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THE USAGE OF ICT IN SECONDARY SCHOOLS; THE CASE OF YEKA SUB-CITY GOVERNMENT SECONDARY SCHOOLS OF ADDIS ABABA CITY ADMINISTRATIO

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BY

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The Usage of ICT in Secondary Education, the Case of Yeka Public Secondary Schools of Addis Ababa City Administration

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Arts in School Leadership.

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DECLARATION

I, Awgichew Abebaw Eshete, hereby declare that this thesis entitled “The Usage of ICT In Secondary Education, The Case Of Yeka Public Secondary Schools Of Addis Ababa City Administration”. Submitted by me for the award of the degree of Master of School Leadership, in Addis Ababa University, is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

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STATEMENT OF CERTEFICATION

This is to certify that Awgichew Abebaw has done a study on the topic "The Usage Of ICT In Secondary Education, The Case Of Yeka Public Secondary Schools Of Addis Ababa City Administration" under my supervision. This work is original and suitable for the submission in partial fulfillment of the requirement for the award of Degree of Masters in School Leadership.

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Signature: _____ Date: _____

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This is to certify that the thesis prepared by Awgichew Abebaw entitled The Usage 0f ICT In Secondary Education, The Case Of Yeka Public Secondary Schools Of Addis Ababa City Administration which is submitted in partial fulfillment of the requirements for the Degree of Masters in School Leadership. Complies with the regulations of the university and meets the accepted standards with respect to originality and quality**.**

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ACRONYMS AND ABBREVIATIONS

AACEB - Addis Ababa City Education Bureau

CAI - Computer Assisted Introduction

FGD - Focus Group Discussion

IAI - Internet Assisted Instruction

ICT - Information Communication Technology

IT - Information Technology

MoE - Ministry of Education

MCIT- Ministry of Communication and Information Technology

PC - Personal Computer

SPSS - Statistical Package for Social Science

UNDP - United Nation for Development Program

UNESCO- United Nations Education Science and Cultural Organization

ESDP - Education Sector Development Program

ABSTRACT

*The purpose of this study was to consider the use of **ICT** in secondary education, the case of Yeka public secondary schools of Addis Ababa city administration. Also, the study investigated the opportunity that teachers offer in use of ICT. A descriptive survey design has been used with a mixed methods approach. Four public secondary schools were deliberately chosen as per their situation to contact each corner of the sub-city. A proportionate sampling and simple random sampling techniques were used to identify 247 sample teachers for the questionnaire and a purposive sampling technique is used to select school principals, for interviews. The data obtained by the questionnaire were analyzed using percentage and frequency as statistical methods. Interviews and FGD were analyzed on the subject narrative form. The results have showed that it is not possible for teachers to use ICT in the education, secondary school of education did not equip for the teachers with necessary skills to effectively utilize ICT tools in the teaching learning process. Generally, the overall practice of using ICT in secondary schools and the improvements gained from schools were not to the expected level. The overall findings show that there is no adequate opportunity for teachers to use ICT for develops their skills and supporting their teaching learning process. According to the quantitative and qualitative data analysis, there are a series of challenges for teachers to use ICT. Thus, without effective use of ICT, the expected improvements in the quality of education and students' academic achievement cannot be enhanced. Based on this, it was recommended that the City Administration Education Bureau should take appropriate measures, including the supply of adequate materials and professional support to the Sub-city as well as the schools. The provision should also include providing ICT laboratories with the necessary accessories to provide modern ICT education in schools, as well as providing administrative support for ICT teachers to fill gaps in their knowledge, roles, and skills required by the profession, so that they can better assist learners and improve the quality of their learning.*

Key Words: ICT, usage, Implementation, perception, Challenges.

CHAPTER ONE

1. INTRODUCTION

In the present day, where digital technologies like computers are becoming more and more important, teachers are expected to be skilled in using information and communication technology [ICT] to facilitate their teaching and learning and to be effective in joining this technology era. Besides to this, ICT is more important to implementing the E-school project. E-school has a great role in speeding up digitalization by saving teachers' time. This section of the study comprises the background and the problem statement, the purpose of the study, research questions, and the significance of the study, delimitation, and operational definition of terms.

1.1 Background of the Study

ICT is a broad term that includes any communication device or program, including radio, television, mobile phones and computer networking equipment and computers, and satellite systems (Solomon, 2016). According to Rajput (2015), ICT refers to any communication tool or application such as computers and the internet. Information and communication technology is the technology that provides access to information through remote telecommunication. It includes computer programs such as the internet and computers. ICT creates dynamic changes in society. It affects all aspects of human life, especially in the era of the knowledge society (information society). ICT has become increasingly prevalent in various fields, such as education, business, management, medicine, finance, transportation and entertainment in all aspect of human life.

Information and communication technologies are important tools that can make a significant difference in the teaching and learning process. The use of ICT provide powerful learning opportunities and can transform teaching and learning process so that students can handle knowledge in a powerful, self-aware, and meaningful way (Rita, 2017). ICT has been considered as important tools for promoting new educational practices. It is used to develop students' skills in collaboration, communication, problem-solving, and lifelong learning.

In developing countries, however, the provision of quality education is challenged by a number of problems, including lack of qualified teachers, teaching materials and the lack

of information required for the subject, the fragmented living conditions in local communities and many other problems. Low literacy skills, coupled with the heavy and unfriendly technological environment. All these factors have driven the need to use information and communication technology (ICT) to deliver education. In addition, today's rapidly changing world requires the creation of an ICT-savvy workforce to meet the needs of the economy. In this regard, the integration and development of ICT in the teaching-learning process is recognized today as one of the methods to improve the quality of education. In developing countries, providing quality education is fraught with many problems such as lack of qualified teachers, teaching materials, and lack of information required for the subject. The reason is that the rural areas are fragmented and the low level of education has been a challenge, literacy, which comes with a poor technological background. All these factors have driven the need to use information and communication technology (ICT) to deliver education. In addition, today's rapidly changing world requires the creation of an ICT-savvy workforce to meet the needs of the economy. In this context, integration and development of ICT in the teaching-learning process is now recognized as one of the methods to improve the quality of education has improved.

By doing this, the entire program of education cannot be conducted without the use of information and communication technology (ICT). Providing new knowledge and connecting people to the world and meeting the needs the modern world requires the use of this technology (Liulseged, 2010).

The use of ICT in education provides an opportunity to share knowledge regardless of time and place. It can access knowledge in remote areas. It also provides opportunities for students to receive a high-quality education from qualified teachers who are well-versed in the subject matter. It exposes itself to the modern world. It can also be used as a technological divide between the "haves" and "have-nots" of societies. Therefore, today education without the use of ICT is to isolate oneself or society from the world and create an educational gap between those who have and have not. Finally, this is one of the main reasons for the teams. Due to this, many countries have introduced a good development in the use of ICT in the education sector (Liulseged H, 2010). It is also been argued that in the 21st century, the use of educational technologies for education is not an option.

Teachers believe that it is important to consider information and communication technology (ICT) as a key factors in achieving the competitive edge of the educational system. Either positively or negatively, no matter how poor a nation is, it is inevitable that globalization affects a nation. (Wakshum, 2013).

Furthermore, the Government of Ethiopia has placed importance on Information Communication Technology of Education for national development. Both the national Information Communication Technology for Development 2010 Plan and ICT in Education Implementation Strategy recognize ICT as an enabler for widening access to education for the Ethiopian population and for facilitating educational delivery and training at all levels. Thus, in its five years policy action plan (2006 – 2010), the Ethiopian Ministry of Capacity Building stated that the government is committed to addressing the nation`s human resource requirements in the area of ICTs through the promotion of mass ICT literacy and training. This is aimed at increasing the use of ICTs in educational institutions as well as implementing initiatives aimed at connecting schools and higher educational institutions to online resources. The young generation is entering a world that is changing in all spheres: scientific and technological, political, economic, social and cultural. The emergence of a knowledge-based society is changing the global economy and the status of education. Yeka Sub City is one of the eleven Sub-cities of Addis Ababa. The sub city has seven public Secondary Schools with 28 principals, 980 teachers (62 ICT teachers), and 14279 students (from schools report). In seven public secondary schools, there are 32 ICT rooms with a total of 700 functional and 120 non-functional computers (from ICT department). Addis Ababa City Education Bureau is implementing the E-school project in all public schools. Therefore, digital technologies like computers are becoming more and more important to achieve quality education. Teachers need to be proficient in the use of information and communication technology [ICT] to facilitate their teaching and learning to effectively participate in this technological world. Therefore, this study aims to investigate the usage of ICT in secondary education, the case of Yeka Public secondary schools of Addis Ababa city administration.

1.2 Statement of the Problem.

Though ICT-based teaching techniques and materials have seen great advances, some studies show that, in both developed and developing countries, the usage of these techniques and approaches in to education presents serious difficulties.

As the World Education Report (UNESCO, 2005), points out education worldwide faces a major challenge in preparing students and teachers for "our future knowledge-based society" at a time when most teachers are not prepared to use ICT and where "most existing school buildings", even in the most developed countries, are not equipped to integrate the new information and communication technologies.

Teo, et al, (2008) conducted a quantitative study examining the potential relationship between Singaporean teachers' teaching beliefs about teaching and technology use. The study's findings imply that although technology can promote interactive, self-directed learning, and higher-order thinking, technology integration is not being used effectively to improve the quality of teaching and learning.

Furthermore, in the United States, a survey conducted by UNESCO (2005) showed that only half of the teachers with access to computers use them in their lessons. Similarly, about half of secondary schools in the United Kingdom reported 'substantial use' and the other half reported 'low use'.

According to UNESCO (2005), only 35% of teachers already in secondary schools in Europe, Asia and Africa have basic ICT skills, leaving behind 65% of the teaching work force without the ICT skills. Thus, national governments around the world understand the need to address the gap in the teaching force and are looking for new strategies and programs to improve the integration of ICT in education. Similarly, Berhane (2012) noted that in many African countries, especially in East Africa, most teachers do not integrate ICT well into their teaching, due to several interrelated factors, such as manipulative, non-manipulative and instructional factors. The manipulative factors include teachers' beliefs, skills and commitment, ICT knowledge, availability of ICT resources, while the non-manipulator factors include age, gender, religion, educational experience, IT experience, national policy and external support.

In particular, studies examining the constraints and challenges faced by teachers in using ICT effectively for the teaching and learning process in secondary schools in Yeka Sub-

city, Addis Ababa, are limited. Of course, to understand the status of ICT use in schools, few studies have been conducted in other contexts and in developing countries such as South Africa, Ghana, Tanzania and Kenya. (Berhane ,2012)

In Ethiopia, a considerable amount of money has been invested in using ICT in education. However, the use of ICT remains very low in the education sector due to various factors such as lack of qualified ICT teachers, lack of computers, lack of ICT infrastructure, lack of internet connectivity, lack of technical support and lack of initiatives in schools (Tella, 2007). Studies also indicate that many secondary education teachers cannot connect computers to other computers, computers to printers, etc. (Girma, 2017). According to Belay (2015), the low level of ICT infrastructure hinders the effective use of ICT in the teaching and learning process.

The country's Growth and Transformation Plan identifies information and communication technologies as a critical element in achieving objectives across all sectors. The government has initially adopted the national ICT for development policy as a framework to facilitate Ethiopia's ICT-led socio-economic development program, aimed at developing an information and knowledge-based society and economy (FDRE, 2009).

Although ICT has become an integral part of Ethiopia’s development programs over the past decade, the country faces a significant gap between interest ICT and policy implementation (Adam, 2010). Furthermore, Jaway (2003) observed that in Uganda and Ethiopia, the education system is still relies heavily on traditional systems and lags seriously behind new technologies; as a result, students’ academic performance is greatly affected. This researcher also asserted that students who receive instruction from ICT users tend to perform better.

Therefore, this paper aims to investigate the usage of ICT in secondary education, in the case of Yeka Public secondary schools of Addis Ababa city administration. The study should describe the existing constraints and uses related to the use of ICT, provide an updated status of the use of ICT by teachers in secondary schools in the sub-city and recommended solutions for appropriate intervention for stakeholders.

1.3 Research Questions

The study will be guided by the following basic questions:

1. To what extent the perception of teachers on the ICT utilization in teaching-learning process?
2. What opportunities are available for secondary school teachers to use ICT in their schools?
3. In what ways does ICT supports the teaching learning process in the sample schools?
4. What are the challenges in using ICT among secondary school teachers in Yeka Sub-city?

1.4. Purpose of the Study

The purpose of this study is to investigate the usage of ICT in secondary education in Addis Ababa, Yeka Sub-city.

1.4.1 General objective

The main objective of the current study is to examine the usage of ICT in secondary education in Yeka Sub-city, Addis Ababa City Administration.

1.4.2 Specific objectives

- To understand the perception of teachers on the usage of ICT in teaching-learning process
- To identify the opportunities for using ICT in secondary schools in Yeka Sub-city.
- To identify the extent ICT supports the teaching learning process in secondary schools in Yeka Sub-city.
- To identify the challenges faced by the teachers to use ICT in the teaching learning process

1.5. Significance of the Study

ICT is one of the driving forces behind the transformation and the solutions of quality education. Today, with the development and advancement of ICT, they are able to offer new solutions and new services for educational activities. For example, ICT can provide new tools in education to transmit knowledge. The use of ICT in education has attracted

considerable interest around the world in recent years. Although ICT tools have become increasingly popular, many secondary school teachers in Ethiopia still face many challenges in integrating ICT tools in to their teaching activities. The study on the usage of ICT in secondary education is of scientific importance because it enriches the knowledge of the strengths and challenges of the use of ICT in educational activities. In particular, this research highlights the use of ICT in secondary education. The study can contribute to the development of plans for the use of ICT in secondary schools. The study can also serve as one source for future studies.

1.6. Delimitation of the Study

In order to make the study more manageable, it is delimited in setting, issues, sampling and sampling technique and data collection instruments. The study was delimited on the usage of ICT in public secondary education, in the case of Yeka Sub-City, Addis Ababa Administration. This study is important if it is carried out in all secondary schools of in Addis Ababa. Yeka is one of the 11 Sub Cities of Addis Ababa. In this Sub-city, there are seven public Secondary Schools. In the schools, there are 28 principals, 980 teachers, (62 ICT teachers) and 14279 students. Hence the target respondents were obtaining teachers and principals in the selected secondary school. The main concern of this study was to examining the usage of ICT in secondary education. The study was also examined the opportunities and challenges faced teachers to use ICT in the teaching learning process. The study was a cross-sectional survey and data was collected at a time. Both qualitative and quantitative data was collected so as answer the research questions of the investigation.

1.7. Operational Definition of Terms

Information and communication technology: - refers to all forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. (UNESCO, 2002).

ICT policy: - is defined as the country or jurisdiction's guide in ICT use and securing the information economy benefits. It deals with issues related to information dissemination, information utilization and technology spread and use (Labelle, 2005).

1.8 Organization of the Study

This study was divided in to five major chapters. The first chapter deals with the introductory part of the study that encompasses the background of the study, statement of the problem, objectives of the study, research questions, Significance of the study, scope/delimitation of the study, limitation of the study, operational definition of the basic terms and organization of the study. The review of related literature presented in chapter two. While chapter three comprises of the methodologies employed in the study were discussed in detail. The fourth chapter in its turn focuses on the results and discussion of the collected data. The fifth chapter comprises of summary of the major findings, conclusion, recommendation and suggestion for future study. Finally, list of reference materials used for conducting the study, Questionnaires, Semi-structured interview questions.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 **Theoretical Literature**

Information and communication technologies (ICTs) have the potential to increase access to information, make learning accessible anytime, anywhere, and make learning more enjoyable for students, thereby improving participation rates and learning outcomes. The use of ICTs can also improve the quality of teaching, enable the creation of more relevant and engaging learning materials, improve educational management, enhance the delivery of educational services, and make these services more efficient. The term information and communication technology refers to all forms of technology that are used to transmit, process, store, create, display, share, or exchange information electronically. Examples of forms of ICT that can be used in education include such things as educational radio programs, DVDs, mobile phone applications (m-learning) and interactive computer programs. ICT in education is a cross-cutting issue across all types and levels of education. Policies related to the use of ICT in education can be integrated into a wide range of educational areas, including educational policy, teacher training, teaching and learning, non-formal education, monitoring and measuring change, research and knowledge sharing, and cross-curricular ICT programs.

2.1.1 Definition of ICT

. Different writers and institutions have defined ICTs differently. According to UNDP in a UNESCO article (2008), ICTs are defined as information-handling tools. A varied set of goods, applications, and services that are used to produce, store, process, distribute, and exchange information. They include both traditional ICTs such as radio, television, and telephones as well as new ICTs such as computers, satellite and wireless technology, and the internet. These different tools are now able to work together and combine to form our networked world. A vast network of interconnected telephone services standardized computing hardware, the internet, radio, and television that reach all corners of the globe.

Rouse (2015), on the other hand, defines ICTs as an umbrella term that covers communication devices or applications that include computers, televisions, radios, networks, satellites, video conferencing, and eLearning. Bluton (1999), cited in

Liulseged, defines ICT as shorthand for a computer, software, networks, satellites, links, and related systems that allow people to access, analyze, create, exchange, and use data, information, and knowledge in ways that, until recently, were almost unimaginable. Similar to the UNDP definition, Rouse also defines an umbrella, which is not a specific definition for this study but has importance in analyzing the concept broadly.

According to Elmo Global (2014), cited in Sibanda Mavellas, Mapenduka Wellington, and Furusa Samuel (2016) study on 'Assessment Of The Availability And Utilization Of Icts For Teaching And Learning In Secondary Schools-Case Of A High School In Kwekwe, Zimbabwe.' defines as ICT in education means teaching and learning using ICTs. In addition, he divided educational ICT tools into three categories, namely: input source, output, and others. According to his categorization, input sources include such things as personal computers (PCs), tablets, application software, student response systems, visualizers, or document cameras. An output source refers to such devices as projectors, interactive boards; monitors, displayers, and television. Others include digital camera, digital recorders, switchers and other technologies. ICTs can lead to improved student learning and better teaching methods.

Dhital (2018) explains that ICT in education means teaching and learning by the use of ICT. Information and communication technologies (ICTs) are currently used in education to assist students to learn more effectively by providing teachers with access to a wide range of new pedagogy. These technologies are also being used to enable teachers to do administrative tasks more efficiently (Flecknoe, 2002). Information and communication technology (ICT) can complement, enrich and transform education for the better.

ICT in education has a multiplier effect throughout the education system, by enhancing learning and providing students with a new set of skills; by reaching students with poor or no access (especially those in rural and remote regions); by facilitating and improving the training of teachers; and by minimizing costs associated with traditional instruction (UNESCO, 2014).

Yusuf (2007) described ICT as an electronic technology used for accessing, processing, gathering, manipulating, presenting, and communicating information. He emphasized that when ICTs are employed in education, they can accelerate, enrich, and deepen basic skills in reading, writing, arithmetic, and the sciences, in addition to motivating and

encouraging students to learn as they become more independent and responsible for their learning. Information communication technology is a tool (Nwakundo, Oguejiofor and Nwankwo, 2006) that comprises electronic devices that are utilized for the information and communication needs of institutions, organizations, students, and individuals. Such electronic devices include computers (software and hardware), networking, telephones, video, multimedia, and the internet. Application and utilization of these devices convert information, text messages, sounds and motion to common digital forms.

Hence, he concludes that information and communication technology in education is the use of all forms of technology-assisted programs, popularly known as Television Assisted Instruction (TAI), Radio Assisted Instruction (RAI), Computer Assisted Instruction (CAI), Mobile Learning, and Internet Assisted Instruction (IAI).

At the beginning of the 21st century, Toomey (2001), cited in Chair, Burton, Lockee & Bond (2017), explained that ICT is generally related to those technologies that are used for accessing, gathering, manipulating, presenting or communicating information. The technologies could include hardware (e.g., computers and other devices); software applications; and connectivity (e.g., access to the Internet, local networking infrastructure, video conferencing). What are most significant about ICT are the increasing convergence of computer-based, multimedia, and communications technologies and the rapid rate of change that characterizes both the technologies and their use.

The International ICT Literacy Panel (2002) defined ICT literacy as using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society.

Unwin (2009) described the conceptual framework of ICTs and noted that although ICTs are primarily defined as computers and the internet, there are also other definitions that place more emphasis on the different types of technologies. He further asserted that ICTs should be seen as encompassing three main "interconnected processes: the capture of information, its storage, and the ways in which people access and share it."

Zuppo (2012) pointed out that defining ICTs in a global world had become challenging due in part to the many different connotations given to the term. Although the acronym ICT (or ICTs) has continuously referred to Information and Communications

Technology, by 2012, ICTs were being defined in close association with the purposes for which they were used..

In summary, the earlier definitions have two categories: On the one hand, the definitions that are explained by UNDP, Rouse, Unwin, and Zuppo concern the general concept of ICTs, their acronyms, how to handle information, how to produce, store, and distribute information to different stakeholders, and the type of ICTs that exist. On the other hand, definitions by Elmo Global, Dhital, Yusuf, and UNESCO reveal the definition of ICTs in education, in particular, by categorizing educational ICT tools and their importance in enriching basic skills, which is more related to the research under study. However, all the definitions have tremendous importance in increasing the understanding of ICTs in different dimensions.

2.1.2 Concept and Evolution of ICT

Abdulsalam et al. (2008) suggest that information can be defined as knowledge transmitted from others or acquired through education, training or learning. It can be a process by which the form of an object of knowledge is influenced by the conscious mind to produce the form of knowledge. On the other hand, technology is the science of using knowledge for practical purposes. Technology determines the quality of life of a people and the general state of their nation (Momah, 1999). Information has been the driving force behind many human activities in search of personal development, which has created a basis for the need for knowledge. ICT is an abbreviation for information and communication technology and is defined as a "diverse set of technological tools and resources used to communicate, create, distribute, store and manage information". The term ICT refers to the forms of technology used to create, store, share or transmit and exchange information. This broad definition of ICT includes technologies as radio, televisions video, DVD, telephones (fixed and mobile), satellite systems, network equipment and software, services associated with these technologies, such as videoconferencing and electronic mail (UNESCO, 2002). ICT has been defined by various commentators, with many of such these definitions focusing specially on 'new' computer-assisted, digital or electronic technologies, such as the internet or mobile telephony. Some, however, involve 'older' technologies such as radio or television. Others also include the full range of technologies that can be used for communication,

including print, theatre, popular media and dialogic processes. Some focus only on the idea of processing information or transmitting of data. Others include the broader concept of tools to improve communication processes and knowledge sharing (Greenberg, 2005; Weigel and Waldburger, 2004). Academics and students who use ICT gain a deeper understanding of complex topics and concepts and are more likely to remember information and use it to solve problems outside the classroom (Apple Computer, 2002). In addition, through ICT, researchers and students expand and deepen their knowledge, research, and inquiry according to their needs and interests when access to information is available at various levels (CEO Forum on Education and Technology, 2001). Babalobi (2010) understands that ICTs are the processing and storage of information, and the use of all aspects of computer, communication, and network and telecommunication technology for the transmission of information. Communication technologies include all information used to transmit sound, images, data or multimedia, such as cable, satellite, fiber optics, wireless (radio, infra-red, Bluetooth, and Wi-Fi). Network technologies include personal area networks (PAN), campus area network (CAN), intranets, extranets, local area networks (LANs), wide area network (WAN), metropolitan area network (MAN) and the internet. Information technologies include all removable media such as optical drivers, disks, flash memory, video books, multimedia projectors, interactive whiteboards and advanced computers that are constantly evolving. According to him, mobile technologies include mobile phones, personal digital assistants (PDAs), laptop computers, etc. These technologies have information as their material object. Information is not reserved for isolated use, but is communicated between users. ICT can be divided into two components; Information and Communication Infrastructure (ICI) which refers to the physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that use information (internet, voice, email, radio, and television). According to Amenyo (2003), ICTs are characterized by a powerful wayt. He says that they include the automation of the information and meta-informational aspects and the representation of people, items, goods, systems, tools, equipment, instrument and machinery. They necessarily include data capture (collection, aggregation, input, retrieval and measurement), data storage (recording, archiving and recording), data retrieval, data processing (manipulation, calculation, computation, analysis, modeling, representation,

presentation and simulation) and data communication (transfer, flow, interchange and exchange).

2.1.3 Use of ICT in Education

It is said that ICT is a key instrument in modern problem solving, to understand problem better, to design solution and ultimately create the kind of society we want. From this, one can understand that with the absence of ICT, it is impossible to bring remarkable changes in education by cultivating citizens who have worldviews and problem solving skills. Therefore, ICT has a profound impact on our lives and educational system because of its potential to change our vision by creating a foundation for understanding. With understanding, we control our vision, create solutions, and provide new services and products to change the country at large. However, this does not mean that ICT can be applied in all countries without any problems to achieve the intended objectives due to different factors such as society's perception and attitudes as well as luck of awareness about a given technology. For instance, Emery (1977) showed that when instructional TV projects were started in the 1950s in the USA, there was great resistance in the fear that TV instruction would destroy the value of face-to-face instructions, displace teachers (who would lose their jobs), and increase costs. Similarly, in Ethiopia, there was great resistance to technological products like millstones, cars, and airplanes in the past.

There was a time when people refused to grind grain in millstones since they considered it the devil's work. Even today, this attitude is not eliminated, though the resisting style varies. For instance, some people argue that the plasma teaching system forces students and teachers to be merely passive observers. Lemlem (2010) stated that it would have been better if plasma had not been introduced at all in Ethiopian secondary schools because it eliminates teachers' roles and discourages students' active involvement. Therefore, the resistance against technology is not ignored since any technology has its own weaknesses and strengths.

Experts suggest that it would be a serious mistake to assume that all resistance to a new medium comes from conservativeness or anti-progressivism, particularly in education. Undoubtedly, there must be reasons beyond resistance. Many teachers feel threatened because they believe that recent technological developments, particularly TV teaching

methods, tend to put greater distance between the teacher and the student, though the developers of TV teaching methods deny this.

However, meaningful learning occurs when tasks are collaborative and cooperative. Khine (2006) argued that humans naturally work in learning and knowledge-building communities, exploiting each other's skills and sharing each other's knowledge. They naturally seek out others to help them solve certain problems and perform tasks. However, TV teaching designers believe that learning is an independent process when learners seldom have the opportunity to do anything that counts as collaborative with a teacher or other student. However, rely solely on a single method of instruction medium cheats learners out of more natural and productive modes of thinking and learning. Therefore, collaborative-working encourages interactive, interdependent, and interrelated skills that promote meaningful learning.

Kedir (2006) suggested that education is a collaborative and collective task rather than transferring knowledge from pre-designed sources to recipients (students). Similarly, Lamish (1989:152) pointed out four different ways in which the TV-teaching method affects students' school performances. They are displacement, information processing, and gratification, and they stimulate interest.

According to Carlson (2002) in the Liulseged study, the planners must first of all be clear about what educational outcomes are being targeted. These broad objectives can easily guide the selection of technologies and modes of use. This is because of the fact that the potential of each technology varies according to how it is used. The scholar mentioned above outlined five levels of technology use in education in general and ICT in particular. These levels are presentation, demonstration, drill and practice, interaction and collaboration. On the basis of his conclusion, ICT can be used in all five levels. However, even though the choices are left to the planners in the education sector, and of course, a firm response must be recorded for the question, like for what purposes do we use ICTs such as educational television, computers, and the internet? Moreover, he recommends the three ways of choice that can be applied whenever ICTs are used in education, as presented below.

In order to harness the full potential of ICTs in education, a nation must come up with policies regarding the implementation of such solutions. Policies are as important as

technological innovation itself. Policies encompass the master plan of what needs to be achieved within the political, economic, and social context (Swarts, 2008). In education, both educators and students need to utilize ICT technologies for purposes of research, lesson preparation, lesson delivery, assignment issuing, and submission. These technologies tend to improve the sources and quality of information obtained, as well as efficiency, effectiveness, and accuracy, which traditional methods did not have.

According to Gardener (2002), ICT has been implemented in schools for many years. Vrasidas and Glass (2005) identify the efforts for introducing ICT into schools as the decade of 1960, when network connection between schools' mainframe computers constituted the first infrastructure for promoting computer-based learning.

Local studies indicate that available ICTs are being utilized to a very low extent, and it is generally agreed that the given factors are indeed the ones affecting or hindering utilization of the available resources in schools. While these findings may not reveal the status of all schools, most of the high schools, especially in rural areas, are worse than in this case.

2.1.4 Benefits of ICT for education

1) ICTs can improve access to education: Measures such as distance education, e-learning and access to personal computers make it possible to provide education to people living in remote areas where recruiting teacher is often difficult. In addition, the internet allows access to these and other educational contents around world without proper transportation.

2) ICTs can improve the quality of education: The quality of education is improved by Information Communication Technologies through the use of digital multimedia teaching and learning materials, the provision of skilled speakers, and distance learning for students and teachers.

3) ICTs can motivate students: ICT not only motivates students to study but also their parents to send their children to school because computers are something new that seems attractive and today people understand that information communication technology skills are necessary in the information age. To achieve the above benefits, several ICT4E projects have been implemented by international organizations, non-governmental

organizations (NGOs) and governments of developing countries. Among these actors, the government is probably the most influential since the education sector is managed within the framework of national education policies and most schools are public. In fact, in the case of Ethiopia, the Ethiopian government has implemented the ICT4E project as a key element of the overall e-government strategy (Getahun, 2006). Furthermore, if one considers that 'government has been the largest collector, user, holder and producer of information' (Heeks 1999: 16) and that the national development policy is created by the government, it is clear that the government is the most important actor and the most important top-down approach to the implementation of not only ICT4E initiative but also ICT4D initiatives in general.

2.1.5 Challenges of Using ICT

Five publications on the topic of problems in adopting ICT in secondary schools were analyzed for the research literature review. The articles were chosen for their relevance to the topic. In addition, three of them are completed in pairs, while the other two are completed separately.

The first article is a study by Ekberg and Gao (2017) and is entitled 'Understanding Challenges of Using ICT in Secondary Schools in Sweden from a Teachers' Perspective." The main objective is to investigate the views of teachers on the challenges of using ICT in secondary schools in Sweden. Ekberg and Gao followed a qualitative research approach with semi-structured interviews. The interviews were open-ended and to address this, they prepared the following research questions:

First, based on past research, a conceptual framework was created. Then, four teachers from six different subjects in Swedish secondary schools took part in semi-structured interviews with open-ended questions to learn more about the problems of using ICT in secondary schools. Mathematics, physical education and health, English, music, art, and religion were among the subjects taught by the participating teachers.

According to the results, the authors found that the biggest challenges were associated with the perspective of teaching and teaching preparation. Most challenges from previous research have been re-confirmed by the interviewees in this study too. The second article is a study by Hadi Salehi and Zeinab Salehi (2012), which is entitled "Challenges for Using ICT in Education: Teachers' Insights'. This study aims to investigate the teachers'

perceptions of the barriers and challenges preventing them from integrating ICT into the classroom**.** They have used a validated questionnaire to examine the high school English teachers' perceptions of the challenges and barriers preventing them from using ICT in the classroom. Thirty high school English teachers (18 male and 12 female) were randomly selected with stratified method from all the educational districts in the city of Isfahan, Iran, to respond to the questionnaire. The participants were familiar with the use of ICT since most of them used the Internet for the purposes of gathering information, sending email and working on social networking. They have prepared a questionnaire which consisted of five main parts and was designed and prepared in English.

Two sections present the findings and results. The data from the second part, teachers' familiarity with ICT, is first provided. The findings are divided in the second section based on the challenges and barriers that prohibit teachers from implementing ICT in the classroom.

Their research findings indicated that although teachers had a strong desire to use ICT in the classroom, they encountered some barriers. Insufficient technical support at schools and little access to the Internet and ICT were considered the major barriers preventing teachers from integrating ICT into the curriculum. Moreover**,** the descriptive analysis of the results showed that the shortage of class time was another significant barrier discouraging teachers from using ICT in the classroom.

The third article is a study by Ganesh Prasad Adhikari (2021) entitled "Teachers' Perception and Challenges of Using ICT in Teaching Mathematics at Secondary Level'. This study is also aimed at identifying the teachers' perceptions and challenges of using ICT tools in the mathematics classroom at the secondary level in Kathmandu district in Nepal. They used a quantitative descriptive survey design for the study, with a simple random sampling method. The researchers had administered a standardized questionnaire to the sample teachers, and the SPSS-25 version database was used to analyze and interpret the collected data. According to their research findings, lack of knowledge, confidence, enough experience, training, interest, and access to ICT tools, lack of technical support, lack of genuine ICT software, and unstable and unreliable internet connection at the schools were the teachers' challenges.

A fourth article, a study by Olokooba, Okunloy, Abdulsalam, and Balogun (2017), is entitled "Teachers' Perceived Challenges of Using ICT in Teaching Secondary School Social Science Subjects in Ilorin, Nigeria." The descriptive survey research design was used by the researchers in the study. A total of 300 people participated in the study. Respondents were selected through a stratified random sampling technique among all social science teachers. A questionnaire titled "Challenges of using ICT in Secondary Schools (CICTSS)" was used.

Findings of the study showed that many challenges, such as unavailability of computer laboratories, lack of instructional software, the inefficiency of teachers' technical knowledge, irregular power supply, and poor maintenance of computer systems, constrain the use of ICT facilities by social science teachers. The study also revealed that there is no statistically significant difference between male and female, private and public social science teachers on the challenges associated with the use of ICT facilities in schools.

The fifth study reviewed is a study conducted by LiulelSeged W/Hana (2010) titled "Achievements, Challenges, and Prospects in Implementing Information and Communication Technology Expansion Program: The Case of Selected Preparatory Schools in Addis Ababa". A descriptive survey method was used to identify the teachers' perceptions and positions, and purposive sampling was used to select them. Teachers were randomly selected from the four schools in the three sub-cities where the study had taken place. The researcher used four data collection instruments, such as questionnaires, interviews, direct observations, and document analysis.

According to the findings, implementations of ICT in schools faced challenges such as inadequate supply of ICT equipment like computers, plasma television displays, and their necessary accessories. In addition, scarce skilled personnel and insufficient ICT rooms, electric disconnection, network problems, all with a heavy background of unfriendliness to technology and little involvement of stakeholders, the challenges of teachers in teaching.

2.1.6 ICT and Education

In recent years, a greater emphasis has been placed on using technology to address global development in recent years. The education sector has received a large part of this attention. ICT has a direct part to play in education and, if used properly, can bring many advantages to learners in the classroom as well as in education and training procedures in particular. According to Collis and Moonen (2001), technology can be used in school education through two different aspects. The first one is called a "core" technology that refers to significant operations in the teaching-learning process based on that technology. These can happen through different means, in many nations; computer technology is used by educators and pupils in computer classrooms or laboratories; or by a teacher as a presentation medium. Besides the use of IT as a core technology, the second way to use technology in the classroom is "complementary" technology. The technologies used as "complementary" can be very varied: for instance, as an instrument for a particular activity, such as communication, database search, graphic applications, and drawing support. ICT plays an important role in the educational progress of a country. ICT is needed to address the challenges of globalization; to meet the countries need to aid the student learning. Especially, in this 21thc a wealth of educational resources can be accessed from anywhere with the Internet and the World Wide Web by an unlimited number of people in every subject. These are especially important for many schools in the developing country that have limited and outdated resources. There are disadvantages in Ethiopian schools, such as poor access to educational library resources (UNESCO, 2012). To overcome these challenges, the education sector development program (ESDP-III, IV and V) in Ethiopia also emphasizes the incorporation of information communication. ICT can remove obstacles that cause low educational issues in any nation. According to Mohanty (2019), ICT serves as an instrument for learners in the teaching process to explore learning subjects, solve problems, and provide solutions to problems. ICT makes the acquisition of information more affordable and learning concepts are understood while engaging learners in the implementation of ICT. Information communication technology has received increasing attention for this purpose in the world system

2.2 Empirical literature.

Information and communication technologies have evolved and now occupy a central place in teaching and learning. The rapid development of information and communication technologies (ICTs), internet technologies and online applications has initiated an unprecedented transformation in the education sector worldwide (Cheng, 2010). Every aspect of human relationships and interactions in the educational environment has been influenced in numerous ways by the World Wide Web. This technological advancement in the field of education has other advantages with the use of e-learning.

2.2.1 Teachers' Belief on Technology-based Teaching and Learning

With the development of learning technologies in the late 20th century, education system has changed rapidly. This is due to the capability of technology to provide a proactive, easy access and comprehensive teaching and learning environment. Nowadays, Ministry of education in all over the world has provide a lot of facilities and training in order to enhance the use of advanced technologies in the countries' teaching and learning process. A high budget has been placed in order to provide the equipment needed by teachers to improve the education system. Despite all the efforts, most of the countries are facing similar problem whereby the teachers are not maximizing the usage of the technology provided (Albirini, 2006). This has become a serious matter as many previous researches have proven the usage of ICT in teaching and learning process could improve students' achievement (Nakayima, 2011, Jamieson-Proctor et al., 2013). Many, researchers have taken an effort to analyse the factors that affecting teachers' acceptance of ICT usage in the classrooms (Capan, 2012; Virkus, 2008; Zhang, 2013; Dudeney, 2010). It shows that, the major barrier of the implementation was the teachers' belief as the teachers are the person who implements the change in their teaching and learning process. Moreover, previous research (Cassim & Obono, 2011) shows that the correlation of teachers' belief and the use of ICT are high. Teachers' role is getting more important especially in usage of ICT in pedagogy which could increase the achievement of the students, their creativity and thinking skills.

Furthermore, a research by Chien, Wu and Hsu (2014) has shown that students in school are having high expectation on ICT integration in classroom as the new generation are born and grown with technologies and could be define as the digital – native

phenomenon. The younger the students, the higher their expectation are on ICT integration in classroom. It also proved that the integration of ICT is mostly dependent on the personal factors which define as self-perceptions. This research also shows that the acceptance of ICT of teachers and students in classroom and outside of classroom whereby both are more likely to use technologies outside the classroom. They found that the barriers of ICT integration in classroom are confidence, competence and attitudes of teachers reduce the percentage of ICT integration.

Results of a previous research (Cox & Marshall, 2007) shows that teachers only need a traditional – centered approach when developing ICT skills in the classroom. The teachers are having high confidence and competency in using ICT in classroom even though it does not represents the types of ICT used. This is because they believe that ICT is a tool could help in learning process especially to relate with real life practices. This factor has reform the teaching method to integrate ICT in order to create and construct knowledge for the students.

The research shows that the relationship between competency and confidence could reflect the 178 *G h avifekr & Athirah,* balances between training and pedagogically focused approaches in ICT professional development. With this, the school management could make sure that there are sufficient supports for the teachers to integrate ICT in the classroom.

However, teachers' efficacy in urban schools changes as the years of experience of working and age of teachers (Cuban, 2001). It shows that the teachers' efficacy are decreasing as the years of experience and age increases but somehow the decrease and the efficacy belief depend on the school management. School management here means the opportunities for collegial interaction, and the use of the instructional resources. Schools that could provide opportunities for teachers to reflect on teaching and learning with their colleagues and for administrators and teachers to collaborate and communicate, as well as support the use of instructional resources. From this research, the teachers efficacy belief is depend on the school management and culture. Therefore, if the school has always implant the culture to change and teachers are always sent for training for upgrading themselves, and then the integration of ICT in classroom will be easier to be enhanced in the classroom.

2.2.2 Opportunities in using ICT among Teachers

According to Eliamani Sedoyeka and Gidufana Gafufenstudy in 2013, computers in Tanzania's secondary schools are challenged and opportunities abound. Their finding shows that information, communication, and related technologies such as the Internet come with a number of opportunities. For rural and remote schools, the impact of ICT will be biblical. However, to be successful in implementing technologies in schools, a phased approach should be applied [Mooij and Smeets, 2001], cited in this research. Not only do ICTs give students, teachers, and communities the power of information, but they also provide alternative economic activities. With ICT, individuals can embark on computer repair businesses, software industries, mobile applications and many more. Small businesses will also benefit from having access to bigger markets and from using computers to manage businesses better. Local governments will also be able to get public services closer to people by making use of freely available platforms such as mobile phones. All these, and many more, are examples of opportunities that communities, governments, and schools will realize if the initiatives to introduce computers to secondary schools succeed.

In general, the definitions of ICT by many writers from various perspectives are evaluated under the review of relevant literature. In addition, the uses of ICT, the challenges of using ICT, and the benefits gained from using ICT are all noted. Regardless of the definitions and opportunities, the review reveals that there are challenges to teachers' use of ICT in secondary schools in various nations.

2.3 ICT in Ethiopia

In the report “The National ICT for Development (ICT4D) Five Years Action Plan for Ethiopia”, as Dzidonu (2006) stated that Ethiopia has recognized the potential and opportunities of the information and technology revolution to engage in a process of economic transformation through the modernization of the key sectors of the economy, particularly agriculture, services and industry, through the implementation and use of ICT. According to Dzidonu, (2006), the Government of Ethiopia not only sees ICT as a tool and means necessary for poverty reduction, but also as a key tool to facilitating the on-going transformation of the state aimed at providing effective and efficient services in all sectors. Therefore, the government considers ICT in the broader context of its

socioeconomic development objectives. The goal is to make Ethiopia an ICT-driven country able to function effectively in a networked global economy. Regardless of the potential benefits of ICT for the developing countries, there are ongoing barriers to implementation of these technologies within many developing countries. The introduction and use of ICTs within the Developing Country has a substantial potential benefit for the economy and social service.

According to Heeks (2003), 35% of e-government projects in developing and transition countries are complete failures and 50% are partial failures. Similarly, Gauld and Goldfinch (2006) mention the high failure rate of e-government projects, especially large projects. Likewise, in the case of Ethiopia, particularly, the report from Addis Ababa University states that Addis Ababa city administration spent huge amount of money for ICT investment but the outcome is not as much as expected (Bekele et al., 2005). Moreover, in the case of ICT4E projects, negative statements are found on the documents from InfoDev/World Bank. In Ethiopia, as in other developing countries, the use of ICT is still at an infancy stage, in spite of Government's effort to promote it. According to the Ethiopian Ministry of Education (MoE) the role that ICTs can play in widening access to education to a wider section of the population cannot be underestimated. Furthermore in its five years action plan (i.e. for the year 2006 – 2010) the Ethiopian Ministry of Capacity Building stated that the government is committed to addressing the nation's human resource requirements in the area of ICTs through the promotion of mass ICT literacy education and training and the increase in the use of ICTs in educational institutes(schools, universities and colleges) as well as implementing initiatives aimed at connecting schools and higher educational institutions to the online resources including the Internet. The Ethiopian government has made the development of information and communication technologies one of the priorities of its strategic plan (GTP, 2017). The main indicators that show the low level of ICT development are as follows: -

- Lack of appropriate legal and regulatory frameworks
- Limitations in telecommunication infrastructure and low level of internet service penetration
- Lack of organized data & information sources and poor access to those that exists
- Lack of qualified human resources related to poor ICT skills.

These constraints present a real challenge for the government, but also an opportunity, for any accelerated development of ICT in Ethiopia (Government of Ethiopia, 2009). The strategic directions of the Ethiopian government are to expand the digital infrastructure, accelerate the development of information and communication and use ICT for government administration. The other strategic direction is to reduce the percentage of the second generation mobile technology from 93% in 2014/15 to 47% by 2019/20, and to create conditions for all government offices and the public to benefit from high-speed internet (GTP II, 2016). Since the majority of Ethiopian's population lives in remote areas and receives poor quality education, ICT is essential to improve access and quality of education. According to Grimus (2000), ICT bring educational innovations that are important in basic education because they are strongly focused on student- centered and increasingly student- led teaching approaches facilitated by ICT. Therefore, the Ethiopian government must ensure the integration of ICT in education.

2.3.1. National ICT Policy and Strategies

ICT is currently developing slowly in Ethiopia. The country has only 0.6 percent of the continent's internet users, and Ethiopia's internet penetration rate of 1.1% is significantly lower than the continental average of 15.6% (Hare, 2007). In an effort to address this situation, the Ethiopian government has made development of ICT one of its strategic objectives. The ICT policy is based on the government's recognition of ICT as a key enabler for transforming Ethiopian's economy and society from an economy based on subsistence agriculture to one based on information and knowledge. Previously, under the former Ministry of Capacity Building, the Ethiopian government developed the five-year action plan for national ICT for development (ICT4D) (2006-2010) initiated by the United Nations Development Program (FDRE, 2009). The Ethiopian government also established a new institutional framework under the minister of communication and information technology to give the sector a legal and regulatory framework additionally to the country's ICT policy and strategy. The Ministry of Information and Communication Technology established the first Ethiopian telecommunication agency and the Ethiopian ICT Development Agency to aid in directing and overseeing the development of ICT. The ministry also creates policy instruments, various programs, and resource mobilization.

The main objective of national ICT policy for the education sector is to ensure that ICT is an integral part of the education and training system at all levels and that ICT should be widely used in the provision of education whenever possible (FDRE 2009). The policy states that ICT should be an essential element of national education systems to improve the quality of education and make it accessible and develop assessment standards and guidelines for the development and use of ICT in schools, colleges, and universities as part of its objective.

According to Hare, H (2007) the Ethiopian National School Network project, the ICT in Higher Education Initiative and the National ICT in education, training and awareness are the three major channels that are working on basic implementation strategies in the education sector. These three channels are based on the ICT implementation strategy in education and the relevant management plan. The woreda network, the e-government communication system, is a useful and important platform for the rapid ICT development in the country's education sector, which was developed by the Ethiopian Telecommunications Company.

2.3.2. Major E-Government Initiatives in Ethiopia

2.3.2.1. Woreda Net

The Woreda Net is a public network infrastructure connecting over 611 Woredas and was developed solely to connect administrative units, ensure transparency in government operations, hold government accountable, increase citizen participation in government, etc. The main objectives of Woreda net are designed to provide ICT services such as voice over IP, video conferencing, directory, messaging and internet connectivity at the woreda-level. The project aims to provide connectivity to school network, e-health, and agricultural networks. By connecting these Woredas, a national data center and eleven regional data centers will be established. The connectivity will be achieved using various types of land and VSAT type (Mesfin, 2014). Video conferencing is one of the most important features used in conferences, training, etc. using point-to-point and multi-point connections. Using a single network, internet access is possible for connected centers.

2.3.2.2. School Net

The impact of ICT on school networks or the development of school networks increases the use of ICT in the classroom. School networks can be defined as a group of schools that use ICT to advance the education system, to promote or improve the use of ICT in the educational context (Bloome, 2002). The term "school" generally consists of the teachers, students, families and the broader community, all of whom can benefit from the integration of school networks. The national School Net initiative, launched in 2004, focuses on the deployment and use of ICT to improve education in secondary schools. The goal is to create a comprehensive network that connects all secondary schools in the country by providing access to the Internet and online education. The full implementation of the School Net plan includes teacher training, local language learning, student performance monitoring and assessment, education system management, and ultimately providing students with the skills they need to transition into the world of work. School Net is another large network linking the different schools spread throughout the nation. More than seven hundred fifty six schools overall are linked in this network, of which 574 + are secondary schools. This plan encourages the process of teaching and learning by providing comparable programs for all classrooms regardless of geographical location or rural and urban disparities (Mesfin, 2014).

2.3 Summary of the Review

The literature review indicates that ICT is a broad concept that comprises diverse technologies that facilitate communication, teaching, and learning. In the Ethiopian context, though there are a number of ICT devices, the dominant facilities used in the school system are very limited. As a result, ICT use in education for this study focuses on using personal computers (PCs), desktops, printers, plasma TVs, smart mobile phones, and the internet. As to the challenges, the present study focuses on the difficulties and constraints related to the use of the aforementioned ICT devices. The literature review also examined some of the opportunities for using ICT in education. A more detailed critical analysis of the literature will continue as the study progresses to instrument development, instrument validation, and other following sections of the study.

CHAPTER THREE

3. RESEARCH DSIGN AND METHODOLOGY

3.1. Introduction

In this chapter the details of all information regarding the methods that was used to carried out the research, the type of research design that should been use, the target population, the sample size, sampling techniques, the procedure that was used to obtain samples and the research instrument and method of data collection was discuss. It also indicated how data was analyzed and presented.

3.2. Description of Study Area

This study was planned to be carried out at Addis Ababa City Administration, Yeka Sub-city. Yeka is one of the 11 Sub Cities of Addis Ababa. In the Sub-city, there are 12 Weredas. The study were focused on public secondary schools in the Sub-city. There were seven public secondary schools in this sub city. In these schools, there are 7 principals, 21 vice principals, and 980 teachers (62 ICT teachers). Among the seven public secondary schools, four were selected deliberately based on their location to address each corner of the sub-city.

3.3. Research Design

The study was used a descriptive research design and a mixed methods approach to assess the use of ICT in secondary schools, the case of Yeka Sub-city, Addis Ababa. A mixed methods approach was selected because this approach helps to collected different types of data and strategies from the study participants (Johnson and Turner, 2003). Mixed method research allows for inherent weaknesses of the quantitative- qualitative method, to take advantage of the inherent strengths of the method, and to compensate for the inevitable biases of the method. Here again, from different types of mixed approaches, the researcher was used a sequential exploratory strategy. This strategy used qualitative data to help interpret the quantitative results. The quantitative data collection was followed by a qualitative phase of data collection and analysis (Creswell, 2003).

3.4 Sample Size and Sampling Technique

According to Kothari (2004), sample design is a definite plan for obtaining a sample from a given population. Target population is defined as the entire group a researcher is interested in. According to (Zikmund, 2003) the definition of population was identifiable total set of elements of interest being investigated by a researcher. The sample was taken from four public secondary schools in Yeka which includes Dejazmach Wondrad , Kokebe-Tsibah, Karalo and Tesfa-Birhan. These four secondary schools were selected deliberately based on their location to address each corner of the sub-city. Teachers and principals in the selected schools are the principal populations in this study. As to the researcher's preliminary data sources, there are 648 teachers (38 ICT teachers), 4 school principals, and 12 school vice principals, in selected four public secondary schools in Yeka Sub-city. The sample size was determined followed two steps sample calculation procedure: in the first step, sample size was determined for infinite population using Yamane (1967) sample size determination formula with 95% confidence level and in the second step, actual sample size for each school was determined by applying selected using proportionate stratified random. This was presented as follow;

$$n = \frac{N}{1 + N(e)2} = \frac{648}{1 + 648\,(0.05)2} = \frac{648}{2.62} = 247$$

Where, n – designates the sample size the research uses.

N - Designates the total number of the target population.

e – Designates maximum variability or margin of error 5% (0.05).

1 – Designates the probability of the event

The researcher selected 247 from the population of 648 and employed this formula to determine the required sample size; here an arithmetic calculation is performed to find sample size of teachers. After determining the sample size, the researcher used proportionate sampling method to identify the teachers who was participated in the study. This sampling was selected because as compared to other probability sampling techniques, it is convenient and easy for the researcher, and it is widely employed by many researchers. The number of participants from each selected school was determined by their number relative to the entire population. Proportional sampling is a method of sampling in which the investigator divides a finite population into subpopulations and

then applies convenience random sampling techniques to each subpopulation. Following Kothari (1999) and Cochran (1997) sampling procedures from each school or stratum, the samples can be taken using the formula

$$n_i = \frac{n^* N_i}{N}$$

Where N - Total Population size

n - Sample size

Ni -The size of i^{th} stratum

ni- The number of participants selected from the schools and i = 1, 2,...,4

Hence, the distribution of samples was taken from four different selecting schools is given as follows.

Table 3.1 Sample Distribution

S.N	Name of schools	Total number of teacher in each school	Number of respondent teachers in each school	Percentage of respondent teachers in each school	Number of respondent principals in each school
1	Dejazmach Wondrad Secondary School	150	57, (15 ICT teachers)	38%	1
2	Kokebe-Tsibah Secondary School	213	81, (14 ICT teachers)	38%	1
3	Karalo Secondary School	166	63, (11 ICT teachers)	37.9%	1
4	Tesfa-Birhan Secondary School	119	46, (8 ICT teachers)	38.7%	1
Total Population and Sample Respondents		648	247 (38 ICT teachers)	38.1%	4

Therefore, according to the above calculation a total of 247 questionnaires was distributed and collected relevant data from 234 teachers in above mentioned four schools. Study participants were selected by using simple random sampling technique.

In order to substantiate data collected from these respondents, a key information interview was held with principals (1) respondent from each school. The participants of the key information interview was purposely selected form the four schools. And the ICT teachers in the sampled four schools were incorporated into the study.

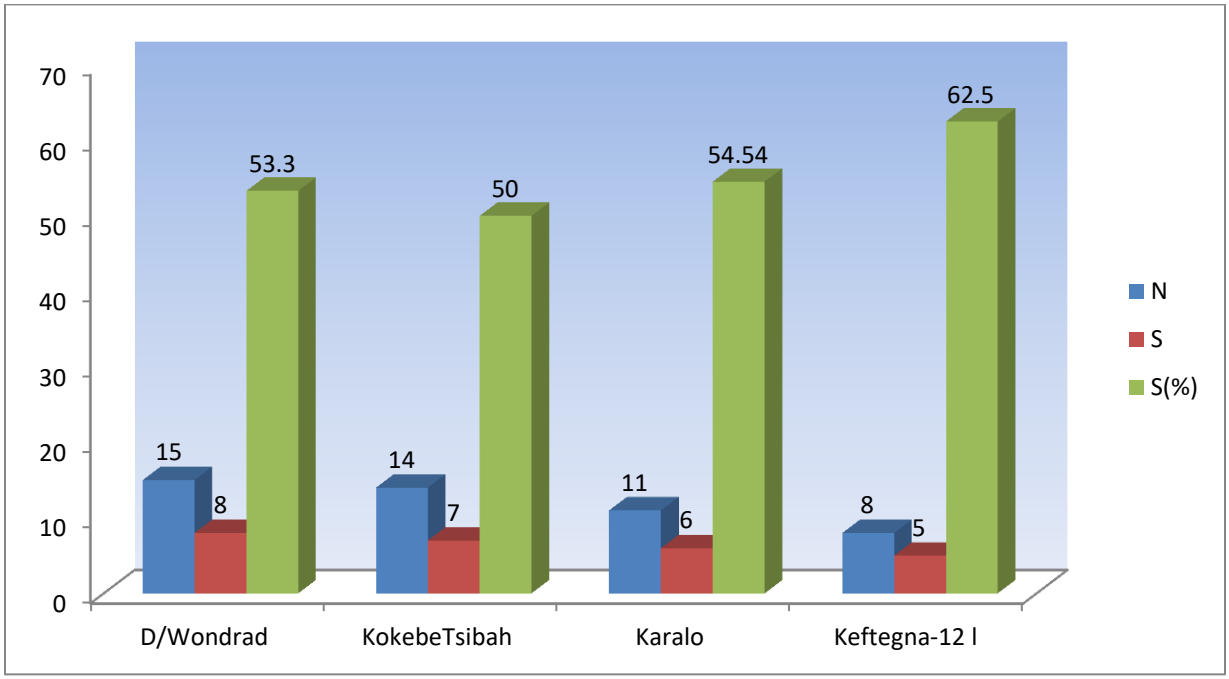


Figure 3.1 Sample of ICT teachers, population and participants in each school

Where N= Total number of ICT teacher in each school S= Number of respondent ICT teachers

S%= Percentage of respondent ICT teachers in each school.

3.5 Data Collection Instruments

The study was gathered from two sources, primary and secondary. The primary data was obtained from both quantitative and qualitative data sources. The secondary data was obtained from published and unpublished sources of the governmental and the non-governmental organizations, and from relevant websites. The detail of data collection instrument was presented as follows.

3.5.1 The primary data sources.

The sources of primary data for the study were school principals, academic teachers and ICT teachers of sample schools. To collect data from the sample participants the researcher was used questionnaire, focus group discussion and Key informant interview.

Questionnaire

The researcher used questionnaire with close-ended and open-ended questions from prior similar studies after reviewing the literature. The questionnaire prepared only for academic teachers. After the advisors had made a constructive comment, the questionnaire was distributed for reliability pilot test in one of the non-sample school of the Sub-city. After the reliability test had taken, the questionnaire was distributed to the teachers of sample school. From the distributed 247 questionnaires, 234(94.7% questionnaires were filled by teachers and returned. The questionnaire had four parts; the first part asked about teachers' perception on the use of ICT contains ten close-ended questions. The second part asked about the effective elements/tools which contains ten close-ended questions. The third part asked about ICT supports learning teaching process contains eight close-ended questions and the last part which asked teachers about factors affecting teachers in the use of ICT contains twelve close-ended questions. In addition to these, there was three open ended questions were presented for respondents. Forty Likert scale close-ended and three open-ended questions were prepared.

Key Informant Interview

Key informant interview is a flexible instrument and it allows for an in-depth questioning when it is properly planned, structured and conducted. It can help to get information about the challenges from the participants' experience. As indicated in Wilkinson and Bhandarkar (1999), interviewing is necessary to get deep feeling, perceptions, values or how people interpret the world around them, and past events.

All kind of data collection tools were designed in Amharic and then translated to English for the report. Interview was held with the four school principal's one from each school, who were selected purposively according to their contribution of giving information. Structured interview guide was prepared for this purpose. Participants' convenient time and place was respected and finally the interview was held in each of the principal's

office with 30-40 minutes duration. The interviews were recorded with video camera for analysis.

Focus Group Discussion

The FGD had been taken with the ICT teachers because these groups of participants have direct contact with using and maintain ICT apparatus and this helps to the study to know some hidden points and to get further information for the study that are not touch by the interview and questionnaire. The discussion was led by the researcher. For this discussions (one at each school) were held with 5 to 8 members and the researcher conducted the discussion at the participants' ICT laboratory room for a period of one hour in each sample school.

3.5.2 Secondary Data Sources

In this study, the information derived from the secondary sources of data was collected from different sources such as published and unpublished materials which include previous research works, books, office documents, websites, journal articles written by different scholars on the issues of area closure, and so on, which was helpful to the completion of the study.

3.6. Piloting the Instruments

The questionnaire was pre-tested with 35 teachers of sample respondents in a non-sampled school before the actual data collection to make sure that the questions are clear, relevant and could be understood by the respondents. As soon as pre-testing of the questionnaire was pretested for Cronbach alpha reliability test and it had completed, the questions were rearranged (clarity, wording of items, and weakness) based on the feedback obtained from the respondents.

3.7 Reliability of the instrument

However, from the pilot test, the researcher was able to understand the ambiguity of some items and so had to modify the level of the questionnaire. That is, the researcher resorted to use simple English. Hence, some items were rejected from the questionnaires. Consequently, the total reliability of the instruments was tested by Cronbach Alpha method by using 'SPSS software 20 versions' and reliability calculated for each of the items prepared for study participants.

Thus, the alpha result for the items prepared to teachers, were: 0.778. The level of reliability of the instrument indicates the consistency of the variables. Cronbach ‘s alpha is an index of reliability associated with the variation accounted for the true score of the underlying construct and it can only be measured for variables which have more than one measurement question. 0.5 is a sufficient value, while 0.7 is a more reasonable value. Therefore, the reliability of the questionnaire was analyzed by using Cronbach’s alpha statistics, and the scales are found reliable.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.773	.687	40

3.8. Data Collection Procedure

After getting scheduled the researcher selected and oriented two data collectors and assigned to the sampled schools. The researcher supervised the data collection process. The collected data were edited and coded by the researcher and entered the data into statistical software SPSS. Finally data were checked carefully for missing value and inconsistencies. Key informant interviews with school principals and FGD with ICT teachers were conducted by the researcher. The interview questions consist of open-ended items. Generally interviews and FGDs were carried out in a friendly and open atmosphere. Interviews and FGDs with the participants took place in their schools at times convenient for them after advance booking. A brief explanation of the aim of the study and confidentiality related issues given to the participants. The researcher was insured that the environment is conducive to conducting interviews and FGDs. Semi-structured interview and FGD guides were prepared and the probing questions technique used to collect data. Each interview and FGDs continued for 40- 60 minutes. All events had recorded using mobile recorder. Following this, the interviews and FGDs had transcribed.

3.8. DATA ANALYSIS METHOD

A. The Quantitative Data

The quantitative data was edited and coded by the researcher to enter the data into statistical software SPSS version-20 and interpreted by using descriptive statistics like frequency and percentage. Finally, the data was checked carefully for missing values and inconsistencies.

B. The Qualitative Data

Recorded interviews and FGDs were transcribed by the researcher. This was done in two ways:

i. The researcher spent time listening to recordings of the interviews in order to become familiar with the data.

ii. The researcher used short notes taken from the interviews and FGDs to internalize the key points of the collected data. The interview and FGD data was narrated in relation with questionnaire items analysis method was used to analyze the data. This was achieved by applying a step-by-step coding and categorizing scheme as proposed by Richie et al. (2003).

Both quantitative and qualitative data analysis techniques were used for the data collected. Data which were collected through close-ended questions were analyzed quantitatively using frequency and percentage. Some data obtained through open ended questionnaires, FGD and semi-structured interviews were categorized in to themes based on research questions. On the other hand, in order to answer all basic research questions, the five likert scales were converted in to three for the sake of convenience to deal with. Accordingly, the first scales (strongly agree + Agree) were grouped together to agree. In the same way, the other three (very high + high) were grouped together in to high. The intermediate scale (undecided) was taken as it is. Additionally, the interviews and FGD results were nested to the quantitative findings in order to support and strengthen it. Finally, based on the data collected, summary and conclusion were drawn and recommendations were forwarded. Following this, the interviews and FGDs had transcribed.

3.9. Ethical Consideration

Each person involved in the study is entitled to the right to privacy and dignity of treatment, and no personal harm caused to the subjects in the research. The information sheet, which describes the study aim and objectives as well as ethical principles of the study such as confidentiality, the right to voluntary participation, and the right to withdraw from the study at any stage without any precondition, was discussed with the participants. Similarly, informed consent was received to ensure that participants understand their rights, and the participants were requested to give informed consent form only after they understood their rights and are willing to participate in the interviews.

Information collected from the participants was kept confidential. The anonymity and confidentiality of the participants was protected by coding. No one had access to the data except the researcher and the advisor.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter deals with data presentation, analysis and interpretation. To collect data three different tools were used these were questionnaire, interview and focus group discussion. The data obtained from the questionnaire were analyzed quantitatively by using frequency, percentage and means On the other hand; the data obtained from interview and focus group discussion were analyzed and described thematically in narrative form.

4.2 Respondents Demographic Information

This section provides results and discussions of the demographic characteristics of the respondents who participated in the study. It analyses the sector representation, gender, education level, and experience in years of each respondent.

4.2.1 Questionnaire Response Rate

A total of 247 questionnaires were distributed to the targeted population and the response was as indicated in Table 4.1

Table 4.1: Questionnaire Response Rate

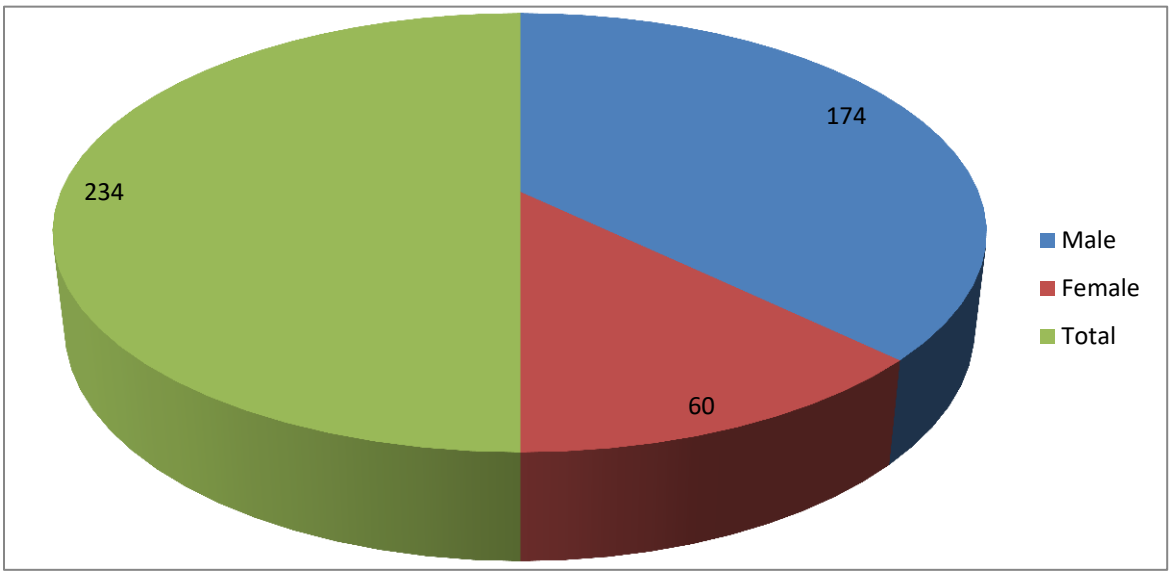
S.N	Name of schools	Total population	Target population	Responses	Percentage of respondent
1	Dejazmach Wondrad Secondary School	150	57	55	96.5%
2	Kokebe-Tsibah Secondary School	213	81	79	97.5%
3	Karalo Secondary School	166	63	58	92.1%
4	Tesfa-Birhan Secondary School	119	46	42	91.3%
Total Population and Sample Respondents		648	247	234	94.7%

Source: Developed by the researcher

From the total of 247 questionnaires disseminated and 234 (94.7%) were returned, the remaining 13 were discarded.

4.2.2 Distribution of Respondents by Gender, work experience and academic status

The responses obtained from teachers regarding their demographic information, work experience and academic status is presented in Table 4.2 below

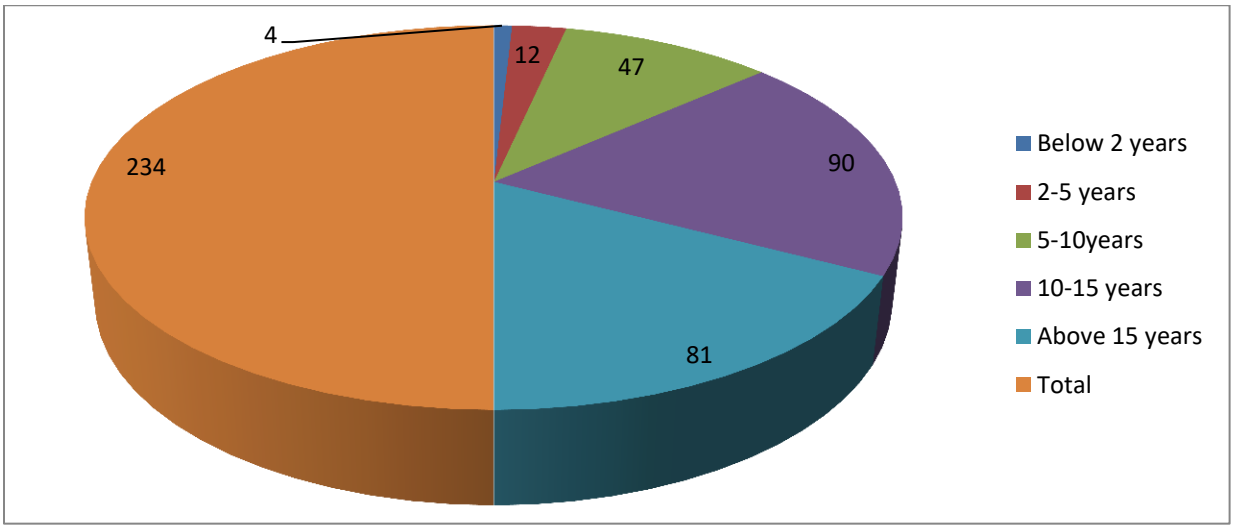


Source: Developed by the researcher

Figure 4.1 Sex distributions of respondents

As shown in figure 4.1 above, 74.4% of the respondents were males. Female teachers accounted only 25.6%.This implies that females representation in secondary schools of the sub city is low as the data obtained from document of the Sub-City indicated that female teacher in the seven schools were 25.3% and hence, a need to work on increasing the participation of female teachers in secondary schools.

4.2.3 Work experience of respondents

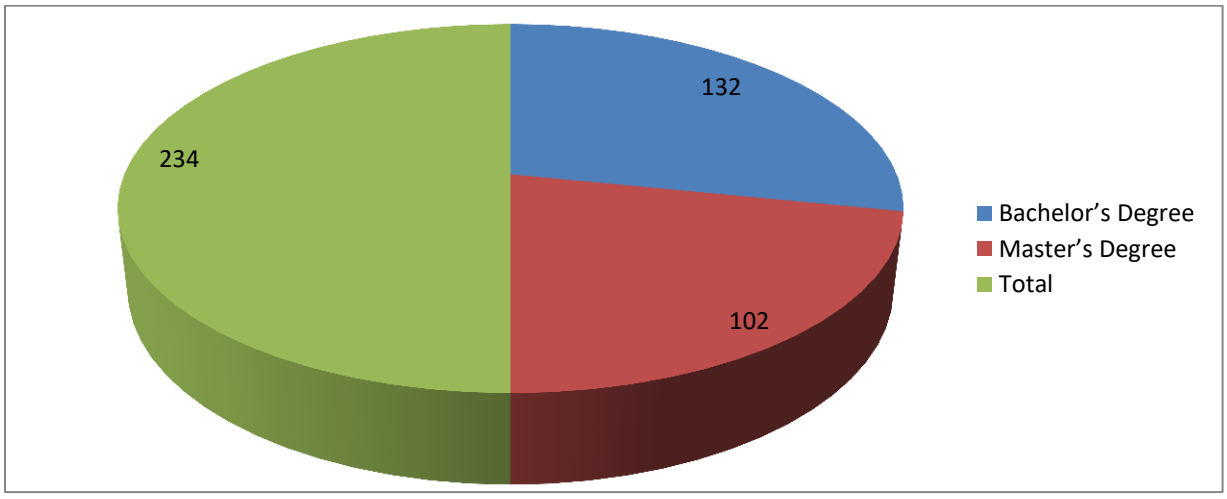


Source: Developed by the researcher

Figure4.2 Experience of respondents

Regarding work experience, 218 (93.2%) respondents have 5 and more than 5 years of experience whereas 16 (6.8%) of the teachers have less than 5 years of experience, This indicates that majority of the teachers in the Sub-city secondary schools are experienced which enables the staff to better share experience.

4.2.4 Academic status of respondents



Source: Developed by the researcher

Figure4.3 Academic status of respondents

Referring to their academic status, diploma and PhD qualification were not observed. Among the sample 132 (56.4%) had Bachelor Degree whereas 102(43.6%) had Master's degree. This academic status shows that the qualification of most of the respondents was more or less up to the standard for grade level to bring the required competency of students.

4.3 Descriptive Statistics Analysis

Analysis of descriptive statistics as shown in the previous chapter, the study used to descriptive products that summarize a given data set, which may be a representation of the entire or a sample of a population. The following sub-sections provide a summary of the descriptive statistics of qualified data collected by the questionnaire.

4.3.1 Teachers' Perception on the use of ICTs in teaching-learning process.

From the data provided in Table 4.3 on the teacher's perception, this sample that most teachers are aware of the goodness and usefulness of ICT in teaching. Most teachers understood that the use of ICT helped teachers to improve teaching with more updated materials that shown the lowest percentage of 84.2. It is undeniable that their educative are provided in line are more up-in and that teachers can refer to him to design more interesting and engaging lesson for students.

Table 4. 2 The responses of teachers on their perception of ICT usage in teaching learning process

			S.Agree	Agree	Undecided	disagree	S.disagree
1	ICT can solve many of our educational problems	Frequency	164	53	9	7	1
		Percent	70.1%	22.6%	3.8%	3%	0.4%
2	ICT will increase my efficiency in teaching.	Frequency	145	68	15	5	1
		Percent	62%	29.1%	6.4%	2.1%	0.4%
3	ICT will bring new opportunities that offers for effective teaching	Frequency	148	67	16	3	0
		Percent	63.2%	28.6%	6.8%	1.3%	
4	ICT enables collaborative learning.	Frequency	113	84	20	6	11
		Percent	48.3%	35.9%	8.5%	2.6%	4.7%
5	ICT can engage learners more than other forms of learning.	Frequency	104	91	26	10	3
		Percent	44.4%	38.9%	11.1%	4.3%	1.3%
6	ICT increases access to education and training.	Frequency	133	86	12	0	3
		Percent	56.8%	36.8%	5.1%		1.3%
7	ICT increases the quality of teaching and learning because it integrates all forms of media: print, audio and video.	Frequency	141	65	19	7	2
		Percent	60.3	27.8%	8.1%	3%	0.9%
8	ICT increases the flexibility of teaching and learning.	Frequency	139	77	14	2	2
		Percent	59.4%	32.9%	6%	0.9%	0.9%
9	The use of ICT improves the quality of teaching.	Frequency	135	78	15	4	2
		Percent	57.7%	33.3%	6.4%	1.7%	0.9%
10	Using ICT reduces workload and provides the latest information	Frequency	148	66	17	0	3
		Percent	63.2%	28.2%	7.3%		1.3%

Source: Own Survey result (2025) SPSS Output

From table 4.2, teachers were requested to express their perception concerning the clarity and educationally usefulness of ICT contents in their teaching and learning process. And from the responses one can grab 217(92.7%) of the teachers agree and strongly agree that ICT can solve many of our educational problems useful while the rest were undecided and disagreed. From this we can perceive ICT allows the teachers to monitor and manage students learning, show way forward to think critically and creatively, solve simulated

real-world problems through collaborative work, engage in ethical decision-making, and adopt a global perspective towards issues and ideas. In table nearly 213(91%) of teachers confirm their agreement on ICT will increase their efficiency in teaching processes, it also helps them to increase the flexibility to teaching and learning. This shows that teachers agree on ICT can help them to develop their teaching system and presented an equal opportunity to those who are lacking success in the area. Nearly 215(91.9%) of teacher's express their attitude towards the idea that ICT will bring new opportunities for organizing teaching and learning with positivism. This implicates that teachers have a positive attitude that ICT will bring new opportunities for organizing teaching and learning resources which the institution needs to work towards fulfilling this crucial requirement. From table 4.2, it is easy to conceive that teachers agree on the idea as ICT enables collaborative learning by 197(84.2%) while the remainders show neutrality to the subject 20 and some few respondents deviate from it. This shows that ICT enables collaborative learning as it represents helping others to learn has to do with offering better channels for communication. With regard the table 4.2, teachers were requested to give their perception on that ICT can engage learners more than other forms of learning, 195(83.3%) of teachers provided their agreement on the issue while the remaining are still neutral to the matter. These indicates that teachers strongly believe that ICT has a power to engage learners more than other forms of conventional learning mechanisms which seems to be outdated less attractive. In table 4.2 above, teachers responded to their perception and practice as ICT increases access to education and training were 219(93.6%) while the remaining were neutral on the subject. This significantly implies that teachers agree on using ICT can make access of education and training much easier as it promotes freedom of stakeholders to align a flexible timeline, location and presence to present needed educational resources.

One can note from table 4.2 that, 206(88%) of responses are positive towards the perception on integration of media use on ICT as it increases the quality of teaching and learning because of the fact when one integrates all forms of media: print, audio and video while the remaining gave response in neutrality. This indicates that teachers are in agreement on their preference to integrate and use graphically rich contents in their teaching learning activities as ICT promotes and made easy of such preparation as well as

uses. From table 4.2 that, 216(92.3%) of responses are positive towards the perception on ICT increases the flexibility of teaching and learning because of the fact when it provides different approaches of teaching methodologies while the remaining gave response in neutrality. This indicates that teachers are in agreement on their preference the flexibility of teaching and learning activities as ICT promotes and made easy of such preparation as well as uses.

From the responses one can grab 213(91%) of the teachers agree and strongly agree that the use of ICT improves the quality of teaching while the rest were undecided and disagreed. From this we can perceive ICT improves the quality of teaching, And teachers responded to their perception and practice as using ICT reduces workload and provides the latest information were 214(91.5%) while the remaining were neutral on the subject. This significantly implies that teachers agree on using ICT reduces workload and provides the latest information much easier as it promotes freedom of stakeholders to align a flexible timeline, location and presence to present needed educational resources. From the above explanation the perception of teachers about different purposes of using ICT is positive and good understanding.

Moreover, in addition to the above quantitative data, the researcher has gathered supportive information from principals through conducting interview and ICT teachers through conducting focus group discussion. Accordingly, most of the interviewee and FGD mentioned that even though school administrator's support on utilization of ICT in teaching-learning process was not adequate, they perceive that using ICT facilitates teaching learning process and it has the power to bring interactive and active teaching-learning environment.

Furthermore, in proportion to the above ideas, the data obtained from open ended questionnaires and the FGD similar with the questionnaire response and beyond these challenges, ICT teacher pointed out that:

> *In our school, one hidden problem is absence of the culture of utilizing existing/accessible ICT tools in the school for teachers and lack of adequate budget to purchase the deficient tools as an additional factor that hindering effective ICT utilization in teaching learning process. (groug.4)*

In this regard, group 1 of the sample school's ICT teacher's focus group suggested their view as follows.

> *Even though there are many problems regarding computer access, ICT lab problems, lab tops, smartphones, there is Wi-Fi, access with Wi-Fi using our own smartphones, laptops, and computers of the administration, we used to send different notes and exams to our students, we send different information to parents, our skills and knowledge had increased, our information access had increased. If the school has given appropriate attention and facilitate the ICT rooms for teachers we do more. Group one ICT teachers. (22/8/2017 E.C)*

In general, from the above both quantitative and qualitative analysis of data, it can be concluded that even though the respondent's perception on very few items vary from others, majority of them strongly agree and agree on the presented statements. This in turn shows that majority of the teachers' perception on ICT utilization in teaching learning process as very important and has a great value to bring change within globalized world. Moreover, they believe that ICT is an important instrument that can transfer the present isolated, teacher centered and book centered learning environment into a student centered environment. It can also change the traditional concept of learning process.

4.3.2 Opportunities and Effective Elements in ICT-based Teaching-Learning in Schools

ICT in education provide digital teaching aids and materials easily, distribute soft copy teaching materials with low cost, important to organize school information, make easy the education process, save time and get updated information. Due to the current situation of teachers to used ICT in their teaching process, the principals said that there are no enough opportunities for teachers to use ICT rather than the ICT teachers and students. Therefore most of the teachers do not use ICT for their teaching process.

Table 4. 3 Responses of Effective elements in ICT- based teaching and learning in public schools

No	Statements		V.high	High	Medim	Low	V.low
1	The ICT facilities in my school are well-functioning and can be used.	Frequency	4	26	71	87	46
		Percent	1.7%	11%	30.1%	36.9%	19.5%
2	The technical supports are provided if teachers are faced with difficulties.	Frequency	3	50	111	61	9
		Percent	1.3%	21.2%	47%	25.8%	3.8%
3	Lack of supports from the school top management discourages me from using ICT.	Frequency	45	64	60	39	26
		Percent	19.2%	27.4%	25.6%	16.7%	11.1%
4	Teaching time are not enough for me to use the ICT for teaching and learning purposes.	Frequency	11	41	106	56	20
		Percent	4.7%	17.4%	44.9%	23.7%	8.5%
5	There is enough training and professional development provided for teachers about ICT use in teaching	Frequency	5	14	52	95	68
		Percent	2.1%	6%	22.2%	40.6%	29.1%
6	All ICT tools in my school go to waste and less used by teachers.	Frequency	51	54	82	35	12
		Percent	21.8%	23.1%	35%	15%	5.1%
7	Teachers are given more time to learn and be comfortable with the use of ICT in teaching.	Frequency	15	47	69	70	33
		Percent	6.4%	19.9%	29.2%	29.7%	14%
8	There is computer lab in my school in which I can bring students there to watch educational videos	Frequency	10	31	31	70	92
		Percent	4.3%	13.2%	13.2%	29.9%	39.3%
9	Teachers' are given the freedom to design their own teaching with the helps from the ICT.	Frequency	17	43	40	84	50
		Percent	7.3%	18.4%	17.1%	35.9%	21.4%
10	Little access to ICT prevents me from using it in teaching	Frequency	54	74	62	34	10
		Percent	23.1%	31.6%	26.5%	14.5%	4.3%

Source: Own Survey result (2025) SPSS Output

From the above table 133(56.8%) of responses were said low and very low and 71(56.8%) respondents were said medium that the ICT facilities in my school are well-functioning and can be used. We understand that ICT facilities provided in school are not well functioning and in not a good condition as it is not being used by teachers and there is no maintenance to make sure the facilities are well taken care of by the schools management. The responses of the question that the technical supports are provided if

teachers are faced with difficulties is as shows in table 4.3 53(22.5%) respondents said that high but 70(29.6%) respondents said that low and the rest 111 (47%) were answered medium. Therefore, technical supports if teachers are faced with difficulties are less provided for teachers about ICT use in teaching. Another question is that the lack of supports from the school top management discourages me from using ICT, then the respondents were said that 109 (46.6%) high and very high, 60(25.6%) medium and 65(27.8%)say low and very low. This implies that most of the teachers are agreed with there is lack of supports from the school top management discourages me from using ICT. According to the table Training and professional development are less provided for teachers about ICT use in teaching with the frequency of respondents 163(69.7%) said that there is low level of training given for teachers about usage of ICT. The school top management must find ways to provide enough technical supports as well as training and professional development for teachers in order to ensure success implementation of ICT in teaching.

The school top management must find ways to provide enough technical supports as well as training and professional development for teachers in order to ensure success implementation of ICT in teaching. Some teachers feels the urge and motivated to use ICT in teaching but there is lack of supports from the school top management that hinder and discourage them from using ICT. The school top management must provide an encouragement for teachers to use ICT in teaching and convince them that ICT can benefits both teaching and learning process. 186 (79.5%) teachers agreed that all ICT tools provided for their school goes to waste and less used by teachers. Other than that, ICT facilities provided in school are not well functioning and in not a good condition as it is not being used by teachers with the and there is no maintenance to make sure the facilities are well taken care of by the schools management.

From the above table 4.3, 172(56.8%) of responses were said low and medium about Teachers are given more time to learn and be comfortable with the use of ICT in teaching. The worst finding shows that teachers are not given enough time to learn and to be comfortable with the use of ICT in teaching. It is better if teachers are given time to learn and be comfortable with ICT for them to explore its use and make the best use of it. For item 8 and 9, the frequency of respondents said that low and medium 193(82.5%) and

174(74.4%) respectively. Besides, teachers are not given the freedom they need to design their own teaching with the helps they received from ICT and some schools are not provided with at least computer laboratory in which teachers will get the chances to integrate the use of ICT for their learning process. Teachers must be given the freedom to design their own teaching and make full use of ICT but they must be remembered to keep it in track with the curriculum designed by the Ministry of Education (MOE). Also teachers must be getting enough training about how to use ICT in teaching purpose due to teachers' lack of knowledge and skills in using it. Sometimes, ICT facilities are completely provided but little access to ICT prevents teachers from using it in teaching. In this regard during interview, one of the school principals said the following:

> *These days, due to a lack of budget and the high price of ICT equipment, a shortage of computers and internet connection infrastructure is common in government secondary schools. Besides, as the number of students increases from time to time, we are working to accommodate the students even by collapsing ICT rooms. In addition, due to T-client being out of use, which is used for school net connection, and a server problem, there is no plasma mode of instruction at all. (30/08/2017e.c)*

Concerning availability of ICT tools and the network connection, among the four ICT teacher groups, group 3 members said that the school administrators are not volunteers to try to solve the problem as much as the school capacity can do.

In general, the above analysis and literature show that the use of ICT in the sample schools was below what was expected and the standard.

Furthermore, as coming to the extent of ICT usage, principals of the school pointed out that:-

> *Due to shortage of budget and related constraints in the school, most of the time short term trainings were provided on latest and current issues like E-school implementation that delivered for short period of time. As a result, majority of the teachers in our school did not utilize ICT facilities for teaching learning processes rather they use for different purposes such as: vesting social sites, playing games and engaging in non-academic activities. (30/8/2017 E.C)*

The overall findings shows that there is none effective elements identified from the data collected regarding the effective elements of ICT integration in teaching and learning in public school. This means the there is no opportunity for teachers to use ICT. All researchers consisting of certain suggestions and advice for teachers and school management add this problem found by research conducted towards teachers. On the basis of this analysis we can understand that secondary school of education did not equip the teacher s with necessary skills to effectively utilize ICT tools in the teaching learning process.

4.3.3 The practical supports of using ICT for learning- teaching process

The practical supports of ICT tools is conceived in a structure way to assess the way technology in the classroom and most importantly, whether such efforts lead to noticeably improved teacher instructional practices and student learning outcomes.

Table 4.4 Responses of the practical supports of using ICT for learning- teaching process

N	Statements		V.high	High	Mediu	Low	V.low
1	ICT improves students learning skills	Frequency	79	70	41	34	10
		Percent	33.8%	29.9%	17.5%	14.5%	4.3%
2	ICT is crucial to supporting educational activities	Frequency	50	41	49	53	41
		Percent	21.4%	17.9%	20.9%	22.6%	17.5%
3	ICT helps to teachers to prepare teaching resources and materials.	Frequency	27	34	45	86	42
		Percent	11.5%	14.5%	19.2%	36.8%	17.9%
4	ICT is currently being used in teaching and learning in a satisfactory	Frequency	25	50	34	73	52
		Percent	10.7%	21.4%	14.5%	31.2%	22.2%
5	ICT will help the teachers to understand the subject materials	Frequency	70	72	33	47	12
		Percent	29.9%	30.8%	14.1%	20.1%	5.1%
6	ICT makes completing work in the teaching-learning process more convenient	Frequency	64	86	47	26	11
		Percent	27.4%	36.8%	20.1%	11.1%	4.7%
7	ICT motivate the teachers to explore many topics they may not have seen	Frequency	68	83	36	31	16
		Percent	29.1%	35.5%	15.4%	13.2%	6.8%
8	ICT facilitates educational administration	Frequency	74	87	28	37	8
		Percent	31.4%	37.4%	12%	15.8%	3.4%

Source: Own Survey result (2025) SPSS Output

From table 4.4, there is a question, such as ICT improves students' learning skills, this shows that most respondents 149(63.7%) high that ICT improves students learning, it is essential to support learning activities, and schools should pay attention to ICT education. With regard to the table 4.4, teachers' response on ICT supporting educational activities show that 140(59.8%) of teachers say medium and high while the remaining are say low. From this we can deduct that teachers highly believe ICT Skills are very crucial for the success in their education activities. However, when asked whether the current use of ICT in the teaching and learning process is good, respondents answered to this item 75(32.1%) high, 125(53.4%) low and others were answered to say medium. This indicates that how ICT is not currently being used for teaching and learning needs to be more satisfactory.

Even though, teachers agree on usefulness of technology help to understand their subject material more deeply on the higher side which is 142(60.7%) teachers show their agreement to the statement while the remaining did want to medium and low. From this we can deduct that majority of the respondents firmly believe technology is a gateway to widen the materials and resources which contribute to their successfulness on their subject matter and their assigned field of teaching in general. In table 4.4, teacher's response on their perception on completing work in their subject more convenient by use technology point out 150(64.2%) of the teachers say high on the issue while the remainder stays medium and low. This shows that teachers use highly on technological utilities enhance and aid their learning activities significantly. With regard to table, 4.4, 151(64.6%) of teachers show their agreement on technology can be highly used to motivates them to explore many topics which they may not have seen before or have the access to use in such a form while the remaining say the motivation level is medium or low. Teachers comprehend different learning abilities through technology. One can derive that higher number of teachers agree that ICT can be utilize in a manner to increase motivation towards exploring study of interest as it is directly proportionate in improving the learning, association as well as recall abilities of students.

In general, teachers agreed that the usage of ICT is important for various educational activities; it's something they want to master. Learning to use it enhances their self-esteem and makes them excited about coming to school or even about the entire teaching

learning process. According to the above survey in the research, most teachers believe that using technology motivates teachers to effective teaching. Technology in the teaching processes allows teachers to take greater control of their subject matter because tools and utilities like access to the internet, use tablets and laptops encourage interactive, hands-on teaching.

During the interview time, one principal pointed out the following idea:

> *Usually, government secondary schools have relied on a textbook- and chalkboard-based teaching system. To support students and teachers, the government should provide adequate information and training, and must be access computers and the internet for schools. While the majority of secondary school teachers carried smartphones, teachers were not integrated and utilized ICT for pedagogical purposes.*

In addition to this, one of the other school principal stated:

> *Although it is impossible to argue that ICT is fully integrated into secondary schools, it is practicable in our school for administrated purpose rather than teaching-learning process. (22/08/2017e.c)*

In addition to this, the researcher also has conducted ICT teachers with FGD. Accordingly, about ICT teachers those taken from four different secondary schools discussed with researcher. However, there are no teachers used any ICT tool during their learning-teaching process. This in turn implies poor practice of technology products in the actual education and poor opportunities for teachers to use ICT for their learning-teaching process. In general, as both qualitative and quantitative data revealed, it is possible to comprehend that the practices of utilization of ICT in teaching learning processes at secondary school of education is at its infant/early stage.

4.3.4 Challenges of ICT utilization in teaching-learning process

The researcher observed many problems in adopting ICT in secondary schools of Yeka Sub City. For example:- understanding of using ICT, Using ICT in Education and Achievements, Challenges, and Prospects in Implementing Information and Communication Technology Expansion Program and so on.

Table 4.5 Teacher's response related to challenges faced in the use of ICTs.

No	Statements		V.high	High	Medium	Low	V.low
1	Insufficient number of Computers.	Frequency	117	80	28	5	4
		Percent	50%	34.2%	12%	2.1%	1.7%
2	Inadequate internet connectivity	Frequency	99	90	33	9	3
		Percent	42.3%	38.5%	14.1%	3.8%	1.3%
3	Fluctuation (interruption) of power supply.	Frequency	79	112	30	10	3
		Percent	33.8%	47.9%	12.8%	4.3%	1.3%
4	Computers are not available for teachers	Frequency	93	101	25	9	6
		Percent	39.7%	43.2%	10.7%	3.8%	2.6%
5	Computers are very old and slow.	Frequency	88	69	46	16	15
		Percent	37.6%	29.5%	19.7%	6.8%	6.4%
6	Shortage of qualified ICT Teachers.	Frequency	40	76	69	35	13
		Percent	17.1%	32.5%	29.5%	15%	5.6%
7	Lack of government interesting efforts to fulfill the school net	Frequency	55	80	63	25	11
		Percent	23.5%	34.2%	26.9%	10.7%	4.7%
8	Lack of technical support.	Frequency	74	97	42	14	7
		Percent	31.6%	33.8%	17.9%	6%	3%
9	uate training on ICT use.	Frequency	101	79	32	17	5
		Percent	43.2%	33.8%	13.7%	7.3%	2.1%
10	Teacher's negative attitude to ICT use.	Frequency	27	53	59	38	57
		Percent	11.5%	22.3%	25.2%	16.2%	24.4%
11	Lack of enough time to use ICT.	Frequency	34	85	56	40	19
		Percent	14.5%	36.3%	23.9%	17.1%	8.1%
12	Computer illiteracy among teachers.	Frequency	82	111	23	10	8
		Percent	35%	47.4%	9.8%	4.3%	3.4%

Source: Own Survey result (2025) SPSS Output

ICTs utilization /integration in education systems may face various challenges with respects to, infrastructure, capacity building, financing, policy and knowledge. In relation to this, studying the obstacles to the use of ICT in learning and teaching environment is crucial because this knowledge could provide "guidance for ways to enhance technology integration. Table 4.5, above concerns the response of teachers to the challenges that face

them during teaching and learning time in their respected schools. Based on the reflections of respondents, the researcher classified the analysis into three categories according to the frequency values of the items.

In the case of items 1, 2, 3, 4, 9 and 12, there are 84.2%, 80.8%, 80.7%, 82.9%,77%and 82.4% of respondent teachers say high and very high respectively which means the mentioned challenges are highly faced teachers to Use ICTs. Hence, the frequency value of teachers who say high and very high on the insufficient number of Computers, Inadequate internet connectivity, Fluctuation (interruption) of power supply, Computers are not available for teachers in school, Inadequate training on ICT use and Computer illiteracy among teachers.

The quantitative data analysis show that there are a series of challenges for teachers to use ICT due to an insufficient number of Computers, Inadequate internet connectivity, Fluctuation (interruption) of power supply, Computers are not available for teachers in school, Inadequate training on ICT use and Computer illiteracy among teachers.

In this case, also, by FGD group 2 of ICT teachers raised their feelings as follows.

> *If we consider our ICT lab, there is a shortage of functional computers in our school. In addition, the ratio of ICT classrooms to the number of students is too far from the standard of 65 to 74 students per class. As a result, we teach and show students in shifts, and the 2 periods of the week that are not covered, students are obliged to learn in shifts. Due to this reason, teachers have not opportunity to use the ICT lab. (28/8/2017 E.C)*

A study by Liulel Seged (2010) on Achievements, Challenges and Prospects in Implementing Information and Communication Technology Expansion Program: The Case of Selected Preparatory Schools in Addis Ababa findings also show that implementations of ICT in preparatory schools faced challenges such as inadequate supply of ICT equipment like computers, plasma television displays, and their necessary accessories. In addition, scarce skilled personnel and insufficient ICT rooms, electric disconnection, network problems, all with a heavy background of unfriendliness to technology and little involvement of stakeholders, are the challenges of teachers in teaching.

The quantitative data analysis, qualitative data analysis, and the literature show that there are a series of challenges for teachers to use ICT due to a shortage of computers and a lack of technical support as well as an absence of incentives from the government.

Concerning items 5, 7, 8 and 11, there are 67.1%, 57.7%, 65.4%, and 50.8% of respondents respectively which respondents very high and highly challenged with Computers are very old and slow, Lack of enough time to use ICT, Lack of technical support, and Lack of government interesting efforts to fulfill the school net infrastructure. However, 13.2%, 15.4%, 9%, and 25.2 of the teachers say low and very low challenged.

A study by HadiSalehi and ZeinabSalehi (2012) also indicated that although teachers had a strong desire to use ICT in the classroom, they encountered some barriers. Insufficient technical supports at schools, little access to the internet, and lack of training for teachers about using ICT. Moreover**,** the descriptive analysis of the results showed that the insufficient number of computers for teachers was another significant barrier discouraging teachers from using ICT in the school.

Regarding items 6 and 10, 49.6%, and 34.1% of teachers say high and very high level of challenged with Shortage of qualified ICT teachers and teacher's negative attitude to ICT use. In this case, also, most of teachers responded that the level of challenging teachers to use ICT is medium and low / very low. Furthermore, in proportion to the above ideas, the data obtained from open ended questionnaires and a semi-structured interview similar with the questionnaire response and beyond these challenges, ICT teachers pointed out that: In our school, one hidden problem is absence of the culture of utilizing existing/accessible ICT tools in the teaching process and lack of adequate budget to purchase the deficient tools as an additional factor that hindering effective ICT utilization in teaching learning process. In this regard one of the school principals noted the following:

> *A lack of computers and internet connection infrastructure is typical in our school these days due to a lack of funds and the expensive cost of ICT equipment. Furthermore, as the number of students grows, we are attempting to address such issues by using shift, and he also added that even if the above problems are there in schools' information communication technology in school have great opportunities. (28/08/2017e.c)*

In general, the practice of ICT utilization in the secondary education was faced by various challenges. But, the major challenges hindering the effective utilization of ICT tools in teaching learning process in the secondary schools were: lack of technical support, lack of knowledge about how to operate computers or computer illiteracy ,lack of training on ICT utilization for teaching learning, poor internet connectivity with poorly managed network infrastructure and services contributed, and lack of support from administrative bodies were the major challenges in hampering the teaching learning environment from upward and healthy growth as lack of attention towards the needs of ICT by education administrators are the main challenges to get the benefits beyond their presence.

4.4 Discussion

ICT undoubtedly can improve teaching outcomes by developing teachers' critical thinking skills and giving them access to the latest knowledge without creating accessibility or distance constraints. Teachers can engage in interactive teaching with a broader range of information and knowledge during their preparation because of the integration of ICT in the teaching-learning process. The opinions and worldviews of the teachers will also influence how they integrate ICT into their lesson plans (Arnseth & Hatlevik, 2012; Rampersad, 2011). Educators can enhance their ICT integration strategies in the classroom by utilizing current and comprehensive resources, all supported by the Ministry of Education. When ICT is used for education and learning, emphasizing Internet accessibility will make learning and instruction global and provide a virtual learning environment for teachers and students.

The findings of the analysis investigating the opportunity and challenges of ICT in Government Secondary Schools of Yeka sub-city, and from the practice of ICT in Secondary Schools illustrates that computers are available for students in schools only, ICT improves students' learning skills, and it is crucial to supporting educational activities. On the other hand, some of the challenges within the schools include a problem regarding the number of computers in the schools, technical support and infrastructure in the schools, Internet connection speed, a skill gap in using ICT, and lack of adequate training for teachers.

Generally, the result of the study revealed that even if there are achievements or changes regarding the accessibility of ICT for students in all Government schools in the sub-city, many problems remain unresolved and impact the ability to implement quality ICT education in the schools.

CHAPTER FIVE

1. SUMMARY, CONCLUSION AND RECOMMENDATION

This part of the chapter deals with the summary of the major findings, conclusions drawn on the bases of the findings and recommendations are forwarded for all concerned bodies.

5.1 Summary of the study

The purpose of this study was to investigate the usage of ICT in secondary education in Yeka Sub-city, Addis Ababa. Considering this, the study tried to get an answer to the following four basic questions.

1. To understand the perception of teachers on the usage of ICT in teaching-learning process?
2. What opportunities are available for secondary school teachers to use ICT in their schools?
3. To what extent ICT supports the teaching learning process in the school?
4. What are the challenges in using ICT among secondary school teachers in Yeka Sub-city?

To answer these basic problems, quantitative data has been collected from the four selected secondary school teachers of Yeka Sub-city through a questionnaire. A convenience random sampling technique has been used to select the determined sample size of the teachers from each department, which were 147. However, 247 questionnaires were distributed and 234 questionnaires were returned. To support the results obtained by the questionnaire and get a depth of information, a focus group discussion guide for group discussion was ready and conducted in each school with members of 5 to 8 ICT teachers. Instead of getting deep perceptions, values or how people interpret the ICT, a structured interview guide had been prepared and an interview was held with the four school principals, one from each school, which was selected purposively according to their contribution to giving information. Mixed research approach with a descriptive survey design has been employed and both primary and secondary sources of data were collected to reach sound findings.

The quantitative data collected from teachers through questionnaires was analyzed quantitatively using frequency mode and percentage methods, while the data performed

by open-ended questionnaires, focus group discussions, and interviews were analyzed in narrative form. According to the question is raised for teachers to give a response, the results were ranked in four categories.

1. Teacher's perception on the use of ICT in teaching-learning process.

The first research question was to examine the perception of teachers' on the use of ICT in teaching learning process in the secondary school. As it has illustrated, majority of teachers perceive the use of ICT in teaching learning process as very important and the need of technology in the process of teaching learning is not questionable. Accordingly, the calculated frequency has been observed that table (4.2), this score shows that majority of the respondent's perception is highly in agreement with the presented statements on importance of ICT in teaching learning process. Majority of the participants exhibited a favoring view (positive attitude towards ICT importance in teaching-learning process.

2. Opportunities and Effective Elements in Technology-based Teaching and Learning in Schools

From the analysis (table 4.3), most of the respondents show that there are no effective elements identified by the ruled data collected regarding the effective elements of ICT integration in teaching and learning in public school. This means that teachers are unable to use ICT. However, the researchers consisting of certain suggestions and recommendations for the teachers and school top management for this problem found from the research conducted towards teachers. The overall findings show that there are no adequate effective elements identified from the data collected regarding the effective elements of ICT integration in teaching and learning in public school. This means there is no adequate opportunity for teachers to use ICT. However, in the secondary school teachers have not opportunities to develop their skills to effectively utilize ICT tools in the teaching learning process.

3. **The practical supports of using ICT for learning- teaching process**

According to the analysis (Table 4.4), most of the respondents showed that there are no adequate ICT tools in the school for teachers. This shown that schools have highlighted less emphasis to supply adequate ICT infrastructures for teachers to run effective teaching-learning process. This on the other hand, negative involvement for poor

practical supports for the teaching-learning process in the school. In consequence, it is possible to conclude that there are no adequate ICT tools to support teaching learning activities in the study area. This finding is line with the result of the study conducted by Yasemin (2008) on "ICT usage in Higher Education pre-service teachers and instructors". The current practice of integrating ICT tools in to teaching learning process at the study area found at its infant/early stage. The finding of this study agreed with the result of the study conducted by Shiang, Sarah, Hui-yinhsu, and Mengping (2008) designed a study on "ICT to develop teacher's global awareness". It was pointed out globalization an inevitable trend everywhere in the world, is an idea that must be practiced and implemented in the 21st century classroom. Hence the majority of the teachers in the secondary school did not utilize ICT facilities for teaching learning processes rather they use for different purposes such as: vesting social sites, playing games and engaging in non-academic activities. In addition to this, the researcher also has conducted ICT teachers with FGD. Accordingly, about ICT teachers those taken from four different secondary schools discussed with researcher. However, there are no teachers used any ICT tool during their learning-teaching process except ICT teachers. This in turn implies poor picture of technology products in the real education and poor opportunities for the teachers to use ICT for their learning-teaching process. In general, as both qualitative and quantitative data revealed, it is possible to comprehend that the practices of utilization of ICT in teaching learning processes at secondary school of education is at its infant/early stage.

4. Challenges of ICT utilization in teaching-learning process

The last research question examined the challenges that hinder ICT utilization in teaching and learning process in secondary education of Yeka sub-city. As both qualitative and quantitative data revealed, the major challenges hindering the effective utilization of ICT tools in teaching learning process in the secondary school were:, Lack of technical support, lack of training on ICT utilization for teaching-learning, inadequate support from administrative bodies shortage of budget to equip the tools, Poor internet connectivity, Lack of knowledge and skill about how to operate computers, the school net infrastructure problem, and lack of awareness and motivation. Generally, the qualitative

and quantitative data revealed that ICT utilization in the case of secondary education in Yeka sub-city has been surrounding by different problems and therefore, needs to be given due attention at a fast pace.

According to the quantitative and qualitative data analysis, there are a series of challenges for teachers to use ICT like, an insufficient number of Computers, Inadequate internet connectivity, Fluctuation (interruption) of power supply. Whereas, Computers are not available for teachers in school, Inadequate training on ICT use and Computer illiteracy among teachers were secondary challenges

5.2 Conclusion

According to the literature and experiences, information and communication technology is one of the six educational packages in the Ethiopian education policy launched to provide citizens with better education and behavioral endeavors. Thus, this study has examined the usage of ICT in secondary education in Yeka Sub-city, Addis Ababa City Administration.

Based on the discussions and summary of the major findings of the study, the following conclusions were drawn.

a. Even though the teachers and administrators of schools have positive perceptions towards the usage of ICT in secondary education delivery and motivated to teach and prepare learning materials using ICT programs in the teaching learning process, there were no adequate ICT tools to support the teaching learning activities in the school and there is no opportunity for teachers to use ICT. However, teachers have not adequate opportunities to develop their skills to effectively utilize ICT tools in the teaching learning process. This shows that the schools have given less emphasis to supply adequate ICT infrastructures to run effective teaching-learning process. Thus, usage of ICT secondary education process in the study area is at its early stage and not well practiced as it has expected.

b. Regarding to major challenges of teachers in using ICT has leveled out according to the data obtained from teachers' responses: an insufficient number of Computers, Inadequate internet connectivity, Fluctuation (interruption) of power supply, computers are not

available for teachers in school, lack of training on ICT use and Computer illiteracy among teachers were a series of challenges for teachers to use ICT. Lack of technical support, inadequate support from administrative bodies, shortage of budget to equip the tools, the infrastructure problem, and lack of awareness and motivation were other challenges hampering the effective utilization ICT in the secondary education.

c. Generally, the overall practice of using ICT in secondary schools and the improvements gained from schools were not to the expected level. Most of the major aspects of currently practiced ICT technologies were not fully or only partially implemented, compromising the very objectives of ICT education. Thus, without effective use of ICT, the expected improvements in the quality of education and students' academic achievement cannot be enhanced.

5.3 Recommendation

In consideration of the findings and conclusions drawn from the study, the following possible areas of intervention are suggested:

1. In the case of availability ICT tools, the research finding was lack of insufficient number of computer, Fluctuation (interruption) of power supply and internet connection, These ICT tools and connections infrastructures are backbones of the implementation and hence it could be one of the challenges of teachers to use ICI in their respected schools. Hence, the Sub-city education office and the Addis Ababa City Education Bureau, in collaboration with the Ministry of Education and other non-governmental organizations, must provide ICT tools in schools for the benefit of teachers as well as students improve school computer supplies and make them available and facilitating conditions for teachers to practice ICT in their school.

2. Use of ICT in secondary education needs to provide an opportunity to promote students' efficiency in schools. It also should help teachers to get suitable teaching materials. In order to achieve this, developing ICT skills of teachers are expected to be resource person to realize the continuous improvement of teaching-learning process. But, the finding reveals that there were a problem of lack of training on ICT use and Computer illiteracy among teachers, Lack of technical support, and inadequate support from administrative bodies,. Therefore, School administrators should pay attention ICT in school. There

should be technical support from the concerned bodies, and Continuous on the job training should be provided for teachers at school level. The training should also include pedagogical application of ICTs. The school principals and supervisors should also consider the on the job training to be e-learning based as we have matured technologies.

3. The findings of the study revealed that, the practices of utilization of ICT in teaching learning processes at secondary school of education is at its infant/early stage In order to improve the practices of ICT utilization, it is better if the school administrative and sub-city education office in cooperation with Addis Ababa city education bureau arrange and search the means of providing in-service trainings, workshops and seminars for the sake of updating teacher's knowledge and skills in using the latest technology products.
4. All concerned bodies/actors (at all levels (higher level - Ministry of education), Non-governmental organizations (NGO) to the lower level (Woreda education office, schools) should give special attention to facilitate for teachers to use and practices ICT integration of teaching-learning process. Finally, to get the maximum benefit from the usage of ICT in Ethiopian secondary schools, country-wide research, involving all other variables and private secondary schools not considered in this study, should be carried out in the future.

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Appendices

Appendix- I

Addis Ababa University College of Education and Behavioral Studies Department of Educational Planning and Management Questionnaire to be completed by teachers

Dear Teachers,

I'm a postgraduate student at Addis Ababa University. Currently, I am conducting a research entitled "The usage of ICT in secondary education, the case of Yeka public secondary schools of Addis Ababa city administration." as partial fulfillment of the requirements for the award of Masters of School Leadership.

The purpose of this questionnaire is to gather data for the proposed study, and hence you are kindly requested to assist the successful completion of the study by providing the necessary information. Your participation is entirely voluntary and the questionnaire is completely anonymous. I confirm you that the information you share will stay confidential and only used for the aforementioned academic purpose. So, your genuine, frank and timely response is vital for the success of the study. I want to thank you in advance for your kind cooperation and dedication of your time to fill this questionnaire.

Sincerely yours!

General Direction

1. You do not need to write your name
2. When you respond for the questions in the bracket, use a tick mark (√)
3. For open-ended questions, write your responses in the space provided

Part I: Background of the Respondents

1. Sex: Male [ ] Female [.]
2. Age: 20-30 [ ] 31-40 [ ] 41-50 [ ] Over 51 [ ]
3. Years of service/experience in the school

   Less than 1 year [ ] 1-2 years [ ] 2-5 years [ ] 5-10year5 [ ] 10-15years [ ] more than 15 years [ ]
4. Your educational level?

College Diploma [ ] First degree [ ] master's /Second degree [ ] PhD [ ]

5. Name of school.....

Part II: Questions related with teachers' perception on the use of information and communication technologies in teaching and learning process.

1. Rate your degree of perception on utilization of ICT or computer in teaching learning processes of your school instruction.

You can use **strongly agree (5) Agree (4), Undecided (3) Dis Agree (2) Strongly disagree** (1)

No	Statements	5	4	3	2	1
1	ICT can solve many of our educational problems					
2	ICT will increase my efficiency in teaching					
3	ICT will bring new opportunities those offers for effective teaching.					
4	ICT enables collaborative learning.					
5	ICT can engage learners more than other forms of learning.					
6	ICT increases access to education and training.					
7	ICT increases the quality of teaching and learning because it integrates all forms of media: print, audio and video					
8	ICT increases the flexibility of teaching and learning.					
9	The use of ICT improves the quality of teaching					
10	Using ICT reduces workload and provides the latest information					

2. If you have another perceptions of use of ICT mention them.----------

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Part III. Questions related to Opportunities and Effective elements in ICT integration in teaching and learning in public schools

1. How often do the teachers use effective elements in ICT integration in teaching and learning in schools?

You can use Very high (5) High (4), Medium (3) Low (2) Very low (1)

No	ITEMS	5	4	3	2	1
1	The ICT facilities in my school are well-functioning and can be used.					
2	The technical supports are provided if teachers are faced with difficulties.					
3	Lack of supports from the school top management discourages me from using ICT					
4	Teaching time are not enough for me to use the ICT for teaching and learning purposes.					
5	There is enough training and professional development provided for teachers about ICT use in teaching.					
6	All ICT tools in my school go to waste and less used by teachers.					
7	Teachers are given more time to learn and be comfortable with the use of ICT in teaching.					
8	There is computer lab in my school in which I can bring students there to watch educational videos					
9	Teachers' are given the freedom to design their own teaching with the helps from the ICT.					
10	Little access to ICT prevents me from using it in teaching					

2. If there are another effective elements in technology-based those you use for the teaching learning process mention them.----------

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Part IV: **The practical supports of using ICT for learning- teaching process**

1. Indicate to what extent ICT supports the teaching learning process in your school?

You can use Very high (5) High (4), Medium (3) Low (2) Very low (1)

No	Statements	5	4	3	2	1
1	ICT improves students learning skills					
2	ICT is crucial to supporting educational activities					
3	ICT helps teachers to prepare teaching resources and materials					
4	ICT is currently being used in teaching and learning in a satisfactory manner					
5	ICT will help the teachers to understand the subject material more deeply.					
6	ICT makes completing work in the teaching-learning process more convenient					
7	ICT motivate the teachers to explore many topics they may not have seen before					
8	ICT facilitates educational administration					

2. If there are another ICT supports the teaching learning process mention them.----------
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Part V: Challenges to faced teachers to use ICT

1. Indicate the extent to which the following Challenges to face teachers in the use of ICT in school.

You can use Very high (5) High (4), Medium (3) Low (2) Very low (1)

No	Factors	5	4	3	2	1
1	Insufficient number of Computers.					
2	Inadequate internet connectivity.					
3	Fluctuation (interruption) of power supply.					
4	Computers are not available for teachers in school					
5	Computers are very old and slow.					
6	Shortage of qualified ICT Teachers.					
7	Lack of government interesting efforts to fulfill the school net infrastructure in the school					
8	Lack of technical support.					
9	Inadequate training on ICT use.					
10	Teacher's negative attitude to ICT use.					
11	Lack of enough time to use ICT.					
12	Computer illiteracy among teachers.					

Part VI Open- ended Questions

1. Please list down the constraints that you have encountered in general when you come to the usage of computers, internet and other ICT related tools in your school.

_____

2. What factors would enhance the use of ICTs in teaching and learning process in your school?

_____

3. What possible recommendations would you make towards improving the use of ICTs in enhancing teaching and learning in your school?

_____

_____

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Appendix- I I

Addis Ababa University College of Education and Behavioral Studies

Department of Educational Planning and Management

Interviews guide for principals of public secondary schools.

The purpose of this interview is to collect data on the usage of ICT in secondary education, the case of Yeka public secondary schools of Addis Ababa city administration. The information that you provide has great importance to the research. Your responses will be kept confidential and will be used only for research purpose.

1. Can you tell me about how it is important to use ICT in education? ----------
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2. How do you evaluate the contribution of ICT to students' learning as compared to the past? ----------
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3. How do you evaluate the opportunities that exist in relation to ICT use and the availability of ICT infrastructure and government support/ initiative?----------
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4. How do explain Teacher's motivation & commitment to use ICT?----------
   ----- ---
5. How do you explain the commitment of the management to fulfill ICT facilities and in encouraging teachers to use the facilities?----------
   ----- ---
   ---
6. What are the challenges related to the use of ICT among teachers in your school?---------
   --- ---
   ---
7. Could you tell me major achievements that have been attained so far in using ICT? -------
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Appendix- III

Addis Ababa University College of Education and Behavioral Studies

Department of Educational Planning and Management

FGD guide for ICT Teachers of public secondary schools.

Dear ICT Teachers,

The purpose of this study is to collect data on the usage of ICT in secondary education, the case of Yeka public secondary schools of Addis Ababa city administration. The information that you provide has great importance to the research. Your responses will be kept confidential and will be used only for research purpose.

The information that you share with the researcher will be kept confidential and will be used for the research purpose only.

1 How do explain Teacher's motivation & commitment to use ICT?----------
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2 How do you explain the commitment of the management to fulfill ICT facilities and in encouraging teachers to use the facilities?----------
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3 . What are the challenges related to the use of ICT among teachers in your school?---------
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4 What opportunities are available in relation to the use of ICT in schools?----------
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