ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

SCHOOL OF INFORMATION SCIENCE

FACTORS AFFECTING THE CURRENT USE OF ICT IN PUBLIC AND PRIVATE SECONDARY SCHOOLS IN GULELE SUB-CITY, ADDIS ABABA

By

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ADDIS ABABA, ETHIOPIA

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

Master of Science in Information Science

By

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Addis Ababa, Ethiopia

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Declaration

This thesis has not previously been accepted for any degree and is not being concurrently submitted in candidate for any degree in any university.

I declare that the thesis is a result of my own investigation, except where otherwise stated. I have undertaken the study independently with the guidance and support of my research advisor. Other sources are acknowledged by citations giving explicit references. A list of references is appended.

Signature: _____

Hailye Tekleselassie

This thesis has been submitted for examination with my approval as university advisor.

Advisor's Signature: _____

Gashaw Kebede (PhD)

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Abstract

The main objective of this study is to investigate factors affecting the current use of ICTs in public and private selected secondary schools in the Gulele sub-city, Addis Ababa. The objectives of the study were: to review the literature on issues affecting usage of ICTs in the teaching-learning processes in high schools and best practices from countries similar to Ethiopia, to explore current usage of ICTs in the teaching-learning process, to assess challenges encountered in using ICTs in the teaching- learning process, to identify factors that enable or hinder the usage of ICTs in secondary schools, and to put forward recommendations to improve the current usage of ICTs in the studied secondary schools.

The use of ICTs have become a major driving force in transforming the education system throughout the world. The usage of ICTs in Ethiopia has also increased from time to time. In this paper, a literature review regarding the challenges that affect the current use of ICTs in education was provided. The researcher used a descriptive survey research design in this study. The targeted population was 1669 teachers and students within the two secondary schools in the Gulele sub-city. Purposive sampling followed by random sampling was used to select 28 teachers, 473 students, 2 school directors and 2 ICTs experts from the 2 purposively selected schools because mainly the study targeted schools that had used some computers and internet for either administrative or teaching and learning purposes.

Data was collected using questionnaires, interview and observation. The data collected was analyzed using statistical package for social sciences (SPSS). Descriptive statistics was used to present the results of the study this involved tabular, frequency, percentage, and the qualitative data were analyzed in a narrative way. The study findings revealed that inadequate number of computers, power supply interruption, slow internet connection or access, lack of time or limited to time to use ICTs, workload of teachers, lack of technical support (lab technician), the incentives given by the government, lack of training, lack of ICTs policies and strategic plan. Even though teachers supported the use of ICTs in teaching, but, majority of the teachers (mathematics, English and history) rarely used ICTs except chalk and blackboard. The results of this research suggest the government should ensure reliable power supply in all schools, trainings should be given for teachers and students, all ICTs tools should be available in the computer lab, school administration should familiarize themselves with national ICTs policies to develop school ICTs policy and strategic plan etc.

Keywords*: ICTs; ICT usage; factor; public and private secondary schools.*

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List of Acronyms

AAU	Addis Ababa University
ICTs	Information and Communication Technologies
IT	Information Technology
IS	Information System
LAN	Local Area Network
WAN	Wide Area Network
MDGs	Millennium Development Goals
CDs	Compact disk
DVDs	Digital Versatile Disk
ARPANET	Advanced Research Projects Agency Network
ETP	Education and Training Policies
MCIT	Ministry of Communication and Information Technology
GTPII	Second Growth and Transformation Plan
UN	United Nation
UK	United Kingdom
SDGs	Sustainable Development Goals
LDCs	Least Developed Countries
CIS	Commonwealth of Independent States (now called Russia)
NIPS	National ICTs Policy and Strategy
UNESCO	United Nations Educational, Scientific and Cultural Organization
FDRE	Federal-Democratic-Republic-of-Ethiopia
ITU	International Telecommunications Union
IWB	Interactive Whiteboard
G4, LTE	Forth generation, Long Term Evolution
Gbps	Gigabits per second
SPSS	Statistical Package for the Social Sciences.
SD	Standard Deviation
UPS	Uninterruptable Power System
ETP	Education and Training Policies

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Education is one of the fundamental factors of development. No country can achieve sustainable economic development without substantial investment in human capital. Education enriches people's understanding of themselves and the world. It improves the quality of their lives and leads to broad social benefits to individuals and society in general. Education raises people's productivity, creativity and promotes technological advancement, it is also an important contributor to technological capability and technical change in organizations. In addition to it plays a crucial role in securing economic, social and political progress and improving fair income distribution among people (Ilhan, 2001).

Information and Communication Technology (ICT) is an essential educational technology tool that can enhance impressive changes in the teaching and learning process. The use of ICT offers powerful learning environments and can transform the learning and teaching process so that students can deal with knowledge in an active, self-directed and constructive way. Present ICT is considered as an important means to promote new methods of instruction. It uses to develop students' skills in cooperation, communication, problem solving and lifelong learning (Rita, 2017).

According to Rajput, (2015), ICT "refers to any communication device or application such as computer and internet ". ICT is a technology which provides access to information via telecommunications. It consists computer applications like internet and computer. ICTs are making dynamic changes in society. They are influencing every aspect of human life, especially in this era of knowledge-based society (information society). ICT become more important in different aspects such as in education, business, governance, medicine, banking, transportation and entertainment generally in every aspect of human life. However, this study focus on education sector, especially in secondary school or high school in the Gulele sub-city Addis Ababa. Modern ICTs will create a "global village" which people can communicate around the world without distance limitation " ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer network hardware and software, satellite systems" (Solomon, 2016).

ICTs usage in developing countries like Kenya and Tanzania secondary school's growth is not rapidly due to the technological factors including internet connectivity (Waithaka, 2013). The use of computers and the internet in developing countries is in its infancy stage due to limited infrastructure and unaffordable cost. The use of ICT in schools can enhance facilities like active communicative, creative, collaborative and lifelong learning, provides better information access, increase students learning motivation. ICT enables to spread the significance of education to create connected society, promote quality of education by making teaching and learning an active process which is associated to real life. ICT changes the way teaching and learning carried out in the schools, the way of teaching changed from teacher centered to student centered. However, studies show that use of ICT in schools involves teacher's perception towards ICTs use, school readiness to use ICTs, continues financial support, curriculum reforming, enhancing teachers' skills are important (Laaria, 2013).

ICT plays a crucial role in the learning and teaching process for instance by using the internet (e-mail) the students can communicate each other from different places. It has a great role in transforming education. The use of ICT in education improves teaching and learning at all levels of education (Abbas, 2015).

ICTs have revolutionized the way people work today and are now transforming education systems. As a result, if schools trained children in yesterday's skills and technologies they may not be effective and fit in tomorrow's world. This is a sufficient reason for ICTs to win global recognition and attention. For instance, ICTs are dependable tools in facilitating the attainment of one of the Millennium Development Goals (MDGs), which is achievement of universal primary education by the year 2015. Kofi Anan, the former United Nations Secretary General, points out that in order to attain the goal of Universal Primary Education by the year 2015; we must ensure that ICTs unlock the door of education systems. This indicates the growing demand and an increasingly important place that ICTs could receive in education. Since ICTs provides greater opportunity for students and teachers to adjust learning and teaching to individual needs, society is, forcing schools to give an appropriate response to this technical innovation (Bonsu, 2013).

Even though ICTs plays significant roles in representing equalization strategy for developing countries, the reality of the "digital divide" the gap between those who have access to, and control technology and those who do not, make a huge difference in the use of ICTs. This means, that the introduction and usage of ICTs at different levels and various types of education is the most challenging. Failure to meet

the challenges would mean a further widening of the knowledge gap and expanding of existing economic and social inequalities among the developed and the developing countries. High-speed internet is another disparity or gap that is widening between rich and poor countries, according to UN Under-Secretary-General for Communications and Public Information, Kiyo Akasaka. He cites Australia, a country with 21 million people, as having more broadband subscribers than the whole of Africa. These factors are part of the context of implementing ICT and the degree to which ICTs usage are included in regular classroom learning and teaching activities

1.2. Statement of the problem

A considerable amount of money has been invested to use ICTs in education (secondary/high school). However, ICT usage is still very low in education sector due to different factors like 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).

According to Girma, (2017), a study found that more respondents cannot connect computer to other computers, computer with printer. Since the government not give enough training for the school administration and ICT teachers about ICTs, they may not have the background knowledge to use ICTs. According to Belay, (2015), the low level of ICT infrastructures hinders the effective use of ICT in the teaching and learning process.

ICTs services such as e-library, e-book and e-examination are available in secondary schools. However, they did not extensively utilized. Because of the constraints like constant power failure, high cost of bandwidth, staff retention, computer illiteracy among staff and students, inadequate fund, unreliable and unaffordable ICT infrastructure (Tambari, 2016).

To fill some existing gaps other researchers should do more research on the roles of ICTs, in education, the constraints and the factors that affect the use of ICT in education and many researches should conduct research in this area to realize effective use of ICTs in education (Belay, 2015) . Only little research done in other counties like South Africa, Ghana, Tanzania and Kenya but in the case of Ethiopian especially in secondary school no research on the issue of factors of usage of ICTs in high schools this indicates that there is a knowledge gap. So this study aims to investigate the factors that affect the current use of ICT and the factors that drive or hinder ICTs usage in selected private and public secondary schools in Gulele Sub-city, Addis Ababa.

1.3. Research Questions

1. What is the current usage of ICTs in the teaching - learning process in secondary school in Gulele sub-city?
2. What are the factors that enable the use of ICT in the teaching and learning process in secondary school in Gulele sub-city?
3. What are the factors that hinder the use of ICT in the teaching and learning process in secondary school in Gulele sub-city?

1.4. Objectives of the study

1.4.1. General objective

The general objective of this study is to investigate the current usage of ICTs and factors that drive/hinder use ICT by Student's and teacher's in the selected secondary schools in the Gulele sub - city.

1.4.2. Specific objectives

- To explore current usage of ICTs in the teaching-learning process in secondary schools in Gulele sub-city.
- To assess challenges encountered in using ICTs in the teaching- learning process in secondary schools in Gulele sub-city.
- To identify factors that enable or hinder the usage of ICTs in secondary schools in the Gulele sub-city.
- To put forward recommendations to improve the current usage of ICTs in the studied secondary schools.

1.5. Significance of the study

The findings of this study will have the following significance:-

- The study would help the stakeholders of the school to understand the factors that hinder/drive the use of ICTs in the teaching and learning process.
- Teachers, students and school stakeholders may get more insights about the use of ICTs in the teaching-learning process.

- The researcher hopes that this study will be able to motivate further research in the area of education involving the use of ICTs. Further, the study will provide information on the extent to which the use of ICTs prepares both teachers and students for the world of ICTs.
- The study will contribute to the body of knowledge regarding the factor that affect ICTs usage.

1.6. Scope of the study

Even though ICT tools has many components this study focus only on computer and the internet. For the purpose of this study the researcher limited the study to only teachers, students, school directors and ICT experts of the selected public and private secondary schools. Teachers and students are the end users of the ICTs used in the teaching-learning process. The study aimed at exploring the factor that affect usage of ICTs and factors that enable/hinder the effective utilization of ICTs by students and teachers in the teaching and learning process. Even though Addis Ababa city administration has ten (10) sub-cities- Addis Ketema, Akakai- Quality, Arada, Bole, Yeka, Kirkose, KolfeKeraniyo, Lideta, Nifssilk- Lafeto and Gulele sub-cities, only one sub city is used as a sample. Gulele Sub-city is one of these ten (10) sub-cities has four public and four private secondary schools.

1.7. Definition of Significant Terms

Challenges: A new or difficult task that tests someones ability and skill

Factors: Elements contributing to a particular result or situation

Funds: Financial resources, usually in the form of money or currency

ICT: Information and communications technology is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services and applications.

Infrastructure: The basic organizational structures and facilities needed for the operation of a society

Connectivity: The ability to link to the Internet via a computer

Broadband: A type of data transmission in which a single medium or fiber optic
Wire that can carry several channels at time.

Bandwidth: the amount of data that can be carried from one point to another in a given time period

Electronic mail (E - mail): is the exchange of computer-stored messages by telecommunication

Training: Is teaching, or developing in oneself or others, any skills and knowledge that relate to specific useful competencies.

1.8. Organization of the Study

The study is classified into five chapters. Chapter one discus about the background of the study, statement of the problem, objectives of the study, research questions, significance of the study, scope of the study, and definition of significant terms. Chapter two talked about the review of the relative literatures. Chapter three describes about research methodology, target population, sampling design and sample size, sampling techniques, data collection instruments, data analysis techniques etc. Whereas, Chapter four discuss on data presentation, analysis and discussion. Faintly chapter five describes about conclusions, recommendations, and suggestions of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

The review of literature on the use of ICT in education, factors influencing ICT usage in private and public secondary school. Lack of ICT infrastructure and lack of qualified ICT professionals are challenges faced by school, literature on challenges in the use of ICT in both private and public secondary schools.

2.2 Information and Communication Technology (ICT)

According to Shahadat, (2012), ICT includes computer and internet. These technologies are applied to education include computers, Internet, that can facilitate not only delivery of instruction, but also the teaching and learning process itself. ICT becomes an important tool (catalyst to change) for realizing a new paradigm of learner-centered education system which supports learners' needs in a better way. Generally ICT can enhance international and national collaboration and networking in education so as to promote teachers professional development. There is a range of ICT options for videoconferencing through multimedia delivery to websites which can be used to meet the challenges teachers face today. In fact, ICT will be able to provide more flexible and effective ways for lifelong learning for today's teachers and students. As a result both teachers and students will get enormous benefits for their empowerment and development.

ICT plays a crucial role in education if properly used, it can provide significant to teachers and students in the classroom. Generally in training and teaching-learning process. ICT also gives opportunities in advancing skills, knowledge and sustaining lifelong learning (Abrham, 2016). ICT is creating active modifications in socioeconomic and political activities of a country and influences all parts of society life, where the effect is high in the case of teachers and students. Since the technology provides both teachers and students with excessive chances in using ICT.

Currently the use of ICT becomes a sources of information for socioeconomic development and political activities is tremendously increasing. However, the status and the endeavors of the country to obtain the advantage and use of ICT highly depend on the level of country development. Information technology (IT) encompasses all kinds of the technology that we use to collect, process, protect, store and disseminate information. The most important concept in the use of technology is not collecting and

storing information rather communicating the information gathered with others and sharing ideas and finally reach an agreement about the basic issues of the information to implement it for the purpose it was generated.

2.3. Brief history of computer and Internet

Computers were found in the simplest form by ancient people in the form of abacuses, then later, not long before the Industrial Revolution, mechanical computational devices. The first fully electronic digital computer was created by Konrad Zuse in 1938.Computers continue to grow smaller and faster, causing increasing industrial automation and buyer convenience. The internet was started by the Department of Defense in 1962, when the 10,000 computers that existed on the face of the earth had about as much power as a digital watch respectively. It was considered a high-risk, high-gain operation, and it connected major universities to secure their research in the case of war or a natural disaster. At that time, it was known as ARPANET. The ARPANET expanded within the government and military for many years (Gerald, 2008).

ARPANET obtained more hosts, protocols (standards for sending and receiving information), and networks. In 1973, there where thirty networks hooked up to ARPANET, a huge expansion from the less than ten that started it all. In 1975, the Department of Energy created their own network system to keep track of data. The ARPANET went public in 1984, then six years later, ARPANET shuts down, close to the time the World Wide Web was created to allow multimedia to travel through the net.

2.4. ICT and the Ethiopian Education System

Education is one of the fundamental pillars for ensuring sustainable and fast economic development that is why the Federal Government of Ethiopia give so much emphasis not only to expand it but also to ensure the quality they offer. Tremendous progress had been made in the education sector of secondary schools since the new Education and Training Policies (ETP) of the country were put in place in 1994. The use of ICT cuts across all aspects of economic and social life. Technological developments in ICT are very rapid. Technology quickly becomes obsolete requiring new skills and knowledge to be mastered frequently. ICT usage is only possible when based on a sound understanding of the principles and concepts of ICT were noted in ICT in Education by (Hiwot, 2013). Specifically, the curriculum materials which the students learn in the school and the methodology sustaining in it are the foremost factors, mentioned by many researchers affecting the students' school experience. Most schools have limited or low access to the Internet. Those schools that are connected generally using e-

mail only and it is available only to the administration and for ICT teachers not for students. Access to ICTs by teachers is also limited, especially to computers and the internet, which makes it difficult to assume that educators can use ICT effectively.

The use of ICT in education has the potential to enhance the quality of teaching and learning, the research productivity of teachers and students and the management and effectiveness of institutions (Nyaga, 2014). However, opportunities for realizing the benefits of using ICT in education face a number of challenges in the developing countries.

2.5. Ethiopian National ICT Policy (NICTP)

The ministry of Communications and Information Technology (MCIT) of Ethiopia is responsible for the National ICT policy. MCIT (2010) the Ethiopian Government has naturally made the development of ICT one of its strategic priorities and has placed a significant emphasis on its role of economic infrastructure as set out in the second Growth and Transformation Plan (GTPII). This stems from the recognition that ICT is a key driver and facilitator for transforming Ethiopia's predominantly subsistence-agriculture economy to a knowledge-based economy and information society. ICT will be fundamental (basic) for Ethiopia’s aspiration (goal) to become a middle income country by 2025. ICT is also a key element in achieving the seventeen UN Sustainable Development Goals (SDGs). Goal 9, and its targets, place an emphasis on the role of technological progress and bridging the digital divide to find lasting solutions for both economic and environmental challenges. Target 9c sets 2020 as the deadline for achieving affordable broadband access for all. Moreover, the achievement of the other SDGs is greatly facilitated by digital technologies (MCIT, 2010)

Accomplishing fast, broad-based, continued and impartial economic growth to eliminate deficiency is a key objective of the government of Ethiopia with the general objective of Ethiopia becomes a lower middle-income country by 2025. In this manner, the telecommunications sector was recognized as a vital Economic Set-up in the government’s first Growth and Transformation Plan (GTP I).

The number of mobile subscribers increased from 6 million to 66 million. Similarly, the percentage of the rural population within 5 kilometers radius to telephone service increased from 62 per cent to 96 per cent. The number of Internet usage rose from fewer than a million to almost more than 11 million. Growth was also experienced in networks connecting government and social institutions such as secondary schools and hospitals. However, the ICT sector in Ethiopia still faces substantial challenges

including amongst others: Differences in the extent of usage of broadband services and availability of the latest broadband technologies , Cost of broadband connectivity impeding its widespread usage; Incomplete connectivity of all institutions in government, education and health networks; Need for ICT legislation and regulation (framework) to adjust to the rapidly evolving ICT sector; Insufficient and unreliable locally relevant ICT services and applications for economic and social development and poverty reduction; Need for ICT to provide a valuable contribution to monitoring the education , Lack of digital literacy and awareness to enable all citizens to access and contribute to sharing of information, ideas and knowledge to create an inclusive information society.

The main way that the government provides an opportunity for Ethiopians to acquire digital literacy and ICT skills is through the educational system. Progress has been made in implementing school networks with the goal of connecting all schools to high-speed Internet. This needs to be complemented with the incorporation of computer skills as a component of the primary and secondary school curriculum. Further, it is essential to equip citizens across the regions, particularly those out of school with a basic knowledge and awareness of digital technologies in order to ensure all communities benefit from ICT (National ICT policy and strategy, 2016).

2.6. Use of ICT in Education

This is the era of ICTs, so to achieve educational planning it is indispensable to use the ICTs in education sector. Student can perform well throughout the usage of ICTs. ICTs helps the students to expand their knowledge skills as well as to improve their learning skills. There is substantial evidence that ICT is an integral part of the global society and its value in schools is to help in knowledge creation, knowledge sharing, problem solving, communication, group and cooperative learning, the development of economic and social change. Tedla (2012) states that new ICTs have the potential to promote and to transform teaching and learning processes. He furthers states that ICTs also provide effective teaching-learning environment by providing opportunities for effective communication between teachers and students.

ICT has the ability to capture attention and focus through its visual application and in so doing can keep students engaged either visually, audibly or both, for periods of time greater than teacher talking would. The findings indicated that in classrooms where ICT devices and ICT activities were effectively used, students indicated that they were less bored and more enthused to pay attention when information was being presented. ICT can make education easy to understand and enjoyable for students, but teachers

still have to plan their lessons and instruct, explain and elaborate, bearing in mind the range of learning styles rather than practical in the classroom.

“ICTs must be harnessed to strengthen education systems, knowledge dissemination, information access, quality and effective learning, and more effective service provision.”(Paragraph 10, Incheon Declaration). According to Fessiha, M, (2011), ICT is making dynamic changes in societies and influences all aspect of their life, where the influence is high in the case of teachers and students. Since the technology provides both school teachers and students with more opportunities in using learning and teaching to individual needs.

Research studies around the world show that ICT help to broaden access to education as well as improve learning outcomes (quality in education). At the same time, research indicates that success in using ICT in education depends on teachers’ skill in using ICT and pedagogy and in effectively utilizing ICT to provide learner-centered interactive education (including interactive whiteboard IWB) , ICT can change the schools to the new learning paradigm (UNESCO, 2007).

According to UNESCO, (2010), ICTs have an enormous effect on schools, on teaching and learning. At the institutional level, schools have similar needs to any small business and use almost the same kinds of computer software for such tasks as accounting, inventory control, communicating, document preparation and printing. Schools also use specialist software for tasks like timetabling, electronic reporting, behavior tracking and student profiling, monitoring attendance and library management. A whole number of ways, then, ICT tools are proving indispensable in making school administration more efficient and responsive to community needs.

ICT is making major changes in the teaching, learning approaches. Schools in the Western World invested huge amount of money for ICT infrastructures over the last 20 years, and students use computers frequently and for a much larger range of applications. Several studies reveal that students using ICT facilities mostly show higher learning gains than those who do not use. For instance, Fisseha's (2011) finding across 75 studies in the United States showed the following. Students who used computer tutorials in mathematics, natural science, ICT and social science score higher result on these subjects. Students who used simulation software in science also scored higher. The findings also indicated that primary school students who used tutorial software in reading scored significantly higher on reading scores. Very young students who used computers to write their own stories scored significantly higher on measures of reading skill. Moreover, students who used word processors or

otherwise used the computer for writing scored higher on measures of writing skill. Furthermore, the use of ICTs in education also shifts the learning approaches. There is a common belief that the use of ICTs in education contributes to a more constructivist learning and an increase in activity and greater responsibility of students. This limits the role of the teacher to supporting, advising, and instruction students rather than simply transmitting knowledge.

Using ICT infrastructure to improve the students' learning, for instance by enabling them to enhance their class work and assignment by taking notes on the computer, or by sending homework using email to the teacher from any place. ICTs also allow for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time. Such facilities allow the networking of academics and researchers and hence sharing of scholarly material.

The Ethiopian Government acknowledges education as the cornerstone of social progress and economic development. ICT can enhance the educational system in areas such as access to a wealth of information and online coursework. Equally important is the digital skills importing function of schools teaching students how to use ICT, as well as to develop higher level skills for future employment in computer related occupations. As the vast majority of the Ethiopian population lives in remote areas with shortages of teachers, ICT is crucial in addressing access and quality of education. This pillar also ties into the foundational area of human capital development.

2.6.1. ICT in the world

Currently studies on growth reliably recognize ICT as a base for economic progress and the enhancement of community and political conditions. The relation between ICT and expansion has been expressed in the shocking terms of the 'digital divide' and the widening of the gap among developed developing countries. There is worry that developing countries are not acquisition from opportunities for economic growth and life improvement generally liked by advanced economies because of the lack of ICT, mainly limited broadband Internet connectivity. Ability of a country's information and communication technology capability can possibly bring about development. Countries like Singapore and Malaysia were more like Kenya at the time of independence; they have recorded a remarkable economic development because of the weighty investment in ICT.

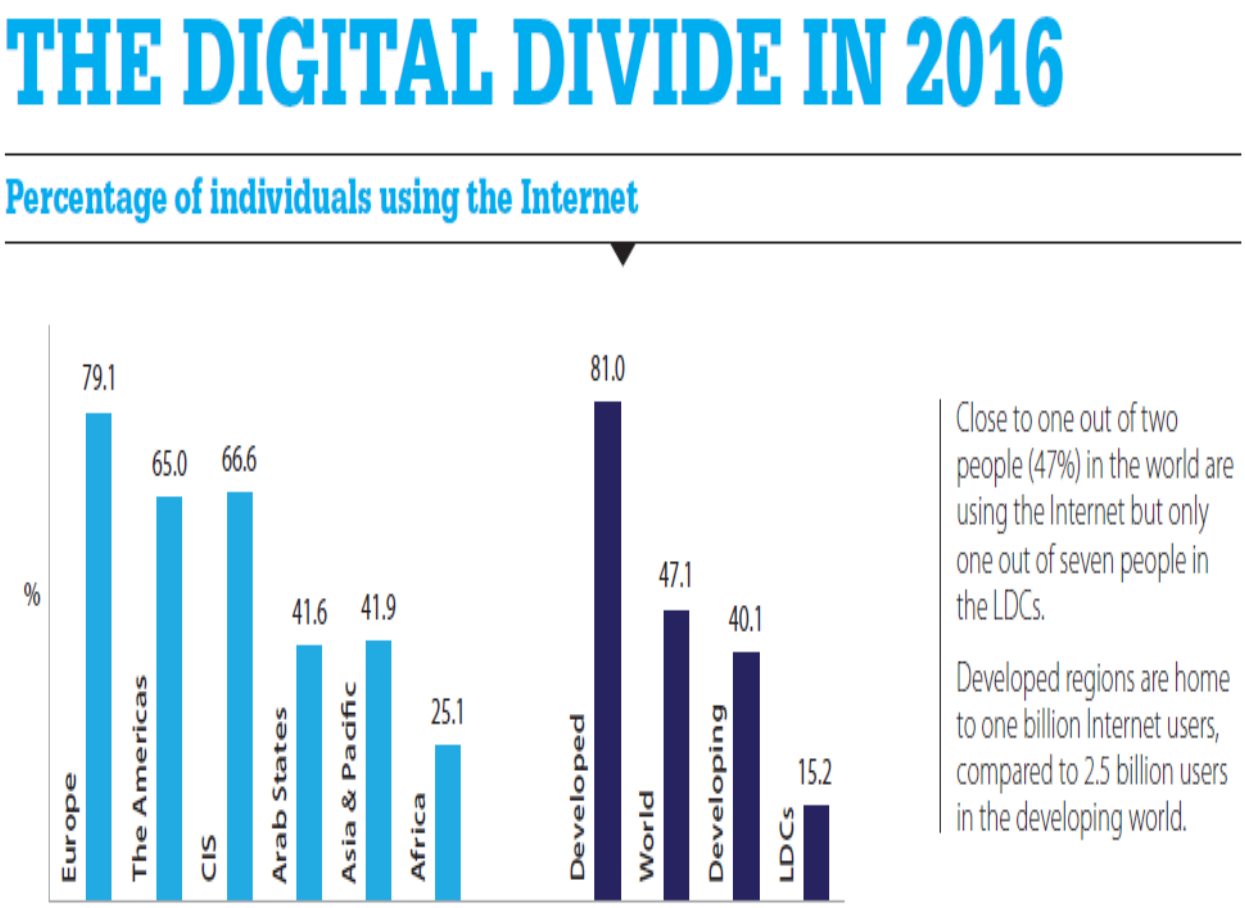
Most developing countries are dynamic in the use of new technology can be defined as dynamic users which include are Brazil, China, India, Indonesia, South Africa and Tunisia, among others. Many of these countries have important high technology industries and technology hubs, but the diffusion of old

inventions is slow, uneven and incomplete to all levels of society, including rural and the poor. The Philippines and Sri Lanka also fall in this category. China's commitment to enable the country in supporting at the highest levels and represents a significant national investment in technology and other capabilities. A clear objective is to make China a major participant in the global economy. China's efforts to connect all major centers with fiber-optic cabling are another clear example of the enthusiasm with which ICTs are being rolled out in countries. Other developed countries have expansive ICTs in all aspects of their daily activities.

2.6.2. ICT in African countries

A number of literature is found in the use of ICTs in Africa, which reports on the rapid growth of ICT use, especially in urban areas. African governments have liberalized their ICT sectors like Kenya but in the case of Ethiopia still government monopoly and invested huge amount of budgets in ICT. There are challenges that confront sub-Saharan Africa as a whole which hinder the need for local development. Low connectivity in Africa is characterized by scarce resources-absence of access or the lack of ICT, the lack of use of the local languages into the system, varying and updating the contents of materials that are posted on the websites .Many rural areas do not yet form part of the national electricity this is particular a problem since technology and the Internet can only be very effective if it is generated by electricity. Africa is facing today inadequate access to and skills in ICT which results to digital divide with the developed countries. This has resulted to over dependence on the developed western countries. Africa are lagging behind in the information revolution. Not surprisingly, the mission for connectivity has been problematic and will require fundamental shifts in the regulatory environment, as well as renewed attention to public-private partnerships and social services. Developed countries have 80 percent of the world's Internet users (Source: ITU, 2016).

Figure 2.1 Internet access in developed and developing country



(Source: ITU, 2016)

The findings show that the greatest number of Internet users in Africa resides in either South Africa or Kenya in the sub Saharan region, Morocco and Egypt in the northern region.

Table 2.1 Internet access and usage

Country	Households with working internet connection	Citizen 16 years and below using internet
South Africa	**4.8%**	**15.0%**
Namibia	3.3%	8.8%
Kenya	**2.2%**	**15.0%**
Cameroon	1.2%	13.7%
Mozambique	0.9%	1.0%
Ghana	0.5%	6.7%
Botswana	0.1%	5.8%
Ethiopia	0.1%	0.7%
Uganda	0.0%	2.4%
Burkina Faso	0.0%	4.3%

(Source: Shihundu, 2014)

2.6.3. ICT in Ethiopia

The ICT sector in Ethiopia is led by strong involvement from the government side. The government has a strong commitment to address the infrastructure development and service expansion throughout the country. The national telecommunication services operator, Ethio Telecom provides fixed, mobile and Internet services ranging from 2G up to 4G (Ethiopian national ICT strategy, 2015). Ethiopia's first information technology park which is named as "Ethio ICT Village" is also installed and started operation recently. The Woreda Net the e-government communication backbone developed by the government and the School Net, are also the major enablers for rapid ICT development in the country. The Telecom Expansion project was executed on the second half of the first 5 years Growth and Transformation Plan (GTP I). As of June 2015, the country has achieved high subscription levels by raising the number of mobile subscribers to 40 Million (currently 66 Million) and Internet users to 11 Million. The TEP has resulted in Mobile service penetration of 44%, and Internet penetration has also

reached 11%. The Country's 85% of geographic area has coverage of mobile service. If only habitable areas are considered, this can be taken as 100% coverage. The mobile network coverage comprises 3G and 2G services, and 4G LTE technology deployment in the capital Addis Ababa.

The government has also been working towards improving its international internet gateway capacity/bandwidth through international fiber optic links via neighboring countries Djibouti, Kenya and Sudan. The current international bandwidth capacity stands at 27.3 Gbps. The Telecom Network and service expansion activities are taken as one of the major component of the second Growth and Transformation Plan (GTP II). It is planned that in 2020, Mobile service subscription will reach 103.7 Million, and that of the internet and Fixed Line will be 56 Million, and 10 Million, respectively. The Mobile and internet penetration will be 100% and 54%. Out of 56 Million Internet subscribers 39 Million will be Broadband Internet Subscribers. The International Internet Gateway Capacity will also show a tremendous increase reaching 1,485 Gbps.

Table 2.2 ICT strategies for 2020 and their indicators

ICT Strategies for 2020 and their Indicators

Indicators	Units	2015	2016	2017	2018	2019	2020
Mobile Subscribers	'000s	40,000.0	52,732.4	65,464.8	78,197.2	90,929.6	103,662.0
Broadband Internet Subscribers	'000s	1,593.2	9,093.4	16,593.6	24,093.7	31,593.9	39,094.0
Narrowband Internet Subscribers	'000s	7,996.3	9,836.0	11,884.1	13,758.8	15,441.0	16,934.9
Fixed Line Subscribers	'000s	3,050.0	4,513.2	5,976.5	7,439.7	8,903.0	10,366.2
Mobile Subscribers per 100 Inhabitants	%	43.9%	56.4%	68.2%	79.4%	90.0%	100.0%
Internet Subscribers per 100 inhabitants	%	10.5%	20.2%	29.7%	38.4%	46.6%	54.0%
Fixed Line Subscribers per 100 inhabitants	%	3.3%	4.8%	6.2%	7.6%	8.8%	10.0%

(Source: FDRE National ICT strategy 2015)

Upgrade level of government electronic services broadband connectivity in all schools, universities, Government administrations, and rural villages ICT skills development, capacity building trainings, creation of information and knowledge based society. Establish ICT research and innovation centers develop standards and legal and regulatory frameworks for ICT sector development reinforce ICT industry and their competitiveness, ICT manufacturing, software development industry, cloud computing electronic commerce improve ICT's contribution to national.

2.7. Factors affecting ICT usage in secondary schools

ICT helps for education to increase teachers' and students' motivation in teaching learning activities. It improves the quality in education. There are several factors affecting ICT usage in private and public secondary schools (Shihundu, et al).

2.7.1. Challenges of ICT usage

National Council for Science and Technology (2010) stated that while ICT continues to advance in western and Asian countries, African countries still experience a lag in its usage, and that continues to widen the digital and knowledge divides. In a recent study by Kiptalam (2010), observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of 1 computer to 150 students against the ratio of 1:15 students in the developed countries. Several researches reported that the lack of access to resources also discourages and limits teachers from using new ICTs in education (Binginlas, 2009). Becta publication, "Primary Schools-ICT and Standards" in 2003 presented strong evidence that schools which were well resourced in ICT tended to achieve better academically than schools with unsatisfactory levels of ICT. Hence, the lack of good ICT resources in schools prevents teachers from utilizing ICT in teaching to improve students' performance. Research studies indicated several reasons for the lack of accessibility. Teacher complained about the difficulties to always have access to ICT materials or hardware and software because most of these were shared with other teachers (Binginlas, 2009).

The lack of effective training is another barrier to effective use of ICT among teachers (Hennessy, 2005; Binginlas, 2009). Sicilia (as cited in Binginlas, 2009) stated that teachers want to learn new ICT tools and approaches but the lack of opportunities for professional development hindered them from using technology in their teaching. The problem of not sufficiently prepared and confident to make full

use of ICT in classroom arises because of the inadequate or inappropriate training given to the teachers. The study revealed a number of factors hindering to use ICT in teaching in both public and private schools. The challenges which teachers are facing towards the use of ICT in both private and public secondary schools in Dodoma municipal. It is evident that the nonexistence of ICT infrastructure in both types of these schools is a major factor pulling back the ICT usage in these schools. This factor contributes 71.7% for private schools and 55.8% for public schools. Other identified challenges are poor support on ICT initiatives provided to these schools (i.e. 15.1% for private schools and 32.7% for public schools), missing required skills (17% for private schools and 8.7% for public schools), and lack or poor, motivation on using ICT for teaching i.e. level of motivation is about 1.9% for private and 5.8% for public(Augstine, 2015).

Many researchers agree with the idea that ICT's role is to be a reliable tool to improve the quality of life and this reduces the economic gap between developed and developing countries. Applying ICT to schooling is an urgent task for developing countries to use (UK Parliamentary Office of Science and Technology, 2006). However, there are challenges that the developing world is facing and these make the 'Digital Divide' continue not only between countries but also within countries (UK Parliamentary Office of Science and Technology, 2006). The hurdles are mainly divided into four categories; a lack of financial resources, poor access to the internet, limited trained teachers and lack of policy.

2.7.2. Enabling factors in Using ICTs in Education

ICT should be used as a tool to support the educational objectives such as skills for searching and assessing information, cooperation, communication and problem solving which are important for the preparation of students for the knowledge society. And, innovative use of ICT can facilitate student centered learning. Hence, every classroom teacher should use learning technologies to enhance their student learning in every subject because it can engage the thinking, decision making, problem solving and reasoning behaviors of students. ICT has gained more and more attention and the use of ICT including radio and television for education has a long history. Furthermore, the strong connection between education and ICT is seen in the comment about MDGs by the former secretary general of the UN, Kofi Annan (2005). In a rapidly changing world, basic education is essential for an individual be able to access and apply information. Such ability must find include ICTs in the global village. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing countries, especially in Africa, are still low in ICT application and use.

2.7.3. Hindering factors in Using ICTs in Education

Researches revealed many hinders that teachers face such as classrooms having more students than they are designed to accommodate; insufficient training of end users to use different technological devices available in schools; non-existent of technical and pedagogical support to teachers; rigid school structures and programs; de-motivated teachers, students and school administration; lack of coordination between school administration and teachers; lack of access to required resources; time pressures to complete the given curriculum; lack of mentoring opportunities for newly inducted teachers in schools and which discourage teachers from using ICT in their classroom teaching. The present generation of students is technology users and they often question the ICT facilities available in their schools and how their teachers used it in classrooms. A study conducted by Geoffrey (2010) in a private school revealed that students wanted their teachers to use ICT in their teaching because students found it useful and believed that it helped them to learn whatever the teacher was teaching. Students also asked the administration to provide them better ICT equipment and faster internet connectivity in their classrooms and computer labs. Students who participated in this research agreed with the idea that ICT improved enhanced academic performance.

It was also found that exposure to computers in schools influenced the career choices of former students. Muriithi (2005) has argued that in Kenya like most developing countries, ICT usage is still limited to computer literacy training. She contends that the present ICT curriculum merely ideals with "teaching about computers" and not how computers can be used to transform teaching and learning in our schools. In her thesis, she says that ICT usage should consider learning pedagogy, the pattern of student use of ICT, and the extent of ICT use in teaching and learning programme. Omwenga (2001) observes that while many teachers complain about lack of ICT resources, they are uncomfortable of not using what is available. The current researcher seeks to find out why these teachers are not acquiring and use what is available in their environment of schools. The proposed study sought to investigate the challenges faced by both teachers and students in the use of ICTs in the teaching and learning process.

2.7.4. Infrastructure on the usage of ICT

Even though ICTs have huge benefits as a means of providing quality in education, the potential of ICTs have not been fully used by education sector especially in developing countries. This is due to problems of infrastructure access (slow or unreliable Internet connectivity). A good ICT infrastructure, therefore, is a situation for improving the well-being of schools to use new technology and improve their teaching and learning processes. The effectiveness of ICT in any school is depends on the quality of the infrastructure present. This study examines ICT infrastructure in schools (private and public). It begins from the

school itself (availability of sufficient class to configure computers) to look at the ICT service, and in particular the extent to which schools engage with the service. ICT funding issues are also considered, as schools frequently raising from time to time specially in developing county this becomes a serious problem. Issues of ICT maintenance, technical support and obsolete technology are also examined, as well as the levels of access by teachers and students to computer and internet facilities in schools. The number and location of computers in private and public schools is also examined, and the issues that can arise as a result are addressed. In this regard reference is made to ICT facilities in areas for use by teachers and students as well as ICT technical support and school administration settings. With regard to the post-primary level, specific reference is made to the dedicated computer room and to ICT in specialist and general classrooms.

According to Girma(2017), demonstrate that, the reliable and sufficient Infrastructure makes easy to access internet services , however the Practical challenges (factors) on those devices are the most impediments one to access the internet services. Governments in developing nations need to work towards improving infrastructure including easy access to the internet information systems, should provide a reliable broadband internet connection, ICT applications and systems, among other occupational resources, so that the availability of infrastructure would be influencing the use of new technology. The most challenging condition to implement ICT strategy in Ethiopian schools is inadequacy of existing infrastructures.

The number of computers available for use by learners is less than the number of pupils in the class. This is a concern expressed by all teachers due to overcrowding. Teachers expressed that it is impossible for each learner to have his or her own computer and consequently they are grouped to work on one computer at a time. Although cooperative learning is encouraged, sometimes other learners do not participate to the full extent and are always in the background leaving the active ones to take the lead in their educational activities. This factor is consistent with inadequate access to ICT infrastructure as pinpointed in the literature review.

The major problem pointed out by the data and statistics (2006) was that Kenya lacked adequate connectivity and network infrastructure. It was pointed out that, although a small number of schools had direct access to high speed connectivity through an internet service provider, generally there was limited penetration of the national physical telecommunication infrastructure into rural and low-income areas. This fact raised a greater need for investigating the role played by ICT infrastructure in determining readiness to adopt ICT in secondary schools (Angeline). Schools in the Western World

invested a lot for ICT infrastructures over the last 20 years, and students use computers more often and for a much larger range of applications. Several studies reveal that students using ICT facilities mostly show higher learning gains than those who do not use (Volman, 2005).

2.7.5. Teachers and students training

Inadequate and inappropriate ICT training was found to be one of the common problems hampering teachers and students from using the technology in their classroom teaching learning activities , teachers are critical (good teachers) to use ICT in schools so the schools should give high emphasis in developing skills and attitudes by giving training. For effective ICT usage in the classroom instruction, teachers must have knowledge of how to use the technology challenges in using the technology, drawback of the technology and knowledge of showing other alternative ways of using the technology and skills of guiding and supporting their students Abrham (2016). This indicates that access to technology to use ICT in education alone, never bring the quality education that we need to provide unless teachers and students know how to use the technology in their teaching-learning system. The success of educational innovations depends largely on the skills and knowledge of teachers about the technology. Teachers' lack of knowledge and skills in applying ICT in the class room is one of the main hindrances to use technology in education both in developed and developing countries. Redesigning (restructuring) the curriculum requires knowledge of national ICT policy, understanding of the level of students learning and understanding of the technology in the classroom, level of technical expertise of teachers to solve the problems they faced during learning-teaching process and school structure whether it is organized in a way it is suitable to use the technology in education.

Teachers' development sits at the heart of any successful technology and education program. Abbas (2015) carried out a quantitative study that looked at the factors facilitating teacher skill, teacher confidence, and perceived student learning in technology-using classrooms. They found that professional development has a significant influence on how well ICT is used in the classroom. Also, they added that teachers' training programs often focus more on basic literacy skills and less on the collaborated use of ICT in teaching. Despite the numerous plans to use technology in schools, however, teachers have received little training in this area in their teacher education programs. When technology is introduced into teacher education programs, the emphasis is often on teaching about technology instead of teaching with technology. Hence, inadequate preparation to use technology is one of the reasons that teachers do not systematically use computers in their classes. Teachers need to be given opportunities to practice using technology during their teacher training programs so that they can see

ways in which technology can be used to expand their classroom activities .Teachers are more likely to use ICT in their teaching activity, when professional training in the use of ICT provides them time to practice with the technology and to learn, share and collaborate with colleagues.

To achieve technology usage, student and teachers must receive robust training equipping them with the skills to pedagogically use these tools to the best of their abilities; this process should focus on the presentation and exploration of software and devices as well as on promoting positive attitudes and teacher efficacy to successfully transfer information to students. From this perspective, and analyzing the established approach in education, draw attention to the curriculum's failure to include technology-based subjects in initial teacher training; this should be addressed cross-curricular so that it encompasses digital competences in different subjects and prompts the student to shift from a "digital user" to being "digitally competent" in the educational use of ICT tools in the inclusive classroom.

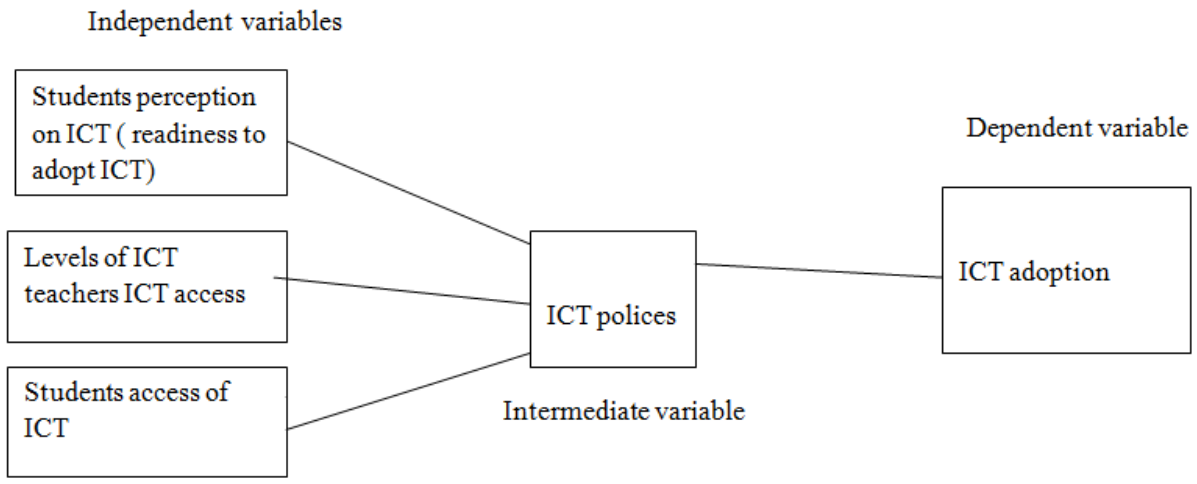
Student teachers acknowledge that there is a need to undertake specific training in ICT and receive guidance in order to use these tools appropriately, and for the education authority to invest more and promote professional recognition in this area. Research findings over the past 20 years provide some evidence as to the positive effects of the use of ICT on students' learning. In spite of such projects, the effects of numerous training programmes and an investment by schools in ICT resources, there has been a disappointingly slow uptake in schools (Shazia, 2000).

Table 2.3 Positive and negative factors influencing use of ICT in classroom

Positive factors	**Negative factors**
Regular use and experience of ICT outside the classroom.	Difficulties in using software/hardware.
Ownership of a computer.	Need more technical support.
Confidence in using ICT.	Not enough time to use ICT.
Easy to control the class.	Is too expensive to use regularly.
Easy to think of new lesson ideas.	Insufficient access to the resources.
Can get help and advice from colleagues.	Restricts the content of the lessons.
Makes the lessons more fun.	Takes up too much time.

2.8. Conceptual framework

Based on the various approaches explain above in the literature review a modified conceptual framework on ICT adoption , student and ICT teachers attitude towards ICT usage in schools are to be developed. The conceptual framework is a presentation of variables in the study and it is used to indicate the framework illustrates the relationship between dependent and independent variables. The independent variables for the study are factors affecting adoption of ICT, whereas, the dependent variable is the adoption of ICT. Influencing factors to the adoption and use of ICT in teaching and learning practice (process) can be categorized in different ways. In a framework addressing challenges to classroom technology use. Shihundu (2014) distinguish several critical factors going from school level factors over factors associate with the students and the teachers to factors inherent to the technology itself and factors associate with the technology. Three interrelated factors: institution, resources, teachers and students. Categorizes influencing factors in factors which can be manipulated and factors which are not manipulative. At the school level, important contextual factors are socio-cultural setting of a school and structural characteristics like government ICT policy, ICT infrastructure and school type. At teacher level, two types of barriers are common; external or first-order barriers, such as limited resources or lack of technical support, and internal or second-order barriers, which include teachers' attitudes to ICT usage.



Source: Shihundu , 2014)

2.9. Chapter summary

In concluding the extensive review of literature on the study of ICTs in the facilitation of teaching and learning, the researcher observes that there are several gaps that need to be researched on. For instance; some scholars have carried out studies in secondary schools such as, Abrham (2016), Ashar(2016),Belay(2015), Birilit(2017),Ewa(2016), Fisseha(2011),Girma (2017), Laaria (2013) and Rita (2017). The above studies did not investigate the challenges facing teachers and students in the use of ICT in secondary schools. The current study therefore want to fill the gaps created by the literature.

CHAPTER THREE

Research methodology

According to Mugenda, (2003) research methodology is a plan of action, design, strategy or process that researcher choose and use in order to get the desired outcomes. It includes research design, target population, sampling design and sample size, data collection methods and data analysis technique.

3.1. Research design

A descriptive survey method was used to study the factors that affect the current ICT usage and factors that enable or hinder to use ICT in the selected secondary schools. This method was preferred because the nature of the problem needs detail explanation and detailed analysis of existing condition with the determined of employing data to justify current conditions. Descriptive surveys are designed to obtain information about the current status of a phenomenon or to answer questions like where, what, how, why, when, and who. The descriptive research attempts to describe, explain and interpret conditions of the present i.e. “what is’. The purpose of a descriptive research is to examine a phenomenon that is occurring at a specific place and time. A descriptive research is concerned with conditions, practices, structures, differences or relationships that exist, opinions held, processes that are going on or trends that are evident.

This method is preferable because information is readily obtainable from participants or respondents in their natural environment, concerning their attitudes or beliefs on the use of ICT and the factors that hinder or drive ICT usage in the selected private and public secondary schools. The population of the study is the school students, teacher’s school directors and ICT experts expected to be involved in the use of ICTs in secondary or high schools in Gulele sub - city.

According to Nyaga (2014), descriptive studies aim at finding out "what is," and so survey methods are frequently used to collect descriptive data. The survey design involves asking a large group of respondent's questions about a particular issue within a short period of time. It also seeks to obtain information that describes an existing phenomenon by asking individuals about their perceptions, attitudes and values.

This study used quantitative and qualitative techniques in collecting and analyzing data. Quantitative involved the collection of numerical data in order to describe existing condition of their natural setting, data analysis was mainly statistical. The qualitative technique involved the collection of extensive narrative data in order to gain insights about the phenomena. The design chosen for the study was suitable because it allowed the researcher to:

1. Describe the current usage of ICTs in the teaching and learning process in the selected secondary schools.
2. Identify the factors that enable the use of ICT in the teaching and learning process in selected secondary schools.
3. Explore the challenges both ICT teachers and students encountered in the use of ICTs in the selected secondary schools.

3.2. Target Population

The students, teachers and school principals found in selected public and private secondary schools of Gulele sub-city are the target population. It is the population to which the researcher plans to generalize his/her findings (Orodho 2008). However, the final study units were selected students, teachers, school directors and ICT experts involved in the teaching and learning process in the study area and fulfill the inclusion criteria indicated in the scope of the study. A total of 1669, 1575 students from public secondary school 1311 (male 678 and female 633) and from private 264(male 156 and female 108), a total of 94 teachers from public secondary school 70 (male 55 and female 15) and from private secondary school 24 (male 23 and female 1) are the target population.

3.3. Sampling design and Sample Size

The primary goal of sampling is to get a representative sample, or a small collection of units or cases from a much larger collection or population, such that the researcher can study the smaller group and

produce accurate generalizations about the larger group. Researchers focus on the specific techniques that will yield highly representative samples.

Sampling involves the selection of a number of study units from the study population or target population. To determine the sample size, the researcher uses 30% of the secondary school Students and teachers population as the sample size as suggested by Kothari (2004). According to Nelly (2015) also 30% of the target population is a good representation for descriptive study. Accordingly, the researcher takes a total of 473 (393 from public schools and 80 from private schools) using 30% target population students from 1575, two ICT experts and two school directors for an interview. Using 30%, a sample size of 414 was used from the public secondary school and 86 sample sizes was used from the private secondary school.

As shown in Table 3.2. This was 30 percent of the targeted population of 24 teachers as recommended by Mugenda, (2003), when the target population is small less than one thousand subjects as: [N < 1000], in the case of this study (in the case of private secondary school) N = 288 as shown in Table 3.2

Table 3.1: sample size of public secondary school population

Kechene debre selam	Population size(N)	Percent (%)	Sample size(n)= 414
Teachers	Male 55	30%	16
	Female 15	30%	4
Students	Male 587	30%	176
	Female 724	30%	217
Total	N= 1381		n = 414

Source: Kechene debre selam secondary school teacher's development (2018)

Table 3.2: sample size of private secondary school population

Lazzarist secondary school	Population size(N)	Percent (%)	Sample size(n)= 86
Teachers	Male 23	30%	6
	Female 1	30%	1
Students	Male 156	30%	46
	Female 108	30%	32
Total	N= 288		n = 86

Source: Lazzarist secondary school teacher's development (2018)

3.4. Sampling Techniques

The study also employed both purposive and stratified sampling techniques, in order to contact potential respondents.

3.4.1 Purposive sampling

Purposive sampling technique was used for the selection of schools, school directors (one each school) and ICT experts in the different public and private secondary schools that encourage the use of ICT as they are considered knowledgeable in providing the required information. According to Denscombe (2008), purposive sampling starts with a purpose in mind and the sample is thus selected to include people of interest and exclude those who do not suit the purpose. Due to a limited number of resources in each sector and getting a better information for the study, the researcher selects purposefully a potential respondents those have more knowledge about the research questions the method was therefore suitable in selecting schools, school directors and ICT experts who engaged in the use of ICT for a reasonable period of time. In this case therefore; the researcher used purposive sampling to select the different staffs. For qualitative study, purposive sampling technique is used to select schools, school directors and ICT experts from the public and private secondary schools.

3.4.2. Stratified sampling

Stratified techniques were used to group the target population into two main strata namely; public and private schools. The researcher used stratified sampling technique in selecting students. The strata were class (grade 9, grade 10) and gender. Incident sampling method which is a probability method. It further helped in the process of identifying the respondents for data collection. Sometimes in survey sampling certain amount of information is known about the elements of the population to be studied. Divide the whole heterogeneous population into smaller groups or subpopulations, such that the sampling units are homogeneous with respect to the characteristic under study within the subpopulation and heterogeneous with respect to the characteristic under study between/among the subpopulations. Such subpopulations are termed as strata. These samples are most likely to yield a sample that truly represents the population. In other words, it enables researchers to make accurate assumptions or generalizations from the sample to the population under investigation.

For the quantitative analysis, stratified sampling technique is selected because the populations are heterogeneous, which are public and private secondary schools. The strata is gender and class level of students (class 9 &10). Incident sampling technique was used in this research because it provides an equal and nonzero chance of being selected for each respondent. Incident sampling technique was used

to select teachers (mathematics, history, English and ICT) and students grade 9 (class E, K, C and G), grade 10 (class I, B, J and class A).In the case of private school students grade 9 (section B), grade 10 (section A).

3.5. Sampling procedure

Sampling is the process of selecting individuals for the study. A sample is any group on which information is obtained. Gulele sub-city has two (2) public and two (2) private Secondary Schools. Systematic sampling techniques use to select two (2) schools out of the four (4) based on their performance and the availability of ICTs infrastructure to be study (for instance in some school no internet service at all). Sampling procedure refers to the technique in which the researcher uses in selecting participants (respondents) for the sample. It is the process of laying down the number of participants to be included in the sample. The study use both purposive and stratified sampling to obtain respondents for the study. Purposive sampling ensure participate in the study. The researcher deliberately includes (school directors and ICT experts) respondents in the sample because they are the right person to give the right information regarding the use of ICT. Stratified sampling use to select students from the two schools and the interviewee participants are schools director and ICT experts.

3.6. Data collection instruments

The main instruments for data collection are questionnaires, interviews and observation. The student's questionnaire was used to gather information from the students, what challenges faced when using ICTs in the learning process and the teacher's questionnaire was used to gather information from teachers background, their experience, age, gender & factors that enable /hinder ICTs usage in the teaching-learning process.

3.6.1. Questionnaire

According to Kombo, (2006), questionnaires are widely used to obtain information about the current conditions and practices to make investigations concerning attitudes and opinions quickly and in the precise form. The questionnaire is a data collection instrument which consists of a number of questions. These questionnaires were divided into two categories, i.e., for the teachers and students. Each questionnaire has four sections as recommended by Orodho (2008): I) Demographic information, II) closed ended questions weighted on a Likert scale of 1-5 with questions on Strongly Agree, Agree, Disagree moderately agree and Strongly Disagree, III) Open ended type of questions and IV) yes no types of questions. It allows the researcher to collect the most complete and accurate data in a logical

flow, in order to reach reliable conclusions from what we are planning to investigate in our research. The use of the questionnaire was found to be important to draw out information on respondent's attitudes and beliefs towards the factors that affect the current use of ICT and factor that enable or hinder ICT usage in the teaching-learning process. The researcher adopted questionnaire from Belay, Shihundu and other to collect information from students and teachers to address specific objectives.

3.6.3. Interview

Interview enables the researcher to collect opinion, perception and attitude from the principals (school directors and ICT experts) about factors affecting the current use of ICT and factors that hinder/enable ICT usage in the teaching & learning process in both public and private secondary schools. Interview involves verbal communication between the researcher and the subject or respondent (Mather et.al, 1998). The researcher design to use open- ended interview questions to gather in depth information about the study.

3.7. Data Collection procedure

Before going to the field, the researcher obtained request letter from AAU to carry out the research. The researcher then visit the sampled schools to establish link, get permission from the school principals and arrange with grades 9 and 10 students of the stratified sampled and teachers incidentally sampled form 2 schools to arrange for when to give out the questionnaires. School directors and ICT experts sampled purposively from public and private secondary schools.

3.8. Data Analysis Techniques

The data will be collected and analyzed using statistical package for social sciences SPSS version 22. The researchers use descriptive statistics for analysis, including, frequency and percentage of the responses from the questionnaire. The quantitative data is categorized and organize based on the objectives of the study for analysis. The qualitative data collected from interview schedule and part of the questionnaire is analyzed, interpreted and presented in a narrative way (involves the reformulation of stories presented by respondents taking into account context of each case and different experiences of each respondent).

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND DISCUSSION

4.1. Introduction

This chapter deals with data presentation, analysis and interpretation. Three different tools were used in order to come up with the data presented, namely interviews, observations and questionnaires. The questionnaires were prepared for 28 teachers, 473 students, two school directors and two ICT experts across in the selected public and private secondary schools in the Gulele sub-city. The respondents were selected from mathematics, ICT, English and history departments. The departments were incidentally selected, followed by random incident to distribute the questionnaire. The departments were chosen incidentally to include students and teachers from all departments or classes as much as possible. The analysis and interpretation of data were carried out by merging two parts. The first part deals with a quantitative analysis of data based on the results of the questionnaire (were organized and analyzed in tabular form and interpreted using percentage, frequency). The second part is about a qualitative or judgmental interpretation based on the results of the interview and observation. The qualitative information gathered through open-ended questions, interviews, observation and document reviews were narrated and interpreted in a manner to support the quantitative information. Observations were also made in data center (server), the students and teachers ICT labs, observation also made or conducted at the class times. The information gathered through these different periods were explored and analyzed as follows.

4.2. Questionnaire Response Rate

The study targeted to collect a total of 500 respondents response whereas, from them only 456 respondents filled in and returned the questionnaires; i.e., a response rate of 91.2%. According to Mugenda (1999), a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. So, based on the statement, the response rate was excellent as indicated by Table 4.1.

Table 4.1: rate of respondents

Variable	Frequency(f)			Percentage (%)
Returned		Public school	369	73.8
	456	Private school	87	17.4
Unreturned		Public school	32	6.4
	44	Private school	12	2.4
Total	500		500	100

4.3 Demographic characteristics of the respondents

In the questionnaire teacher participants were asked to indicate their gender, i.e. male or female. The study results from data analysis showed that 82.3 percent of the respondents were males while 17.6 percent of the respondents were females from public secondary school teachers, whereas in the case of private secondary school 100 percent of the respondents were males. This indicated that male teachers were 3/4th of the study population while female teachers were 1/4th in the case of public secondary school teachers but, in the case of private secondary school there were no female respondents in the selected sample for this study.

Table 4.2: Public school teacher respondents by department

Department	ICT	Math's	History	English	Total
Items	%	%	%	%	%
Male	11.7	29.4	23.5	17.6	86.7
Sex					
Female	-	17.6	-	-	17.6
Total	11.7	47	23.5	17.6	100.0

Table 4.3: Private school teacher respondents by department

Department	**ICT**	**Math's**	**History**	**English**	**Total**
Items	%	%	%	%	%
Male Sex	14.2	42.8	28.5	14.2	100.0
Female	-	-	-	-	17.6
Total	14.2	42.8	28.5	14.2	100.0

Table 4.4 Public school teacher respondents by gender

Sex	**Frequency(f)**	**Percentage (%)**
Male	14	82.3
Female	3	17.6
Total	17	100.0

Table 4.5 Private school teacher respondents by gender

Sex	**Frequency(f)**	**Percentage (%)**
Male	7	100.0
Female	0	0.0
Total	7	100.0

The study participants were asked to indicate their age from a specific distribution of age ranges as indicated in the questionnaire: 20-30 years, 31-40 years, 41-50 years, and over 51 years. The responses were tabulated as shown in Table 4.6.

Table 4.6 Public school teacher respondents by Age

Respondent's age in years	**Frequency(f)**	**Percentage (%)**
From 20 – 30 years	6	35.2
From 31 – 40 years	9	52.9
From 41 – 50 years	2	11.7
Over 51 years	0	0.0
Total	17	100.0

As shown in Table 4.6 52.9 percent of the respondents were in the age between 31 years to 40 years old, 35.29 percent of the respondents were in the age between 20-30 years, and 11.7 percent of the respondents were aged between 41-50 years old.

Table 4.7 Private school teacher respondents by Age

Respondents' age in years	**Frequency(f)**	**Percentage (%)**
From 20 – 30 years	1	14.28
From 31 – 40 years	6	85.17
From 41 – 50 years	0	0.0
Over 51 years	0	0.0
Total	7	100.0

As shown in Table 4.7 85.1 percent of the respondents were in the age between 31 years to 40 years old, and 14.2 percent of the respondents were in the age between 20-30 years old.

Table 4.8 Public school teacher respondents by highest levels of education.

Level of education	**Frequency(f)**	**Percentage (%)**
Diploma in education	0	0.0
Bachelors' degree in education	17	100.0
Master's degree in education	0	0.0
PhD degree in education	0	0.0
Total	17	100.0

As shown in Table 4.8 100.0 percent of the respondents from the public school had Bachelor's degree level of education, whereas in the case of private school 57.1 percent of the respondents had Bachelor's degree level of education, and 42.8 percent of the respondents had Master's Degree.

Table 4.9 Private school teacher respondents by highest levels of education.

Level of education	**Frequency(f)**	**Percentage (%)**
Diploma in education	0	0.0
Bachelor's degree in education	4	57.1
Master's degree in education	3	42.8
PhD degree in education	0	0.0
Total	7	100.0

Table 4.10 Public school teacher respondents by work experience

Work experience	**Frequency(f)**	**Percentage (%)**
< 1 year	0	0.0
2 years	0	0.0
3 years	1	5.8
4 years	2	11.7
5 years	2	11.7
>5 years	12	70.5
Total	17	100.0

According to Table 4.10 70.5% of the public school respondents had work experience of more than five years. Nearly 11.7% had four to five years of experience, 5.8% had three years working experience while in private school 85.7% of the respondents had more than five years work experience. This indicate private school teachers were more experienced than public school teachers (Table 4.11).

Table 4.11 Private school teacher respondents by work experience

Work experience	Frequency(f)	Percentage (%)
< 1 year	0	0.0
2 years	0	0.0
3 years	0	0.0
4 years	1	14.2
5 years	0	0.0
>5 years	6	85.7
Total	7	100.0

4.4 Demographic characteristics of students

Table 4.12 Public school student respondents by gender

	Sex	Frequency(f)	Percentage (%)
Grade 9	Male	56	35
	Female	104	65
	Total	160	100
Grade 10	Male	60	31.5
	Female	132	69.4
	Total	192	100
	Cumulative total	352	100

In the questionnaire student participants were asked to indicate their gender (male or female). The study results from data analysis showed that 35 percent of the respondents from the public school were male while 65 percent of the respondents were female, (grade 9 students), 31.5 percent of the respondents were male while 69.4 percent of the respondents were female, (grade 10 students) while 50 percent of the respondents from private school were female and 50 percent male in both case grade 9 and 10 students (Table 4.13).

Table 4.13 Private school student respondents by gender

	Sex	**Frequency (f)**	**Percentage (%)**
Grade 9	Male	24	50
	Female	24	50
	Total	48	100
Grade 10	Male	16	50
	Female	16	50
	Total	32	100
	Cumulative total	80	100

4.5. Respondent's response to questionnaires

4.5.1 Utilization of ICTs tools by teachers in the teaching-learning process.

ICTs includes computers and printers ICTs are widely used in today's education sectors. Thus, schools are important environment in which students and teachers used these tools in order to transform the education system.

Table 4.14: Teacher's Utilization of ICTs in the teaching-learning process (public school)

ICT tools	Always	Sometimes	Undecided	Rarely	Never	Total
	%	%	%	%	%	%
Computers	23.5	23.5	11.7	23.5	17.6	100
Laptops	5.8	11.7	-	23.5	58.8	100
Projectors	5.8	23.5	11.7	29.4	29.4	100
Videos	5.8	41.1	17.6	5.8	29.4	100
Printers	11.7	35.2	11.7	23.5	17.6	100
Internet	17.6	29.4	-	17.6	35.2	100

From table 4.14, 23.5% from the public school teacher respondents reported that they used computer always, 23.5% of the teacher respondents reported that they used computer sometimes, 23.5% of the teacher respondents reported that they used computer rarely and 17.6% of the teacher respondents reported that they never used computer in the teaching and learning processes:- 5.8% of the respondents reported that they used laptop always, 11.7% of the teacher respondents reported that they used laptop sometimes, 23.5% of the teacher respondents reported that they used laptop rarely and 58.8 % of the teacher respondents reported that they never used laptop in the teaching and learning processes:- 5.8% of the respondents reported that they used projector always, 23.5% of the teacher respondents reported that they used projector sometimes, 29.4% of the teacher respondents reported that they used projector rarely and 29.4 % of the teacher respondents reported that they never used projector in the teaching and learning processes:- 5.8% of the respondents reported that they used video always, 41.1% of the teacher respondents reported that they used video sometimes, 5.8% of the teacher respondents reported that

they used video rarely and 29.4 % of the teacher respondents reported that they never used video in the teaching and learning processes:- 11.7% of the respondents reported that they used printer always, 35.2% of the teacher respondents reported that they used printer sometimes, 23.5% of the teacher respondents reported that they used printer rarely and 17.6 % of the teacher respondents reported that they never used printer in the teaching and learning processes:- 17.6% of the respondents reported that they used internet always, 29.4% of the teacher respondents reported that they used internet sometimes, 17.6% of the teacher respondents reported that they used internet rarely and 35.2% of the teacher respondents reported that they never used internet in the teaching and learning processes.

Table 4.15: Teacher's Utilization of ICTs in the teaching-learning process (private school)

	Always	**Sometimes**	**Undecided**	**Rarely**	**Never**	**Total**
ICT tools	**%**	**%**	**%**	**%**	**%**	**%**
Computers	14.2	71.4	-	-	14.2	100
Laptops	28.5	42.8	-	14.2	14.2	100
Projectors	14.2	28.5	-	-	57.1	100
Videos	-	14.2	14.2	28.5	42.8	100
Printers	28.5	42.8	28.5	-	-	100
Internet	42.8	57.1	-	-	-	100

From table 4.15, 14.2% from the private school teacher respondents reported that they used computer always, 71.4% of the teacher respondents reported that they used computer sometimes and 14.2% of the teacher respondents reported that they never used computer in the teaching and learning processes:-

28.5% of the respondents reported that they used laptop always, 42.8% of the teacher respondents reported that they used laptop sometimes, 14.2% of the teacher respondents reported that they used laptop rarely and 14.2 % of the teacher respondents reported that they never used laptop in the teaching and learning processes:- 14.2% of the respondents reported that they used projector always, 28.5% of the teacher respondents reported that they used projector sometimes and 57.1% of the teacher respondents reported that they never used projector in the teaching and learning processes:- 14.2% of the teacher respondents reported that they used video sometimes, 28.5% of the teacher respondents reported that they used video rarely and 42.8 % of the teacher respondents reported that they never used video in the teaching and learning processes:- 28.5% of the respondents reported that they used printer always, 42.8% of the teacher respondents reported that they used printer sometimes in the teaching and learning processes:- 42.8% of the respondents reported that they used internet always and 28.5% of the teacher respondents reported that they used internet sometimes in the teaching and learning processes.

4.5.2 Utilization of ICTs tools by students in the teaching-learning processes.

Table 4.16: Student's Utilization of ICTs in the teaching-learning process (public school)

	Always	**Sometimes**	**Undecided**	**Rarely**	**Never**	**Total**
ICT tools	**%**	**%**	**%**	**%**	**%**	**%**
Computers	19.3	14.7	3.4	5.1	56.8	100
Laptops	14.7	15.9	30.6	11.3	27.2	100
Mobile	30.6	28.4	20.4	12.5	7.9	100
Internet	11.3	10.2	13.6	56.8	7.9	100

From table 4.16, 19.3% from the public school student respondents reported that they used computer always, 14.7% of the student respondents reported that they used computer sometimes, 5.1% of the student respondents reported that they used computer rarely and 56.8% of the student respondents reported that they never used computer in the teaching and learning processes:- 14.7% of the respondents reported that they used laptop always, 15.9% of the student respondents reported that they used laptop sometimes, 11.3% of the student respondents reported that they used laptop rarely and 27.2 % of the student respondents reported that they never used laptop in the teaching and learning processes:- 30.6% of the respondents reported that they used mobile always, 28.4% of the student respondents reported that they used mobile sometimes, 12.5% of the student respondents reported that they used mobile rarely and 7.9 % of the student respondents reported that they never used mobile in the teaching and learning processes:- 11.3% of the respondents reported that they used internet always, 10.2% of the student respondents reported that they used internet sometimes, 56.8% of the student respondents reported that they used internet rarely and 7.9% of the student respondents reported that they never used internet in the teaching and learning processes.

Table 4.17: Student's Utilization of ICTs in the teaching-learning process (private school)

	Always	**Sometimes**	**Undecided**	**Rarely**	**Never**	**Total**
ICT tools	**%**	**%**	**%**	**%**	**%**	**%**
Computers	20	50	10	20	-	100
Laptops	10	60	20	5	5	100
Mobile	20	40	25	15	-	100
Internet	30	30	10	20	10	100

From table 4.17, 20% from the public school student respondents reported that they used computer always, 50% of the student respondents reported that they used computer sometimes and 20% of the student respondents reported that they used computer rarely in the teaching and learning processes:- 10% of the respondents reported that they used laptop always, 60% of the student respondents reported that they used laptop sometimes, 5% of the student respondents reported that they used laptop rarely and 5 % of the student respondents reported that they never used laptop in the teaching and learning processes:- 20% of the respondents reported that they used mobile always, 40% of the student respondents reported that they used mobile sometimes and 15% of the student respondents reported that they used mobile rarely in the teaching and learning processes:- 30% of the respondents reported that they used internet always, 30% of the student respondents reported that they used internet sometimes, 16% of the student respondents reported that they used internet rarely and 10% of the student respondents reported that they never used internet in the teaching and learning processes.

4.5.3 Trainings given on preparation & use of ICTs to teachers & students in the teaching-learning process

Trainings are very important for both students and teachers to use ICTs effectively and efficiently. These trainings were anticipated to help teachers and students in the school to use ICT tools in the teaching-learning process. The literature review revealed that for proper use of ICTs in schools teachers should have adequate computer skills. ICT knowledge and skills would enable them to use computers. Participants were asked whether they have taken ICT training or not. But, adequate training were not given to teachers; only ICTs teachers and mathematics teachers (MS-access) were given training. However English and history teachers were not given training and no student had a training on ICTs tools.

Table 4.18: Trainings given to teachers (public school)

Programs	**Yes Percentage (%)**	**No Percentage (%)**	**Total Percentage (%)**
MS-word	58.8	41.1	100
MS- excel	41.1	58.8	100
MS-access	41.1	58.8	100
MS-power point	29.4	70.5	100
Internet browsing	52.9	47.0	100

As indicated in Table 4.18 above, more than half of the teachers in the public school were trained about MS-word 58.8% and about internet browsing 52.9%. But most of them (70.5%) were not trained MS-power point 58.8%, MS- excel and MS- access 58.8%. However, all of the students were not given trainings on MS-word, MS-excel, MS-access, Microsoft power point and Internet browsing. From the responses, it can be concluded that even though teachers took training on office programs, students did not took these trainings.

Table 4.19: Trainings given to teachers (private school)

Programs	**Yes Percentage (%)**	**No Percentage (%)**	**Total Percentage (%)**
MS-word	57.1	42.8	100
MS-excel	57.1	42.8	100
MS-access	71.4	28.5	100
MS-power point	57.1	42.8	100
Internet browsing	42.8	57.1	100

As indicated in Table 4.19 above, most of the teachers in the private school were trained in MS-word 57.1%, MS-excel 57.1%, MS-access 71.4% and MS-power point 57.1%, but some of them were not trained internet browsing and 42.8%. The findings show than private school teachers were more trained than public school teachers. However, all of the students were not given trainings on MS-word, MS-excel, MS-access, Microsoft power point and Internet browsing. From the responses, it can be concluded that even though teachers took training on office programs, students did not take these trainings. As the results indicated relatively private school teachers were more trained than public school teachers.

Table 4.20 Factors enabling use ICTs by teachers (public school)

Drive factors	I don't know	None	Low	Medium	High
	%	%	%	%	%
Teacher's motivation & commitment to use ICT.	5.8	-	11.7	41.1	41.1
The support they experienced in their school.	-	11.7	23.5	29.4	35.2
Availability of ICT infrastructure.	-	17.6	11.7	58.8	11.7
Government support & initiative.	5.8	11.7	23.7	52.9	5.8
Teachers' attitudes towards the use of ICT	-	5.8	17.6	35.2	41.1

As it is shown in Table 4.20, the respondents were asked their perception about factors that drive the use of ICTs. Accordingly, 41.1% of the teachers said that teacher's motivation and commitment to use ICTs have high drives, 41.1% of the teachers said that teacher's motivation and commitment to use ICTs have medium drives, 41.1% of the teachers said that teacher's motivation and commitment to use ICTs have low drives to use ICTs, 35.2% of the teachers said that The support they experienced in their school have high drives to use ICTs, 23.8% of the teachers said that The support they experienced in their school have medium drives to use ICTs, 21.5% of the teachers said that The support they experienced in their school have medium drives to use ICTs.

11.5% of the teachers said that availability of ICTs infrastructure have high drives to use ICTs, 58.8% of the teachers said that availability of ICTs infrastructure have medium drives to use ICTs, 11.7% of the teachers said that availability of ICTs infrastructure have low drives to use ICTs, 5.8% of the teachers said that government support and initiatives have high drives to use ICTs, 52.9% of the teachers said that government support and initiatives have medium drives to use ICTs, 23.7% of the teachers said that government support and initiatives have low drives to use ICTs, 41.1% of the teachers said that teachers' attitudes towards the use of ICT have high drives to use ICTs, 35.2% of the teachers

said that teachers' attitudes towards the use of ICT have medium drives to use ICTs, 17.6% of the teachers said that teachers' attitudes towards the use of ICT have low drives to use ICTs.

Table 4.21 Factors enabling use ICTs by teachers (private school)

Drive factors	I don't know	None	Low	Medium	High
	%	%	%	%	%
Teacher's motivation & commitment to use ICT.	5.8	-	11.7	41.1	41.1
The support they experienced in their school.	-	11.7	23.5	29.4	35.2
Availability of ICT infrastructure.	-	17.6	11.7	58.8	11.7
Government support & initiative.	5.8	11.7	23.7	52.9	5.8
Teachers' attitudes towards the use of ICT	-	5.8	17.6	35.2	41.1

As it is shown in Table 4.21, the respondents were asked their perception about factors that drive the use of ICTs. Accordingly, 42.8% of the teachers the public school said that teacher's motivation and commitment to use ICTs have high drives, 14.2% of the teachers said that teacher's motivation and commitment to use ICTs have medium drives, 14.2% of the teachers said that teacher's motivation and commitment to use ICTs have low drives to use ICTs, 71.4% of the teachers said that the support they experienced in their school have high drives to use ICTs, 14.2% of the teachers said that The support they experienced in their school have medium drives to use ICTs, 14.2% of the teachers said that The support they experienced in their school have medium drives to use ICTs.

57.1% of the teachers said that availability of ICTs infrastructure have high drives to use ICTs, 14.2% of the teachers said that availability of ICTs infrastructure have medium drives to use ICTs, 28.5% of the teachers said that availability of ICTs infrastructure have low drives to use ICTs, 28.5% of the teachers said that government support and initiatives have high drives to use ICTs, 57.1% of the teachers said that government support and initiatives have medium drives to use ICTs, 14.2% of the teachers said that government support and initiatives have low drives to use ICTs, 71.4% of the teachers

said that teachers' attitudes towards the use of ICT have high drives to use ICTs, 14.2% of the teachers said that teacher's attitudes towards the use of ICT have medium drives to use ICTs, 14.2% of the teachers said that teacher's attitudes towards the use of ICT have low drives to use ICTs.

Table 4.22 Factors enabling use of ICTs by students (public school)

Drive factors	I don't know	None	Low	Medium	High
	%	%	%	%	%
Teacher's motivation & commitment to use ICT.	21.5	13.6	10.2	27.8	26.7
The support they experienced in their school.	31.2	14.7	21.5	23.8	7.9
Availability of ICT infrastructure.	27.2	15.9	32.9	20.4	7.9
Government support & initiative.	27.2	12.5	28.4	18.1	15.2
Teachers' attitudes towards the use of ICT	27.8	7.9	15.9	17.0	36.3

As it is shown in Table 4.22, the respondents were asked their perception about factors that drive the use of ICTs. Accordingly, 26.7% of the students in the public school said that teacher's motivation and commitment to use ICTs have high drives, 27.8% of the teachers said that teacher's motivation and commitment to use ICTs have medium drives, 10.2% of the teachers said that teacher's motivation and commitment to use ICTs have low drives to use ICTs, 7.9% of the students said that The support they experienced in their school have high drives to use ICTs, 23.8% of the students said that The support they experienced in their school have medium drives to use ICTs, 21.5% of the teachers said that The support they experienced in their school have medium drives to use ICTs.

9.7% of the students said that availability of ICTs infrastructure have high drives to use ICTs, 20.4% of the students said that availability of ICTs infrastructure have high drives to use ICTs, 32.9% of the students said that availability of ICTs infrastructure have high drives to use ICTs, 15.2% of the students said that government support and initiatives have high drives to use ICTs, 18.1% of the teachers said

that government support and initiatives have medium drives to use ICTs, 28.4% of the students said that government support and initiatives have low drives to use ICTs, 36.3% of the students said that teacher's attitudes towards the use of ICT have high drives to use ICTs, 17.0% of the students said that teacher's attitudes towards the use of ICT have medium drives to use ICTs, 15.9% of the students said that teacher's attitudes towards the use of ICT have low drives to use ICTs.

Table 4.23 Factors enabling use of ICTs by students (private school)

Drive factors	**I don't know**	**None**	**Low**	**Medium**	**High**
	%	**%**	**%**	**%**	**%**
Teacher's motivation & commitment to use ICT.	-	5	20	30	45
The support they experienced in their school.	10	15	25	20	30
Availability of ICT infrastructure.	-	5	10	45	40
Government support & initiative.	45	30	-	10	15
Teachers' attitudes towards the use of ICT	10	5	-	25	60

As it is shown in Table 4.23, the respondents were asked their perception about factors that drive the use of ICTs. Accordingly, 45% of the students in the private school said that teacher's motivation and commitment to use ICTs have high drives, 30% of the students said that teacher's motivation and commitment to use ICTs have medium drives, 20% of the students said that teacher's motivation and commitment to use ICTs have low drives to use ICTs, 30% of the students said that The support they experienced in their school have high drives to use ICTs, 20% of the students said that The support they experienced in their school have medium drives to use ICTs, 25% of the students said that The support they experienced in their school have medium drives to use ICTs.

40% of the students said that availability of ICTs infrastructure have high drives to use ICTs, 45% of the teachers said that availability of ICTs infrastructure have high drives to use ICTs, 10% of the

students said that availability of ICTs infrastructure have high drives to use ICTs, 15% of the students said that government support and initiatives have high drives to use ICTs, 10% of the students said that government support and initiatives have medium drives to use ICTs, 60% of the students said that teacher's attitudes towards the use of ICT have high drives to use ICTs, 25% of the students said that teacher's attitudes towards the use of ICT have medium drives to use ICTs.

4.6. Challenges faced in the use of ICTs

According to this objective, both the teachers and students were asked to state the challenges they face in using ICTs in the teaching-learning processes.

Table 4.24 Public school teacher's response on challenges of ICTs usage

Hindering factors	Strongly Agree	Agree	Moderately agree	Disagree	strongly disagree
1. Inadequate number of Computers.	41.1	23.5	23.5	11.7	0
2. Lack of internet connectivity.	35.2	41.1	23.5	0	0
3. Fluctuation (interruption) of power supply.	52.9	23.5	23.5	0	0
4. High cost of hardware and software.	11.7	29.4	29.4	17.6	11.7
5. Computers are very old and slow.	52.9	5.8	23.5	11.7	5.8
6. Shortage of qualified ICT Teachers.	5.8	35.2	5.8	29.4	23.5
7. Lack of government incentives for Teachers.	41.1	29.4	17.6	5.8	5.8
8. Lack of technical support.	41.1	23.5	35.2	0	0
9. Inadequate training on ICT use.	58.8	11.7	29.4	0	0
10. Students lack interest when ICT are used.	11.7	29.4	5.8	29.4	23.5
11. Lack of enough time to for using ICT.	23.5	17.6	29.4	17.6	11.7
12. Computer illiteracy among teachers and students.	5.8	23.5	41.1	17.6	11.7

41.1% of the teachers from public school strongly agreed that inadequate number of computers hinder them from using them in class, while 23.5% agreed, 23.5% were moderately agree while 11.7% disagreed and none strongly disagreed. Teachers also sensed that lack of internet connectivity also

contributed to the slow use of ICTs in teaching and learning; 35.2% strongly agreed, 41.1% agreed, 23.5% were moderately agree while none disagreed and none strongly disagreed.

Teachers revealed that Fluctuation (interruption) of power supply hinder them to access computer and internet in their schools; 52.9% strongly agreed, 23.5% agreed, 23.5% were moderately agree while none disagreed and none strongly disagreed. This makes it even harder to prepare ICT based class lessons. More to this, the computers were very old and slow; 52.9% strongly agreed, 5.8% agreed, 23.5% were moderately agree while 11.7% disagreed and 5.8% strongly disagreed.

High cost of hardware and software made it challenging for the teachers to acquire appropriate ICT facilities in schools; 11.7% strongly agreed, 29.4% agreed, 29.4% were moderately agree while 17.6% disagreed and 11.7% strongly disagreed. The teachers also pointed out shortage of qualified ICT teachers in their school; 5.8 % strongly agreed, 35.2% agreed, 5.8% were moderately agree while 29.4% disagreed and 23.5% strongly disagreed.

Inadequate training on ICT use was a big challenge. 58.8% strongly agreed that there was inadequate training, 11.7% agreed, 29.4% were moderately, none disagreed and none strongly disagreed. Teachers also pointed out lack of government incentives or initiatives for teachers, 41.1 % strongly agreed, 29.4% agreed, 17.6% were moderately agree while 5.8% disagreed and 5.8% strongly disagreed.

Teachers revealed lack of enough time for using ICT; 23.5% strongly agreed, 17.6% agreed, 29.4% were moderately agree while 17.6 disagreed and 11.7 strongly disagreed. The teachers also pointed out computer illiteracy among teachers and students; 5.8 % strongly agreed, 23.5% agreed, 41.1% were moderately agree while 17.6% disagreed and 11.7% strongly disagreed.

Table 4.25 Private school teacher's response on challenges of ICTs usage

Hindering factors	Strongly Agree	Agree	Moderately agree	Disagree	strongly disagree
1. Inadequate number of Computers.	28.5	42.8	28.5	0	0
2. Lack of internet connectivity.	57.1	42.8	0	0	0
3. Fluctuation (interruption) of power supply.	71.4	0	28.5	0	0
4. High cost of hardware and software.	28.5	14.2	28.5	14.2	14.2
5. Computers are very old and slow.	42.8	42.8	14.2	0	0
6. Shortage of qualified ICT Teachers.	28.5	28.5	42.8	0	0
7. Lack of government incentives for Teachers.	71.4	0	28.5	0	0
8. Lack of technical support.	57.1	42.8	0	0	0
9. Inadequate training on ICT use.	28.5	42.8	28.5	0	0
10. Students lack interest when ICT are used.	0	28.5	0	28.5	42.8
11. Lack of enough time to for using ICT.	14.2	14.2	71.4	0	0
12. Computer illiteracy among teachers and students.	0	42.8	28.5	28.5	0

28.5% of the teachers from private school strongly agreed that inadequate number of computers hinder them from using them in class, while 42.8% agreed, 28.5% were moderately agree while none disagreed and none strongly disagreed. Teachers also sensed that lack of internet connectivity also contributed to the slow use of ICTs in teaching and learning; 57.1% strongly agreed, 42.8% agreed, none were moderately agree while none disagreed and none strongly disagreed.

Teachers revealed that Fluctuation (interruption) of power supply hinder them to access computer and internet in their schools; 71.4% strongly agreed, none agreed, 28.5% were moderately agree while none disagreed and none strongly disagreed. This makes it even harder to prepare ICT based class lessons. More to this, the computers were very old and slow; 42.8% strongly agreed, 42.8% agreed, 14.2% were moderately agree while none disagreed and none strongly disagreed.

High cost of hardware and software made it challenging for the teachers to acquire appropriate ICT facilities in schools; 28.5% strongly agreed, 14.2% agreed, 28.5% were moderately agree while 14.2%

disagreed and 14.2% strongly disagreed. The teachers also pointed out shortage of qualified ICT teachers in their school; 28.5 % strongly agreed, 28.5% agreed, 42.8% were moderately agree while none disagreed and none strongly disagreed.

Fluctuation (interruption) of power supply was a big challenge. 71.4% strongly agreed, agreed none, 28.5% were moderately, none disagreed and none strongly disagreed. Teachers also pointed out lack of government incentives or initiatives for teachers, 71.4 % strongly agreed, none agreed, 28.5% were moderately agree while none disagreed and none strongly disagreed.

Teachers revealed lack of enough time for using ICT; 14.2% strongly agreed, 14.2% agreed, 71.4% were moderately agree while none disagreed and none strongly disagreed. The teachers also pointed out computer illiteracy among teachers and students; none strongly agreed, 42.8% agreed, 28.5% were moderately agree while 28.5% disagreed and none strongly disagreed.

Table 4.26 Public school student's response on challenges of ICTs usage

Hindering factors	**Strongly Agree**	**Agree**	**Moderately agree**	**Disagree**	**strongly disagree**
1. Lack of enough time for using ICT.	53.4	21.5	12.5	7.9	4.5
2. Fluctuation (interruption) of power supply.	36.3	13.6	20.1	15.6	14.2
3. Lack of technical support.	30.1	17.6	27.2	15.9	9.0
4. Computers are very old and slow.	30.6	14.7	15.9	22.7	15.9
5. Shortage of qualified ICT Teachers.	20.4	11.3	15.9	22.7	29.5
6. Teachers lack interest to use ICTs.	15.9	12.5	22.7	27.2	21.5
7. Inadequate number of Computers.	45.4	19.8	11.3	8.5	14.7
8. Lack of internet connection.	26.1	13.6	27.2	14.7	18.1

36.3% of the students from public school strongly agreed that fluctuation (interruption) of power supply hinder them from using them in class, while 13.6% agreed, 20.1% were moderately agree while 15.6% disagreed and 14.2% strongly disagreed. Students also sensed that lack of technical support also contributed to the slow use of ICTs in teaching and learning; 30.1% strongly agreed, 17.6% agreed, 27.2% were moderately agree while 15.9% disagreed and 9.0% strongly disagreed.

Students revealed that hinder the computers were very old and slow to access computer and internet in their schools; 30.6% strongly agreed, 14.7% agreed, 15.9% were moderately agree while 22.7% disagreed and 15.9% strongly disagreed. More to this, inadequate number of Computers; 45.4% strongly agreed, 19.8% agreed, 11.3% were moderately agree while 8.5% disagreed and 14.7% strongly disagreed.

The students also pointed out shortage of qualified ICT teachers in their school; 20.4% strongly agreed, 11.3% agreed, 15.9% were moderately agree while 22.9% disagreed and 29.5% strongly disagreed.

Lack of enough time for using ICT was a big challenge. 53.4% strongly agreed, 21.5% agreed, 12.5% were moderately agree, 7.9% disagreed and 4.5% strongly disagreed.

Students revealed teachers lack interest to use ICTs; 15.9% strongly agreed, 12.5% agreed, 22.7% were moderately agree while 22.7 disagreed and 21.5% strongly disagreed. The students also pointed out lack of internet connection; 26.1% strongly agreed, 13.6% agreed, 27.2% were moderately agree while 14.7% disagreed and 18.1% strongly disagreed.

Table 4.27 Private school student's response on challenges of ICTs usage

Hindering factors	**Strongly Agree**	**Agree**	**Moderately agree**	**Disagree**	**strongly disagree**
1. Lack of enough time to for using ICT.	20	5	30	20	25
2. Fluctuation (interruption) of power supply.	10	20	50	20	0
3. Lack of technical support.	30	10	40	20	0
4. Computers are very old and slow.	15	10	50	10	15
5. Shortage of qualified ICT Teachers.	10	0	10	35	45
6. Teachers lack interest to use ICTs.	5	5	20	50	20
7. Inadequate number of Computers.	10	5	10	25	50
8. Lack of internet connection.	40	10	30	10	10

20% of the students from private school strongly agreed that lack of enough time for using ICT hinder them from using them in class, while 5% agreed, 30% were moderately agree while 20% disagreed and 25% strongly disagreed. Students also sensed that fluctuation (interruption) of power supply in the

teaching and learning process; 10% strongly agreed, 20% agreed, 50% were moderately agree while 20% disagreed and none strongly disagreed.

Students revealed that the computers were very old and slow to access computer and internet in their schools; 15% strongly agreed, 10% agreed, 50% were moderately agree while 10% disagreed and 15% strongly disagreed. More to this, inadequate number of Computers; 10% strongly agreed, 15% agreed, 10% were moderately agree while 25% disagreed and 50% strongly disagreed. The students also pointed out shortage of qualified ICT teachers in their school; 10% strongly agreed, none agreed, 10% were moderately agree while 35% disagreed and 45% strongly disagreed.

Lack of internet connection was a big challenge. 40% strongly agreed, 10% agreed, 30% were moderately agree, 10% disagreed and 10% strongly disagreed. Students revealed teachers lack interest to use ICTs; 5% strongly agreed, 5% agreed, 20% were moderately agree while 50% disagreed and 20% strongly disagreed.

4.7 ICT infrastructure in the schools

The use of ICTs in education is directly dependent on the availability of important ICTs infrastructure which include: computers, electricity power supply and internet connectivity.

4.7.1 Number of computers in the schools

Although the schools have computers, they are too few compared to the users in the Schools. This not only limits the access but it also becomes difficult to rely on them in teaching and learning. The researcher observed that in the computer lab (number of computers are not proportional to students) one computer is for four (4) students in public school while in private school one computer for two (2) students. A total of 60 computers (20 computers per lab) were available, but nearly half of the computers were not functional and there was no lab technician (to maintain the computers) in both public and private schools. As a result, from five up to eight students shared a single computer, which leads many of the students to be passive. In private school there were better access when we compared to public school, but not enough as expected.

Both public and private schools did not have computers in the staffroom. This limits the teachers to use computers to prepare their class presentation. In addition only the private school had a projector.

4.7.2 Internet access in the schools

In both schools (public and private) internet connection were available but, poor or limited Internet connectivity, unreliable networks, internet connection often disrupted by slow connectivity, and frequent electricity power interruption (insufficient power supply) were the serious challenges teachers

and students faced. High-speed internet connection is important in using ICTs in the teaching-learning processes. But unfortunately internet access is very poor.

4.8 When and for what purpose computers and the internet were used by teachers and students

4.8.1 Purpose of Using Computers and internet by teachers and students

When the study conducted, respondents were asked the reasons that they used ICT tools, like computers and internet. Teachers and students used computer and internet for different purposes, such as; preparing exam question, to store students result and for printing. The majority of teachers (75%) used computer for preparing exam, grading students result and for storing student result but, they did not use them for the purpose of teaching in the classroom. Some (5%) teachers used the internet to find new information about the course they deliver, 12.5%; for social purpose, 12.5%. for hearing news. The majority of the teachers did not use computer and the internet.

Most of the students used computer and internet during class time. And they use for different purpose like, for doing assignments, for finding new information, for telegram and other social media, for downloading videos and music, for chatting and entertainment (more than half of respondents).

4.9 Teacher's & student's suggestions on overcoming the challenges faced

Out of 24 respondents; 37.5 % of the teachers suggested that teachers should be trained on how to use ICTs such as computers, internet 23% of teachers suggested that the schools should buy more computers, 54.1% of teachers suggested that students should be ready to use ICTs. Out of 352 student respondents 44.3% suggested that schools should buy enough computers and; 23.5 % of students suggested that the schools should give training for teachers and students on use of ICTs. And some students suggested that schools should buy generator for the case of power fluctuation.

4.10 Administrative practices that influence the use of ICT in the schools

The interviews conducted with the principals had the following outcome. Two of the principals had greater than five years of experience as principals in different schools. They had common challenges like the consistence interruption of power, having poorly equipped computer lab, not having adequate trained teachers, and shortage of ICTs tools; only basic computer skill training was given for teachers but, not that much enough. The principals also noted that they did not have specialized ICT teachers in their schools; the factors that enable use of ICTs was to keep up the students with the latest technologies, to have connection with other world. They suggest ways to use ICTs in the schools such as there should

be adequate trained teachers, there should be specific rooms for ICTs equipped with ICTs tools, there should be consistent availability of electric power, there should be trainings given for teachers and students.

4.11 discussion of the findings

As the results indicated that some of the teachers used only computer but, they did not use other ICTs tools (laptop, videos, projectors and the internet). As the results indicated that some of the students used mobile and the internet but, they did not use computer and laptop. As the findings showed that majority of the private school students used computer, laptop, mobile and the internet. The study revealed that private school students had more access than public school students.

As the results indicated that some of the teachers used computer, laptop, printer and internet but, they did not use videos and projector. The findings revealed that private school teachers used well than public school teachers. As the results indicated, relatively private school teachers were better trained than public school teachers.

Most of the students used computer and internet during the class time. And they used for different purpose like, for doing assignments, for finding new information, for telegram and social media, for downloading videos and music, for chatting and entertaining (more than half of the respondents). The results show in the case of the private secondary school lack of time was the first main factor, power interruption the was the second main factor, poor internet connection the third and inadequate number of computers was the fourth main factors to use ICTs in the teaching-learning process. Whereas in the case of public secondary school inadequate number of computer the first, power interruption the second, lack of time the third and poor internet connection were the fourth main constraints to use ICTs in the teaching-learning processes. The study has revealed that private secondary schools in the Gulele sub-city are better than public secondary schools in ICTs usage.

The use of ICTs in class has the potential to enhance the presentation in class. But there is limited use of ICTs in the secondary schools. The research findings credited this limited use to:

Inadequate number of computers in the schools: The number of computers in the schools was evidently low where 60 computers for 1311 students are available in the public school and 24 computers for 264 students in the private school. This makes them inadequate and inaccessible for use by the teachers and the students. In the literature review Afshari (2009) states that limited access to computers is a barrier to effective use of class.

Poor internet connection: There is low internet connection in the public and private secondary schools. But in the case of the public school the problem was too serious. Frequent interruption of internet connection was the main challenges in public and private secondary school.

It was evident that the use of the internet is mainly used for social communication with friends and search for hearing news from the internet. Only 5% use the internet to find for teaching learning materials. Most of the respondents (70%) have not used internet due to the different factors like interruption of power supply, unreliable internet connection and work load. Jensen (2002) in his research finding had outlined unreliable telecommunications networks form a major hindrance for using ICTs by many people in Africa. This also applies to education.

Insufficient power supply: This was the most serious challenge in the public and private secondary schools in the Gulele sub-city. It had contributed to the slow use of ICTs in the schools. And there were no power backup like Uninterruptible Power System (UPS) in the schools.

Absence of technical support on computer maintenance: This leaves teachers unable to handle computer breakdowns in the absence of technicians in the schools. The teachers and students accepted that there were regular computer failures which interrupt classroom progress. Teachers also lack familiarity with best practice on accepting of how to use ICTs, because of lack of ICT policy in their schools.

The findings of the study revealed that teachers and students were influenced by different factors like shortage of computers, lack of training, time available to use, reliable power supply, and attention given by the administration for the use of ICTs. The novelty in this study are lack of time, workload of teachers and rank the four main factors (these make different from Shihundu). Current utilization of ICTs in secondary school mainly depends on teachers and principals, who require detailed professional development as they lack of knowledge and skills. Afshari et al, (2009) state that professional development is necessary for teachers to enable them to successfully use ICTs to improve student learning. Students see ICTs like fun and entertainment which another enabler to use ICTs. On the other hand, students lack the skills to use computers in their schools and the students reported teacher did not the use computer lab due to continuous power interruption and regular computer failure. Both the public and private schools lack ICT policies that would enable proper use of ICTs in teaching and learning.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

The main purpose of this chapter is to make a conclusion of the findings in light on the objectives of the study and make suggestions and recommendations for possible action and further research. This chapter, therefore, consists of three sections namely; the conclusion of the findings, recommendations and finally suggestions for further studies.

5.2. Conclusion

The use of ICTs in secondary school education, requires computers and the Internet that can facilitate not only delivery of instruction, but also the learning process itself. The use ICTs in education improves teaching and learning at all levels of education. However, some of the ICTs tools were available for teaching and learning process. These include: computers, televisions, videos, projector, whiteboard, laptops and mobiles. The available ICTs tools were inadequate in terms of number or quantity specially computers. Not all the available ICTs were accessible to both teachers and students for teaching and learning process. As the student respondents reported the computer lab was closed frequently, half of the computers always failed, and the period of 40 minutes were not enough. As teacher respondents reported that students have more interest to use ICTs for they see ICTs as fun, entertainment and enjoyable. This is one of the main enabler factor to use ICTs.

The usage of ICTs was influenced by their availability, technical knowledge and skills on how to use ICTs, and the time available to use ICTs. Other factors include: inadequate number of computers, power supply interruption, slow internet connection or access, lack of time or limited to time to use ICTs, workload of teachers, lack of technical support (lab technician), the incentives given by the government, lack of training, lack of ICTs policies and strategic plan. Even though teachers supported the use of ICTs in teaching, but, the majority of teachers (mathematics, English and history) rarely used ICTs except chalk and blackboard.

Lack of ICTs infrastructure and power interruption within secondary schools are a major hindrance to ICTs in a developing country like Ethiopia. Lack of computers and other ICT-supported tools in the classroom can seriously limit the use of ICTs by a teacher and students. Limited resources results in

lack of computer usage, which in turn results in lack of sufficient computer experience for both students and teachers (Afshari et al, (2009)

As the results show in the case of the private secondary school lack of time was the first main factors, power interruption the second, poor internet connection the third and inadequate number of computers the fourth main factors to use ICTs in the teaching-learning process. Whereas in the case of the public secondary school inadequate number of computer the first, power interruption the second, lack of time the third and poor internet connection the fourth main constraints to use ICTs in the teaching- learning processes. The study has revealed that the private secondary school in Gulele sub-city are better than public secondary schools in ICTs usage.

5.3. Recommendations of the study

As indicated in the reviewed literature and part of the study findings, secondary school students in developing countries like Ethiopia are already behind their peers in the developed countries in ICTs usage, thus widening the global digital divide in the use of ICTs.

The following recommendations were made based on the findings of the study:

i. The school administration should familiarize themselves with national ICTs policies to develop school ICTs policy and plan.
ii. The period allocation should be revised (40 minutes, two times per a week which is not enough).
iii. The number of students per computer lab should be minimized not more than 20 students per computer lab.

5.4 Suggestions for further studies

i. Related studies could be carried out in the whole of Ethiopia including the rural area to establish whether or not the findings of this study apply to other areas.
ii. This study was carried out in one sub-city only; a similar study could be carried out in the other sub-cities.
iii. A comparative study can be carried out on the impact of using ICTs in secondary school.

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APPENDICES

APPENDIX A: QUESTIONNAIRES

Addis Ababa University

College of Natural and Computational Sciences

School of Information Science

Questionnaire to be filled by the teachers of public and private secondary schools.

Dear teachers,

I am a Master of Science student in the School of Information Science at Addis Ababa University, currently working on a thesis research on the topic "Factors affecting the current use of ICT in public and private secondary schools in Gulele sub-city" in partial fulfillment of the requirements for the Master's degree. The purpose of this questionnaire is to collect data in order to investigate the factors that affect the use of ICT in the selected public and private secondary schools. Your responses will be more important for this study. I kindly request you to fill this questionnaire carefully. The information that you provide me through the questionnaire would be great importance to the research I am undertaking as well as to your School. The information and your responses that you share with the researcher will be confidential and used for the research purpose only.

Thank you for taking the time to participate in this *Study*

Instructions:

Kindly answer the following questions fully by ticking the appropriate response in one of the box provided. Do not write your names anywhere in this questionnaire. Please be as honest as possible.

SECTION A: DEMOGRAPHIC INFORMATION

1. Sex: Female [ ] 2) Male [ ]

2.Age : 20-30 [ ] 31-40 [ ] 41-50 [ ] Over 51 [ ]

3. Years of service/working experience in the school

Less than 1 year [ ] 2 year [ ] 3 year [ ] 4 year [ ] 5year [ ] more than 5 year [ ]

4. Your highest educational level?

College Diploma [ ] Bachelors‟ degree [ ] master's degree [ ] PhD [ ]

5. Name of school.....

6. Department……

SECTION B: USE OF ICTs.

Directions: Please tick (√) in the box that describes your viewpoint about the usage of ICT tools

7. How often do you use any of the following ICT tools in your class?

4 = Always 3 = Sometimes 2 = Undecided 1 = Rarely 0 = Never

No	ICT tools	4	3	2	1	0
1	Computer					
2	LCD Projector					
3	Videos					
4	Printers					
5	Laptop					

If others (please specify) _____

If you don't use any of the above ICT tools, please specify your reason_____

SECTION C: TRAININGS GIVEN ON PREPARATION AND USE OF ICT.

8.Have you ever received any training on the following programs?

Direction: - Please check all that apply and indicate your answers using a (√) mark

2 = yes 1 = No

No	Programs	*2*	*1*
1	Word processing		
2	MS-excel		
3	MS-access		
4	Power point presentation		
5	Internet browsing		

If others (please specify) _____

SECTION D: **FACTORS THAT DRIVES ICT USAGE**

9.In this section, you are kindly requested to indicate the extent to which the following factors drive the use of ICT in teaching and Learning, where (5= I don't know, 4= none, 3= low 2=medium, 1=high).tick by using "√".

Factors that drive the use of ICT	5	4	3	2	1
1. Teacher's motivation & commitment to use ICT.					
2. The support they experienced in their school.					
3. Availability of ICT infrastructure.					
4. Government support & initiative.					
5. Teachers' attitudes towards the use of ICT					

If other please specify_____

SECTION E: **CHALLENGES FACED IN THE USE OF ICT.**

10. In this section, you are kindly requested to indicate the extent to which the following factors hinder the use of ICT in teaching and Learning.

5= Strongly Agree 4= Agree 3= moderately agree 2= Disagree 1= strongly disagree

Factor	5	4	3	2	1
1. Inadequate number of Computers.					
2. Lack of internet connectivity.					
3. Fluctuation (interruption) of power supply.					
4. High cost of hardware and software.					
5. Computers are very old and slow.					
6. Shortage of qualified ICT Teachers.					
7. Lack of government incentives for Teachers.					
8. Lack of technical support.					
9. Inadequate training on ICT use.					
10. Students lack interest when ICT are used.					
11. Lack of enough time to for using ICT.					
12. Computer illiteracy among teachers and students.					

If any other please specify …….

11. Suggest ways in which the above challenges can be overcome.

……..

……..

12. When and for what purpose you are using computer and internet?

……..

……..

13 .What are the problems hinder you to use computer and internet? And what mechanism you will take to avoid these problems?

……..

……..

……..

Thank you!

APPENDICES

APPENDIX B: QUESTIONNAIRES (STUDENTS)

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2	ላፕቶፕ					
3	ሞባይል					
4	□□□□□□					

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2 =□□ 1 =□□□□□□ (አሎሰድንም)

□.□	□□□□□□ (program)	2	1
1	Word processing		
2	MS-excel		
3	MS-access		
4	Power point presentation		

3.አይሲቲ ለመጠቀም የሚገፋፉ ሁኔታዎች ፣ የሚከተሉት ሁኔታዎች አይሲቲ ለመጠቀም ምን ያህል ይገፋፋሉ?

□□□□□□□□ □□□□ □□□□□ 5= አላውክም 4= ምንም 3= ዝቅተኛ 2= መካከለኛ 1=ከፍተኛ

አሲቲ ለመተከም የሚገፋፉ ሁኔታዎች	5	4	3	2	1
1.የአስተማሪዎች ተነሳስነት እና ቁጠኝነት					
2.አስተማሪዎች ከ/ት/ቤቱ የሚያገኙት ድጋፍ					
3.የአሲቲ መሰረተ ልማት መሟላት					
4.የመንግስት ድጋፍ እና ማበረታቻ					
5.አስተማሪዎች አይሲቲ ለመጠከም ያላቸው አመለካከት					

4. □ይ□□ □□□□□ □□□□ □□□□

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□.□	□□□□	5	4	3	2	1
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8	□□□□□□□ □□□□□					

5. ኮምፒውተር እና ኢንተርኔት የምትጠቀሙት መቼ እና ለምን አገልግሎት ነው?

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6. ኮምፒውተር እና ኢንተርኔት እዳትጠቀሙ ያደረጋቺሁ ችግር ምንድነው? ይህን ችግር ለመፍታት ምን ትጠቀማሏቺሁ?

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APPENDICES

APPENDIX C: INTERVIEW QUESTIONS

Addis Ababa University

College of Natural and Computational Sciences

School of Information Science

Dear school director,

I am a Master of Science student in the School of Information Science at Addis Ababa University, currently working on a thesis research on the topic "Factors affecting the current use of ICT in public and private secondary schools in Gulele sub-city" in partial fulfillment of the requirements for the Master's degree.

The purpose of this interview is to find out the current use of ICTs and challenges that teachers and students are facing in the use of ICTs. You are kindly requested to provide as accurate, genuine and relevant information as much as possible. The information and your responses that you share with the researcher will be confidential and used for the research purpose only.

Thank you very much!

1. Gender: Male [ ] Female [ ]

2. Age: 20-30 [ ] 31-40 [ ] 41-50 [ ] Over 51 [ ]

3. Years of service/working experience in the school

Less than 1 year [ ] 2 year [ ] 3 year [ ] 4 year [ ] 5 year [ ] more than 4. Year [ ]

5. Your highest educational level?

College Diploma [ ] Bachelors‟ degree [ ] master's degree [ ] PhD [ ]

6. What are the administrative challenges you are experiencing in your school as regards the use of ICT?

7. Does your school have ICT policy and plan?

8. How well is the school equipped with ICTs for use in the teaching and learning process?

9. To what extent are your teachers trained to use some of the ICT?

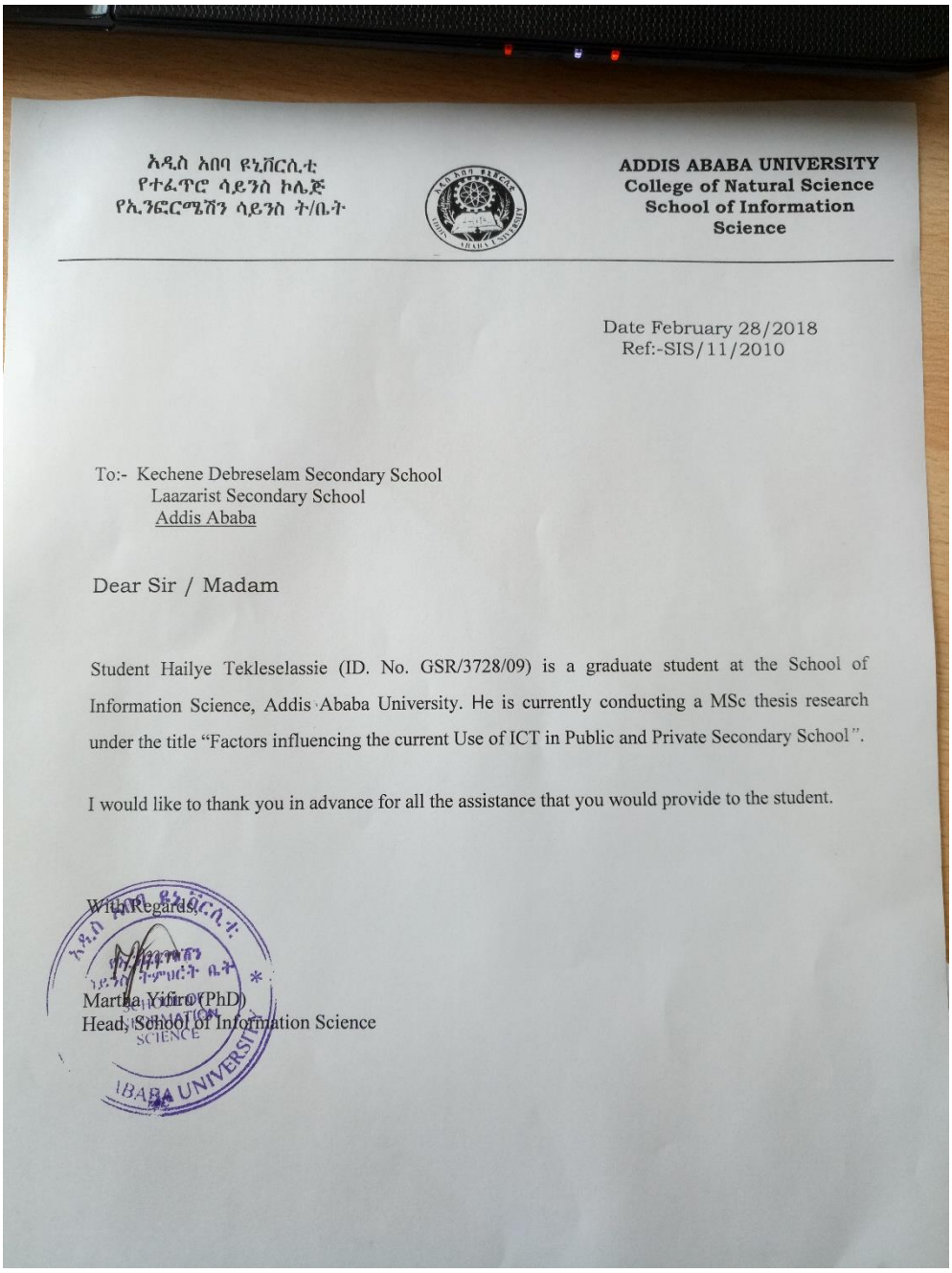
10. What are the factors that enable to use ICT?

11. What are the challenges hindering the effective utilization of ICT?

12. What are the possible ways to ensure the effective utilization of ICTs in school?

Thank you for your co-operation!

APPENDIX D: PERMISSION LETTER



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የተፈጥሮ ሳይንስ ኮሌጅ
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ADDIS ABABA UNIVERSITY
College of Natural Science
School of Information Science

Date February 28/2018
Ref:-SIS/11/2010

To:- Kechene Debreselam Secondary School
Laazarist Secondary School
Addis Ababa

Dear Sir / Madam

Student Hailye Tekleselassie (ID. No. GSR/3728/09) is a graduate student at the School of Information Science, Addis Ababa University. He is currently conducting a MSc thesis research under the title "Factors influencing the current Use of ICT in Public and Private Secondary School".

I would like to thank you in advance for all the assistance that you would provide to the student.

With Regards,

Martha Yifiru (PhD)
Head, School of Information Science