is a term that is used to describe a system that transmits the identity of an object or person in the form of a unique serial numbers using radio waves. Apart from its numerous applications that aid across human endeavour, RFID application in education includes automatic person identification system (APIS), class / laboratory.

The following are ways in which ICT support teachers on their work:

**A. Resources / material preparation**

- (i) Lesson planning
- (ii) Report writing
- (iii) Curriculum planning
- (iv) As a lesson resources (e.g. website)
- (v) Time tabling
- (vi) School policy development
- (vii) Reprographics / photocopying
- (viii) Presentation of demonstrations
- (ix) Marking and assessment
- (x) Monitoring pupil's progress
- (xi) Record keeping (e.g. data base entry)
- (xii) Special educational needs coordination
- (xiii) Development planning
- (xiv) Exam entries and results
- (xv) Records of achievement
- (xvi) Extra curriculum activities

## **B. Registration**

- (i) Staff appraisal / supervision or monitoring
- (ii) Monitoring attendance
- (iii) On-line communities
- (iv) Financial records
- (v) Continuing professionals development / training
- (vi) Budgeting
- (vii) Partnership links (contact outside the school)
- (viii) Pupil contact (for example, council / internet)
- (ix) Staff contacts (for example arranging through email / internet)
- (x) On-line purchasing of services and / or goods

Source: Selwood (2005).

## **2.11 Benefits of ICT in education**

According to World Bank (2010) the following are the importance of ICT in education as follow:

Increasing access through distance learning, ICTs can provide new and innovative means to bring educational opportunities to greater numbers of children of all ages, especially those who have historically been excluded, such as populations in rural and remote-rural areas, girl children facing social barriers, and children with disabilities and other compulsions. In almost all the developing countries of South Asia, distance learning has been an important component of the education policy of these nations. It is probably in this domain that traditional ICTs like radio, television, and audio cassettes were first deployed in the education space. In India, distance learning offered by institutions like National Institute of Open Learning (NIOS) and Indira Gandhi National Open University have used a combination of print and audio-visual material as well as traditional face-to-face interactions to deliver their content.

Enabling knowledge network for students, with knowledge as the crucial input for productive processes within today's economy, the efficiency by which knowledge is acquired and applied determines economic success. Effective use of ICTs can contribute to the timely transmission of information and knowledge, thereby helping education systems meets this challenge.

Training Teachers, Large numbers of school teachers will be needed to meet the MDGs for education. The use of ICTs can help in training teachers to accomplish the targeted tasks on a mission mode. Moreover, ICTs provide opportunities to complement on the job training and continuing education for teachers in a more convenient and flexible manner. The use of ICTs for teacher training has been recognized by the governments of most South Asian countries and teacher training programmes like Intel Teach across India, Pakistan, and Sri Lanka; Microsoft Shiksha in India; and several other initiatives in Nepal and Bhutan are focused on using ICTs for training teachers. This includes training in applying ICTs in their teaching practices as well as using ICTs as a mode of delivery for these trainings.

Broadening the availability of quality education materials, Development of relevant, good quality content is perhaps the biggest challenge and opportunity in the educational technology space. While infrastructure, capacity building, monitoring, and evaluation are critical support structures without quality content, the learning experience of students will not be significantly improved by the mere presence of ICT. To that end content development is being focused on in many of the focus countries in our study. In India, several initiatives are ongoing for creating digital repositories and learning objects; the Sakshat Portal of Government of India, initiatives like National Program of Technology Enhanced Learning (NPTEL), the Multimedia Educational Resource for Learning & Online Teaching (MERLOT) seek to create quality digital content for different levels of education.

Enhancing the efficiency and effectiveness of educational administration, new innovative technologies can help schools administration to simplify work especially on recording keeping and on decision making because of the use of ICT. The Government of Afghanistan's articulation of the policy for ICT in education focuses on the need to provide access to ICT for all Ministry of Education administrative staffs, teachers, and students. The policy further envisages that through the use of information management systems, ICT will be extensively used to automate and mechanize work such as human resource management, financial management, monitoring and evaluation, the processing of student and teacher records, communication between government and schools, lesson

planning, assessment and testing, financial management, and the maintenance of inventories.

Given the wide variety of tasks that can be done on computers, they are clearly the most versatile learning tool available today. Students can write, draw, paint, model, program, discuss, animate, speak, record, report and calculate. In secondary classes, concepts and principles become increasingly complex; computers support cognitive flexibility through hypertext, simulations and micro worlds.

ICTs open up a world of ideas for children; they can see that there are different cultures and languages that make up not only our country, but also the world. They can see how different species interact with each other and with geological systems to create ecosystems. This awareness of differences, and the understanding that these differences are valuable, is the critical first step in ensuring a sustainable and peaceful future.

Computers can serve administrative functions; they can replace the laborious exercise of filing papers in filing cabinets and shelves where records accumulate dust over a long period of time. Another administrative application of the computers is their use for budget planning, accounting for expenditure, writing correspondences and reports, assigning students to classes, reporting students' progress and testing students and scoring tests which help to reduce paper work.

Computer can enhance educational efficiency; the efficiency in teaching various subjects could be improved. For instance, many secondary school teachers are already teaching large classes of students. In this situation, students no longer receive the much desired individual assistance.

## **2.12 Challenges facing the adoption of ICT in provision of secondary education**

There are many challenges in implementing ICTs effectively in existing schools. Policy-makers need to give ICTs adequate priority and attention so as to reap the benefits of deploying ICTs in school education. Students from rural locations or impoverished communities often tend to slip under the radar so that they do not have even basic access to ICT. Given that a number of schools still do not even have appropriate classrooms,

computers, telecommunication facilities and Internet services; ICT continues to be a distant dream. The existing shortage of quality teachers further compounds the problem. In developing countries, budgetary allocations for deploying ICTs in school education are typically limited, and given the high initial costs of setting up ICT systems, the cost factor works as a further deterrent. Shifting the existing focus from traditional educational models to an ICT-based education system is bound to be met with constraints and roadblocks (Ajayi & Ekundayo 2007).

According to a UNESCO (2005) survey, about 35% of the already trained teachers in secondary schools in Europe, Asia and Africa have basic skills in ICT, which leaves 65% of the teaching workforce on the three continents still in need of computer skills (Auerswald & Magambo, 2007). The demand for ICT learning has been tremendous and the number of teachers who are trained to teach ICT cannot meet the demand. There are more students willing to be taught computing skills than there are teachers to transfer the skills. UNESCO (2005) reported that teachers, professors, technical and administrative staff must be given training that enables them to integrate new information and communication technologies into their teaching programs.

Computers are still very expensive and despite spirited efforts by the government agencies, NGO, corporate organizations and individuals to donate computers to as many schools as possible, there still remains a big percentage of the schools unable to purchase computers for use by their pupils. Access to IT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries (Kiptalam, 2010).

Many schools are still not yet connected to electricity; being developing countries, the EA governments have not been able to connect all parts of their countries to the national electricity grid. Consequently, those schools that fall under such areas are left handicapped and may not be able to offer computer studies. In countries within this South Asian region, large areas are still without a reliable supply of electricity and the nearest telephones are miles away. Power situation in rural and remote-rural areas even in some advanced countries in this region is undependable, and this affects the

functioning of any ICT initiative. Power outages and fluctuations add to the high maintenance costs of computer hardware (Ajayi & Ekundayo, 2007).

Computers are still expensive in Africa, in a country with a GDP of \$1600, majority of the individuals and schools cannot afford to buy a computer and consider it as a luxury item, more expensive than a TV. While 2nd hand computers cost as little as \$150 and branded new computers being sold at \$500 or higher. Broken down computers, while a good number of schools have benefited from donated used computers, they have not been adequately equipped with the same on maintenance and repair, hence its very common to see a schools computer lab full of broken down computers, some repairable and some not. This has actually been a major problem, and the government has now put strict measures on any person, NGO or corporate bodies willing to donate 2nd hand computers. (It was seen as a dumping ground); e-waste management (World Bank, 2010).

The price of computer hardware and software continues to drop in most developed countries, but in developing countries, such as Tanzania, the cost of computers is several times more expensive. While a personal computer may cost less than a month's wages in the United State, the average Tanzania worker may require more than two years' income to buy one. the fact that computers are still very expensive in East Africa, makes them a target for thieves who usually have ready markets to another party at a much less figure. This has made many schools to incur extra expenses trying to burglar proof the computer rooms. This extra expense makes some schools shy away from purchasing computers for their students (Ajaye & Ekundayo, 2007).

There is still a strong perception especially by the older generation that computers require highly skilled personnel to operate them, while this may not be the case, some school administrators also fear that their students will be exposed to adult sites and other undesired sites, through the use of the internet. Some also fear the infection of viruses to their computers leading to data loss, while this may be true to some extent, proper education on the safe use of computers and help alleviate some of these fears. In theory some people may have the opinion that the teachers who had not experienced ICT

throughout their learning tend to have a negative attitude towards it, as they may lack the training in that area of the curriculum (Blatchford & Whitebread, 2003).

Resistance is commonly witnessed while attempting to introduce ICTs into schools, very often from the teachers themselves, since they may be of the opinion that they shall become redundant once technology comes in or due to their perception that it is too late for them to adapt to a new environment. Educators themselves may be sceptical about the effectiveness of using ICTs in school education. Also, teachers may fear being rendered irrelevant by the introduction of computers in his/her class. The 'feel' that the teacher still remains an authority and a 'know it all' in class is something that most teachers cherish, and anything that makes them otherwise is deemed an enemy of the classroom. According to Lau & Sim (2008) "most of the teachers considered themselves as having limited knowledge of ITs; and indicated other channels to provide them with more effective ICT training". Hence, the government should also ensure the provision of computer staff and teacher immediately in the secondary schools for effecting teaching of IT skills (World Bank, 2010).

Most schools are not able to connect to the World Wide Web, due to the high costs involved in the connectivity. On average, it may cost approximately \$120 per month to connect to about 15 computers on a bandwidth of 128/64kbps. This is considered as very expensive for a very slow speed. While the Internet contains tremendous potential for education, as described in the sections earlier, it also has its own pitfalls. For one, providing all the students with Internet access is a very expensive proposition for most Government schools. This is more so in the case of rural centres and remote areas, where Internet connections are bound to be erratic, if available at all. A different challenge altogether when it comes to Internet usage is the effort involved in monitoring the students usage of the Internet to ensure that they do not visit educationally irrelevant and socially undesirable sites, thus detracting from the intended objective (World Bank, 2010).

English is the dominant language of the Internet. An estimated 80 percent of online content is in English. A large proportion of the educational software produced in the world market is in English.

For developing countries in sub-Saharan desert region where English language proficiency is not high, especially Tanzania areas, this represents a serious barrier to maximizing the educational benefits (World Bank, 2010).

Lack of initiative by the community leaders; the community leaders who are charged with looking at the interests of a given community do not see the need to purchase and subsequent installations of computers to their schools as a priority. They consider health care, provision of water and other amenities as more important than buying computers for their schools (World Bank, 2010).

Lack of relevant software, there is no doubt that the ultimate power of technology is the content and the communication. Though, software developers and publishers in the developed countries have been trying for long to develop software and multimedia that have universal application, due to the differences in education standards and requirements, these products do not integrate into curriculum across countries. Software that is appropriate and culturally suitable to the Tanzania education system is in short supply. There is a great discrepancy between relevant software supply and demand in developing countries like Tanzania.

According to Salomon (1989) there are clear indications from many countries that the supply of relevant and appropriate software is a major bottleneck obstructing wider application of the computer. Even if Tanzania tries to approach this software famine by producing software that would suit its educational philosophies, there are two major problems to be encountered. First, the cost of producing relevant software for the country's educational system is enormous. Second, there is dearth of qualified computer software designers in the country. To overcome this, people need to be trained in instructional design.

Many of the issues and challenges associated with ICTs in education initiatives are known by policy-makers, donor staff, and educators. However, data on the nature and complexity of these issues remains limited because of the lack of good monitoring and evaluation tools and processes. Where evaluation data is available much of the work is seen to suffer from important biases. Another problem in this area is the lack of a

common set of indicators for ICTs in education. And, where data has been collected, it is often quantitative data related to infrastructure (number of computers, for example) rather than data that can help policy-makers gauge the impact of ICT interventions on student learning (Trucano & Michael, 2005).

### **2.13 Overview of ICT facilities toward secondary education**

Information and communications technology (ICT) are indispensable tools in the administration of education. Electronic management (e-management) facilitates decision making in an organization (Hastim, 2010), development of ICT in administration of schools as suggested by international institute for communication and development (IICD) “needs to be strengthened in order to manage and plan activities more effectively. Information is mostly in hardcopy format and is not easily accessibility. Data about teachers’ salaries, students grade, the number of pupils per class and statistical information in general and scattered and are not readily available” (IICD, 2007).

School administrators need to be equipped with knowledge, competencies and should have a deep understanding of educational and social dimension of ICT integration. Educational understanding or dimension includes application of ICT in curricular, technical management and financial aspects, while social dimension referred to understanding how ICT are applied in day-to-day social interaction (Tinio, 2003).

Studies on the application of ICT in the administration of education reveals major achievements; a study on the use of e-learning software among future school heads in educational management and leadership reveals that e-headship succeeded in promoting teaching and learning strategies to a higher degree (Moh’d , 2009).

ICT helps administrators to perform schools duties effectively, to increase and provide information to the fingertips of administrator and build very conducive atmosphere for work.

### **2.14 Empirical Literature Review**

There are quite some research efforts on ICT investments on service delivery. However, understanding ICT investments’ contribution to business value and service delivery has

been challenging and perhaps more challenging in developing countries due to generally less predictable changes in social, political, and economics infrastructure (Roztocki & Weistroffer, 2004).

According to Makewa, Meremo, Role, & Role (2013) the study found that both teachers and administrators saw the use of ICT in secondary school administration as important. Teachers and administrators viewed the use of ICT in student administration as equally important while administrators rated the importance of using ICT in supervision of instruction and in student administration higher. This is encouraging for the implementation of ICT in secondary school administration because administrators, who have a greater influence in implementing ICT use in schools, have a higher perception than that of the teachers. They could easily influence the staff they lead through mentoring. In fact, they rated the importance of ICT use in supervision of instruction and in student administration higher than any other item. It is evident from this study that ICT has a dominant position in education; it enters the school environment progressively, aiming to adopt technological applications not only in the teaching and learning process but also in the management of the whole school. Information systems provide tools that contribute to the improved execution of administrative work. More specifically, using an information system in school administration provides for data integration where data is derived from several information sources, for decision making as well as for management. As such, the implementation of ICT facilitates the effectiveness of administrative services and reinforces communication channels within the school community.

A survey in US by the National Centre for Education Statistics (NCES) in 2000 using the Fast Response Survey System (FRSS) revealed that 99% of full-time regular public school teachers had access to computers or the internet somewhere in their schools. The survey also wanted to establish how teachers use computers and the internet at school and their perception of preparedness. The results showed that 39% of the teachers used computers and the internet to create instructional materials, 34% used them a lot for administrative record keeping and less than 10% reported accessing model lesson plans or research and best practice using computers or the internet. Newer teachers were more

likely to use computers and the internet than those with more than 20 years' experience, who mostly used computers and the internet to communicate with colleagues.

According to Saitoti (2007), increasing computer literacy in Kenya's secondary schools is a prerequisite for improving IT in the education system. He further insists that if Kenya wants to attain the Millennium Development Goals of increasing literacy levels, government education policies must embrace the spirit of technology by introducing an ICT syllabus in all secondary schools. Five years later we still have educators who see the ICT use as important but a nightmare to put into administrative practice.

Oliver (2002) emphasised the impact of ICTs on educational practice in higher education, as a tool with the capacity to transform education from a teacher directed enterprise to more of student-centred models. He also argued that the use of ICT in higher education settings could enhance knowledge creation through increased use of ICT among students.

Yang (2008) examined the impact of ICT on higher education among tertiary teachers and students. The study also explored the issues that emerged from the implementation of ICT in higher education institutions, in the University of Tasmania. His finding revealed that ICT tools employed in learning and teaching can be both advantageous and disadvantageous.

According to Okebukola (1997), computer is not part of classroom technology in over 90% of public schools in Nigeria, thus the chalkboard and textbooks continue to dominate classroom activities. This is an indication that the students are still lagging behind in the trend of changes in the world. This presupposes that there is the tendency for the teachers and students to be denied the opportunities which ICT offers in the teaching-learning activities. There is the need to replace the traditional pedagogical practices that still underpin the educational system in the country, hence the need for the application of ICT in Nigerian Secondary Schools.

According to Yusuf (2005) the author posited that ICT is an indispensable part of educational administration as its application makes institutions more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers'

pedagogical activities. For instance, e-learning is becoming one of the most common means of using ICT to provide education to students both on and off campus by means of teaching online offered via web-based systems.

### **2.15 Conceptual Framework**

This study is built in the concept that contribution of ICT on service delivery can only be observed through adhering to the objectives of information and communication technology (ICT) policy for basic education of 2007, and also by giving secondary education a priority by investing on ICT facilities so that to improve employee efficiency, to speed up information sharing and decision making in the management. Appropriate ICT facilities are; computer, internet, projector, television sets, radio (tape record), electronic notes board, and video also providing ICT experts and training. Quality service delivery on education sector can be achieved through help of appropriate ICT facilities as follow:

Computer is an electronic device which stores information on disc or magnetic tape; analyses it and produces information as required from the data on the tape. It is basically a processor of information. Computer is a machine designed to make life easier due to its speed, accuracy, ability to store large quantity of information and to carry out long and complex operation without human intervention (Reith, 1993).

Through computer quality service delivery can be achieved because computers can serve administrative functions, they can replace the laborious exercise of filing papers in filing cabinets and shelves where records accumulate dust over a long period of time. Another administrative application of the computers is their use for budget planning, accounting for expenditure, writing correspondences and reports, assigning students to classes, reporting students' progress and testing students and scoring tests which help to reduce paper work.

Internet is a worldwide network of computers, but sociologically it is also important to consider it as a network of people using computers that make vast amounts of information available. Through internet speedup information sharing and help on decision making on the school management.

Projectors, many teachers find chalkboards to be almost a thing of the past with the advent of projectors in the classroom. Rather than writing notes across a board, teachers can make use of PowerPoint presentations, images and even film as teaching tools through the use of projectors. With the use of projectors in the classroom, students can take better notes with the ability to discern what information the teacher displays is most useful to them. Using projector would provide better learning for the students. Students can participate in real-time interactive activities, and problem-solving activities promote the development of critical thinking skills.

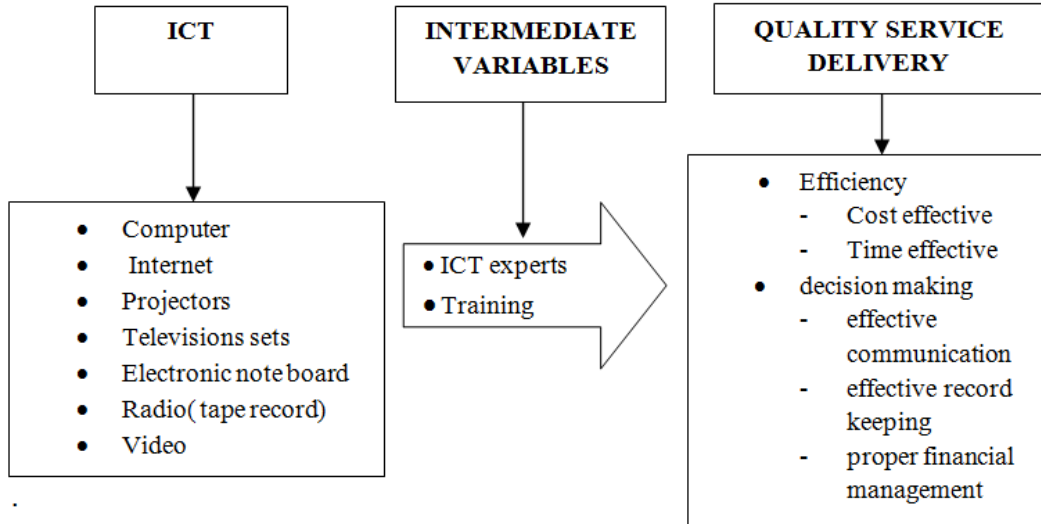
Electronic Notice Boards typically consist of an LCD display screen mounted in either portrait or landscape mode, connected to a PC or a digital signage player. One of the major benefits of an Electronic Notice Board is the instant distribution of information. The MediaCAT Digital Signage player is completely managed via its easy to use web interface, which can be accessed by any PC or Mac on network without having to install any extra software. This allows staff to login to a MediaCAT and instantly update media or messages being displayed on the Electronic Notice Board, even if they are on the other side of a campus - or if Internet connected, even the other side of the world.

Radio and broadcast television have been used for years to extend the reach and delivery of education to many who wish to learn, particularly those in rural areas, while print has been the basis of distance education in correspondence courses. These one-way technologies can now be combined with two-way, interactive, multimedia systems that bring to learners, on demand, voice, video and data in text and graphics (Suppes, 1981).

But all these cannot be accomplished if the government and community did not investing on ICT facilities in secondary education and giving it priorities the same as other sector like health, also government have to attract investor on education sector and to find sponsorship on ICT. In order to have effective use of ICT facilities there should be ICT experts and training for the user. But at the end appropriate ICT facilities in secondary education contribute to quality service delivery.

**Independent variable**

**Dependent variable**



**Figure 2.1: Conceptual Framework**

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This part describes the practical methods used to answer the research questions and fulfil the purpose of this research. It also describes the techniques that were used in obtaining data. It describes research type, research design, the study focus, sampling procedure, data collection methods, data analysis method as well as ethical consideration which were used in the study.

#### **3.2 Research design**

According to Kothari (2004) research design is defined as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact, research design is a conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher was doing from writing the hypothesis and its operational implications to the final analysis of data. The study adopted was a case study research design which is descriptive in nature. The case study was used because it is relatively less expensive and data collection is manageable than in other research designs (Kothari, 2004). Also, the researcher wished to triangulate the study through the use of multiple methods (Shuttleworth, 2008).

#### **3.3 Area of the study**

The area of study was Karatu District Council. Karatu district council is one among six councils in Arusha region. The council is situated in northern Tanzania which has thirty two secondary schools. Purposive sampling technique was used to select Karatu district as a study area. A researcher made this choice due to her understandability factor about the Karatu district, time limitations on conducting research work and also being among the District Council in Tanzania which need to have effective use of ICT facilities in provision of education service especially in secondary schools.

### 3.4 Target population of the study

The target population of this study were District Secondary Education Officers, Teachers and Students in secondary schools in Karatu district that make total of 10432 people.

#### 3.4.1 Units of enquiry

**Table 3.1: Unity of enquiry**

S/N	Unit	Population	Sample	Percentage (%)
1	DSEOs	2	2	100
3	Teachers	540	60	11.1
4	Students	9890	90	0.9
	<b>Total</b>	<b>10432</b>	<b>152</b>	<b>1.45</b>

Source: Karatu District Secondary Education Office (2015)

### 3.5 Sample size

Rwegoshora (2006) defined sample as part of population which is studied in order to make inference about the whole population. The sample size consisted of 152 respondents, whereby a researcher drawn 150 respondents from six representative secondary schools out of thirty two (32) secondary schools at Karatu district, and 2 respondents from District Secondary Education office. The sample size of 152 respondents was selected because the researcher was interested in carrying out in-depth investigation of the study problem which could not easily be achieved with huge sample of respondents. Prince (2005) argues that a sample of 30 elements and above is sufficient for the study.

### 3.6 Sampling techniques

Sampling is the procedure a researcher uses to gather people, places, or things to study. This study employed the following procedures: Stratified sampling, purposive and accidental/ convenience sampling.

#### 3.6.1 Stratified Sampling

According to Kothari (2004) if the population from which a sample is to be drawn does not constitute a homogeneous group, then stratified sampling technique is applied so as

to obtain a representative sample. In this technique, the population was stratified into a number of non-overlapping subpopulations or strata and sample items were selected from each stratum. With regard disproportionate stratified sampling technique, the researcher segment entire secondary school teachers and students from selected schools at Karatu district council into three strata and select representative from each stratum this is due to the large population the study have. Also, the researcher used disproportionate stratified sampling so as to have large number of teacher's representatives than number of students because teachers were more important in the study.

This technique was selected because it helps to get representative sample whereby the total population were divided into different group called strata by considering element which is homogenous that means all element having similar characteristics are grouped into the same stratum.

### **3.6.2 Accidental or convenience sampling**

According to Milanzi (2002) a convenient sample is obtained by selecting convenient population units. A fraction of a population being investigated which is selected neither by probability nor by judgment but by convenience. With regard accidental sampling the researcher employed this technique to select respondents by convenience from the selected secondary schools at Karatu district so that they can attend questionnaires. This technique was employed in the study because subjects were selected because of their convenient accessibility and proximity to the researcher due to the study has element of heterogeneous.

### **3.6.3 Purposive Sampling**

Purposive sampling is also called deliberate sampling. This sampling technique involves deliberate selection of a particular unit of the universe for constituting a sample, which represents a universe (Kothari, 2004). This technique does not give any guarantee estimating that every element in the population has a chance of being included in the sample (Adam & Kamuzora, 2004). According to Laerd dissertation (2012) the main goal of purposive sampling is to focus on particular characteristics of a population that are of interest, which will best enable you to answer your research questions. Six

secondary schools were selected by researcher purposively because firstly, most of the rural public secondary schools (ward schools), have the same operation management and high percentage delivery depends on the government; also urban secondary schools have the same operation management in Karatu district, secondly insufficient time to collect and process data and lastly financial constraints, which is lack of sufficient amount of money to visit all 32 secondary schools in Karatu District Council. The six secondary schools that were purposively selected by researcher were Welwel, Banjika, Ganako, Endarofta, Dr. Wilbroad Slaa and Gyekrumlambo secondary schools and not the rest of schools in a council due to geographical location of those schools which were not much in the interior for a researcher to visit because of the financial constraints as the researcher was still a student and hence could not afford follow-up costs. Also, in this study the respondents who seemed to be more reliable were chosen purposively from each stratum such as, District Secondary Education Officers (DSEOs), teachers and students from selected secondary schools at Karatu district council.

### **3.7 Types and Sources of Data**

Generally, the nature of the problem under study and nature of respondents determine the methods of collecting (Kothari, 2004). This study used both primary and secondary data.

The primary data are those which are collected afresh and for the first time, and thus happen to be original in character. Under this study primary data was collected through interviews and questionnaires directly from the respondents.

The secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process (Kothari 2004). And thus secondary data were gathered through the review of the existing documentary sources. Such documentary sources included reports and other sources.

### **3.8 Primary data collection methods**

The nature of the study determines the methods of collecting data (Kothari, 2004). This study used three methods of data collection namely: questionnaire, and in-depth interview and observation.

### **3.8.1 Questionnaire**

The questionnaire is most frequently a very concise, pre-planned set of questions designed to yield specific information to meet a particular need for research information about a pertinent topic. The research information is attained from respondents normally from a related interest area (Key, 1970). The questionnaire is given to respondents who are expected to read and understand the questions and write down the answers in the space meant for the purpose in the questionnaire itself. Questionnaire facilitates the collection of data by asking all, or a sample of people, to respond to the same questions. So, this study used questionnaires on collecting the data in the field and it comprised both close-ended and open-ended questions. Under this study a series of questions were supplied to the teachers and students in secondary schools at Karatu Council, the close ended questions did not offer a set of alternative answers from which the respondents were not asked to choose the one that most closely represented their s but respondents had to answer all questions by choosing and ticking against the appropriate answer.

This method was employed in the study due to the fact large amount of information could be collected from a large number of people in a short period of time and in a relatively cost effective way.

### **3.8.2 Interview**

An interview is a method of asking quantitative or qualitative questions orally of key participants. Quantitative questions are closed-ended, and have specific answers to choose among that can be categorized and numerically analysed. Qualitative questions are open-ended, that is, the respondent provides a response in his or her own words (Evaluation eta, 2009). The purpose of the research interview is to explore the views, experiences, beliefs and/or motivations of individuals on specific matters. Under this study interview was conducted with District Secondary Education Officers as they provided accurate details information concern Karatu district secondary schools. Also, interview was conducted with Head Masters, Deputy Master, Academic masters/ Mistress, as they provided general information concern ICT in secondary schools at Karatu District Council. Also, few teachers and students were interviewed as they also had important details on the matter and they experience environment and thus could

provide accurate and precise data. This method was employed because it helped to clarify or paraphrase questions to the respondents.

### **3.8.3 Observation**

Is an extension of what happens in many other areas of life, and it has developed out of the attempts to be systematic both in the ways people make and record observations in everyday life and in the ways people interpret those observations (Milanzi, 2002). The researcher obtained valuable information through observing daily activities performed on different activities in secondary schools. The researcher gathered data by watching behaviour, events, or noting physical characteristics in their natural setting in selected secondary schools at Karatu District Council. Observation helped the researcher to obtain relevant information and accurate data.

## **3.9 Secondary data collection method**

### **3.9.1 Documentary review**

This method were used to collect secondary data from both published and unpublished materials related to contribution of ICT on service delivery specifically in secondary education. The researcher reviewed different materials such as books, journals, articles, and researches from other authors. The researcher through conducting documentary research was helped to access to information that would be difficult to get in other way such as people or cases who might not be willing to talk in a formal research interview or might be difficult to track down.

### **3.10 Data analysis**

Data analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data-groups (Kothari, 2004). After collecting data the researcher examined the collected data in details before analysing them. The researcher used both qualitative and quantitative data analysis in analysing the collected data. Quantitative data were analysed by using descriptive statistical analysis, using SPSS V16 (Statistical Package for Social Science), percentages, and Microsoft excel of data analysis. Results were presented by frequency tables, bar charts and pie charts (figures). Qualitative data were pen ended questions were post-coded and entered on the computer. Data entry was done using statistical package for social sciences (SPSS)

version 16. Cross tabulation analysis of the data was employed so as to measure association between the independent variables which is ICT constitutes of Computer, Projector, Radio (tape recorder), Video, slides, and electronic notice boards whereas dependent variables is quality service delivery.

### **3.11 Ethical considerations**

Ethical clearance was sought from Mzumbe University at the Directorate of Research and Publications. Participants were asked to participate voluntarily and were also free to withdraw from the study at any time; they were assured of anonymity and confidentiality throughout the study. The informed consent was sought from study participants prior to their participation in the study and the aim of the study was well explained to them.

## **CHAPTER FOUR**

### **DATA ANALYSIS AND PRESENTATION**

#### **4.1 Introduction**

This chapter presents the findings of the study; it presents the demographic characteristics of the study population and the findings of the specific objectives that guided the study. Specific objectives were: firstly, to examine availability of appropriate ICT facilities for teaching in secondary schools at Karatu District Council; secondly, to find out if teachers and students are exposed to the use of ICT facilities in secondary schools at Karatu District council; thirdly, to identify perceived benefits of ICT facilities in service provision at secondary schools at Karatu District Council; and lastly, to examine the challenges facing the use of ICT in service provision at secondary schools at Karatu District Council.

#### **4.2 Demographic characteristics of the study population**

This part presents demographic characteristics of 150 respondents from selected six secondary schools that attended to the questionnaires, while two (2) more respondents from the district secondary education office were interviewed only to get more details about the study in general; that is why they were not included in presentation of findings. So, the total sample size of the respondents was 152. This part shows; sex of respondents, age of respondents, education qualification of the respondents, and occupation and levels of education of respondents.

##### **4.2.1 Sex of Respondents**

This part presents sex of the respondents of the study. It presents findings of six (6) secondary schools at Karatu District council, whereby each school had equal number of respondents. Also, the study presents findings of 150 respondents in which 50% were male and 50% were female. Table 4.1 below shows details of demographic description which shows sex of the respondents.

**Table 4.1: Sex of Respondent of the study**

School Name	Male		Female		Total
	Number	Percentage	Number	Percentage	Number
Banjika Secondary School	14	56	11	44	25
Ganako Secondary School	13	52	12	48	25
Welwel Secondary School	10	40	15	60	25
Endarofta Secondary School	10	40	15	60	25
Dr. Wilbroad Silaa Secondary School	12	48	13	52	25
Gyekrumlambo	16	64	9	36	25
<b>Total</b>	<b>75</b>	<b>50</b>	<b>75</b>	<b>50</b>	<b>150</b>

**Source:** Field data (2015)

#### 4.2.2: Ages of respondents

The study presents 150 respondents in which their ages ranged from below 24 to 45 and above in each school. Below 24 years of age were 61% of respondents, 25-34 years were 20% respondents, 35-44 years there were 19% respondents, and lastly above 45 years there were 1% respondent. Table 4.2 below shows details of age categories of the respondents in each secondary school.

**Table 4.2: Ages of respondents**

School Name	Age Category								
	<24		25-34		35 – 44		>45		Total
	No.	%	No.	%	No.	%	No.	%	No.
Banjika Secondary School	15	60	6	24	4	16	0	0	25
Ganako Secondary School	16	64	5	20	4	16	0	0	25
Welwel Secondary School	15	60	4	16	5	20	1	4	25
Endarofta Secondary School	15	60	5	20	5	20	0	0	25
Dr. Wilbroad Silaa Secondary School	15	60	10	40	0	0	0	0	25
Gyekrumlambo	15	60	0	0	10	40	0	0	25
<b>Total</b>	<b>91</b>	<b>61</b>	<b>30</b>	<b>20</b>	<b>28</b>	<b>19</b>	<b>1</b>	<b>1</b>	<b>150</b>

**Source:** Field data (2015)

#### 4.2.3 Education qualification of respondents

The study presents data from different levels of education of respondents. Questionnaires were given to respondent's accordance to level of education for instance

those who have Bachelor degree, Diploma, Form six, Form five, Form four, Form three, Form two, and Form one so as to get accurate data from all levels of education of respondents. Table 4.3 below shows details of levels of education of respondents

**Table 4.3: Education qualifications of respondents**

Variable	Number	Percentage
Bachelor	43	29
Diploma	17	11
Form six	6	4
Form five	9	6
Form four	11	7
Form three	20	13
Form two	26	17
Form one	18	12
<b>Total</b>	<b>150</b>	<b>100</b>

**Source:** Field data (2015)

#### 4.2.4 Occupation and Position level of respondents

There were headmasters given questionnaires that amounted to 1%, Deputy Masters who amounted to 2%, Academic masters who amounted to 4%, Teachers who amounted to 33%, and Students who amounted to 60% of the total sample size. This distribution is seen in Table 4.4 below.

**Table 4.4: Occupation and Position level of respondents**

Variable	Number	Percentage
Head master	2	1
Deputy master	3	2
Academic master	6	4
Junior Teacher	49	33
Student	90	60
<b>Total</b>	<b>150</b>	<b>100</b>

**Source:** Field data (2015)

#### 4.3 Availability of appropriate ICT facilities for teaching in secondary education

This objective aimed at finding out whether appropriate ICT facilities were available in secondary schools in Karatu District Council. A series of questions were given to respondents so that they could give their views. Respondents were asked to agree or disagree with the statement on availability of appropriate of ICT facilities for teaching in

secondary schools so as to obtain data. Also, two supportive questions were given to them so as to support and add some information on specific objective one. The questions were; Are ICT facilities in secondary schools applicable? And are ICT facilities enough for authority activities with respect to number of employees using them?

#### 4.3.1 Availability of appropriate ICT facilities for teaching in secondary schools

This part presents findings which were obtained from respondents while they were given a chance by the researcher to agree or disagree with the question that was provided which is availability of ICT facilities for teaching in secondary schools. Table 4.5 below shows responses of respondents on availability of ICT facilities.

**Table 4.5: Availability of appropriate ICT facilities for teaching in secondary schools**

Variable	Agree		Disagree		Strong disagree		Total
	No.	Percent	No.	Percent	No.	Percent	
Computers	35	2	23	15	92	61	150
Projectors	33	22	35	23	82	55	150
Internet	28	19	10	7	112	75	150
Radio	10	7	40	27	100	67	150
television sets	0	0	20	13	130	87	150
Video	10	7	58	39	82	55	150
Electronics notice boards	0	0	42	28	108	72	150
Slides	15	10	37	25	98	65	150

**Source:** Field data (2015)

Table 4.5 showed ICT facilities like Computer were available for only 23%, Projector 22%, Internet 19%, Radio 7%, Video 7%, Slides 10%, while other percentages were not available. Also ICT facilities like televisions sets and electronic notice boards were not available for 100%.

#### 4.3.2 Applicability of ICT facilities in secondary schools

On this supportive question one, respondents were asked to agree or disagree on if there applicability of ICT facilities in secondary schools, those ICT facilities is computer, projector, internet, radio, video, slides and electronic notice board.

**Table 4.6: Applicability of ICT facilities in secondary schools**

Applicability	Strong agree		Agree		Disagree		Strong disagree		Total
	No.	%	No.	%	No.	%	No.	%	No.
Computers	10	7	31	21	54	36	55	37	150
Projectors	0	0	78	52	27	18	45	30	150
Internet	10	7	70	47	20	13	50	33	150
Radio	0	0	58	39	37	25	55	37	150
Television sets	0	0	31	21	64	43	55	37	150
Video	0	0	36	24	54	36	60	40	150
Electronic notice boards	0	0	26	17	54	36	70	47	150
Slides	0	0	83	55	27	18	40	27	150

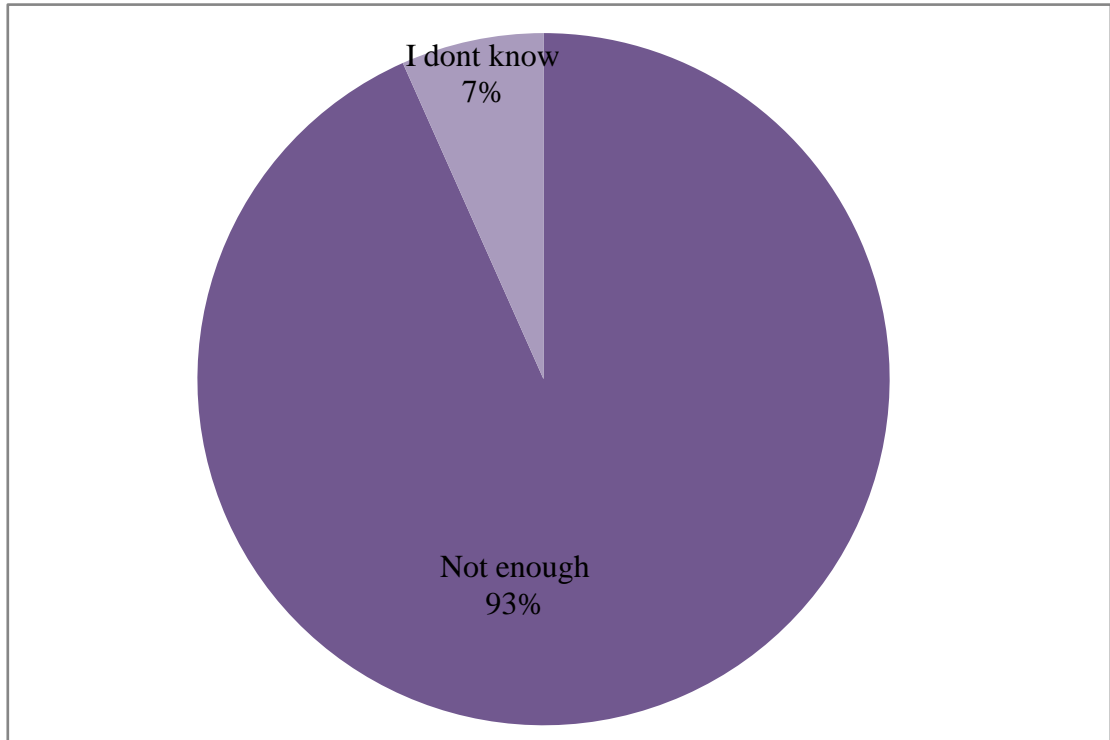
**Source:** Field data (2015)

Results in Table 4.6 show the applicability of ICT facilities in secondary schools. Computers (28%), Projectors (52%), Internet (54%), Radio (58%), television sets (21%), Video (24%), Electronic notice boards (17%), and lastly are slides (55%). This result showed that few respondents agreed that there is applicability of ICT facilities in secondary schools, while majority of respondents disagreed with applicability of ICT facilities.

#### **4.3.3 Whether ICT are facilities enough for authority activities with respect to number of employees using them**

This was another supportive question to specific objective one. During interview with two (2) DSEOs and heads of school, the researcher interviewed them by giving them chance to compare availability of ICT facilities in Karatu secondary schools with respect to number of employees using them. They were given three options to choose and explain why. Those options were enough, not enough and I don't know. Through interview, the researcher identified if the availability of ICT facilities in schools were enough compared to the number of users.

**Figure 4.1: Adequacy of ICT facilities for authority activities with respect to number of employees using them**



**Source:** Field data (2015)

Figure 4.1 shows that ICT facilities enough for authority activities with respect to number of employees using them is only 7% of respondents agreed, while 93% of respondents disagreed that, ICT facilities in secondary schools were not enough compared to number of users. This means that ICT facilities in secondary schools were not enough compared to number of users as also it was revealed from interview data that ICT facilities in secondary schools whether public or private schools were not enough compared to the number of users.

#### **4.4 Whether teachers and students are exposed to the use of ICT facilities in secondary schools at Karatu District council**

This objective aimed at finding out whether teacher and students are exposed to the use of ICT facilities in secondary schools. Responses of respondents on exposure of teachers and students to the use of ICT facilities in secondary schools were obtained through different questions that were provided to them so that they could agree or disagree on it. Those questions were functional internet facilities for browsing, teacher are exposed to

the use of ICT in teaching, enough ICT materials in teaching, teacher and students are knowledgeable on the use of ICT, and periodic training for teachers and students on ICT. Also, on this specific objective two there were some questions accompanied to add some information, those are; how long have you been using ICT facilities in your school? Have you attended any training concern ICT? , How often are you attending training on ICT courses? , and are there experts of using ICT facilities in their school?

#### 4.4.1 Exposure of teachers and students on the use of ICT facilities in secondary schools

On this specific objective two, findings were revealed from questionnaires whereby respondents were given chance to agree or disagree with the questions they were given.

**Table 4.7: Exposure of teachers and students on the use of ICT facilities in secondary schools**

Variable	Strong agree		Agree		Disagree		Strong disagree		Total
	No.	percent	No.	Percent	No.	percent	No.	Percent	No.
Functional internet facilities for browsing	0	0	48	32	82	55	20	13	150
Teachers are exposed to the use of ICT in teaching	22	15	42	28	66	44	20	13	150
Enough ICT materials in teaching	0	0	42	28	78	52	30	20	150
Teachers are knowledgeable on ICT	22	15	25	17	103	69	0	0	150
Students are knowledgeable on ICT	0	0	15	10	105	70	30	20	150
Periodic training for teachers on ICT	0	0	5	3	109	73	36	24	150
Periodic training for students on ICT	0	0	5	3	125	83	20	13	150

**Source:** Field data (2015)

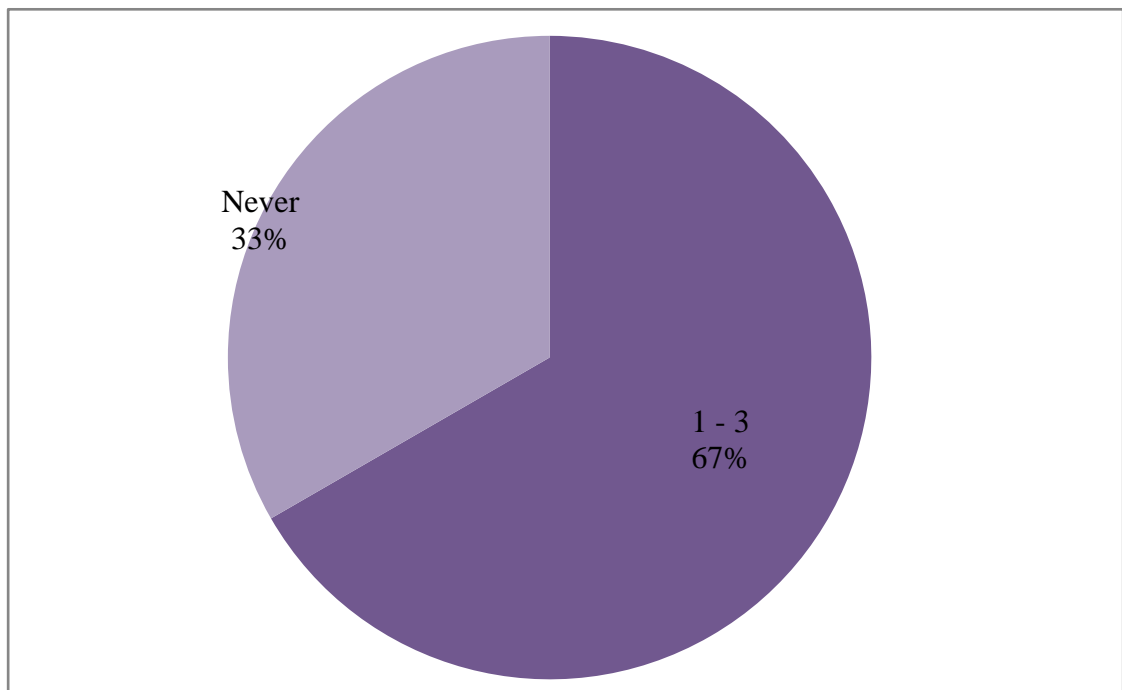
Table 4.7 shows the extent to which the teachers and students are exposed to the use of ICT facilities in secondary schools. 32% of respondents agreed that there are functional internet facilities for browsing, only 43% of respondents agreed that the teachers are exposed to the use of ICT, only 28% of respondents agreed that there are enough ICT materials in teachings, only 32% of respondents agreed that teachers are knowledgeable on use of ICT, only 10% of respondents agreed that students were knowledgeable on the

use of ICT, and only 3% of respondents agreed that teachers and students had periodic training on ICT. This means that teachers and students were not much exposed to the use of ICT.

#### 4.4.2 Whether respondents were using ICT facilities in your school

This was supportive question which helped the researcher to have more information concerning specific objective two. On this supportive question, respondents were asked how long ICT has been adopted and applied in schools so as to figure out how they have been experiencing on the use of ICT facilities, to capture how ICT contributed on quality service delivery.

**Figure 4.2: Respondents' duration in using ICT facilities in their schools**



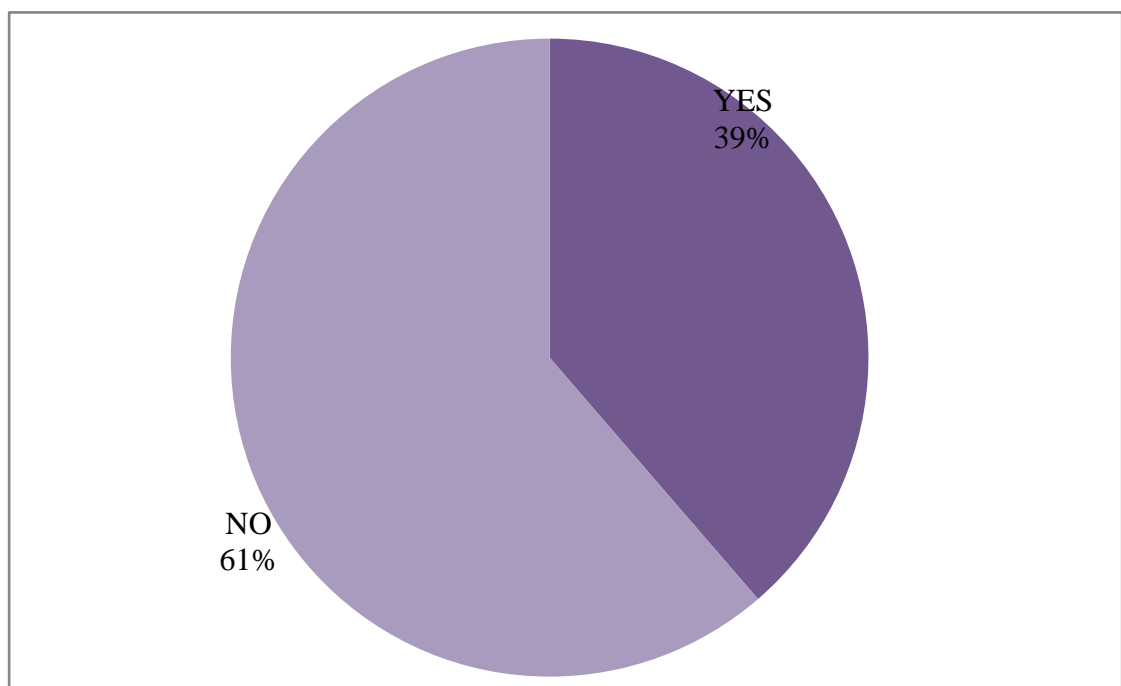
**Source:** field data (2015).

Figure 4.2 shows that 67% of respondents agreed that their schools were using ICT facilities between 1-3 years only, while 33% of the respondents stated that they had never used ICT facilities in their schools.

#### 4.4.3 Whether they had attended any training on ICT courses

This was a supportive question which helped in eliciting additional information to the specific objective two. Also, on this part respondents were asked if they have attended any training on ICT courses so as to figure out if they were capable of using ICT facilities so as to contribute to quality service delivery in their schools. Also, respondents were given this question to add some information to specific objective two.

**Figure 4.3: Respondents' attendance to training on ICT**



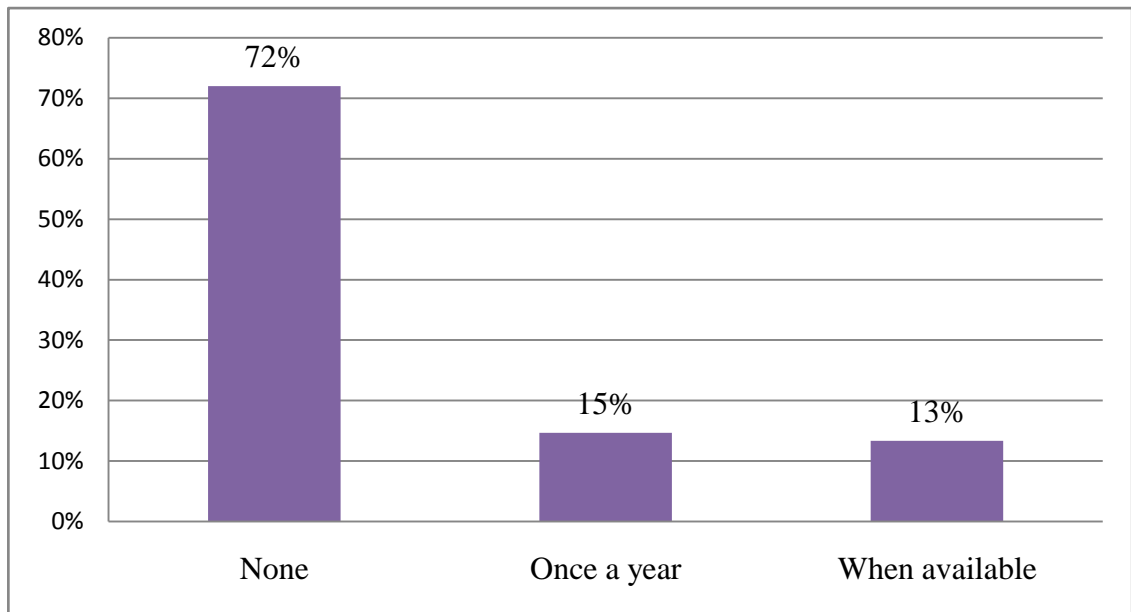
**Source:** Field data (2015)

Figure 4.3 above shows that only 39% of respondents had attended training of ICT courses. This means that few teachers and students had attended training on ICT courses.

#### 4.4.4 How often do you attend training on ICT courses in a year?

This also was a supportive question which added some information to specific objective two. Respondents were asked how often they were attending training on ICT courses in a year, they needed to choose between none, once a year, twice a year, and when available so that the researcher could understand how it helped in teaching process and also to know how it contributed to quality service delivery.

**Figure 4.4: Respondents' frequency in attending training on ICT**



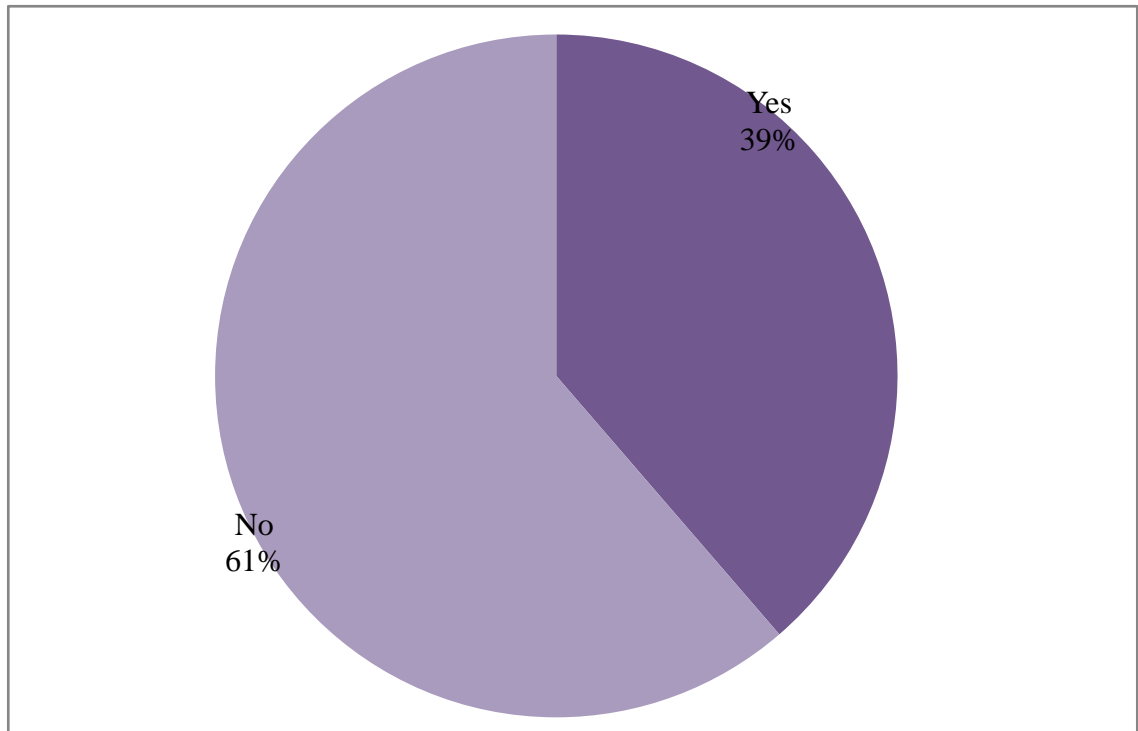
**Source:** Field data (2015)

Figure 4.4 show that 72% of the respondents didn't attend any of the trainings concerning ICT, 15% of the respondent agreed that they attended once a year, while 13% of the respondent agreed they attended training on the ICT courses when available.

#### **4.4.5 Whether they have experts of ICT facilities in secondary schools**

This was last supportive question which was added so as to add some information to specific objective two. Respondents were asked if there were experts of ICT facilities in their secondary schools. Experts of using ICT facilities help teachers when they fail to use some of the ICT facilities and also they make sure that ICT facilities in school are used properly so as to enhance quality service delivery.

**Figure 4.5: Availability of ICT experts in secondary schools**



**Source:** Field data (2015)

Figure 4.5 shows that 39% of respondents agreed that there were experts of ICT in their school. This means that there were few experts of ICT in their schools.

#### **4.5 To identify perceived benefits of ICT facilities in service provision at secondary schools at Karatu District Council**

This specific objective three aimed at identifying whether there were perceived benefits on the use of ICT facilities in service provision at Karatu District Council. This part shows how ICT contributes to quality service delivery as respondents were needed to respond on the questions that were given to them. Also, this specific objective was accompanied by several questions which helped to add some details on the findings. Those questions were: Do ICT facilities contribute to quality service delivery? , which way between ICT and Manual (chalk and talk) support teachers on their service provision? And also which teacher activities are supported by ICT facilities?

##### **4.5.1 Responses on perceived benefits of ICT facilities in service provision**

On this specific objective three, respondents were asked to agree or disagree on the statements which show benefits of ICT facilities in the education sector. The aim of this

specific objective was to analyse benefits of ICT facilities in secondary schools. Respondents were given questions to agree or disagree to the perceived benefits of ICT on secondary education. The responses to those questions helped to analyse the perceived benefits of ICT on service delivery in secondary schools.

**Table 4.8: Responses on perceived benefits of ICT in the secondary schools**

Variable	Agree		Total
	No.	Percent	No.
ICT helps in making teaching learning more interesting	150	100	150
ICT enhance quality of work of both teachers and students	150	100	150
It makes teachers to be up to date in their various disciplines	150	100	150
ICT enhance efficiency of workers	150	100	150
It makes decision making in the education sector easy and faster	150	100	150
It enhances the management of financial records in schools	150	100	150
ICT helps in distance learning programme	150	100	150

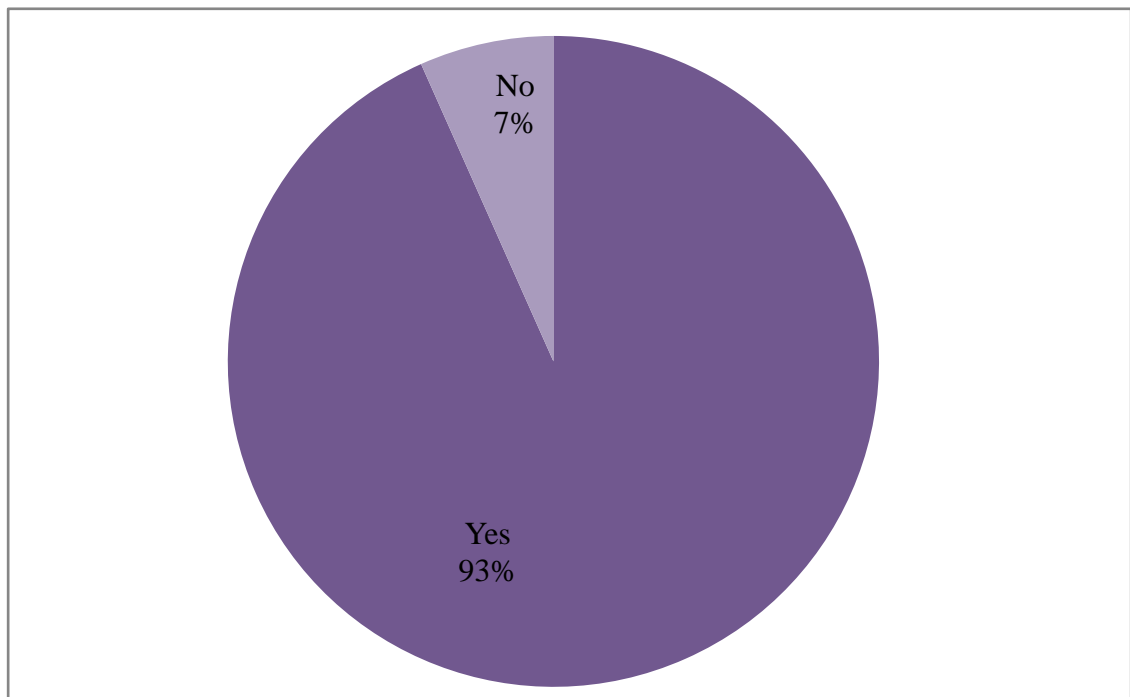
**Source:** Field data (2015)

The results in Table 4.8 show the perceived benefits of ICT in the secondary schools by the respondents. These include: ICT helps in making teaching learning more interesting (100%). Those who indicated strongly agree constituted 58% and agree constituted 42%, enhancing quality of work of both teachers and students (100%) whereby those who indicated strongly agree constituted 58% and agree constituted 42%; it makes teachers to be up to date in their various disciplines (100%) whereby those who indicated strongly agree constituted 51% and agree constituted 49%, ICT enhance efficiency of workers (100%) whereby those who said strongly agree constituted 55% and agree constituted 45%, it makes decision making in the education sector easy and faster (100%) whereby those who said strongly agree constituted 51% and agree constituted 49%, It enhances the management of financial records in schools (100%) whereby those who said strongly agree constituted 45% and agree constituted 55%, and ICT helps in distance learning programme (100%) whereby those who said strongly agree constituted 58% and agree constituted 42%.

#### 4.5.2 To find out if ICT facilities contribute to quality service delivery on secondary schools at Karatu District Council

This was supportive question on specific objective three, which added some information on specific objective three. The respondents were asked to give their views on whether ICT facilities contributed to quality service delivery in their secondary schools. ICT facilities which can help teachers on teaching process and led to quality service delivery are computer, internet, projector, slides, video, and radio (tape recorder).

**Figure 4.6: Responses on whether ICT facilities enhance quality service delivery**



**Source:** Field data (2015)

Figure 4.6 shows 96% of respondents agreed that ICT facilities enhancing quality service delivery. 7% of respondents disagreed by saying that ICT facilities do not contribute to quality service delivery. This means that high percentage of respondents agreed that ICT facilities enhance quality service delivery in secondary schools. Therefore, ICT facilities on education in secondary schools contribute on quality service delivery.

Also, during interview with two (2) DSEOs and head of schools, majority of respondents revealed that ICT facilities contribute to quality service delivery. They make teachers effective in teaching and hence raise students' interest especially when

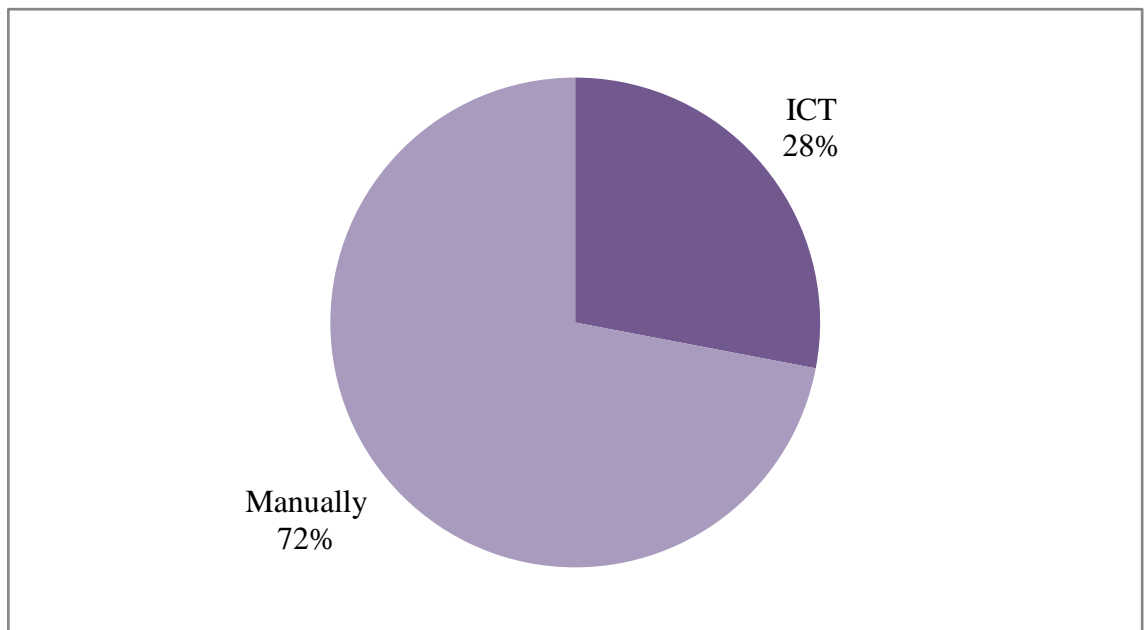
they apply ICT facilities such as LCD projectors, video and slides. DSEO academic had the following to say:

*It's true that ICT facilities in education sector contribute to quality service delivery; if schools have appropriate ICT facilities teachers can be interested in using them and ignore the old method of chalk and talk (manually)*

#### **4.5.3 Which ways between ICT and manual (chalk and talk) support teachers on their service provision?**

This is another supportive question on specific objective whereby respondents were asked on which ways between ICT and manual support teachers on teaching process, as they needed to choose between ICT facility and manual way. This question helped the researcher to examine which ways teacher use in service provision.

**Figure 4.7: Responses on ways teachers use to deliver services**



**Source:** Field data (2015)

Figure 4.7 shows that 28% of respondents agreed that ICT facilities support teachers on their service provision while 72% of respondent's state that teachers still uses old methods (manual). This result means that teachers were still using old method (manual way) rather than using ICT facilities in teaching. Therefore, this was a challenge where most of teachers were still using chalk and talk method rather than applying ICT

facilities that contribute to enhancing quality service delivery. This was because teachers were still reluctant to adopt the new technology or it is due to lack or shortage of ICT facilities in their schools.

#### 4.5.4 Which teacher’s activities are supported by ICT facilities?

This was also a supportive question on specific objective three whereby respondents were asked to agree or disagree if teacher’s activities are supported by ICT facilities in their schools. Those activities are lesson planning, report writing, curriculum planning, time table, marking and assessment, record keeping and examination and results. This question was given to respondents so as to examine how teachers are supported by ICT or to examine if they still use manual ways of teaching.

**Table 4.9: Responses on teachers’ activities supported by ICT facilities**

Variable	Strong agree		Agree		Disagree		Strong disagree		Total
	No.	percent	No.	Percent	No.	percent	No.	percent	No.
Lesson planning	5	3	10	7	70	47	65	43	150
Report writing	27	18	26	17	32	21	65	43	150
curriculum planning	5	3	10	7	70	47	65	43	150
Time table	5	3	48	32	32	21	65	43	150
Marking & assessment	22	15	21	14	42	28	65	43	150
Record keeping	27	18	26	17	32	21	65	43	150
Examination & results	37	25	16	11	32	21	65	43	150

**Source:** Field data (2015)

Result in Table 4.9 shows teacher’s activities which were supported by the ICT facilities. ICT support in lesson planning (10%), ICT supports in report writing (35%), ICT supports in curriculum planning (10%), ICT supports in time table making (35%), ICT supports in marking and assessment (29%), ICT supports in record keeping (35%), and lastly is ICT supports in examination and results (36%). This means that teachers are very little supported by ICT facilities in their works as majority of them are still using old methods (manually).

#### 4.6 Challenges facing the use of ICT in service provision at secondary schools at Karatu District Council

This objective aimed at examining whether there are challenges in the use of ICT in service provision at secondary schools at Karatu District Council. Respondents were given some questions of agree or to disagree which helped to examine what are the challenges facing the use of ICT facilities in secondary schools.

**Table 4.10: Challenges facing the application of ICT in secondary schools**

Variable	Strong agree		Agree		Disagree		Strong disagree		Total
	No.	percent	No.	Percent	No.	Percent	No.	Percent	No.
Lack of computer literate teachers	45	30	95	63	10	7	0	0	150
Lack of computer IT	45	30	105	70	0	0	0	0	150
Irregular power supply	45	30	105	70	0	0	0	0	150
Cost of purchasing computers in schools is high	60	40	90	60	0	0	0	0	150
Inadequate facilities to support full application of ICT	60	40	90	60	0	0	0	0	150
Non inclusion of ICT programmes in teachers training curriculum	45	30	95	63	10	7	0	0	150
Teachers are very reluctant to adapt to use ICT	35	23	79	53	26	17	10	7	150
Lack of fund hinders school from embracing ICT	50	33	100	6	0	0	0	0	150

**Source:** Field data (2015)

Results in Table 4.10 shows that the major challenges facing the application of ICT facilities in secondary schools are lack of computers in schools, irregular power supply, high cost of purchasing computers for schools, Inadequate facilities to support full application of ICT and lack of funds that hinders schools from embracing ICT (100%). Other challenges facing the application of ICT facilities in secondary school are lack of computer literate teachers (93%), Non-inclusion of ICT programmes in teachers training curriculum (93%), and lastly is that teachers are very reluctant to adopt and use ICT facilities (76%).

The interview with two DSEOs and head of schools revealed that in Karatu district secondary schools have many challenges concerning application of ICT facilities on service delivery as many schools seem to have few ICT facilities while other have none. Also, irregular power supply was a big challenge in secondary schools in Karatu district whereby few schools had reliable electric power supply, while others had unreliable energy for instance solar energy or have no access to the electric grid at all. DSEO academic had the following to say:

*Most of rural secondary schools in Karatu District had no access to electric grid at all; for example Gyekrumlambo and Dr. Wilbroad Slaa secondary schools. Therefore, those schools cannot use the few available ICT facilities because they have no access to electric grid which supports the use of ICT.*

## CHAPTER FIVE

### DISCUSSION OF FINDINGS

#### 5.1 Introduction

This chapter deals with discussion of research findings presented in chapter four. The findings are discussed according to the research specific objectives that guided this study to enhance consistence and logical conclusion.

#### 5.2 Availability of appropriate ICT facilities for teaching in secondary schools

Table 4.6 shows that most of secondary schools at Karatu District Council do not have appropriate ICT facilities. As table 4.6 shows that only 23% of respondent agreed that there were some availability of ICT facilities in their schools while 81% of respondents responded that there were no appropriate of ICT facilities in their schools. They had very few of ICT facilities which are computer, internet and projector while other ICT facilities such as television sets, slides, electronic notice boards and radio were not available at all. Despite some schools having computer, internet and projector; they did not match with the number of users. So, this affected service delivery.

From the findings, 93% of respondents disagreed that ICT facilities in their secondary schools were enough compared to the authority activities and teaching activities with respect to number of employees using them. Also, it revealed that some ICT facilities were not from the government or from schools fund but from the donors. Schools that had already been donated with ICT facilities and solar systems to help in the use of the ICT were Welwel secondary school which receive 20 computers and some fund to connect to electrical power, also Banjika had been given 25 computers, 2 moderns for internet connection, one projector and solar power to be used in running those ICT facilities which were given. Also, Ganako secondary school received 15 computers, 5 internets moderns and 1 projector. This is due to the fact that computers are still expensive. Though some NGOs, corporate organisations and individuals donated computers to many schools, still they are not enough and a big number of schools are unable to purchase computers for use by their pupils. Access to ICT facilities is a major challenge facing African countries, with a ratio of one computer to 150 students (Kiptalam, 2010).

Therefore, this study result revealed that there were not adequate appropriate ICT facilities in secondary schools at Karatu District Council. This could be as a result of inadequate funding of the schools by the government. This also could be a result of irregular power supply which hinders the use of those available ICT facilities. Even if the teachers and students are willing to learn and use ICT in their schools, the non-availability of the facilities will hinder them. Furthermore, opinions from one respondent affirmed that:

*Among of ICT facilities, we only have computers in our school as an ICT facility which supports us in teaching learning process, but those computers are not enough for the whole school compared to the number of teachers and students.*

Also, one head of school had this to say:

*In our school we have few ICT facilities which are computers, projector and internet but those three ICT facilities they are not even enough compared to the number of users as it may be found that there are only ten computers and one projector and two modems for internet connection for the whole secondary schools, he continues saying that the problem of having few ICT facilities is not the problem of our school only but the problem of many secondary schools at Karatu District Council, so this situation affects service delivery which is supported much by ICT in nowadays.*

Also on this part, it was observed that many secondary schools at Karatu District Council do not have appropriate ICT facilities for teaching-learning process, as it was seen, there were few computers, few projectors and some modems for internet connection which helped to conclude that it is true that there were no appropriate ICT facilities in Karatu secondary schools.

The interview with DSEOs and head of schools revealed that, at Karatu district secondary schools lacks appropriate ICT facilities which limit teachers with knowledge of ICT to fail to use them in service delivery process. DSEO academic had the following to say:

*In karatu district, secondary schools have so many problems but among the problems which hinder quality service delivery is lack of appropriate of ICT facilities because when you find a secondary school with appropriate ICT facilities as the one from developed countries you will find they have a quality service delivery just because they are supported by ICT on service provision and they have knowledge to use it.*

Therefore, the result of objective one show that, lack of enough appropriate ICT facilities in secondary schools in Karatu District Council hinders its contribution to quality service delivery because teachers failed to embrace ICT facilities in teaching process because the facilities are not available forcing them to use old methods of chalk and talk. So, at Karatu District Council there is low contribution of ICT facilities to quality service delivery because teachers do not have appropriate ICT facilities which support them on teaching process as nowadays ICT contributes to quality service delivery in many sectors in the world.

### **5.3 Exposure of teachers and students to the use of ICT facilities**

Table 4.7 shows that 43% of the respondents agreed that teacher were exposed to the use of ICT facilities, and also 37% of respondents agreed that teacher were knowledgeable on ICT, while 10% of respondent agreed by arguing that students were not knowledgeable on ICT. Therefore, this study revealed that teachers and students were not much exposed to the use of ICT. The study shows that most of teachers are still reluctant, they are still using the old methods of teaching (chalk and Talk) while they have some ICT facilities such as computers, projector and internet. This is a pointer to the low level of application in the teaching learning in secondary schools. The implication is that most of the teachers are still fond of old methods of chalk and talk, the practice which will make them lag behind in the world of ICT (Ajaye & Ekundayo, 2009).

Also, this study result shows that most of students were not exposed to the use of ICT facilities at all which hinders the application of it, this is due to the fact that high percentage of students were not given training courses on the use of ICT facilities in secondary schools. . Furthermore, opinion from one respondent affirmed that:

*In our school we have few computers which are not enough for the number of users, so myself I never even switch on the computer in our school; even myself I don't have one, therefore how can I be exposed to the use of computers while I end up seeing them only. So, this problem affects service delivery in our schools.*

Figure 4.5 shows that only 39% of respondents agreed that there were experts in their schools, while 61% of respondent disagree that there are experts of ICT on their schools. That means many of Karatu secondary schools do not have ICT experts to help in enhancing proper use of ICT facilities and contribute to quality service delivery.

Interview data revealed that only in two schools there were expert teachers out of six schools. Furthermore, opinion from one respondent affirmed that:

*In this school, I'm the only dependable expert of ICT in this. Also, in Karatu district we are only three which means that some of the Karatu secondary schools do depend on us which is a huge burden for us, he continued arguing that the government of Tanzania really needs to find a solution for this because it affects service provision in schools*

Figure 4.3 shows that only 39% of respondents agreed that they received training on ICT courses while other percentage; respondents disagreed by arguing that they had never attend any of the training on ICT courses. According to Borko, Whitcomb, & Liston (2009) teachers are the key source of transferring ICT skills in the up-coming generation; so, every teacher should possess ICT skills and be trained properly on the use of ICT in their teaching learning processes. Also, according to UNESCO's (2005) survey, about 35% of the already trained teachers in secondary schools in Europe, Asia and Africa have basic skills on ICT, which leaves 65% of the teaching workforce on the three continents being still in need of computer skills. Furthermore, opinion from one respondent affirmed that:

*From the day I became a teacher in this school, I have never heard about training on ICT courses, so in our school there is no such kind of thing, that is why some fellow teachers with little knowledge concerning ICT and myself are using old methods of chalk and talk which affects service delivery. Therefore, we need training so as to embrace those available ICT facilities so as to contribute to quality service delivery*

Therefore, this study shows that majority of teachers at Karatu District Council were not exposed to the use of ICT facilities which affected service delivery in secondary schools.

#### **5.4 Perceived benefits of ICT facilities in the secondary schools**

Table 4.8 shows the results on perceived benefits of ICT facilities in the secondary schools. All respondents (100%) agreed that they were aware of the benefits as follow: Firstly, making teaching-learning interesting, Secondly, helping the distance learning programme, Thirdly, helping teachers to be up-to-date, Fourthly, enhancing quality of work by both teachers and students, Fifthly, it makes decision-making in the education sector easy and faster, Lastly, it enhances the management of financial records in schools and also helps in distance learning programme.

Also, the interview data revealed that, application of ICT facilities enhances quality service delivery. Results shows that many of respondents agreed that ICT facilities enhance quality service delivery especially respondents from the schools embracing ICT facilities. It was seen that ICT facilities help in enhancing time management among both teachers and students, it is a source of cost effectiveness in school management, it enhances proper record keeping, it helps to speed up decision making, it enhances effective communication, it enhances financial record management and it enhances service coordination. This means that study results show that ICT facilities contribute to quality service delivery in secondary schools. This finding is supported by Kwache (2007) who submitted that the application of ICT makes institutions more efficient and productive, enhances and facilitates pedagogical activities. Furthermore, opinion from one respondent affirmed that:

*It's very true that the use of ICT facilities in secondary schools contributes to quality service delivery. He continued saying that in our school we wish to have appropriate ICT facilities so that it can help us in the teaching process and it can help in enhancing quality service delivery.*

Also, one of the DSEOs had the following to say:

*I wish all secondary schools in Tanzania especially Karatu district secondary schools could have appropriate ICT facilities because I do believe hundred per cent that ICT contributes to quality service delivery especially in this current decade. As it has been observed that with ICT you can do wonders; so, appropriate ICT facilities in our schools will contribute to quality service delivery as it helps teachers to be more updated, helps in distance learning, enhances speed, material accessibility, record keeping, marking, adopting a modern way of teaching through projector, video and slides, also time and cost effectiveness.*

Figure 4.6 shows that 96% of respondents agreed that ICT facilities in secondary schools enhance quality service delivery while the remaining small percentage of respondents disagreed with that fact that ICT contributes to quality service delivery. In this part, results show that ICT contributes and enhances quality service delivery in secondary schools. According to the World Bank (2010) computer enhance educational efficiency, as many secondary school teachers are already teaching large number classes of students. In this situation, students are no longer receiving the much desired individual assistance. Furthermore, opinion from one respondent affirmed that: *“Hundred percentages (100%) ICT contribute to quality service delivery in secondary schools if there are appropriate availability of ICT facilities”*

Table 4.9 shows teacher activities were supported by ICT facilities. It shows that ICT supports in lesson planning (10%), ICT supports in report writing (35%), ICT supports in curriculum planning (10%), ICT supports in time table making (35%), ICT supports in marking and assessment (29%), ICT supports in record keeping (35%), and lastly is that ICT supports in examination and results (36%). This means that teachers are not much supported by ICT facilities in their work as many of them are still using old methods (manually). ICT simplifies the administrative support levels of their academic in various levels of the academic pursuit. Student’s services like records, admission/recruitment, class schedules, attendance, registration, time tabling and accessing result can be realised via network of computers and other communication avenues called students portals (Horn & Siew, 2011). Furthermore, opinion from one Academic Master affirmed that:

*In our school ICT facilities such as computer help us in different aspects pertaining to student service like records, registration, and class schedule. Therefore, they contribute to quality service delivery.*

Therefore, the specific objective four shows that, ICT facilities contribute to quality service delivery in education sector especially in secondary schools. At Karatu District Council, majority agreed that ICT facilities contribute to quality service delivery in secondary schools if there are appropriate ICT facilities, exposed teachers on the use of ICT facilities, training courses and ICT experts, as well as availability of electric supply which supports ICT facilities on the use. So, ICT facilities contribute to quality service delivery.

### **5.5 Challenges facing ICT facilities in secondary schools**

The study revealed that irregular power supply, high cost of purchasing computers, and lack of funds are major challenges facing the application of ICT in secondary schools in Karatu district council. If schools are well funded, the management of the school can always make provision for alternative power supply in the schools. This finding supports Yusuf's (2005) findings who submitted that irregular power supply in the country is a major obstacle to the use of ICT in all spheres of the economy. The other challenges are, non-inclusion of ICT programmes in teachers training curriculum, and teacher were reluctant to adopt ICT facilities in teaching. Furthermore, opinions from one respondent affirmed that:

*The problem facing our secondary school in embracing ICT facilities are irregular power supply and lack of funds to purchase computers, as government failed to fund us. This made our school fail to adopt the application of ICT facilities to improve quality service delivery in our school.*

Data collected also revealed that majority of public schools compared to private secondary schools didn't have required number of staff or they lacked computer literate teachers. Only few secondary schools had computer literate teachers (experts) while other schools had no computer literate teachers. Therefore, the study shows that majority of secondary schools at Karatu district are not computer literate because they

didn't attend any ICT training courses. According to Kiptalam (2010) majority of teachers did not receive any ICT training prior to joining the teaching profession. Furthermore, opinions from one respondent affirmed that:

*We were never given any of ICT training courses in our school and also I have never even heard about it since I became a teacher in this school; therefore, lack of ICT training affects teachers in service delivery because they don't know how to use those ICT facilities thus they continue using the old methods of chalk and talk.*

It has also been observed that most secondary schools in Karatu District Council, lack computer literate teachers; and irregular power supply appear to thrive in the schools. Moreover, it seems that the schools could not purchase computers for use because of inadequate funds. Besides, the non-inclusion of the ICT programmes in teachers' training curriculum seems to be another major challenge facing the adoption of ICT in secondary schools which affects service delivery in secondary schools.

From interview, data revealed that budgetary allocation for deploying ICTs in schools education are typically limited in Tanzania government. As has been seen that policy-makers give ICTs priority so as to reap the benefits of deploying ICTs in schools education but the problem is that there is limited government budgetary allocation and lack of community commitment to donate funds in schools because they think that, that is not their responsibility but government's responsibility. One of the DSEOs had the following to say:

*Our Tanzania government has a need to put much effort on investing in education sector as it has been observed that currently many of the secondary schools have no enough ICT facilities as the SEDP II of Tanzania emphasised so as to improve quality service delivery for teachers and students to perform better.*

Therefore, these challenges affect teachers service delivery in education because it hinders teachers from embracing fully ICT facilities on teaching-learning process as ICT contributes much on service delivery in many sectors especially in the education sector. So, at Karatu District Council the challenge mentioned above are obstacles to ICT in contributing to quality service delivery in secondary schools as teachers failed to embrace fully ICT facilities in service provision and hence remained using the old method of chalk and talk (manually).

## **CHAPTER SIX**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **6.1 Introduction**

This chapter presents a summary for the study, conclusion and recommendations based on the findings presented and discussed in chapter four.

#### **6.2 Summary of the study**

The study focused on contribution of ICT on service delivery in secondary schools. Specifically, the study examined how ICT facilities contribute to service delivery in secondary schools at Karatu District Council. Four research questions were used to accomplish the study objectives were: (i) To what extent are the ICT facilities available for teaching in secondary schools at Karatu District council? (ii) To what extent are teachers and students in secondary schools exposed to ICT facilities at Karatu District Council? (iii) What are the perceived benefits of ICT facilities in secondary schools at Karatu District Council? (iv) What are the challenges facing the use of ICT facilities in service provision at Karatu District Council?

A case study research design was applied, employing both primary and secondary data collection methods in order to achieve the study objectives. Data collected were analyzed by using various statistical techniques and presented in tables, figures, percentages and frequency. The qualitative data were presented using direct quotation. From the analysis of data collected, the following are the findings of the study:

In respect to the first objective, the study aimed at examining availability of appropriate ICT facilities for teaching in secondary schools at Karatu District Council. The findings from documentary review revealed that there was lack of enough of ICT Facilities which means some of the secondary schools had few ICT facilities which are, computer, Internet and projector. Majority of respondents agreed that many secondary schools at Karatu district had no appropriate ICT facilities; therefore that situation affected service delivery at those schools.

In the second objective, the study aimed to find out if teachers and students were exposed to the use of ICT facilities in secondary schools at Karatu District Council. The findings from the interviewed respondents revealed that the majority of students and teachers were not exposed to the use of ICT facilities because many teachers were still relying on old method of chalk and talk while others did not know how to use them at all, the situation which affected service delivery in schools.

In the third objective, the study aimed to identify perceived benefits of ICT facilities in service provision at secondary schools at Karatu District Council. The findings from questionnaire data and the interview data revealed that ICT facilities in secondary schools contribute to quality service delivery at Karatu district Council. Majority of respondents agreed to the perceived benefits of ICT facilities on secondary schools and also they agreed on high percentage that ICT facilities in secondary schools contribute to quality service delivery.

In the last objectives, the study aimed to examine the challenges facing the use of ICT facilities in service provision at secondary schools at Karatu District Council. The findings from questionnaire and observation data revealed that many schools from Karatu District Council do not have appropriate ICT facilities which supported them on service provision. Majority of respondents agreed that there are so many problems which hinder the use of ICT facilities which contribute to quality service delivery in secondary schools, those challenges were; irregular power supply, lack of funds to purchase new ICT facilities such as computers, and lack of computer literate teacher. Therefore, those challenges affect the use of ICT facilities in secondary school to contribute to quality service delivery at Karatu district.

### **6.3 Conclusion**

This study suggests that the majority of respondents agreed that ICT contributes to quality service delivery in their schools rather than old method of chalk and talk. According to the study, ICT facilities enhance time management for both for teachers and students, it enhances service coordination, it enhances proper record keeping and it is a source of cost effectiveness.

Also, what is seen there is an access of teaching learning materials from different sources of website and ICT helps in making teaching learning more interesting as majority of respondents agreed on that.

Despite the perceived benefits in the use of ICT in school, there are a lot of factors inhibiting the successful application of ICT in secondary schools. The study results have shown that Karatu secondary schools are lagging behind in the level of application of ICT in the teaching-learning process. Some of the ICT facilities are lacking in schools, the capacity for using ICT by both teachers and students is also very low.

The findings of this study show that respondents suggested that enough ICT facilities are needed to all secondary schools as it was seen there were not enough of it so that to help them to move from old method of teaching or old method of services delivery to the world of ICT which enhances quality service delivery.

#### **6.4 Recommendations**

- i. The government should increase funding for the entire educational sector with emphasis on ICT; this will help improve the level of ICT facilities in the schools.
- ii. Teachers may be provided incentives to complete the computer literacy program and professional development programmes at all levels. These incentives may include laptops, mobile phones having internet facility. Teachers over a certain age need to be encouraged in more distinctive ways to be involved in in-service
- iii. There should also be continuous and periodic training of teachers on computer and ICT skills acquisition. This will help provide them with practical and functional knowledge of the computer, the internet and associated areas of ICT with the hope of integrating it with instructional methods of teaching and learning.
- iv. Other public and private secondary schools need to adopt and use ICT facilities in teaching learning process in secondary schools as it is on Tanzania education policy under its programme of secondary education development programme II (SEDP II) of 2010 up to 2015.

- v. While the study has useful information, further research should be conducted so as to obtain more concise information on the usage and utilisation of the ICTs, particularly for some of the indicators used in the conceptual framework adopted for this study. It would be interesting to investigate further the links between penetration, utilisation and impact of the ICTs and develop an assessment model out of the conceptual framework for use in assessing these links and its outcomes in secondary schools.
- vi. This can be extended to look at schools that are both connected and unconnected to the Internet with the view of making comparative analysis of the factors that determining use of ICT and related technologies, though it is expected that most of the indicators would demonstrate lower levels of availability and accessibility to ICT facilities.

### **6.5 Area for further studies**

This study is not representative of the whole country because only a single district council was included under the study and 152 employees were used as a sample of the study. It is therefore recommended that, for more reliable generalisation of findings, a similar study should be carried out on a large scale involving a large sample of municipal council units. Hence, such an approach would give more representative results.

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## APPENDICES

### APPENDIX I:

#### QUESTIONNAIRE

##### MZUMBE UNIVERSITY SCHOOL OF PUBLIC ADMINISTRATION AND MANAGEMENT

##### CONTRIBUTION OF INFORMATION AND COMMUNICATION TECHNOLOGY ON SERVICE DELIVERY IN SECONDARY SCHOOLS IN TANZANIA: A CASE OF KARATU DISTRICT COUNCIL.

This questionnaire aims to study the contribution of ICT on service delivery of the secondary schools. It is expected that this research will be helpful at all level of management and decision makers of the Council to know clearly the contribution of the use of ICT on service delivery in education sector especially in secondary education.

It is on this note that I request you to answer the attached questionnaire. This exercise is solely for academic purpose. I therefore guarantee that the information supplied will be treated confidentially and used only for this study.

#### SECTION A

##### PERSONAL PARTICULAR

Please tick (✓) where appropriate.

1. **Name of school** \_\_\_\_\_
  
2. **Sex:** Male   
Female
  
3. **Age:** 45 - Above   
44 - 35   
34 – 25   
24 – Below

4. **Position:** Head master   
Deputy Master   
Academic master   
Teacher   
Student

5. **Education Qualification:** Masters   
Bachelor   
Diploma   
Form six   
Form five   
Form four   
Form three   
Form two   
Form one

6. **Years of experience:** 1 – 5   
6 – 10   
11 – 15   
15 – 20   
21 – Above

## SECTION B

The instrument below is a Like rating scale questionnaire. It is designed in a two points rating scale:

SA = Strongly Agree = 1

A = Agree = 2

D = Disagree = 3

SD = Strongly Disagree = 4

Please tick as you deem appropriate in the column below

### 7. Availability of ICT facilities for teaching in secondary schools.

S/N	STATEMENT	SA	A	SD	D
I	Enough Computers in secondary education				
ii	Availability of Projectors in secondary education				
iii	Access of Internet in secondary education				
iv	Availability of Radio (Tape recorder) in secondary				
V	Availability of Television sets in secondary education				
Vi	Availability of Video in secondary education				
Vii	Electronic notice boards in secondary education				
Viii	Availability of Slides in secondary education				
Others					

### 8. Exposure of teachers and students to the use of ICT facilities.

S/N	STATEMENT	SA	A	SD	D
I	There are functional internet facilities owned by the school for browsing				
ii	Teachers are exposed to the use ICT in teaching				
iii	There are enough ICT materials to teach the student				
iv	Teachers are knowledgeable in the use of ICT				
V	Students are knowledgeable in the use of ICT				
Vi	Periodic training is organized for teachers on the use of ICT				
vii	Periodic training is organized for students on the use of ICT				
Others					

### 9. Perceived Benefits of ICT facilities in the secondary schools.

S/N	STATEMENT	SA	A	SD	D
I	ICT helps in making teaching-learning more interesting.				
Ii	ICT enhances quality of work of both teachers and students.				
Iii	It makes teachers to be up-to-date in their various disciplines.				
Iv	ICT enhances efficiency of workers.				
V	It makes decision-making in the education sector easy and faster.				
Vi	It enhances the management of financial records in schools.				
Vii	ICT helps in distance learning programme.				
Others					

### 10. Challenges facing ICT facilities in secondary schools

S/N	STATEMENT	SA	A	SD	D
I	Most secondary schools lack computer literate teachers.				
Ii	There is lack of computer information technology in the secondary schools.				
Iii	Irregular power supply hinders the use of computers in schools.				
Iv	The cost of purchasing computers in the school is high.				
V	There are inadequate facilities to support full application of the information and communication technology.				
Vi	The non-inclusion of ICT programmes in teachers' training curriculum affects its adoption in schools.				
Vii	Teachers are very reluctant to adapt to use of ICT in teaching-learning process.				
Viii	Lack of fund hinders school from embracing ICT.				
Others					

### 11. Applicability or usage of ICT facilities in secondary school

S/N	STATEMENT	SA	A	SD	D
I	Usage of Computers in secondary education				
Ii	Usage of Projectors in secondary education				
Iii	Usage of Internet in secondary education				
Iv	Usage of Radio (Tape recorder)				
V	Usage of Television sets in secondary education				
Vi	Usage of Video in secondary education				
Vii	Usage of Electronic notice boards in education				
Viii	Usage of Slides in secondary education				
Others					

13. Application of ICT facilities enhance quality service delivery

S/N	Statement	SA	A	SD	D
I	It enhance time effective both for teachers and students				
Ii	It is a source of cost effectiveness in schools managements				
Iii	It enhance proper record keeping				
Iv	It helps to speedup decision making				
V	It enhance effective communication				
Vi	It enhance financial record management				
Vii	It enhance service coordination				
Others					

14. Which ways support teachers in their service provision?

(i) ICT

(ii) Manually

15. Ways which ICT support teachers in their work

S/N	STATEMENT	SA	A	SD	D
I	Lesson planning				
Ii	Report writing				
Iii	Curriculum planning				
Iv	Time table				
V	Marking & assessment				
Vi	Record Keeping				
Vii	Examination & results				
Viii	Monitoring attendance				
Others					

16. Are ICT facilities enhance quality service delivery? If yes or no why?

.....  
.....  
.....

17. How long have you using ICT facilities in your school?

(i) 1-3

(ii) 4-6

(iii) Never

18. Have you are attended any training on using ICT?

(i) Yes

(ii) No

19. How often are you attending training on ICT courses?

(i) None

(ii) Once a year

(iii) Twice a year

(iv) When available

20. Are ICT facilities enough for authority activities with respect to number of employees using them?

(i) Not enough

(ii) Enough

(iii) I don't know

21. Are there experts of ICT facilities in secondary education?

(i) Yes

(ii) No

22. Mention any availability of ICT facilities in your school

.....  
.....  
.....  
.....

23. In your own considered view, what are the challenges facing the application of ICT in your school?.....

.....

24. What are the factors that your school should take/ consider so as to have effective application of ICT?

.....  
.....  
.....

25. Please give any comments on the usage and application of ICT at your school?

.....  
.....  
.....  
.....  
.....

## **APPENDIX II:**

### **INTERVIEW**

#### **Interview Questions to the, District Secondary Education officers, Head of schools, and Academic Masters of secondary schools at Karatu District Council.**

- i. Does the secondary school have appropriate ICT facilities?
- ii. To what extent are ICT facilities available for teaching in secondary school at Karatu District Council?
- iii. Do ICT facilities on secondary school facilitate service provision?
- iv. To what extent are teachers and students in secondary school exposed to ICT facilities?
- v. Does user knowledge of ICT applied in the education provision?
- vi. What are the perceived benefits of ICT in secondary school?
- vii. What are the challenges facing the use of ICT in secondary school at Karatu District Council?

### **APPENDIX III:**

#### **OBSERVATION**

- i. Existence of ICT facilities in secondary schools
- ii. Available ICT facilities applied on the process of teaching-learning process in secondary schools
- iii. Existence of electricity supply which support ICT facilities to be applied in the secondary schools
- iv. Exposure of teachers and students on the use of ICT facilities