



**Addis Ababa University**  
**School of Graduate Studies**  
**Institute of Educational Research**

**The Status and Utilization of ICT in Sebeta College of Teachers Education  
and its Challenges**

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Addis Ababa, Ethiopia

January 2015

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A Thesis Submitted to Institute of Educational Research for the Partial Fulfillment  
of the Requirements for the Degree of Masters of Art in Educational Research.

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This is to certify that the thesis prepared by Belay Ejigu, entitled: *The Status and Utilization of Information Communication Technology in Sebeta College of Teachers Education and its Challenges* and submitted in partial fulfillment of the requirements for a degree of Masters of Arts (Educational Research) complies with the regulations of the university and meets to accepted standards with respect to originality and quality.

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## **Abbreviations and Acronyms**

ADHD	Attention-Deficit/Hyperactivity Disorder
ARM	Annual Review Meeting
ARPA	Advanced Research Projects Agency
CAI	Computer Assisted Instruction
CD-ROM	Compact Disk - Read Only Memory
ECA	United Nations Economic Commission for Africa
EFA	Education for All
EICTDA	Ethiopian ICT Development Agency
EMIS	Education Management Information System
ESDP	Education Sector Development Program
FDRE	Federal Democratic Republic of Ethiopia
GEQIP	General Education Quality Improvement Package
HEI	Higher Education Institution
ICT	Information and Communication Technology
ICT4D	Information Communication Technology for Development
ICT4E	Information Communication Technology for Education
IT	Information Technology
LCE	Learner-Centered Education
MCIT	Ministry of Communications and Information Technology
MDG	Millennium Development Goal
M&E	Monitoring and Evaluation
MoE	Ministry of Education
MS	Microsoft
NEPAD	New Partnership for Africa's Development
NICTP	National Information Communication Technology Policy
OECD	Organization for Economic Cooperation and Development
OLPC	One Laptop per Child
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PSEP	Post-Secondary Education Project

REB	Regional Education Bureaus
SCTE	Sebeta College of Teachers Education
TESO	Teacher Education System Overhaul
TGEB	Town Government Education Bureau
TV	Television
TVET	Technical Vocational and Educational Training
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
U.S.A	United states of America
VSAT	Very Small Aperture Terminal
WEO	Woreda Educational Officers
WSIS	World Summit on the Information Society

## ABSTRACT

*The purpose of this study was to assess the status and utilization of information communication technology in Sebeta College of Teachers Education and its challenges. It stresses how ICT helps in improving the quality of education. It is stating that information and communication technology is an important instrument that can transfer the present isolated, teacher-centered and book-centered learning environment into a student-centered environment. Mixed method approach was employed in the study. Questionnaires, interviews, and a personal observation were used in order to get pertinent data. The research identified that the current status of ICT in Sebeta College of Teachers Education is at its infant stage. No ICT policy at work is found in the College. As the findings showed, unavailability of some ICT tools, inconsistent technology usage (computer virus, poor internet connection) and fluctuating of electricity made ICT more unproductive in improving the quality of education. Moreover, the result of the study indicated that there are several factors that hinder the implementation of ICT at the College. These include infrastructure problem, lack of motivations, lack of ICT skill and of training facilities, lack of administrative management and technical support and resistance of individuals to change. Based on the findings of the study, conclusions were drawn and recommendations were forwarded.*

## **CHAPTER ONE**

### **INTRODUCTION**

This chapter deals with the general introduction part of the paper which focuses on the concept and base of the study. It comprises the background, statement of the problem, objectives, research questions, significances, scope, limitations, operational definitions and organization of the study.

#### **1.1. Background of the Study**

Education is a very socially oriented activity and quality of education has traditionally been associated with strong teachers having high degrees of personal contact with learners (Daniels 2002). The use of ICT in education lends itself to more student-centered learning settings. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21<sup>st</sup> century. Effective use of ICT for education, along with ICT use in the teaching learning process can enhance quality and accessibility of education; learning motivation and learning environment.

Modern economies are in the process of being transformed from agricultural and industrial economies to information and knowledge-based economies. Such rapid transformation has had significant impact on the social, economic, political and cultural dimensions of development across the world. For such development and growth, Information and Communication Technology (ICT) is seen as a driver and an enabler towards establishing and developing the various sectors in an economy that contribute to stronger, more developed and richer societies. During any such transformational passage, the leaders of a society and policy makers are likely to undergo a paradigm shift that involve developing their capacity and providing tools and direction for accepting such changes in mind-sets (Duncan & Sonail, 2012). Education is conceived as a powerful agency, which is instrumental in bringing about the desired changes in the social and cultural life of a nation.

The development of a country has positive linkage with education, because education is believed to be one of the most important factors for the wellbeing of a country. In relation to this, Transitional Government of Ethiopia in the Education and Training Policy stated that education is a process by which man transmits his experience, new findings and values accumulated through years in his struggle for survival and development. It enables individuals and society to

make all rounded participation in the development process (ESDP-III) 2005/2006 – 2010 /2011(MoE, 2005).

The Government of Ethiopia has placed importance on Information Communication Technology for Education (ICT4E) for national development. Both the national Information Communication Technology for Development (ICT4D) 2010 Plan and ICT in Education Implementation Strategy recognize ICT as an enabler for widening access to education for the Ethiopian population (Hare, 2007) and for facilitating educational delivery and training at all levels. Thus, in its five years policy action plan (2006 – 2010), the Ethiopian Ministry of Capacity Building stated that the government is committed to addressing the nation's human resource requirements in the area of ICTs through the promotion of mass ICT literacy and training. This is aimed at increasing the use of ICTs in educational institutions as well as implementing initiatives aimed at connecting schools and higher educational institutions to online resources. ICT related technologies are being deployed to support learning at different levels of the educational system (Getahun, 2006).

The Government's current vision for education development is described in the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), with the ESDP IV serving as the overarching framework, giving high priority to quality improvement at all levels. Within the framework of the ESDP III, the MoE has developed a General Education Quality Improvement Package (GEQIP). A key recommendation of the education sector Annual Review Meeting (ARM) 2007 is that MoE and Development Partners (DPs) work together to implement the GEQIP through a pooled funding mechanism (MoE, 2007).

In provision of quality of education, the use of information and communication technologies (ICT) in education is no longer optional. A substantial change in society and individuals has occurred thanks to development in ICT, its penetration into the structures of production, knowledge management, communication and culture, the demand for new skills and competencies. In addition, there has been a change in ways of approaching and understanding the world and development of new industries. For all these reasons, schools, countries and regions are compelled to develop new initiatives that incorporate ICT tools in teaching and learning, so that education systems can succeed in linking the new demands of the knowledge society with the new characteristics of learners (Kozma, 2005).

Historically, long-established customs found in schools that society has traditionally believed appropriate instruction in education was conventional or traditional instruction which was simple oral reading. Conventional means of instructions were the teacher, the textbooks, and the chalk with board. In traditional teacher-centered methods of teaching, books, paper, pens, and pencils were the essential means for accessing, communicating, and sharing information (Beck & Robert, 2009).

The other instruction in education is progressive or modern instructional education (the education approaches based on development), or alternative education (Beck & Robert, 2009). Instructional technology is student-centered instruction that deals with ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources (Richey, 2008).

To use ICT in educational activities, integrating ICT tools into the curriculum and adapting pedagogy according to the social environment are necessary for achieving qualitative improvements in learning (Kremer and Holla, 2008; Sreekumar and Sanchez, 2008; Barret, 2009; Gurumurthy, 2009). Kremer and Holla argue that pedagogical innovations that work around the distortions in educational systems can improve student achievement at low cost. Technology-assisted learning or standardized lessons can mitigate weaknesses in teaching and substantially improve test scores. The general impression is that integrating ICT in learning and teaching is a very valuable asset in the process of learning, appealing to many aspects of students' learning, and hence, a vital necessity for adoption in education. This impression has been resounded by many scholars and studies.

Amy, Baylor, and Ritchie (2002) argue that the way in which ICT is used in the classroom is a critical measure of its success. They state that it is becoming increasingly clear that ICT, in and of itself, does not directly change teaching or learning. Rather, the critical element is how ICT is incorporated into instruction. The researcher believes that these and other perceived challenges of ICT integration by different scholars raise questions on the nature of ICT integration processes in institutions and hence a need for formatively evaluating them ,so that the benefits of ICT in education quality was maximally realized.

## **1.2. Statement of the Problem**

Information and communication technology (ICT) is a force that has changed many aspects of the way we live. If one was to compare such fields like medicine, tourism, travel business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous. The way these fields operate today is vastly different from the ways they operated in the past. But when one looks at education, there seems to have been an uncanny lack of influence and far less change than other fields have experienced.

As it was stated by Rahel (2010), incorporating the learning styles of students in the teaching learning process makes learning easier for students to enhance their interest and understanding. The implementation of educational technology and the preparation and utilization of ICT is an important component here. It was important to understand that computer-assisted technologies provide students with some readiness to learn, where by using ICT tools is one of the methods or materials used to bridge the existing gap and promote independent and active learning. However, there is a doubt that the courses given at colleges of teachers' education in general and specifically on the employment of the ICT or the outcome out of it have not been up to where it should be expected.

According to study made by Mirressa (2007) on the usage of information communication technology in a higher education institute, there is a common situation where most of the staff members have the awareness and access towards it. However, he continued to set that his findings come with some doubt whereby the awareness of the staff members does not guarantee the integration of ICT into the teaching-learning system.

While examining the condition of the implementation of ICT in colleges of teachers' education in preparing and using e-lessons, the usage of educational technology in general and the usage of ICT in particular were outlined because they are the basic pillars in seeing whether the available infrastructure and trainings given are up to how they are supposed to be. Access to and the status of the available ICT related technologies were also examined. In general, how effectively using ICT in teaching - learning process for achieving quality of education had been employed. Therefore, in this study an attempt had been made to assess the overall effectiveness of the practices of ICT in teaching - learning process for achieving quality of education and challenges which hold back the use of ICT in Sebeta Teachers College of Education.

### **1.3. Research Questions**

In view of all of the above statement of the problem, the following research questions have been considered with the aim of examining the problems critically and look for potential solutions and suggest them on the way:

1. What are the status and the current usage of ICT in Sebeta College of Teachers Education (SCTE)?
2. What are the challenges encountered in using ICT in Sebeta College of Teachers Education?
3. What are the factors that enable or hinder the usage of ICT in Sebeta College of Teachers Education?
4. How can stakeholders such as students, instructors and educational administrators use educational technologies for better implementation of ICT to improve quality of education?

### **1.4. Objectives of the Study**

#### **1.4.1. General objective**

The main objective of this study is to assess the status and utilization of ICT in Sebeta College of Teachers Education and its Challenges.

#### **1.4.2 Specific objectives**

- To identify the integration of ICT into the learning process as a way to improve the quality of education.
- To identify factors that enable or hinder the usage of ICT in Sebeta College of Teachers Education?
- To assess challenges encountered in using ICT in achieving quality of education in Sebeta College of Teachers education.
- To identify whether the teaching learning processes in Sebeta College of Teachers Education are utilizing ICT resources effectively.

### **1.5. Significances of the Study**

The result of this study has the following significances:

- To a gradual improvement of the quality, scope and depth of the learning environment, as well as to provide a remarkable opportunity for teachers' development.
- Teacher Training Institutes may get more insights about the use of ICTs in the teaching-learning process.
- Since curriculum designing involves the provision of learning experience to achieve stated objectives, the result of the study may indicate, especially to those curriculum specialist involved in the teacher training institutions, what kind of learning experience should trainee teachers be provided with good quality of education by using ICT.
- Since teacher professional development includes training in the adaptation to the evolution of change of the profession of teachers and managers of education systems, the study may provide hint to equip teachers not just with basic ICT skills, but should encourage the evolution towards integrating technologies into teaching subjects and practices.

### **1.6. Scope of the Study**

There are ten colleges of teachers' education in Oromia regional administrative state. However, this study is delimited to Sebeta College of Teachers' Education. The study could give more wide-ranging information if it covered all of the ten colleges of teachers' education in Oromia regional state. But, due to limitations of financial and other resources, the study has been delimited to Sebeta College of Teachers' Education only. For this study, Natural, Social and Language streams have been included. This is to include all the streams found in the College.

### **1.7. Limitations of the Study**

Some of the limitations faced during the study were that the unavailability of college administrations during appointments and at office hours that affected the on time collection of necessary data. The other limitation of the study was that it was conducted on one College (SCTE) and except Fiche College of Teachers Education other Colleges were not included in the study.

## 1.8. Operational Definition of Terms

The terms used in this study may convey a different interpretation in a different context. So, to avoid some possible confusion, the following are operational definitions of some of the terms used in this study.

- **Electronic learning (E-learning)** – Is an electronically supported learning and teaching, which can be networked learning or not, and serve as specific media to implement the learning process.
- **Information Communication Technology (ICT)** – Information and communication technology is used as 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 associated with them, such as videoconferencing and distance learning.
- **Information Communication Technology for Education (ICT4E)** – ICT for Education (ICT4E) is a subset of the ICT4D that has a collaborative learning network linking humanitarian agencies to technology and the benefits it provides to achieve improvement of the educational situation.

## 1.9. Organization of the Study

This study has five chapters. The first chapter of the study includes the introduction part that contains background of the study, statement of the problem, objectives of the study, research questions, and significances of the study, operational definition of terms, scope and limitations of the study.

The second chapter provides a review of literature on overview of Ethiopian education system, what information communication technologies are, general education quality improvement packages (GEQIP) in Ethiopia, Ethiopian national ICT policy, information communication technologies and theories of learning, the roles of information and communication technologies in education, facilitating and inhibiting factors in using information technologies in education, E-school or e-learning initiatives in Ethiopia, the roles of teachers, students and college governing bodies in integrating ICTs in education and ICT in learner-centered education.

The third chapter covers the research setting, the conceptual model of the study, the research design, and participants of the study. This section also presents information on data collection instruments, validity and reliability of data collection instruments and data analysis

techniques used in the study. Finally, the chapter concludes with procedures of the study and ethical consideration.

The fourth chapter presents the results of the analyzed data of the study. It includes analysis and discussion results of the findings. The last chapter covers the summary, conclusions, recommendations and implications for future research.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

This chapter includes views of different writers and philosophers on the different aspects of role of information communication technology in realizing quality of education. Facilitating and inhibiting factors in using ICT in education, e-learning initiatives in Ethiopia, the roles of teachers, students and college governing bodies in integrating information communication technologies in education and ICT in learner-centered education were synthesized. An attempt was also made to see other countries experience and the Ethiopian context.

#### **2.1. Overview of Ethiopian Education System**

The Federal Democratic Republic of Ethiopia has proposed different plans for education through MoE under its Education Sector Development Programs (I, II, III, and IV). In an Action Plan of ESDP I (MoE,1998), which was launched in September1998, it was indicated that the expansion of higher education during Education Sector Development Programs I will be limited to meeting the immediate needs of the country for educators, engineers, health workers, and public administrators. Universities will be required to become fully efficient before they expand their facilities. However, nothing was mentioned about ICT in any part of the ESDP I document. In ESDP II (MoE,2002), the plan about the introduction of Information Communication Technology (ICT) in the secondary schools was intended to be a major undertaking in between 2002/3 and 2004/5. A financial management system for improving the efficiency of the higher education institutions was also intended to be developed and implemented, though there was little said about the development of ICT infrastructure in higher education and under sub-section of Education Sector Development Programs II, it was planned that necessary additional infrastructure like classrooms, laboratories, computer centers, workshops etc. would be constructed.

ESDP-III program action plan was intended to be covered between 2005/2006–2010/2011. ESDP III was planned to enhance the quality of education at secondary level, ICT infrastructures were planned to be provided to schools to receive satellite education transmission (MoE, 2005). Moreover, with the objective of improving the quality of education and supporting teachers, the process started to make use of School Net service for the 161 preparatory schools (grades 11-12). The objective of the School Net program was to support the country's education system with ICT which involved providing personal computers to schools to set-up internet

laboratories, organizing training for teachers, digitization of existing video-based educational contents for web access and eventually facilitating community access to ICT. Fiber cable institutional networking was being provided in higher education institutions and secondary schools are provided with necessary ICT infrastructure to receive satellite education transmissions in six subjects (MoE, 2005).

Moreover, the facilitation of Internet laboratories in high schools was also underway which was believed to bring about improvements in the quality of education, as it would enable students to utilize on-line and electronic libraries and information. It would also assist the professional development of teachers. As to teachers' ICT literacy, Information Communication Technology had been put as an independent course in the newly designed Teacher Education System Overhaul (TESO) courses where teachers would be introduced to ICT through pre-service and in-service training programs (MoE, 2005).

The two priorities under ESDP IV were also given to improve the quality of general education and to increase access and equity where the quality improvement program integrated core priorities such as “teacher and leader development” and “Information and Communication Technologies ” (ICT). There were many challenges which were stated and one of them was the low level of confidence amongst a number of teachers on the benefits of ICT. In order to improve the quality of teaching and learning, it was necessary to go beyond the provision of more ICT infrastructure (MoE, 2010).

Through these, the development of an e-learning culture among students and teachers was envisioned. The technical capacity in maintenance of ICT equipment at regional level was also planned to be expanded (MoE, 2010). The development and implementation of a technology responsive ICT national curriculum for primary, secondary and higher education as well as for other educational institutions as also under way with the where the curriculum was developed as a start.

In general, modern education was introduced to Ethiopia nearly a century ago. However, the education and training offered during these long years had limited positive impact on the lives of the people and national development. During both the initial phase and it's the more planned and coordinated expansion of modern education after 1941, the primary objective of education in our country had been to produce trained manpower that could run the emergent government bureaucracy. According to MoE 2002, after a certain grade level, the ambition of the

student population was largely to secure government employment. Limited vocational education was introduced both at high school and college levels during the 1950s and 1960s. The education of the time nonetheless did little to change trainees' outlook or help them break the cycle of dependency on the government for employment and develop a capacity to create their own jobs in the private sector. Moreover, it can be safely said that in all these long years, there was never as such a clear policy by which to evaluate and accordingly shape the direction of education and training in Ethiopia.

Hence, as a result of the lack of clear and coherent direction and other problems related with the very social order, the majority of the people of Ethiopia were not beneficiaries of the advantages of modern education. It has now been many years since the transitional government, recognizing this fundamental problem, launched and began to implement the 1994 new education and training policy. Since a policy statement never spells out all the elements factored in its formulation, but only indicates the salient strategic directions and objectives couched in the concept-laden language of short phrases, it is difficult to grasp its basic rationale. The 1994 education and training policy statement is no exception to this general truth. In fact, the inadequacy of all previous work done to raise public awareness of the education policy has compounded the problem. As a result, numerous accurate and inaccurate statements regarding the policy are heard from time to time. Education is all about people. It is, therefore, imperative that students, teachers, parents, and the public in general have a firm grasp of the essence of the policy.

## **2.2. What are Information Communication Technologies?**

Anderson and Glen (2003) define ICT as those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (e.g. computers and other devices); software applications; and connectivity (e.g. access to the Internet, local networking infrastructure, and video-conferencing). According to UNESCO (2002) information and communication technology (ICT) may be regarded as the combination of 'Informatics technology' with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and

CD ROMs, etc. have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007).

Adeya (2002) in a United Nations Economic Commission (ECA) report, states that ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centers, commercial information providers, network-based information services, and other related information and communication activities. He simplified the definition by describing ICT as an 'electronic means of capturing, processing, storing and disseminating information. Alemna and Sam (2006) quoting Bartlett (2002), state that 'ICT refers to systems for producing, storing, sending and retrieving digital files'. ICT can thus be described as a diverse set of technological tools and resources used for creating, storing, managing and communicating information electronically.

Pelgrum and Law (2003) state that near the end of the 1980s, the term 'computers' was replaced by 'IT' (information technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term 'ICT' (information and communication technology) around 1992, when e-mail started to become available to the general public (Pelgrum and Law, 2003).

Generally, ICT is a tool that any sector can use to deliver its services. The ICT revolution has turned the whole planet into a 'Global Village' where communication among people has become independent of physical distance and time. ICTs, especially the Internet in which they all converge as a huge network, are transforming all human activities that depend on information, including library services. In this digital era therefore, the most appropriate technology used by libraries to enhance information provision is ICT. According to different studies above ICT has several definitions depending on the nature of its use and ICT (information and communication technology) is used as 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 associated with them, such as videoconferencing and distance learning.

Information and Communication Technologies (ICT) can be an extremely powerful enabler in efforts to bring positive and sustainable development to countries around the globe. Today almost a full decade into the 21<sup>st</sup> century, we live within an extraordinary revolution in the

advancement of ICT. We are also, however, surrounded by widespread poverty, and social and economic inequalities are the norm. Considered as a powerful tool to promote social and economic development, education has become a primary focus of the recently artificial Information and Communication Technologies for Development (ICTD) community, especially in the Least Developed Countries. One way of ensuring equitable development targeted at the very poorest is through universal social protection, including education, health and income (Help Age International, 2005).

Young people today live in a world are characterized by dramatic cultural, economic, social and educational differences; individual circumstances depend largely on where a person is born and raised. More than 800 million adults (two-thirds of them women) still lack basic literacy skills; at the other end of the spectrum, the use of information and communication technologies (ICT) is skyrocketing. Notwithstanding the immense diversity in living environments, an unprecedented and unifying global media culture has developed that challenges and often surpasses such traditional forms of socialization as family and school (Robins and Webster, 1999).

According to Beck (2003), this complex cultural situation in which young people are struggling to find direction in their lives or simply to survive, to improve their living conditions, and to develop their identities has been given various names. Some call it the information or informational age, while others prefer the term techno culture or techno capitalism, global media culture, or simply globalization, referring to the dialectic process in which the global and the local exist as “combined and mutually implicating principles”. Labels such as post-industrial, virtual and cyber society are also in use. The idea behind all these terms is that across the globe, ICT are playing a central role in young people’s lives and in society at large.

According to Castells (2001), the two major assumptions underlie the role of ICT are the proliferation of these technologies that is causing rapid transformations in all areas of life and function of ICT to unify and standardize culture. It is on the basis of these assumptions that the term “media culture”, incorporating the phenomena of information and globalization, is used in the present stage.

World War II, during the 1940s played a significant role in the development of the field of information technology (Lin, 1995). That is, World War II which created an enormous instructional problem: thousands of military personnel had to be trained rapidly to perform

thousands of tasks critical to their own survival and the success of the war effort. As response to this, the U.S. government produced and purchased several hundred training films, slide projectors, audio recording and playback equipment, equipment simulators, and the newly invented overhead projector. Since then, the administrators of school learning resource centers have tried their best to equip their institution with all materials used in teaching and learning, whether printed, auditory, visual, tactile, or a combination of these (Lin, 1995).

After World War II, the climate in the United States was one of fear that the country would be attacked by Russia. During the Cold War era, the fear of being attacked became even more prevalent. As a result, the Advanced Research Projects Agency (ARPA) of the Pentagon began to develop a way for different computers within the government to communicate with each other if the country was attacked and/or if one of the computers was destroyed due to an attack. The result was the ARPA net, which became available in 1969 and was the precursor of the modern day Internet (Lin, 1995).

There are various definitions given to e-learning by different authors. For instance, New Zealand Ministry of Education (2004) defined e-learning, as a learning technique that supported by the digital technologies and contents. This learning mechanism includes online interaction among the teacher and the learner (student). E-learning is usually accessed through the Internet and CD-ROM. In addition, according to Capper (2001), e-learning is defined as individualized instruction delivered over public (Internet) or private (Intranet) computer networks. As a result, it was first called 'internet-based training' then 'web-based training'.

### **2.3. General Education Quality Improvement Package (GEQIP) in Ethiopia**

The Ministry of Education of Ethiopia, in different scenarios has stressed the importance of strengthening human resource capacity and achievement of the MDGs, of which education is a key element, is a cornerstone of the Government development strategy. The package which was launched by MoE, namely General Education Quality Improvement Package (GEQIP), in November 2008, is part of the whole process which has strengthened the basement of the strategy (MoE, 2008). The MoE (2008) planned to strengthen the existing education system, under the first phase of the GEQIP, through a combination of capacity development for policy analysis and planning; renewal, renovation, repair and ongoing maintenance of IT infrastructure at the federal, regional and Woreda levels; and several enhancement initiatives that will make education information more accessible and relevant. This sub-component would support MoE

and Regional Education Bureaus (REBs) to strengthen the existing education management information systems; and build the capacity for policy analysis and planning of the MoE in order to improve education provision.

The package touches teachers' education institutes by equipping them with practicum offices to better organize school placements and supervision/M&E and with student teacher ICT resource centers (MoE, 2008). MoE tried to pin point the possible constraints and drawbacks in the process which affect Education Management Information System (EMIS) operations and data analysis and application as they were undermined by inadequate IT equipment at all levels and by poor communication lines between REBs and the center. Related with infrastructure, the federal ICT infrastructure was in the process of being upgraded with \$500,000 under a separate project Post-Secondary Education Project (PSEP); this subcomponent was planned to support additional upgrading, including a data center and an ICT training center (MoE, 2008).

#### **2.4. Ethiopian National ICT Policy (NICTP)**

Ministry of Communications and Information Technology (MCIT) of Ethiopia is responsible for the National ICT policy. MCIT (2010) indicated that Ethiopia's Information and Communication Technology (ICT) policy is an integral part of the country's larger development goals and objectives setting the goal is to rapidly transform the country's subsistence agricultural-based economy and society into a predominantly knowledge- and information-based economy and society. The focal point of the policy being on the country's ICT development process, the Government of Ethiopia has developed multiple policies, most notable of which are the National ICT Strategic Plan and the ICT4D Action Plan for the year 2006-2010. The broad ICT sector policy of the Ethiopian government that derives from Plan for Accelerated and Sustained Development to End Poverty (PASDEP), as developed in 2006 by the Ethiopian ICT Development Agency (EICTDA). The policy aims to:

- Develop ICT as a globally competitive industry, and as an engine of national growth;
- Create the necessary conditions for the rapid development of ICT within the economy and society to accelerate Ethiopia's socio-economic development process;
- Promote and facilitate an extensive use of ICT in support of key sectors of the economy including agriculture, industry and the services sectors;
- Transform Ethiopia into a knowledge and information-based society and economy; and promote the use of ICT for modernizing the civil and public service to enhance

its efficiency and effectiveness for service delivery, to promote good governance and reduce wastage of scarce resources (MCIT, 2010).

Former Minister of Capacity Building of Ethiopia, His Excellency Ato Tefera Walua (2006), has delivered a speech at the 1<sup>st</sup> International Conference on ICT for Development, Education, and Training in Africa held in May, 2006, in Addis Ababa, Ethiopia. In his speech, he has mentioned that Ethiopia has been actively engaged in using ICT as an enabler for democratic governance, development, and to integrate technology into the education system where the government considers ICT as a tool in its efforts to transform the society.

According to the Higher Education Proclamation, No. 650/2009, (FDRE, 2009), the objectives of higher education are to prepare knowledgeable, skilled, and attitudinally mature graduates in numbers with demand-based proportional balance of fields and disciplines so that the country shall become internationally competitive. Besides this, it has also an objective of promoting and enhancing research focusing on knowledge and technology transfer consistent with the country's priority needs.

The Ministry of education is expected, according to the proclamation (FDRE, 2009), to encourage government organizations, professional associations, business organizations, and other appropriate persons to work jointly on matters concerning education, training, research, practicum or apprenticeship and research and technology transfer. His Excellency Tefera (2006) further mentioned that information and communication technologies have drastically changed the way individuals, organizations, and enterprises think and do business. The development of e-medicine and e-education in the higher education system is the other important point where he attached due considerations as the development of e-medicine and e-learning infrastructures will make great contribution in order to have skilled manpower.

A year before this conference, the former Prime Minister Meles Zenawi of Ethiopia noted the importance of ICT while speaking to an ICT conference in Addis Ababa in 2005 by saying:

*“We were convinced that we should invest every currency we have on securing the next meal for our people. We did not believe serious investment in ICT had anything to do with facing the challenges of poverty that kills. Now I think we know better. We recognize that it is a vital and essential tool for fighting poverty for beating poverty that kills*

– *and ensuring our survival.*” Meles (as cited in Farrell and Isaacs, 2007: 4).

Besides the documents prepared by the government and practical efforts being practiced, the above statements also show how much is the government convinced and dedicated in using the ICT or technology in general in the poverty eradication and development process and in education specifically. Education can be regarded as one of the most important sectors among many sectors in which ICT is used. As it was mentioned by Takeuchi (2008) about ICTs for Development in Ethiopia, ICT’s application is significant in the buildup of e-government initiatives which include e-Administration, e-Society, e-Services, and e-Citizens. This is further described in the case of Ethiopia, the e-government projects such as the SchoolNet (distance education), HealthNet (telemedicine), AgriNet (agricultural information sharing) are classified as e-Services, which aim to provide better public services, while the WoredaNet (TV conference between the central and local public offices) is categorized into e-Administration which aims to improve work processes in the public offices.

Both the Millennium Development Goals (MDGs) and Education for All (EFA) underline the importance of education is a focal point of development considering it as the (UN 2004) and (UNESCO 2007). ICT4D projects in Ethiopia include SchoolNet, WoredaNet, AgriNet, HealthNet, EtherNet, and RevenueNet. Of these, SchoolNet and EtherNet concentrate on education. SchoolNet plans to connect more than 550 high schools in the country with Very Small Aperture Terminal (VSAT) based broadband for delivery of video-based distance and standardized education. EtherNet is connecting all public higher learning institutions at campus, local institutional, regional and national levels.

According to a study made for University of Manchester by Takeuchi (2008), though the ICT use in Ethiopia is lower level than other countries; it seems that the situation has been improving recently which is somehow depicted by the number of the Internet users that has increased more than twenty times in the last decade. A study made ten years earlier than that by Mulat and Tadesse (2002) showed that Institutions with Internet connection mainly used the technology for e-mail and there was no widespread practice of downloading/uploading information. The use of Internet for education purpose or procurement of material was not reported by the majority of the institutions that have the connection.

There are various purposes and reasons for adopting e-learning in HEIs throughout the globe. For instance, Govindasamy (2002) states that, many HEIs adopt e-learning as a means of solving the reliable learning and operation problems, while other higher institutions simply adopt e-learning because others adopt it or they do not want to be left behind others. Regardless of the different reasons for adopting e-learning in the HEIs, e-learning has supported to transform learning and this can be interpreted into various contexts, such as online learning, network learning and distance learning (Wilson 2001). Moreover, e-learning is used to support the processes of teaching learning process. It has been firmly established as having an important and ongoing role in the delivery of education and training using digital technologies (McLean 2001; Sharpe & Benfield 2005; Australian Flexible Learning Framework Survey, 2005).

E-learning encompasses more than online learning, virtual learning, distributed learning, networked or web-based learning. As the letter “e” in e-learning stands for the word “electronic”, e-learning would incorporate all educational activities that are carried out by individuals or groups working online or offline, and synchronously or asynchronously via networked or stand-alone computers and other electronic devices (Romiszowski, 2004).

The rapid growth in ICT is the major driving forces of globalized and knowledge-based societies in the globe. They will have a profound impact on various functions like teaching and learning and others. The revolutionary change which is taking place in Information and Communication Technologies (ICTs) has various dramatic effects on the way HEIs carry out their functions of teaching, learning and research, particularly on the creation, dissemination and application of knowledge. These developments pose unprecedented challenges to HEIs in developing countries (Herselman and Hay, 2003).

## **2.5. Theories of learning and instructional technology in education.**

According to behaviorist learning theory by Skinner (1974), a learner will gradually develop patterns of responses to specific stimuli when such responses are followed by a particular reinforcement. However under the paradigm of cognitivist a learner’s mind is perceived to contain components of short term and long term memories, plus a working memory (Jackie J.F.Hsu, Der Thanq Chenand David, 2000). The assumption is that learning is about how information is received, processed and started in these memory components. Under the framework of behaviorism and cognitivist the major roles of the teacher is as information provider and the student’s role is as information receiver. Subsequently, the teacher must plan

sequential and structured activities to achieve objectives and finally the teacher should plan tests with specific expected outcomes to evaluate students' achievement.

In relation to the above learning theories, the computer plays traditional role acting like a tutor by providing a learning environment. In performing the tutor's role, the computer may be used to deliver instructions, reinforce practice and provide feedback. Using the concepts of the computer as a tutor, Education Technology Department has developed educational software that can be classified in to different modes such as drill and practice, simulations, instructional games and electronic book. These modes can provide for different types of students' skills. The instructional materials have been prepared by teachers who have undergone training under the Education Technology Department in developing multimedia interactive modules. Teachers can then better select the specific computer activity they need to support their instructional objectives through integration strategies.

Traditional theories of learning such as a behaviorism and cognitivist have dominated educational practices for decades and focused on the outcomes of learning. However the other paradigm of educational schools of thought the constructivist raises the importance of knowledge construction process. The constructivist paradigm as advocated by Piaget (1981) and Bruner (1990), stresses that whatever gets into the mind has to be constructed by the individual through knowledge discovery. By using the theory of constructivism the teacher's role is no longer as a knowledge or information provider. Rather the teacher is a facilitator and a coach to assist students to model learning using various strategies and to inspire students in playing with ideas and manipulating information they have gathered (JackieJ.F. Hsu, Der Thanq Chen and David, 2000).

In integrating technology by using this learning theories, the computer can play a significant role in either being used as a tool or providing access to instructional materials. When integrated with lessons, a teacher can use technology as an informative tool in order to provide information for the students to manipulate and from which knowledge can be constructed. Students use the informative tools such as multimedia encyclopedia or resources available on the Internet (Pusat Perkembangan Kurikulum, 2001). During the knowledge construction process, students develop various important complex skills such as searching, assessing or integrating relevant information. Using ICT as a communicative tool will enable easy communication between the teacher and the students or among students beyond the physical barrier (either by

space, time or both) of the classroom. Communicative tools include e-mail, electronic bulletin boards, chat and electronic white boards.

Active and collaborative learning are well known as alternative strategies to conventional teaching models (e.g. Kaufman, Sutow & Dunn, 1997; Prince, 2004). In particular, active and collaborative practices in ICT (information and communication technologies) classrooms are an emerging branch of the learning sciences concerned with studying how people can learn together with the help of computers. The pedagogical and socioeconomic forces that have driven the higher learning institutions to adopt and incorporate ICT in teaching and learning are already changing the organization and delivery of higher education (Sife, Lwoga & Sanga, 2007). However, like Silva et al. (2002) say, there is still much to be done within the culture of the universities, to overcome the individualistic matrix to a culture of collaborative learning. ICT integration and collaborative learning can be intertwined. ICT has the potential not merely to transmit information and thereby substitute the source of packaged information but also to support collaboration, leading to a number of computer applications developed deliberately and explicitly to facilitate collaborative knowledge construction (Dias, 1999). Computer-supported collaborative learning with the help of modern ICT has great potential to improve teaching and learning (Jarvela, et al, 2001) and this potential has to be employed by teacher educators.

The change from teacher-centered education system to learner centered education of the world over in the past few years contributes to the use of ICTs in education. Borrowing from the word “Knowledge-Driven world” as conceived by (Hawkins, 2004; Inwent, 2004), it means that education reform practices should focus on equal access and quality of education which should highlight the importance of change in the education sector through use of ICTs and equipping new generations with enhanced skills to operate in the 21<sup>st</sup> century.

## **2.6. The Roles of Information and Communication Technologies in Education**

Education is essential for addressing development issue such as unemployment, poor health and gender inequality. Therefore, more efficient and effective educational projects are always needed for national development. Unsurprisingly, for this purpose, ICT has gained more and more attention, and the use of ICT including radio and television for education has a long history (Grace and Kenny 2003). 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.

*'One of the Millennium Development Goals is achievement of universal primary education by 2015. We must ensure that information and communication technologies are used to help unlock the door to education'*  
*Kofi Annan (2005: para 2).*

To achieve improvement of the educational situation, several kinds of ICT4E projects such as New Partnership for Africa's Development (NEPAD's), e-school initiative and One Laptop per Child (OLPC) have been implemented. Though the projects are different, the reasons why ICT is expected to 'unlock the door to education' have the same rationales, such as, more access to education, better quality of education (Cawthera, 2001; Wims and Lawler 2007) and motivation for students to study (Wims and Lawler, 2007). Achievement of universal primary education, which is one of the basic Millennium Development Goals, can be facilitated by emerging technologies, as well as the old ICTs such as radio and television. The main barriers to achieving universal primary education are issues such as lack of proper transport facilities, lack of adequate teachers and gender sensitive education, but the introduction of ICTs can improve education provision. The usage and impact of ICTs needs to be carefully monitored to ensure that they are used effectively.

There is a growing need for cross-nationally comparable indicators in the area of information and communication technologies (ICTs) in education. The Plan of Action that was decided at the Geneva phase of the World Summit on the Information Society (WSIS) in 2003 identified two targets which are directly related to education.

- To connect universities, colleges, secondary schools and primary schools with ICTs
- To adapt all primary and secondary school curricula to meet the challenges of the information society, taking into account national circumstances. The development of indicators that monitor such targets can facilitate policy makers to design and monitor need-based programs targeted at improving the economic and social development of the country. Thus ICTs can be used in education to improve administrative efficiency, disseminate teaching and learning materials to teachers and students, improve the ICT skills of teachers and students, allow teachers and students access to sources of information from around the world, share ideas on education and learning, collaborate on joint projects and conduct lessons from a remote location. ICTs have the following roles in the education world.

### **2.6.1. ICT Enhancing Teaching and Learning Process**

ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).

Many different types of technology can be used to support and enhance learning. Everything from video content and digital moviemaking to laptop computing and handheld technologies has been used in classrooms. Similarly, new uses of technology such as pod casting are constantly emerging (Marshall, 2002). To Marshall, various technologies deliver different kinds of content and serve different purposes in the classroom. Word processing and e-mail promote communication skills; database and spreadsheet programs promote organizational skills; and modeling software promotes the understanding of Science and Mathematics concepts. It is important to consider how these electronic technologies differ and what characteristics make them important as vehicles for education (Berker, 1994).

Technologies available in classrooms today ranges from simple tool-based applications (such as word processors), to online repositories of scientific data. Others are primary historical documents, handheld computers, closed-circuit television channels, and two-way distance learning classrooms. Prensky (2005) asserts that even the cell phones that many now carry with them can be used to learn. According to Lei and Zhao (2006) each technology is likely to play a different role in students learning. Rather than trying to describe the impact of all technologies as if they were the same, researchers need to think about what kind of technologies are being used in the classroom and for what purposes. Two general distinctions could then be observed from the literature. Students can learn from computers where technology are used essentially as tutors and serve to increase student's basic skills and knowledge. Moreover, they can learn with computers where technology is used as tool that can be applied to a variety of goals in the learning process and can serve as a resource to help develop higher order thinking, creativity and research skills (Reeves, 1998; Ringstaff and Kelley, 2002).

According to Murphy, et al., (2001), the primary form of student learning from computers is described as Discrete Educational Software (DES), Integrated learning system (ILS), Computer-assisted Instruction (CAI), and Computer-based instruction (CBI). These software applications are also the most widely available applications of educational technology

in schools today, along with word-processing software, and have assisted in classroom for more than 20 years (Becker, Ravity and Wong, 1999). Murphy et al., (2001) explains that teachers use DES not only to supplement instruction, as in the past, but to introduce topics, provide means for Self-study, and offer opportunities to learn concepts otherwise inaccessible to students. The software also manifests two key assumptions about how computers can assist learning. First, the users' ability to interact with the software is narrowly defined in ways designed specifically to promote learning with the tools. Second, computers are viewed as a medium for learning, rather than as tools that could support further learning.

As Discrete Educational Software is recognized as the commonly used approach to computer use in student learning, in more recent years, use of computers in schools has grown more diversified as educators recognize the potential of learning with technology as a means for enhancing students reasoning and problem solving abilities. Zhang (2005) notes that "this shift which has been driven by the plethora of new information and communication devices now increasingly available to students in school and at home, each of which offers new affordances to teachers and students alike for improving student achievement and for meeting the demand for 21st century skills." It should be noted at this juncture that there appear to be three main approaches to ICT taken by teachers according to (UNESCO, 2004). These are:

**Integrated approach:** planning the use of ICT within the subject to enhance particular concepts and skills and improve students' attainment. This involves a careful and considered review of the curriculum area, selecting the appropriate ICT resource which will contribute to the aims and objectives of the curriculum and scheme of work, and then integrating that use in relevant lessons.

**Enhancement approach:** planning the use of an ICT resource which will enhance the existing topic through some aspect of the lessons and tasks. For example, using of an electronic white board for presenting theory about a topic. In this approach, the teacher plans to complement the lesson with an innovative presentation method to promote class discussion and the visualization of problems.

**Complementary approach:** Using an ICT resource to empower the students' learning, for example by enabling them to improve their class work by taking notes on the computer, or by sending homework by email to the teacher from home, or by word processing their homework. All three approaches can enhance attainment, but the effects may be different. In the integrated

approach, students' learning is enhanced because they are confronted with challenges to their existing knowledge and given deeper insights into the subject being studied. The enhancement approach could improve students' learning through presenting knowledge in new ways, promoting debates among students, and encouraging them to formulate their own explanations. The complementary approach draws on the approach that suggests that learning can be enhanced by reducing the mundane and repetitive aspects of tasks such as writing essays and homework by hand, freeing the learner to focus on more challenging and subject-focused tasks (Kemmis et al., 1977 in UNESCO, 2004). These different types of use require the teacher to have an extensive knowledge of ICT and to be able to fit its use either into their existing pedagogy or to extend their pedagogical knowledge so they can accommodate ICT effectively in their teaching.

### **2.6.2. ICT Enhancing the Quality and Accessibility of Education**

ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of learning. In concert with geographical flexibility, technology-facilitated educational programs also remove many of the temporal constraints that face learners with special needs (Moore & Kearsley, 1996). Students are starting to appreciate the capability to undertake education anywhere, anytime and anyplace.

One of the most vital contributions of ICT in the field of education is- Easy Access to Learning. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002).

Wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. ICT also allows the academic institutions to reach disadvantaged groups and new international educational markets. As well as learning at any time, teachers are also finding the capabilities of teaching at any time to be opportunistic and able to be used to advantage. Mobile technologies and seamless communications technologies support teaching and learning. Thus, ICT enabled education will ultimately lead to the

democratization of education. Especially in developing countries like Ethiopia, effective use of ICT for the purpose of education has the potential to enhance the quality of education.

People have to access knowledge via ICT to keep pace with the latest developments (Plomp, Pelgrum & Law, 2007). ICT can be used to remove communication barriers such as that of space and time (Lim and Chai, 2004). 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 (Bhattacharya and Sharma, 2007; Cholin, 2005). Such facilities allow the networking of academics and researchers and hence sharing of scholarly material. This avoids duplication of work (Cholin, 2005). ICT eliminates time barriers in education for learners as well as teachers, It eliminates geographical barriers as learners can log on from any place (Sanyal, 2001; Mooij, 2007; Cross and Adam, 2007; UNESCO, 2002; Bhattacharya and Sharma, 2007).

ICT provides new educational approaches (Sanyal, 2001). It can provide speedy dissemination of education to target disadvantaged groups (UNESCO, 2002; Chandra and Patkar, 2007). It can also enhance the international dimension of educational services (UNESCO, 2002), and can be used for non-formal education like health campaigns and literacy campaigns (UNESCO, 2002). Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems (Bottino, 2003; Bhattacharya and Sharma, 2007; Mason, 2000; Lim and Hang, 2003).

What is more, ICT improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy (Kozma, 2005). In line with this, Plomp et al (2007) state that, the experience of many teachers, who are early innovators, is that the use of ICT is motivating for the students as well as for the teachers themselves. Bottino (2003) and Sharma (2003) mention that the use of ICT can improve performance, teaching, administration, and develop relevant skills in the disadvantaged communities. It also improves the quality of education by facilitating learning by doing, real time conversation, delayed time conversation, directed instruction, self-learning, problem solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn (Yuen et al, 2003).

A great deal of research has proven the benefits to the quality of education (Al-Ansari 2006). Hepp, Hinostroza, Laval and Rehbein (2004) stated that the literature contains many

unsubstantiated claims about the revolutionary potential of ICTs to improve the quality of education. They also note that some claims are now deferred to a near future when hardware will be presumably more affordable and software will become at last an effective learning tool.

## **2.7 . Facilitating and Inhibiting Factors in Using ICT in Education**

The use of information and communication technology (ICT) creates a powerful learning environment and it transforms the learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way (Volman & Van Eck, 2001). ICT is not just regarded as a tool, which can be added to or used as a replacement of existing teaching methods. ICT is seen as an important instrument to support new ways of teaching and learning. It should be used to develop student's skills for cooperation, communication, problem solving and lifelong learning (Plomp et al., 1996; Voogt, 2003). But there are facilitating and inhibiting factors in using information technologies in education.

### **2.7.1. Facilitating Factors in Using Information Technologies in Education**

Integrating ICT into curricula with the intent of positively influencing teaching and learning has been in a state of evolution over the past 20 years (Dias & Atkinson, 2001; Dockstader, 1999). Driven primarily by hardware and software evolution, accessibility to computers in educational settings, and popular instructional technology trends, technology integration has covered the continuum from instruction on programming skills, self-directed drill and practice, interactive learning software, online training, testing, instructional delivery augmentation, and Internet-based accessibility to information, communication, and publication (Dias & Atkinson, 2001). According to Flanagan and Jacobsen (2003), ICT integration is meant to be cross curricular rather than become a separate course or topic in itself. 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 children for the knowledge society (Drent & Meelissen, 2007). 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 (Grabe, 2001). These are cognitive behaviors that children need to learn in an information age.

As a classroom tool, the computer has captured the attention of the education community. This versatile instrument can store, manipulate, and retrieve information, and it has the capability

not only of engaging students in instructional activities to increase their learning, but of helping them to solve complex problems to enhance their cognitive skills (Jonassen & Reeves, 1996). Generally, three objectives are distinguished for the use of ICT in education, according to Brummelhuis, & Rapmund (1996), the use of ICT as object of study, the use of ICT as aspect of a discipline or profession; and the use of ICT as medium for teaching and learning. The use of ICT in education as object refers to learning about ICT, which enables students to use ICT in their daily life. The use of ICT as aspect refers to the development of ICT skills for professional or vocational purposes. According to Drent and Meelissen (2007), the use of ICT as medium focuses on the use of ICT for the enhancement of the teaching and learning process. It is a fact that teachers are at the center of curriculum change and they control the teaching and learning process. Therefore, they must be able to prepare young people for the knowledge society in which the competency to use ICT to acquire and process information is very important (Plomp et al., 1996).

## **2.7. 2. Inhibiting Factors in Using Information Technologies in Education**

There are different inhabiting factors in using ICT in education, namely content and curriculum; appropriateness and efficacy; quality and branding of distance and e-learning; stakeholders' resistance (teachers, institutions and students); lack of appropriate software.

### **2.7.2.1. Content and curriculum**

While much attention is being given to the development technologies that drive ICT-mediated learning, one of the most critical issues remains the curriculum content. Stevens noted: "A current impediment to the further growth and diffusion of more advanced systems in all parts of the world is the unavailability of relevant, well-designed instructional content. This is particularly true in the technical/vocational training area." (Stevens, 2001, p. 52) Considerable upfront investment must be made in developing program materials for electronic delivery. This is especially problematic in TVET because recovering investment costs could be difficult or even impossible due to the relatively small markets, particularly in developing countries.

### **2.7.2.2. Appropriateness and efficacy**

There is a perception that distance education is not an appropriate method for delivering educational skills. However, "... for many occupations within the emerging 'knowledge economies' the cognitive and affective learning domains are becoming more substantial relative to psychomotor skills" (Stevens, 2001, p. 52). Providing distance education in these two domains

is much less challenging than teaching manual skills at a distance. The efficacy for distance learning in education will keep improving with the upgrading and improvement of learning technology, instructional design, adaptive learning models, simulation of workplace environment, learners' support systems, access to e-learning, and the development of intelligent tutoring. Greater emphasis on a self-directed style of learning and an increase in computer literacy among stakeholders will further enhance the efficacy of distance learning in education (Stevens, p. 52).

### **2.7.2.3. Stakeholders' Resistance**

#### **2.7.2.3.1 Teachers' resistance.**

The shift to technology-based learning may represent a threat to job lost for some stakeholders, thus resulting in resistance to embrace the innovation. "Adopting ICTs for teaching will not result in job loss, however there will be a change in the instructor's role, moving from teaching to facilitating and guiding the learning experience" (Stevens, p. 54) .

Brennan, McFadden and Law (2001, p. 7) noted that "there is a potential loss of work if the scenario of teacher less classrooms comes anywhere near reality. Secondly, technology by its very existence and its degree of present and predicted permeation of education and training, throws all existing methods up to scrutiny. Practitioners are forced to examine and justify their existences." The case studies of online learning conducted by Curtin also confirmed this problem: "Where the institutional constraints are not addressed, the case studies suggest that online delivery is likely to remain an island of innovation in a sea of resistance." (Curtin, 2002 p.7).

#### **2.7.2.3.2. Institutional Barriers.**

Institutional barriers associated with ICT are: Lack of equipment and support, difficulties in scheduling, lack of adequate resources, high cost of program development, Instructional difficulties, difficulties in recruiting qualified instructors, difficulties in maintaining reliable technical assistance and support (Zircle, 2002).

#### **2.7.2.3.3 Student Barriers.**

These include: Cost of equipment and access to technology, motivation, lack of immediate feedback form instructors, lack of adequate support and services, alienation and isolation, lack of ICT literacy skills, lack of skills in managing data and time (Zircle, 2002).

## Inhibiting and Facilitating Factors for e-learning

<b>Students</b>	<b>Teacher</b>
Motivation	Technological confidence
Conflicting priorities (time)	New learning style and confidence
Academic confidence	Motivation and commitment
Technological confidence	Qualification and competence
Learning style	Time
Gender	
Age	<b>Course</b>
	Curriculum design
<b>Technology</b>	Pedagogical model
Access	Subject content
Software and interface design	Teaching & Learning Activities
Costs	Flexibility of educational resources
Localization	Localization
	Availability of educational resources
<b>Institution</b>	
Knowledge management	<b>Support</b>
Training of teachers and staff	Support from faculty
	Social support of students
<b>Costs</b>	Support from employer
Technology	Support for faculty
Access rates	
Tuition, course fees	<b>Society</b>
Books	Role of teacher and student
Instructional economy and funding	Attitude on e-learning and IT
	Rules and regulations

*Source: Anderson (2008:46)*

### 2.8. E-school or e-Learning Initiatives in Ethiopia

In the era of globalization, developments in Information and Communication Technologies (ICTs) have impacted all sectors of society such as educational institutions, health institutions and business institution. In higher education in particular application of ICTs the form of e-learning is already changing teaching learning processes (Sife et al. 2007). According to Fisser (2001) and Pelliccione (2001), there are many pedagogical and socio-economic factors that have driven higher learning institutions to adopt e-learning. These include greater

information access, greater communication via electronic facilities, synchronous learning, increased cooperation and collaboration, cost-effectiveness (by reaching different students in greater numbers) and pedagogical improvement through simulations, virtual experiences and graphic representations.

Accordingly, both trainers and learners can choose more appropriate applications which are flexible in time, in place, personalized, reusable and adapted to specific domains and more cost-efficient. Moreover, according to Herselman and Hay (2003), the revolutionary change taking place in ICTs has dramatic effects on the way universities carry out their functions of teaching, learning and research, particularly on the creation, dissemination and application of knowledge. These developments created unprecedented challenges to higher education institutions (HEIs) in developing countries.

Those conditions at hand, the environment of higher education is evolving because of rising costs, shrinking budgets, and increasing needs for distance education are causing educational institutions to reexamine the way that education is delivered (New Media Consortium 2007). In response to this changing environment, e-learning is being implemented more and more frequently in higher education, creating new and exciting opportunities for both educational institutions and students. E-learning has been successfully incorporate in the educational system of the developed countries; there have been studies that show the positive contribution of technology in facilitating learning. For instance, according to Scheffler and Logan (1999) conducted a study to identify technology related competencies that were important for teachers and students. He investigates on the studies the general operation of hardware and software has become less important for most teachers. Barker and Drucker (2000) stated that e-learning concerned with providing easy access to learning resources, anytime, anywhere, through a repository of learning resources, it is also concerned with supporting such features as the personal definition of e-learning goals, and the synchronous and asynchronous communication, and collaboration, between learners and between learners and instructors.

### **2.8.1. The ICT Park**

The Ethiopian government has launched an ICT park, becoming the second East African nation, after Kenya to do so. The ambitious project, known as Techno polis is being constructed in Addis Ababa. The establishment of the ICT Park is expected to attract overseas investment, generate foreign earnings, stimulate growth of domestic ICT industry and create employment and career opportunities for Ethiopian citizens (Africa CEO forum, 2012).

### **2.8.2. WoredaNet**

WoredaNe initiative is a major e-government initiative that connects Ethiopia's local councils '*woredas*' to the regional capitals through Internet telephone and video-conferencing. In addition, the initiative provides connectivity to SchoolNet, eHealth and AgriNet. It is implemented by Ethiopia Telecommunication Agency with funding from the World Bank and African Development Bank through the Ministry of Capacity Building. Ethiopic Standards Development and Dissemination Program Development is a Government of Ethiopia and UNESCO-supported initiative that enables unrestricted and easy communication using modern computers and software for Ethiopic script users. The project has developed a standard keyboard layout and has provided standard terminology of computer words in Amharic [www.eictda.gov.et/Standard.htm](http://www.eictda.gov.et/Standard.htm).

## **2.9. The Roles of Teachers, Students and College governing Bodies in Integrating Information Communication Technologies in Education**

It is largely agreed in most literatures that infrastructure, trained teachers, e-literacy or stand-alone computer lessons though necessary are not sufficient. Integrating ICT tools into the curriculum and adapting pedagogy according to the social environment are necessary for achieving qualitative improvements in learning (Kremer and Holla, 2008; Sanchez, 2008; Barret 2009; Gurumurthy 2009). Kremer and Holla argue that pedagogical innovations that work around the distortions in educational systems can improve student achievement at low cost. Technology-assisted learning or standardized lessons can mitigate weaknesses in teaching and substantially improve test scores.

A case study of ICT-enriched school environment in Rishon Le-zion, Israel (OECD 2001) which analyzed the impact of innovation in teaching learning methods implemented in a school supports the argument that successful implementation of ICT depends mainly on instructors capability to assimilate ICT in teaching and learning processes. The amount and

variety of teachers' training assured competency of staff regarding ICT implementation in pedagogy. In addition, the wide range usage of ICT in all subject matters, all grades and at all times made ICT a vital and essential means of learning. Students were led by their teachers in an effort to improve their ICT skills and fostering appropriate usage of technology in pedagogical practices. In the era of technological advancement, we can observe tremendous change in information technology such that now we are an information society, and that has greatly influenced our education. According to Al-Oteawi (2002), information technology has become the backbone of a global society. Furthermore, "Information technology is changing every institution, every business and every individual in a profound way" (Tuller & Oblinger, 1997, p. 33).

One of the major trends of educational reform is geared towards acquiring and using information technology. For example, one of the benchmarks of research studies indicating how technology has benefited the process of education in America is the 1997 nationwide survey of teachers and school superintendents by Jostens Learning Corporation. In the survey, 74% of the general public and 95% of educators indicated that computers had improved the quality of education, teaching, and learning (Earle, 2002). In that regard, technology integration in education poses as one of the crucial elements in educational endeavors nowadays and suggests that it is almost inevitable that governments and institutions strive to adopt and integrate technology in their educational curricula.

Shuldman (2004), states that the most troubling gap is classroom teachers' lack of integration understanding. He says that this is because technology's greatest impact on student learning appears only after teachers have sufficient skills, coupled with an understanding of how various technologies can be used as cognitive tools, and are able to weave technology experiences into their daily practice. The other major challenge that has been indicated by scholars concerning technology integration in schools is the achievement of the process itself (Edyburn, 1998; Katz & Rudy, 1999; Shuldman, 2004).

## **2.10. ICT in Learner-Centered Education (LCE)**

Learner-Centered Education (LCE) focuses on both teacher's and learner's experiences. It helps to motivate teaching, learning and its achievement. ICT can be exploited to enhance the integration of the learning centered principles by supporting the learners and teacher's need and capabilities while promoting creative and critical thinking. Teachers must advance in their methods of instruction and knowledge of technology to support the individual learner in learner-centered frame work. Informed educators are rapidly adopting Learner-Centered Education for the classes they teach because the students are benefiting in a number of ways: students are more actively engaged with the subject, they are more motivated as learners, and they learn more skills, including discipline knowledge and collaborative and communication skills. Faculties who employ LCE interact more closely and richly with their students, thereby developing a clearer picture of student understanding. Faculty guidance and feedback to students is thus better informed and more appropriately aimed. There is little question among informed educators that getting students actively engaged in a well-designed LCE classroom environment facilitates learning better than do teacher-centered classrooms.

Learner-centered education places the focus on each student's individual needs. According to this model, the educator must first understand each student's unique educational context and evaluate the student's progress toward specified learning objectives. The purpose of the learner-centered model using ICT is to provide an individualized, flexible learning environment for every student.

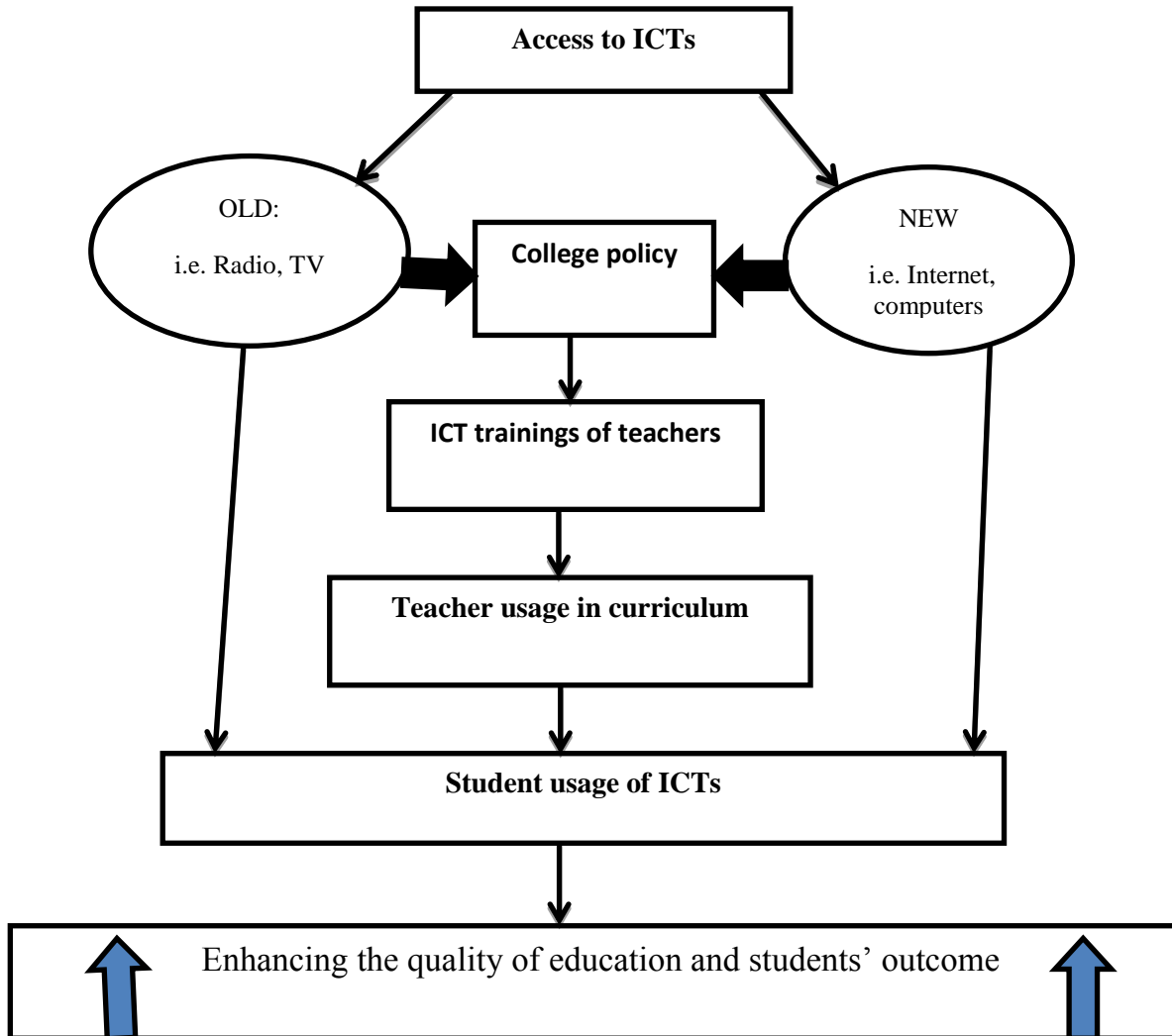
ICTs can be used in learner-centered model of education such as:

- The role of the educator shifts. No longer is the teacher simply someone who stands at the front of the room imparting knowledge on students. Instead, the instructor works as an educational architect and facilitator.
- Students assume responsibility for their own learning. The educator and student work together to decide on appropriate coursework and evaluation. It is the student's job to follow through with these choices.
- Rather than revolving around content, the learner-centered classroom centers on learning processes. These are meta-cognitive skills that the student can apply in any educational scenario. Therefore the student is more likely to attain success in a new educational environment.

- The student is no longer a passive “receptacle” for the teacher’s knowledge. Instead the student becomes an active part of the learning process, and may even assist in teaching his or her classmates.
- The learner-centered classroom provides an emphasis upon higher-order thinking skills, such as the ability to judge and evaluate. Students who master these skills are better able to assimilate new information and apply it to different situations.
- In addition to gaining a strong knowledge base, students develop learning skills and self-awareness. Because they must make decisions along with their instructors, they must pay attention to how they learn best, evaluate their own strengths and weaknesses, and act accordingly.
- Students learn self-advocacy skills. They have to articulate their needs on a regular basis. This practice means that they not only get better at expressing themselves, but they also learn how to communicate appropriately and effectively with a wide variety of people, from fellow students to instructors.
- Reluctant learners are more motivated to participate in their own education, since their stake in the process is clearly defined. Because they can steer themselves toward curriculum that they find interesting and rewarding, such reluctant students become more enthusiastic learners.
- The learner-centered classroom provides a built-in system for accommodating different learning styles or specific challenges. Because the learner-centered classroom offers a tailored program for each student, special needs like ADHD or specific learning disabilities can be addressed seamlessly and effectively.

Students in the learner-centered classroom feel significant as individuals, since their opinions and viewpoints are an integral part of their classroom experiences. This aspect of the learner-centered environment is particularly significant to troubled teenagers, who often have less sense of self-worth than their peers. Using this model, students demonstrate improvement in motivation, learning, and achievement. Ultimately, the learner-centered classroom has a higher rate of student retention, and students are better prepared for success outside the classroom.

## 2.11. Conceptual Model of the Study



*Figure 1: Conceptual model of the study*

The rapid spread of electronic communications has the capacity to affect the quality and efficiency of basic education throughout the world in dramatic ways positively. The straightforwardness with which teachers and students can gather information over the internet on virtually any topic has the potential to transform instructional content and pedagogical practice. Moreover, courses developed by the best teachers in one country can be made available to students across many countries.

Indicators of access to relatively newer forms of ICTs in education (personal computers, mobiles, telephones, internet, etc.) are important; and access to the “older” technologies such as transistor radios or analogue television cannot be ignored. In many developing countries like

Ethiopia these technologies still play a vital role such as providing access to education in remote areas. The two classifications cover students and instructors contexts of the college, internal environment and external environment. The former addresses aspects of the college environment such as infrastructure, instructors' utilization of ICTs, the college administrators, and most importantly ICTs utilization by the students; the latter describes the home setting or a location other than the college. Each of these categories is examined from the perspective of access to ICTs and the use of ICTs by students and their instructors to improve the quality of education.

In general, this theoretical approach and framework which is helpful to understand the use of information and communication technology (ICT) in the formal education sector are reviewed and examined. Relationships between ICT, curriculum development, pedagogy, and practice in classroom setting are considered. A framework for the investigation of contemporary understandings of ICT in pedagogical practice is presented. Three dimensions of ICT curriculum: intended, implemented, and achieved are employed in this framework. The structural approaches that can be applied for the examination of ICT in each of these three dimensions are discussed. The proposed is a link between the theoretical approaches and aims that policies integrated ICT, proposed at the top-level of policy making; the teaching and learning practices, implemented at the middle-level of educational system; and the student's learning outcome, expected at the base-level of educational system.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

In this section, research setting, design of the study, participants of the study, instruments used, and procedures of the study, validity and reliability of data collection instruments and methods of data analysis are presented.

#### **3.1. Research design**

The research design used for this study was a mixed method research approach. A mixed methods research design is a procedure for collecting, analyzing, and “mixing” both quantitative and qualitative methods in a single study or a series of studies to understand a research problem (Creswell & Plano Clark, 2011). The basic assumption is that the researcher uses of both quantitative and qualitative methods in combination and provide a better understanding of the research problem and question than either method by itself. Hence, this study used a mixed method research design. According to Creswell (2011), mixed method research is based on pragmatic world view or knowledge claim, i.e., it is consequence-oriented, problem-centered, and pluralistic.

In this study, an attempt has been made to develop a more comprehensive framework which comprises major variables to be investigated. To achieve the intended purpose and to answer the basic questions of the study, a descriptive research design has been employed. A mixed approach was used to collect the relevant data in this study. To achieve the intended purpose and to answer the basic questions of the study, a descriptive research design have been employed. According to Burns and Grove (2003), descriptive research “is designed to provide a picture of a situation as it naturally happens”. It may be used to justify the current practice and make judgment and also to develop theories. For the purpose of this study, descriptive research have been used to obtain a participant’s opinions and the current practice of the college on using ICT in teaching learning process with a view to improving the quality of education.

Descriptive research can be either quantitative or qualitative. Descriptive studies, primarily concerned with finding out "what is," might be applied to investigate the following questions: Do teachers hold favorable attitudes toward using ICTs in colleges? What kinds of activities that involve technology occur in social science classrooms and how frequently do they occur? What have been the reactions of college administrators to technological innovations in teaching the social sciences? Mixed method approaches (quantitative and qualitative approach)

have been used to collect the relevant data. The integration of both qualitative and quantitative approach have been intended to explicate the researcher's investigation with the intention that one does not fault or lessen the strength of another, but rather complement each other to make stronger interpretation and argument.

### **3.2. Research Setting**

The setting of this study is situated in Sebeta town. Sebeta is a town and separate woreda in central Ethiopia. Located in the Oromia Special Zone Surrounding Finfinne of the Oromia region, this town has a latitude and longitude of 8°55'N 38°37'E and an elevation of 2,356 meters (7,730 feet) above sea level. The Sebeta School for the Blind is located in Sebeta. It became part of the Haile Selassie-I foundation in 1959. Since October 2008 this school for the Blind was upgraded to teachers training college. Sebeta College of Teachers Education has three education streams. Social science education stream includes History, Geography and Civics departments; natural science education stream that contains Biology, Physics, Chemistry and Mathematics departments; and Language education stream that includes Afaan Oromo and English. ICT department, Special need education, Sport education and Music education departments exist in this college.

### **3.3. Participants of the Study**

The participants of the study were college instructors, College administrators, department heads and students from the selected departments. Purposive sampling method was used to select participants who were involved to respond the questionnaires and interviews. Those selected targeted groups are expected to be familiar with the forwarded interviews and questions because of their experience. Totally there are 1201 students and 32 instructors in Sebeta College of teachers' education. From the total number of 1201 students, only 200 students took the ICT as a common course. So the subjects of the study were 131 respondents from students, 18 respondents from instructors, 5 College administrators', 3 respondents from stream heads of the College, 1 respondent from ICT department head and one respondent from the education Bureau officials. A questionnaire was used to collect data from instructors, students and college administrations. To complement the information obtained through questionnaire, interviews were held with stream heads, college administrators and educational officers.

### **3.4. Instruments of Data Collection**

In order to get adequate and complementary information for the study, diverse set of data gathering instruments were employed. Observations, questionnaire and interviews are major data gathering instruments.

#### **3.4.1 Questionnaire**

Since it is the most proper means to gather the necessary information from larger sample size within short time, it was used to collect data from instructors, students and College administrators. The questionnaire was composing closed-ended and open-ended questions, items for ordering (ranking), and items in a Likert scale. Moreover, the use of the questionnaire was found to be important to draw out information on respondents' attitudes and beliefs towards the role of ICT in improving quality of education.

In order to get information on the role of ICT in achieving quality of education both close ended and open-ended questions were initially designed based on the conceptual framework of the study. For the study, questionnaires were distributed to selected college students, instructors and administrators of the college. The purpose of the questionnaires was to gather the responses of these subjects regarding the situation in the classroom and at their college in general which were related to the use of ICT in teaching-learning process. The questionnaires also sought to produce respondents' opinion about the utilization of ICT in teaching-learning process.

The questionnaires basically covered background of the respondents, ICT related skills and activities of teachers and students in the teaching-learning process, respondent's perceptions and attitudes towards instructional technologies, integration of information communication technology in education, reasons for not using computers, training given on the utilization of ICT, tools of ICT that a college used, levels of technology implementations of the college and constraints observed and suggested solutions. The questionnaire for students was initially prepared in English. Then, as it was assumed that the students are more proficient in Affaan Oromo than they are in English, the questionnaire was translated into Affaan Oromo language. This was purposely done to avoid the problem of language barrier which might interfere in obtaining the necessary information. During the administration of the questionnaire in each section, the selected students and teachers were advised to carefully go through the items in the questionnaires and to ask for clarification on points they might not be clear with.

### **3.4.2 Interview**

Interviews were conducted to see the quality and implementation level of ICT in solving educational problems of the college. It was made with some principals, Woreda educational Officers (WEO) and Town Government Education Bureau (TGEB) with face to face basis. Because of the respondents' different background, the interviews were prepared in English and translated into Afan Oromo to avoid language barrier during discussion. Each interview was held by the respondents' permission. Probing questions were also asked to the interviewees to capture in depth and detail information.

### **3.4.3. Observation**

Beside in-depth interviews and questionnaires the researcher used direct observation technique to get contextual information for the data collection conducted. It was necessary to understand the context beside what the respondents have said. As Creswell (2007) wrote contexts are important for understanding what the participants are saying. Thus, the observation serves as an additional technique that complement the information obtained through the interview and questionnaires. The researcher has also used it to triangulate the data collected from other sources.

## **3.5. Validity and Reliability of Data Collection Instruments**

### **3.5.1. Validity of Data Collection Instruments**

The results of this research need to be measured for validity and reliability. Validity is an important consideration in research. Davidson and Tolich (2003) put forward the following definition of validity: "Validity refers to the extent to which a question or variable accurately reflects the concept the researcher is actually looking for" (p. 32). McTaggart (1998) suggests that validity can be improved by ensuring their detailed transparency of method, data, including interpretation, reporting and triangulation of data. Validity also "refers to the accuracy of the measure: Does it accurately measure the variable that it is intended to measure?" (Dejong et al., 1998, p.106). To improve the validity of the data collection instrument, it was used to measure the variables precisely; steps were being taken to do so.

The first step was to enhancing the quality of the questionnaires and interviews. Secondly arranging the use of separate classrooms for student respondents during questionnaire administration and was minimizing the possibility that responses would untruthful due to pressure from friends. The use of a self-administered questionnaire also contributes to the

generation of valid data. A variable was evaluated statistically and was determined to be valid for analysis by a goodness-of-fit test at a non-parametric level (chi-square test). The repeated use of the study's instruments was further support validity in the studies.

Content validity regards the representativeness or sampling adequacy of the content of a measuring instrument. Content validity is always guided by a judgment (Kerlinger, 1986). Content validity answers whether the content of the measure represents the universe of the content of the concept being measured. Based on this regard, the researcher used 131 students as a sample to represent 1201 students which is the entire number of students of the college. The researcher also used 18 instructors from the total of 32 instructors in Sebeta College of teachers' education. 5 College administrators, 3 respondents from stream heads of the College, 1 respondent from ICT department head and 1 respondent from the education Bureau officials were also included. All of these dimensions are represented on the test (e.g. the questionnaire).

Although both face validation and content validation of a measurement is judgmental, the criterion for judgment is different. While the belonging of each item to the concept being measured is to be determined in the evaluation of face validity, content validation determines whether any left-out item should be included in the measurement for its representativeness of the concept. In general, the stability of similar results and homogeneity or internal consistencies of the research results were carefully employed as a content validity. The researcher also carefully employed measurement instruments and tools to check whether the measurement employed really measures the theoretical concepts (variables) which were known to be face validity.

### **3.5.2. Reliability of Data Collection Instruments**

According to Davidson and Tolich "reliability refers to consistency" (2003, p. 32). This means that the same results would be achieved when repeated at a different time, situation or place. According to Bogdan and Biklen (1992) reliability in qualitative research: "can be regarded as a fit between what researchers record as data and what actually occurs in the natural setting that is being researched, i.e. a degree of accuracy and comprehensiveness of coverage" (p. 48).

In general, reliability refers to the consistency or stability of a study instrument. In this research, in order to ensure reliability, descriptive research was used to generate questionnaire items based on the thoughts of members of the study population. Terms, concepts, and themes were generated through descriptive study. To ensure reliability, pilot survey instruments have

been developed and applied. Different data gathering instruments like questionnaires', interviews and observations were also employed by the researcher in the study of role of ICT in achieving quality of education.

After the questionnaire had been developed, the first draft was given to the advisor for its clarity and simplicity. Based on the feedback obtained, some items of the instrument were changed and some were modified. Then, the instrument was tried out for its suitability, reliability and validity in Fiche College of Teachers Education before it was distributed to the main respondents. 10 Students and 5 Instructors were selected using purposive sampling technique as participants of the pilot study. After the questionnaire was collected, modification was made on the items based on the hints obtained from the pilot study. The pilot results found to be reliable between 0.544 and 0.78 alphas. The pilot of the interview was also practiced with two principals about the procedures, clarity and validity of the questions.

### **3.6. Procedure of the Study**

In the first phase of the study, the literature review that contain overview of Ethiopian education system, what information communication technologies are, general education quality improvement packages (GEQIP) in Ethiopia, Ethiopian national ICT policy, information communication technologies and theories of learning, the roles of information and communication technologies in education, facilitating and inhibiting factors in using information technologies in education, E-school or e-learning initiatives in Ethiopia, the roles of teachers, students and college governing bodies in integrating ICTs in education and ICT in learner-centered education were discussed.

After all the above literature have been reviewed, based on the prepared questionnaires and interview guide lines all the necessary data for the study were collected, the processing and analyzing of data were also performed. Processing implies, coding and classifying of the collected data. Editing on the other hand is examining a collected data in order to be sure it was properly recorded. To put data in to a limited number of categories or classes, tally was used. This was used to reduce ambiguity and arranging the raw data in to a group on the bases of common characteristics which must be reduced to homogeneous groups. After processing and classifying the data, the analysis was made. The analyzed data was organized in tables. Using percentages and graphs descriptive analysis was applied on those data. Feelings and opinions of

the respondents were described qualitatively. In general both qualitative and quantitative data analysis (mixed method) was used.

### **3.7. Ethical Consideration**

The cooperative or attachment letter provided from the institute of educational research and development was given to the organizations and the study area to get their permission and voluntary support to access relevant data and information smoothly. Each concerned body was pre-oriented about the purpose of the research and the intension of the researcher to undertake the study in those organizations. The participants were provided with written consent (informed consent) in the introduction part of the questionnaires, and given the opportunity to determine their confidentiality. In addition, all information that was provided by individuals, groups and institutions was kept confidential by the researcher. The researcher understood and respecting of informants' requests and informants were informed that they would remain unidentified throughout the study. Generally, any confusion was clarified before the study had been conducted and at any time of conducting the research for the informants of a study.

## **CHAPTER FOUR**

### **DATA PRESENTATION, ANALYSIS, AND DISCUSSION**

This chapter deals with data presentation, analysis and interpretation. Three different tools were used in order to come up with the data presented subsequently, namely interviews, observations and questionnaires. The questionnaires were prepared for 15 instructors, 131 students registered and five college administrators across three streams in Sebeta College of Teachers' Education: These streams include Social science, Natural science and Language. The three streams were chosen purposefully to include students and instructors from all streams as much as possible. All students participated in this study had took ICT course as a common course at least once in Sebeta College of Teachers' Education. Department heads of the three streams, college administrators and vice dean of the college were interviewed based on their long year experiences. The data gathered from these interviews were also analyzed relating each with the responses of the questionnaires. Observations were also made in the instructors' offices, ICT labs and at class times. The information gathered through these different periods were explored and analyzed.

## 4.1. Characteristics of Respondents

### 4.1.1. Characteristics of Student Respondents

Table 1.A: Student participants

<b>Education Streams</b>				
	<b>Natural</b>	<b>Social</b>	<b>Language</b>	<b>Total</b>
<b>Items</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
<b>Sex</b>				
Male	35(27.2)	27(20.9)	11(8.5)	73(56.6)
Female	20(15)	19(14.2)	19(14.2)	58(43.4)
<b>Total</b>	<b>55(42.2)</b>	<b>46(35.1)</b>	<b>30(22.7)</b>	<b>131(100)</b>
<b>Age</b>				
15-20	32(24.4)	19(14.5)	14(10.7)	65(49.6)
21-25	24(18.3)	28(21.4)	14(10.7)	66(50.4)
<b>Total</b>	<b>56(42.7)</b>	<b>47(35.9)</b>	<b>28(21.4)</b>	<b>131(100)</b>

*N= number of participants*

In Table 1A, the male-female ratio of the student participants is (73:58). This means that from the total participants of 131 students 73 male students and 58 female students were involved in this study. Based on the above table that contains the data gained from student respondents, the age of students participated in this study encompassed the age group which ranges from 15 to 25. This means that the age group from 15-20 accounts 49.6% and from 21-25 accounts 50.4% respectively. Regarding students' involvement depending on their education streams, from 131 total participants 55 students (42.2%) from natural science education stream, 46 students (35.1%) from social science education stream and 30 students (22.7%) from language streams were involved in this study.

#### 4.1.2. Characteristics of Instructor Respondents

Table 1. B: Instructor participants

Items	Education Streams		
	Natural	Social	Total
	N (%)	N (%)	N (%)
<b>Sex</b>			
Male	3(20)	11(73.3)	14(93.3)
Female		1(6.7)	1(6.7)
<b>Total</b>	3(20)	12(80)	15(100)
<b>Age</b>			
31-40	2(13.3)	4(26.7)	6(40)
41-50	1(6.7)	6(40)	7(46.7)
>50	-	2(13.3)	2(13.3)
<b>Total</b>	3(20)	12(80)	15(100)
<b>Qualification</b>			
Bachelor degree	2(13.3)	3(20)	5(33.3)
Master's degree	1(6.7)	9(60)	10(66.7)
<b>Total</b>	3(20)	12(80)	15(100)

*N = number of participants*

In the Table 1B, the male-female ratio of the participant instructors is greatly unbalanced in which only one female instructor participant was involved and all the rest participants are male instructors. This shows that there are hardly any female instructors in the college. This ratio accounts (1:14) and this on the other hand shows that a lot has to be done to maximize the number of female instructors in the college. The above table also shows that the age distribution of the instructors tends to be between the age group of 30-40 (26.7%), between the age group 41-50 (46.7%) and above 50 years accounts 13.3%. Regarding qualifications of instructors, 66.7% of the instructors hold masters' degree while 33.3% of them hold bachelor degree

### 4.1.3. Characteristics of Administrator Respondents

Table 1. C: Administrator participants

<b>Sex</b>	<b>N (%)</b>
Male	5(100)
Female	-
<b>Total</b>	<b>5(100)</b>
<b>Age</b>	<b>N (%)</b>
21-30	1(20)
31-40	-
41-50	3(60)
>50	1(20)
<b>Total</b>	<b>5(100)</b>
<b>Qualification</b>	
Diploma	2(40)
Degree	1(20)
Master's	2(40)
<b>Total</b>	<b>5(100)</b>

*N = number of participants*

In the Table 1C above, all the college administrator participants for this study are male. In other words this table shows that there is no female college administrator participant for the study which in turn implies there is no female who is in the administrator position of this college. Based on qualification of the college administrator participants of this study, two of them are diploma holders; one participant is degree holder and the other two are masters' holders which constituting 40%, 20% and 40% respectively. As shown in the table 1C above, regarding the age group of administrator participants of the study, between age group of 21-30 represents 20%, between age group of 41-50 represents 60% and above 50 represents 20%.

#### 4.2. Utilization of ICT tools by instructors during teaching-learning process

Information and Communication Technology (ICT) includes computers, Internet, and electronic delivery systems such as radios, televisions, and projectors among others, and is widely used in today's education field. Thus, schools and colleges are important environment in which students and their instructors used these tools in order to improve the quality of education. Based on the above information, both instructors and students of SCTE were asked how often instructors used ICT tools during the teaching-learning process.

Table 2: Instructors' Utilization of ICTs during the Teaching-learning process

ICT tools	Respondents	Never	Rarely	Undecided	Sometimes	Always	Total	Chi-square( $X^2$ ) (df = 1)	
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	Value	P-value
Computers	1	2(13.3)	1(6.7)	1(6.7)	1(6.7)	10(66.7)	15(100)	10.135(a)	.038
	2	48(36.6)	36(27.5)	7(5.3)	35(26.7)	5(3.8)	131(100)		
Projectors	1	10(66.7)	1(6.7)	2(13.3)	2(13.3)	-	15(100)	2.150(a)	.708
	2	73(56.6)	23(17.8)	14(10.9)	13(10.1)	6(4.7)	131(100)		
Audio materials	1	12(80)	-	1(6.7)	2(13.3)	-	15(100)	2.530(a)	.470
	2	101(77.1)	-	9(6.9)	8(6.1)	13(9.9)	131(100)		
Video materials	1	12(80)	-	2(13.3)	1(6.7)	-	15(100)	4.514(a)	.341
	2	106(81.5)	8(6.2)	4(3.1)	11(8.5)	1(0.8)	130(100)		
Television	1	12(80)	1(6.7)	1(6.7)	-	1(6.7)	15(100)	3.860(a)	.425
	2	111(84.7)	11(8.4)	6(4.6)	2(1.5)	1(.8)	131(100)		

*N = number of participants*

*1 = instructors*

*2 = students*

\* $p < 0.05$  CV=3.84

df = n - 1 df = 2 - 1 = 1

As indicated in Table 2 above, the two groups of respondents were requested to rate their views regarding the usage of ICT tools by instructors during the teaching-learning process. The results show that 66.7% of instructor respondents confirmed that they always used computers during teaching-learning process. However, the majority of the student respondents (36.6%) indicated that instructors were never used computers during teaching-learning process. The chi-

square result for the two group respondents ( $x^2 = .038$ , for  $P < 0.05$ ) implied that there is a significance difference in using computers during teaching-learning process among the two groups of respondents.

As indicated in the same table of item 2 above, 66.7% of instructor respondents and 56.6% of student respondents were responded that instructors had never used projectors during teaching-learning process. The chi - square result for this is ( $x^2 = .708$ ,  $P < 0.05$ ). This implied that there is no significant difference in never using projectors during teaching-learning process among the two groups of respondents for the obtained P-value is greater than 0.05.

Regarding the use of audio materials, 80% of instructors and 77.1% of students responded that instructors were never used such materials during teaching-learning process ( $x^2 = .470$ ,  $P < 0.05$ ). Moreover, concerning the utilization of video materials, most of the instructors (80%) and students (81.5%) indicated that instructors did not employ video materials during teaching-learning process. The chi-square result for this response was ( $x^2 = .341$ ,  $P < 0.05$ ), which shows no significant difference among the two group respondents. Based on the usage of Television during teaching learning 80% of instructor respondents and 84.7% of student respondents responded that instructors did not use Television during teaching-learning processes in the class ( $x^2 = .341$ ,  $P < 0.05$ ).

In general, the responses show that instructors did not utilize other instructional technologies except computers during the teaching learning process.

#### 4.2. 1. Purpose of Using Computers

During the study, respondents were asked the reasons that they used ICT tools, like computers.

The following results were obtained.

Table: 3 Purpose of using computers

Instructors' Purpose of Using Computer	Never	Rarely	Undecided	Sometime	Always	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Organizing teaching materials	-	3(20)	-	7(46.7)	5(33.3)	15(100)
Teaching in the classroom	10(66.7)	3(20)	1(6.7)	1(6.7)	-	15(100)
Using Internet	-	-	3(20)	7(46.7)	5(33.3)	15(100)
Grading of results	-	-	1(6.7)	4(26.7)	10(66.7)	15(100)
For research	2(13.3)	1(6.7)	2(13.3)	8(53.3)	2(13.3)	15(100)
For office work	-	1(6.7)	-	9(60)	5(33.3)	15(100)
<b>Students' Purposes of Using Computer</b>						
Doing assignments	59(45)	25(19.1)	35(26.7)	8(6.1)	4(3.1)	131(100)
Communicate with my teachers and other students	74(56.5)	28(21.4)	21(16)	4(3.1)	4(3.1)	131(100)
Internet and E-mail	70(53.4)	23(17.6)	22(16.8)	10(7.6)	6(4.6)	131(100)

*N = number of participants*

Computers can be used for different purposes by different people. As indicated in Table 3, students and instructors of Sebeta Teachers College used computers for many purposes. That is, instructors sometimes employed computers (46.7%) to organize their teaching materials. The maximum number of them (66.7%) always used computers for grading the result of students. In the contrary, 66.7% of instructor respondents never used computers during teaching in the classroom. In fact, they sometimes used computers for office works (60%), for research purposes (53.3%) and to browse Internet sources (46.7%).

Students in their part replied that they never used computers to do their assignment (45%), to communicate with their teachers and students (56.5%) and to browse Internet sources and email (53.4%). This is due to insufficient computers for the students, lack of access for many ICT tools and lack of training how to operate the ICT tools, as students reply.

In general, the data in the table imply that most instructors used computer for different educational purposes, but students never used computers for different educational activities.

#### 4.2. 2. Places of Using Computers

Instructor and student respondents in SCTE can use computers both inside and outside of the classroom. The researcher asked them the place where they use computers for educational activities and they responded as follows.

Table3. A: Places of using computers

Place	Respondents	Never	Rarely	Undecided	Sometimes	Always	Total
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Home	1	1(6.7)	1(6.7)	2(13.3)	8(53.3)	3(20)	15(100)
	2	104(79.4)	12(9.2)	3(2.3)	12(9.2)	-	131(100)
Lab of SCTE	1	6(40)	6(40)	3(20)	-	-	15(100)
	2	5(3.8)	26(19.8)	10(7.6)	40(30.5)	50(38.2)	131(100)
Office	1	1(6.7)	1(6.7)	-	5(33.3)	8(53.3)	15(100)
	2	<i>Students have no office</i>					
Internet center	1	8(53.3)	1(6.7)	3(20)	3(20)	-	15(100)
	2	99(75.6)	17(13)	5(3.8)	8(6.1)	2(1.5)	131(100)

*N = number of participants                      1 = instructors                      2 = students*

The above table shows where the instructors and students used computers. Based on the gained data, 53.3% of instructor respondents used computer sometimes at their home. This is because of many instructors have their own laptops. When we look at the data gained from students the reverse is true that 79.4% of student respondents never used computers at their home. Students have their own reason for not using computer at their home. The reason is many

of students of the college came from different rural areas and poor families. So they did not have laptop or desktop computer to use it at home.

ICT lab of SCTE is one of the places where instructors and students of the college can use computers. However, based on the above table, most of the instructors never (40%) and the other (40%) rarely used computers in ICT lab of SCTE. This is because they were frightened of the existing virus in desktop computers in the ICT lab and some of them also had their own laptops. In case of students, for most of them, ICT lab is the only way of getting computer to use. Instructors that represent 53.3% of the total respondents always used computers at their office for office work, for grading student results and for research purposes. The instructor respondents and student respondents who never used computers at internet café sum up to 53.3% and 75.6% respectively.

In general, instructors used computers mostly at their home and in their office. This is because of many instructors have their own laptops. The existence of computer virus in the desktop computers of the ICT lab of SCTE prevents instructors from being used the computer in the lab. Regarding students, Sebeta College of Teachers' Education ICT lab is the only way of getting computer to use for most of the students.

### 4.2. 3. Students’ Reasons for Not Using Computers

Different factors can be mentioned by SCTE students as a reason for not using computers. The balance between the hindering factors versus encouraging ones shows why college students are not using computer for their educational activities. The researcher asked them the reason of not using computers. The following table shows this to some extent.

Table3. B: Students’ reasons for not using computers

<b>Reasons for not using computers</b>	<b>Respondents</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Undecided</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
		<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
I don’t know how to operate computers	Students	8(20.5)	9(23.1)	7(17.9)	7(17.9)	8(20.5)
I don’t have access to computers	Students	11(28.2)	10(25.6)	7(17.9)	5(12.8)	6(15.4)
I don’t have time to use computers	Students	2(5.1)	7(17.9)	8(20.5)	4(10.3)	18(46.2)
I don’t need to use computers	Students	6(15.4)	1(2.6)	5(12.8)	7(17.9)	20(51.3)

*N= number of participants*

As shown in Table3. B, 20.5% of the students strongly agreed and 23.1% of them agreed that they did not know how to operate computers. This can be taken as the reason of their not using computers. In fact, 17.9% and 20.5% of student respondents disagreed and strongly disagreed with the above idea respectively. Moreover, student respondents indicated that they did not use computers as they did not have access to computers; 28.2% of the respondents strongly agreed and 25.6% of them agreed. Lack of time was not taken as the major factor for using computers in the teaching learning process; that is, the majority of the responders strongly disagreed (46.2%). Based on students need to use computers, even though few students did not need to use computers (17.9% disagreed and 51.3% strongly disagreed) with the idea of not need to use computers. In general, the main reasons for not using computers for students are lack of access to computers and lack of knowledge how to operate computers.

#### 4.2.4. Students' responses regarding the status of access computers and other ICT tools

Accessing computers and other ICT tools by the college students can highly affects the implementation of e-learning in the college to improve the quality of education. Having this in mind, student respondents were asked to indicate the status of accessing computers and other ICT tools in the College. Their responses were presented in the table below.

Table 4: Students' rate towards the status of accessing computers and other ICT tools

Description	Respondents	Poor	Fair	Good	Very Good	Excellent	Total
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Speed of computers	Students	8(6.1)	24(18.3)	36(27.5)	43(32.8)	20(15.3)	131(100)
Comfort of chairs and tables	Students	14(10.7)	32(24.4)	32(24.4)	32(24.4)	21(16)	131(100)
Internet connection	Students	40(30.5)	33(25.2)	31(23.7)	19(14.5)	8(6.1)	131(100)
Electric power supply	Students	31(23.7)	49(37.4)	28(21.4)	14(10.7)	9(6.9)	131(100)
Access to printers	Students	54(41.2)	19(14.5)	36(27.5)	18(13.7)	4(3.1)	131(100)
Access to scanners	Students	61(46.6)	29(22.1)	25(19.1)	11(8.4)	5(3.8)	131(100)

*N= Number of participants*

Students forwarded their rating ICT tools and other accessories or infrastructures of the computers found in SCTE in the above table. Concerning the speed of computers, the majority of the students (60.3%) rated that the status of the computers were good and very-good. The researcher's observations also confirmed this; the researcher did not find any tremendous problems in terms of the speed of the computers. Regarding the comfort of chairs and tables in the computer lab, student respondents stated that the chairs and tables found in the computer lab are good except their insufficiency. Students stated that there are no an adequate amount of chairs and tables per students during exercising on computers in the lab. Of the total student respondents 40(30.5%), 33(25.2%) and 31(23.7%) explained that the internet connection of the

computers are poor, fair and good respectively. Regarding electric power supply of the college, the majority of students (37.4%) replied that it is fair. On the other side, education stream heads and ICT department head replied there is shortage of electric power in the college. Finally based on access of printer and scanner, students that accounts 54 (41.2%) for printer and 61 (46.6%) for scanner responded poor access of it. In general based on status of computers SCTE has good status of computer's speed and comfort of chairs & tables. But poor status of internet connection, electric power supply, access to printers and access to scanners.

#### 4.2.5 Trainings Given to the Instructors and Students

Short and long term trainings on different ICT programs are very important for both students and their instructors to improve the quality of education. These trainings were intended to help instructors and students in Sebeta College of teachers' education to use ICT tools in the class during teaching learning processes. Based on this idea, respondents were asked whether they were given the following fundamental ICT trainings.

Table 5: Trainings given to the instructors and students

Programs	Respondents	Yes	No	Total
		N (%)	N (%)	N (%)
MS-Office Word	Instructors	15(100)	-	15(100)
	Students	115(87.8)	16(12.2)	131(100)
MS-Office PowerPoint	Instructors	14(93.3)	1(6.7)	15(100)
	Students	33(25.2)	98(74.8)	131(100)
Internet browsing and e-mail	Instructors	7(46.7)	8(53.3)	15(100)
	Students	47(35.9)	84(64.1)	131(100)
Spreadsheet	Instructors	9(60)	6(40)	15(100)
Database	Instructors	11(73.3)	4(26.7)	15(100)

*N= number of participants*

As indicated in Table 5 above, almost all of the instructors were trained about MS-office word (100%), MS-power point (93.3%), spreadsheet (60%) and database (73.3%), but most of

them were not trained about internet browsing and E-mail (53.3%). However, the majority students were not given trainings on Microsoft power point (74.8%) and Internet browsing and e-mail (64.1%). In fact, the majority of the students reported that they were given training on MS-Office word program (87%). From the responses, it can be concluded that even though many instructors took training on office programs, students did not take some of these trainings.

#### 4.2. 6. Places Where Trainings are given to the Instructors and Students

It is possible to see where the respondents of the study have taken trainings on different ICT programs. The respondents were also asked by the researcher whether they trained the indicated ICT programs themselves or trained by other computer training centers.

Table 5. A: Places where trainings were given to the instructors and students.

Programs	Respondents	Trained myself	At SCTE	In another college	At a computer training center	MoE	Total
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
MS - Office Word	Students	24(8.3)	94(71.8)		6(4.6)		124(94.7)
	Instructors	5(33.3)	7(46.7)	1(6.7)	2(13.3)		15(100)
MS - Office PowerPoint	Students	6(4.6)	59(45)		9(6.9)		74(56.5)
	Instructors	6(40)	5(33.3)	2(13.3)			13(86.7)
Internet browsing and E-mail	Students	26(19.8)	13(9.9)		36(27.5)		75(57.3)
	Instructors	7(46.7)	2(13.3)		2(13.3)		11(73.3)
Spreadsheet	Students	Not given training					
	Instructors	3(20)	8(53.3)		1(6.7)		12(80)
Database	Students	Not given training					
	Instructors	1(6.7)	7(46.7)	1(6.7)	1(6.7)		10(66.7)

*N = number of participants*

In Table5A, it is possible to see where the participants have taken trainings on different programs. Based on the data found in the above table 71.8 % of student respondents and 46.7% of instructor respondents were trained MS-word program in SCTE. In addition, 18.3% of student respondents and 33.3% of instructors' trained themselves on MS-word program. Students and instructors also took training on MS-Office PowerPoint; that is, 45% of student respondents and 33.3% of instructor respondents were given MS-Office PowerPoint training at SCTE while40% of instructor respondents are trained themselves on MS - Office PowerPoint. According to respondents, based on Internet browsing and E-mail, 46.7% of instructors trained themselves but 13.3% of instructors were trained at a computer training center. Based on Spreadsheet and Database training 53.3% and 46.7% of instructors were trained at SCTE respectively. In general, both students and instructors had given training on MS-word program and MS-Office PowerPoint, but students did not take training on some of the programs like spreadsheets and database at different places of computer training centers.

#### 4.2.7. Benefits of the Usage of ICT for Instructors and Students

ICTs are making a dynamic change in education. The uses of ICT is making major differences in the learning of students and teaching approaches of teachers. ICT tends to expand access to education. Through ICT, learning can occur anytime and anywhere. This table below contains respondents answer on benefits of the usage of ICT in SCTE.

Table 6: Benefits of the usage of ICT for instructors and students

<b>Benefits of the usage of ICT for Instructors</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Undecided</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Total</b>
	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
The usage of ICT is important	13(86.7)	2(13.3)				15(100)
The usage of ICT will raise the students interest to learn	12(80)	3(20)				15(100)
Computer simulations can help me to explain some lessons better	11(73.3)	2(13.3)	2(13.3)			15(100)
I can save and use more time in class if I use E-lessons	9(60)	3(20)	2(13.3)	1(6.7)		15(100)
<b>Benefits of the usage of ICT for Students</b>						
It makes the subjects more Interesting	70(53.4)	47(35.9)	12(9.2)		2(1.5)	131(100)
It makes the subjects easy to understand	64(48.9)	50(38.2)	12(9.2)	2(1.5)	3(2.3)	131(100)
It gives me another option to learn about the subject matter	63(48.1)	44(33.6)	17(13)	2(1.5)	5(3.8)	131(100)
It help me to internalize complicated topics through computerized simulations	66(50.4)	37(28.2)	16(12.2)	5(3.8)	7(5.3)	131(100)

*N = number of participants*

ICTs have made a lot of change in human beings life throughout their development. A lot of advantage can be gained through the use of ICT in education. Most of the advantages were mentioned in the above table based on perception of the instructors and students. As illustrated in the table, 86.7% of instructor respondents strongly agreed that the usage of ICT is important for educational activities. Furthermore, 80% of instructor respondents strongly agreed with the idea of the usage of ICT will raise the student's interest to learn. Most of the instructors (73.3%) also strongly agreed that computer simulations can help them to explain some lessons better and other instructor respondents 60% also strongly agreed they can save more time in class if they use e-lessons.

Regarding the benefits and usage of ICT for students, 53.4% of students strongly agreed and 35.9% of them agreed that ICT makes the subjects more interesting. Moreover, 48.9% of student respondents strongly agreed and 38.2% agreed with ICT makes the subjects easy to understand. Students' respondent also agreed with the idea of ICT's benefit that it is used to learn the subject matter and it can help them to internalize complicated topics through computerized simulations.

In general, both instructors and students agreed that the usage of ICT is important for different educational activities. But lack of different training on how to use ICT tools, poor internet connection and electric power supply and lack of attention towards the needs of ICT by college administrators are the main challenges to get the benefits from the usage of ICTs.

#### 4.2. 8. ICT Related Problems that Need Urgent Solution

The use of ICT in teaching-learning process is a relatively new phenomenon and it has been the educational researchers' focus. The effective integration of this technology into classroom practices poses a challenge to teachers, students and administrators. This study aimed at finding out the factors influencing use of ICT to make teaching learning effective in SCTE.

Table7: ICT related problems that need urgent solution based on instructors' response

<b>Problems</b>	<b>Highly urgent</b>	<b>Moderately urgent</b>	<b>Not urgent</b>	<b>I don't know</b>	<b>Total</b>
	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
College lack of attention towards ICT	3(20)	6(40)	6(40)		15(100)
Instructors lack of confidence to use the available technology	3(20)	4(26.7)	7(46.7)	1(6.7)	15(100)
Inconsistent technology usage (computer virus, poor internet connection)	9(60)	3(20)	2(13.3)	1(6.7)	15(100)

*N= number of participants*

According to instructor respondents, the most highly urgent problem is the inconsistent technology usage (computer virus, poor internet connections), 60%. Lack of attention towards ICT needs also considered as moderately urgent attention for ICT related problems of the college (40%). However, lack of confidence to use the available technologies was not taken as an urgent problem (46.7%).

#### 4. 2. 9. ICT Related Policy

ICT in education policy consists of integration of ICT in education and training, capacity-building and professional developments. The researcher asked administration respondents about ICT policy of SCTE and forwarded the following responses.

Table 8: Responses of administrations related to ICT Policy of SCTE

	Yes	No	I don't know	Total
Policy descriptions	N (%)	N (%)	N (%)	N (%)
Does your college have an ICT policy?	2(40)	2(40)	1(20)	5(100)
Does this policy or any other policy at your college specify anything regarding e-lesson?	1(20)		4(80)	5(100)

*N= number of participants*

Based on the above Table 8, 40% of the administration respondents witnessed Sebeta College of Teachers Education has ICT related policy. On the contrary the other 40% of administration respondents denied the above statement and answered the college has no ICT related policy. The other 20% of the administrator respondent did not know whether the college has ICT related policy or not. Some of the administration respondents also stated the policy of ICT specify some regarding e-lesson in this policy. ICT department head and education stream heads of the college were asked about the ICT policy of the college during an interview. They said that there is an ICT policy as a principle on the paper but it has not been implemented yet in Sebeta College of Teachers Education.

#### 4.2.10. ICT Related Skills of Instructors and Administrators

The interest level and skill of using computers among each and every one of us differs a lot. Some people excelled in the applications of computers and related functions where as some others refrain from using computers for fear of failure, and still others don't make efforts because of lack of basic skills. Many instructors and administrators are found in between and among these situations in SCTE.

Table 9: ICT related skills of Instructors and Administrators

Descriptions	Respondents	High Experience	Medium experience	Low experience	No experience	Total
		N (%)	N (%)	N (%)	N (%)	N (%)
Using word-processing applications like Microsoft Word	1	6(40)	8(53.3)	1(6.7)	-	15(100)
	2	4(80)	1(20)	-	-	5(100)
Using spreadsheet applications like Microsoft Excel	1	4(26.7)	7(46.7)	3(20)	1(6.7)	15(100)
	2	1(20)	1(20)	1(20)	2(40)	5(100)
Using databases systems like Microsoft Access	1	3(20)	8(53.3)	3(20)	1(6.7)	15(100)
	2	1(20)	1(20)	2(40)	1(20)	5(100)
Using e-mail	1	3(20)	7(46.7)	5(33.3)	-	15(100)
	2	-	2(40)	2(40)	1(20)	5(100)
Using search engine (like Google, yahoo)	1	6(40)	-	9(60)	-	15(100)
	2	3(60)	1(20)	1(20)	-	5(100)
Using online teaching and learning materials	1	6(42.9)	4(28.6)	3(21.4)	1(7.1)	14(100)
	2	2(50)	-	2(50)	-	5(100)
Uploading and downloading different materials	1	-	2(13.3)	10(66.7)	3(20)	15(100)
	2	-	-	3(60)	2(40)	5(100)
Using educational CD-ROMs like Encarta encyclopedia	1	1(6.7)	2(13.3)	8(53.3)	4(26.7)	15(100)
	2	1(20)	-	4(80)	-	5(100)
Using PowerPoint presentation	1	7(46.7)	1(6.7)	6(40)	1(6.7)	15(100)
	2	1(20)	1(20)	1(20)	2(40)	5(100)
Using LCD projector for teaching	1	2(14.3)	3(21.4)	4(28.6)	5(35.7)	15(100)
	2	<i>Administrators are not using</i>				
Using printers	1	11(73.3)	-	4(26.7)	-	15(100)
	2	3(60)	1(20)	1(20.)	-	5(100)

*N = number of participants      I = instructors      2 = Administrations*

Based on the above data in Table 9, 40% of instructors had high experiences on word application like MS-word and 53.3% of them had medium experiences on this program. Regarding College administrator respondents 80% had high experiences and 20% of them had medium experiences on MS-word application. Instructors have medium experience on spreadsheet application with 46.7% and high experiences with 26.7% of respondents. But college administrations had no experience with spreadsheet application or excel. Both instructors and administrators of the college are using databases systems like Microsoft Access with medium and low experiences respectively. College instructors and administrations have similar experiences on using e-mail in which both have medium experiences to use electronic mail.

As shown in the above table, in using search engine (like Google, yahoo) to find different teaching materials on the Internet, college administrators have better experiences(60%) than that of instructors (40%). Instructors of the college are also using online teaching and learning materials to upload and download different materials from the internet having the experience levels of (42.9%). Regarding the using experiences of educational CD-ROMs like Encarta encyclopedia by college instructors and administrations they have low experiences with the percentage of 53.3% and 80% respectively.

The majority of college instructors had low experiences of using LCD projector for teaching in the class; that is, 35.7% of college instructor respondents that had no experiences of using LCD projector for teaching in the class. In using printers, both college instructors (73.3%) and administrators (60%) had high experiences.

From the above results, we can observe that both instructors and administrations have high experiences on using word application like MS-word programs. However, instructors and college administrators have low experience and no experiences on using spreadsheet programs respectively. Both instructors and administrators of the college also have an experience to use databases systems like Microsoft access with medium and low experiences respectively. Instructors of the college also have low experiences on using search engine (like Google, yahoo), using LCD projector for teaching in the class and educational CD-ROMs like Encarta encyclopedia.

#### 4.2.11. Levels of Technology Implementation in Sebeta College of Teachers Education

Colleges today should meet the growing need for highly qualified educational technologists. Educators also have to prepare themselves by increasing their skills and competencies to improve the quality of education. The researcher asked the college instructors about the level of technology implementation in SCTE. The instructor respondents also forwarded as indicated in the table below. Levels of Technology Implementation was designed to address the concerns by providing a structured way of assessing the degree to which teachers are using technology in the classroom and, most importantly, whether such efforts lead to noticeably improved teacher instructional practices and student learning outcomes. As claimed by Moersch (2002), levels of ICT implementation are categorized under six levels. Having this in mind, attempts were made to look into the level of ICT implementation at SCTE. The results are summarized in the table below.

Table10. Levels of Technology Implementation in SCTE

Levels	Descriptions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Total
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Non-Use (0)	A perceived lack of access to technology-based tools and existing technology is predominantly text - based (e.g. chalkboard).		4(26.7)	5(33.3)	6(40)		15(100)
Awareness (1)	Available classroom computer(s) are used primarily for teacher productivity (e.g., e-mail, word processing, grading programs).		11(73.3)	3(20)	1(6.7)		15(100)
Exploration (2)	Technology-based tools serve as a supplement to existing instructional program (e.g., tutorials, educational competitions, simulations).		7(46.7)	4(26.7)	4(26.7)		15(100)

(3) Infusion	The use of the technology reinforces higher cognitive skill development and complex thinking skills such as problem-solving, reasoning, decision-making, and scientific inquiry (e.g., science kit experiment using spreadsheets or graphs to analyze results).	3(20)	5(33.3)	7(46.7)	15(100)
(4) Integration	The use of outside resources and/or interventions aid the teacher in developing challenging learning experiences using available classroom computers.(e.g.,multimedia, databases, spreadsheets, word processors) is perceived as a tool to identify and solve authentic problems relating to an overall concept.	2(13.4)	5(33.3)	8(53.3)	15(100)
(5) Expansion	Teachers actively use technology and information from outside entities to expand student experiences directed at problem solving, issues resolution, and student action (e.g. contacting research institutions, directed at problem solving, and student activism surrounding a major theme or concept.	1(6.7)	3(20)	11(73.3)	15(100)

In level 0, it is known as non-use of ICT tools and a perceived lack of access to technology-based tools, or a lack of time to pursue electronic technology implementation. Existing technology is predominately text-based (e.g. chalkboard). No visible evidence of computer access in room, classroom computers sit idle during the instructional day. Based on the data gained from instructors in the above Table4, 26.7% of the instructor respondents agreed that Sebeta College Teachers' Education is categorized under this level of technology implementation, but (40%) of instructors disagreed this idea and the other 33.3% had neutral views. Computers and Internet access are used to improve the quality of education. But based on the observation of the researcher, internet and computers are not integrated into their classroom in SCTE. So technology will not have a significant impact on student learning until teachers change the way they teach.

In awareness level which is level 1, available classroom computer(s) are used primarily for teacher productivity (e.g., e-mail, word processing, grading programs). Based on this idea from the above table, we can see that (73.3%) of instructors respondents agreed that SCTE is on the awareness level.

In level 2 (Exploration level), the introduction of ICTs to support teaching, learning and administration of the educational delivery processes begins. This also changes the educational delivery and support landscape. This level is also characterized by technology-based tools serve as a supplement to existing instructional program (e.g., tutorials, educational competitions, simulations). Regarding Exploration, 46.7% of respondents agreed that Sebeta College of teachers' education is at this level.

The third level of technology implementation is called infusion. This level is characterized by Technology-based tools that include databases, spreadsheet and graphing packages, multimedia and desktop publishing applications, and internet use complement selected instructional events. Students are involved with different forms of "WebQuest" projects that require students to research information, draw conclusions from their research. The use of the technology reinforces higher cognitive skill development and complex thinking skills such as problem-solving, reasoning, decision-making, and scientific inquiry (e.g., science kit experiment using spreadsheets or graphs to analyze results). Based on this technology implementation level 46.7% of respondents disagreed that SCTE is not at this level and 33.3% of respondents are neutral.

Level 4 or Integration level is characterized by Technology-based tools integrated in a mechanical manner that provides rich context for students' understanding of the pertinent concepts, themes, and processes. Full confidence is placed on prepackaged materials and/or outside resources and interventions that aid the teacher in the daily management of their operational curriculum. At this level, teachers can readily design and implement learning experiences that empower students to identify and solve authentic problems relating to an overall theme or concept using the available technology. Regarding integration level, 53.3% of respondents disagreed that SCTE is not at this technology implementation level.

Level 5 is also called expansion level. At this level access is extended beyond the classroom. Classroom teachers actively elicit technology applications and networking from other schools, business enterprises, governmental agencies research institutions, and universities

to expand student experiences directed at problem-solving (e. g. contacting research institutions, directed at problem solving, and student activism surrounding a major theme or concept. According to respondents of this study, 73.3% of respondents answered SCTE is not at this level and they disagreed.

In general, based on the information gained from participants of this study, the level of technology implementation in Sebeta College of teachers' education is at its beginning stage in which an available classroom computer(s) are used primarily for teacher productivity (e.g., e-mail, word processing, grading programs).

#### **4.2.12. Problems on the usage of ICT in Education.**

Though the benefit of ICT usage as an educational technology is agreed by all, there are some hindrances that come on the way of the applications. Some of them were observed in SCTE and presented here. During my discussion with the head of the ICT department, I was informed that there were some ICT programs which were installed on some of the computers in the computer lab, but due to computer viruses which attacked the PCs, all the computers had to be formatted, and this shows how much safety first rules are supposed to be respected before taking any curative actions. The proper availability and adjustment of protective systems and accessories is inevitable as they are some of the ICT components which have a big role in teaching learning processes. Poor status or inconsistencies of technology like the breakdown of computers and poor internet connection are some of the problems which need a highly urgent solution. The researcher observed that there is a poor internet connection in many offices of the college. Based on the interview conducted with students and instructors, lack of accessories like printers and scanners are also highly urgent problems in SCTE.

### **4.3. Discussion and Interpretation of the Findings**

#### **4.3.1. Usage of ICT tools by instructors during teaching-learning process**

Information and Communication Technology (ICT) tools includes computers, internet, and electronic delivery systems such as radios, televisions, and projectors and are widely used in today's education field. Technology integration in education is one of the essential elements in educational endeavors nowadays and suggests that it is almost inevitable that governments and institutions strive to adapt and integrate technology in their educational set of courses. The use of ICT in the classroom teaching-learning is very important. It provides opportunities for instructors and students to operate, store, manipulate and retrieve information. The usage of ICT tools

encourages active learning and self-responsibility for learning such as distance learning. The usage of ICT tools also motivates instructors to continue using learning outside school hours, plan and prepare lessons and design materials to improve the quality of education. This versatile instrument has the capability not only of engaging students in instructional activities to increase their learning, but also helping them to solve complex problems to enhance their cognitive skills (Jonassen, 1996).

Based on data obtained from respondents, instructors used computers for different purposes such as grading results of students, organizing teaching materials, for research work, for office work and using for internet. Nevertheless, the level of their usage of computer for different purposes varies. Based on primary data gained from instructors, they used computers more for the purpose of grading the results of the student, but they did not use them for the purpose of teaching in the classroom. The three education stream heads of the college reason out why instructors did not used computers for the purpose of teaching in the classroom. They pointed out that there was no appropriate environment to use ICT tools during teaching in the classroom.

Generally, the use of ICT as medium for teaching and learning focuses on the enhancement of the teaching and learning process. It is a fact that instructors are at the center of curriculum change and they control the teaching and learning process. Therefore, in addition to improving the quality of education instructors must be able to prepare young people for the society in which the competency to use ICT to acquire and process information is very important. Based on the information gained from the study participants, instructors did not utilize ICT tools except computers for the teaching learning process. Instructors used computers for grading the results of students and other documentations. In general the usage of computers and other ICT tools for teaching-learning processes in the class was minimal in SCTE.

#### **4.3.2. Reasons for not Using ICT Tools**

Nevertheless, the effectiveness of integrating ICT into education has been questioned, and challenges have been pointed out by various scholars; Barron, Orwig, Ivers, and Lilavois (2002) argue that integrating ICT into education is not easy because it is still difficult for schools to afford enough resources to meet the demands. The key question is whether the teachers have really integrated ICT in learning to enhance the quality of education or not, and if they have, to what extent they have done so; or, if not, what is the essence of the problem of not doing so? According to Ivers and Lilavois (2002), ICT has been used in many parts of the world to improve the quality and increase access to education but most African countries still face the challenge that increased expenditure on education is not necessarily achieving the expected benefits. According to Berhanu (2012), there is a disparity between teachers' and students' teaching-learning philosophy and the instructional technology based education. Most of the students and teachers believed that better knowledge is gained from face-to-face interactions and book-board sources, not from the technology. They wanted to deal with people not machines.

Among student respondents of the study, many of them responded that they did not have access to computers and they did not know how to operate computers for the reasons of not using computers. Department head of ICT in Sebeta College of teachers' education during interview pointed out that there is a shortage of ICT tools in the college so that the students are in problem to access ICT tools. Where those conditions were not met, educators might do better to stick to the age-old instructions of "chalk and talk".

#### **4.3.3. Trainings given to the instructors and students**

The amount and variety of instructors' ICT training assured competency of staff regarding ICT implementation in pedagogy. In addition, the wide range usage of ICT in all subject matters, all grades and at all times made ICT a vital and essential means of learning. Students were led by their teachers in an effort to improve their ICT skills and fostering appropriate usage of technology in pedagogical practices. In the era of technological advancement, we can observe tremendous change in information technology such that now we are information society, and that has greatly influenced our education.

Some instructors and students took training on few ICT programs in Sebeta College of teachers' education. Based on instructors' response all instructors were trained Ms-office program and except one instructor all also took Ms-power point training. Many instructors were

also given training on Spreadsheet and database. But the number of instructors trained on internet browsing and E-mail are below an average. Regarding students, the only training program they took was MS-word office at Sebeta College of Teachers' Education and few students trained internet browsing and E-mail at private computer training centers.

#### **4.3.4. Benefits of the usage of ICT for instructors and students**

Among many sectors in which ICT is used, education can be regarded as one of the most important sectors. The uses of ICT is making major differences in the learning of students and teaching approaches. 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 (Volman, 2005). Several studies reveal that students using ICT facilities mostly show higher learning gains than those who do not use. For instance, Kulik's (1994) finding across 75 studies in the United States showed that students who used computer tutorials in mathematics, natural science, and social science score significantly higher on tests in these subjects. Students who used simulation software in science also scored higher. Furthermore, the use of ICTs in education also shifts the learning approaches. As put by (Bransford, Brown, and Cocking, 1999) cited in Volman (2005), 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 coaching students rather than merely transmitting knowledge. The gradual progress in using computers changes from learning about computers, to learning computers, and finally to learning with computers (Volman, 2005).

Both instructors and students in this study agreed that the usage of ICT is important for different educational activities. Students agreed that ICT has many benefits such as it makes the subjects more interesting and easy to understand, it gives them another option to learn about the subject matter and it help them to internalize complicated topics through computerized simulations. Instructors also stated the benefits of ICT as the usage of ICT will raise the student's interest to learn; computer simulations can help instructors to explain some lessons better and instructors can save and use more time in class if they use E-lessons. But lack of different training on how to use ICT tools, poor Internet connection and electric power supply and lack of attention towards the needs ICT by college administrators are the main challenges to get the benefits from the usage of ICTs.

#### **4.3.5. ICT related problems**

According to instructors of SCTE, the most highly urgent problem selected is the inconsistent technology usage (computer virus, poor internet connections). Nevertheless, administrators indicated that lack of confidence to use the available technology by instructors is another problem on using ICT tools in education. On other hand, instructor respondents and department head of the ICT stated that the college's lack of attention towards ICT is the main problem on effective use of ICT to improve quality of education.

This is in line with Shuldman's (2004) assertion in that that the most troubling gap in using ICT tools is classroom teachers' lack of integration understanding. He said that this is because technology's greatest impact on student learning appears only after teachers have sufficient skills, coupled with an understanding of how various technologies can be used as cognitive tools, and are able to weave technology experiences into their daily practice. The other major challenge that has been indicated by scholars concerning technology integration in schools is the achievement of the process itself (Edyburn, 1998; Katz & Rudy, 1999; Shuldman, 2004).

There exist infrastructure, socio- economic, linguistic and physical barriers in developing countries like Ethiopia for people who wish to access education. This includes infrastructure, teacher and the processes quality. There exist drawbacks in general education in Ethiopia as well as all over the world like lack of learning materials, teachers, remoteness of education facilities, high dropout rate, etc. (UNESCO, 2002).

#### **4.3.6. ICT related skills of Instructors and Administrators**

Instructors' skills play an important role in the teaching-learning process to utilize ICT and internet connections. Although instructors' attitude towards the use of these technologies is vital, the reality on the ground revealed that teachers did not have clarity about how far technology can be beneficial for the enabling and enhancement of learning. Of course, some instructors may have positive attitudes to the technology, but conclude from using it in teaching due to low self-efficacy, tendency to consider themselves not qualified to teach with technology.

#### **4.3.7. ICT Related Policy**

MCIT (2010) indicated that Ethiopia's Information and Communication Technology (ICT) policy is an integral part of the country's larger development goals and objectives setting. The goal is to rapidly transform the country's subsistence agricultural-based economy and society into a predominantly knowledge and information-based economy and society. The Government of Ethiopia has developed multiple policies, most notable of which are the National ICT Strategic Plan and the ICT4D Action Plan for the year 2006-2010. The broad ICT sector policy of the Ethiopian government that derives from Plan for Accelerated and Sustained Development to End Poverty (PASDEP), as developed in 2006 by the Ethiopian ICT Development Agency (EICTDA). The policy aims to develop ICT as a globally competitive industry, and as an engine of national growth; Create the necessary conditions for the rapid development of ICT within the economy and society to accelerate Ethiopia's socio-economic development process; and Promote and facilitate an extensive use of ICT in support of key sectors of the economy including agriculture, industry and the services sectors. Transform Ethiopia into a knowledge and information-based society and economy; and promote the use of ICT for modernizing the civil and public service to enhance its efficiency and effectiveness for service delivery, to promote good governance and reduce wastage of scarce resources (MCIT, 2010).

One of the directions of the proclamation (FDRE, 2009) is stated as the focus of research in any institution shall be on promoting the relevance and quality of education and on the country's development issues focusing on transfer of technology. It is also asserted that every institution shall allocate sufficient fund particularly for research focusing on technology transfer and innovation. This is related to what was said earlier (Garrison and Anderson, 2003), that content agents can also be built to supervise and to report on research activities of researching

teachers, thus creating new content automatically that both informs and involves students in the research process.

Based on data obtained from administrator respondents, even though some of the respondents stated that Sebeta College of Teachers' Education has an ICT implementation guideline, some respondents replied that the college has no implementation guideline regarding ICT. But based on data gained during the interview from the stream heads of the college and the ICT department head, this college has ICT implementation guideline but simply written as a long term plan on the future plan of the college. So that, there should be an ICT plan for the college and should be implemented to use ICT tools and also improve the quality of education.

#### **4.3.8. Levels of Technology Implementation in Sebeta College of Teachers Education**

UNESCO's (2008) study found that most of the universities and teacher training Colleges (TTCs) in African countries had started to address the ICT infrastructure issues and had also introduced ICT curriculum standards. However, few had addressed ICT pedagogy issues or were even aware of UNESCO's work in this area. Teacher standards that Integrate ICT in teaching learning processes are either non-existent or poorly developed to meet the needs and contexts of African countries in improving educational qualities. It is also found out that African countries within and among the regional communities are at various levels of ICT use in education. The study also forwarded recommendations such as use a consultative and participatory method in developing and promoting ICT standards. This would increase awareness and chances of adoption of the standards, develop ICT pedagogy standards. In addition, introduce ICT pedagogy courses for lecturers or tutors of TTCs in each country.

According to a study made for University of Manchester by Takeuchi (2008), though the ICT use in Ethiopia is lower level than other countries, it seems that the situation has been improving recently which is somehow depicted by the number of the Internet users that has increased in the last decades.

The education system and policy support in the areas of budget, curriculum, professional development and research may facilitate or hinder the launching of a country's ICT program, as well as its expansion and sustainability in the future. The national ICT infrastructure (connectivity and accessibility) may also affect the implementation of ICT in education policy. Thus, based on the findings of this study the level of technology implementation in Sebeta College of teachers' education is at its beginning stage.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS FOR FUTURE RESEARCH**

This chapter presents the summary of the major findings, conclusions, recommendations and implications for further research. After presenting the summary of the findings, concluding remarks based on the results of the study was made. This was followed by the presentation of recommendations for the identified problems. This chapter ended by suggesting future studies that need to be undertaken to fill the other gaps.

#### **5.1. Summary of the Main Findings**

This study has revealed that ICT is an effective means for widening educational opportunities, but most instructors neither use ICT as an instructional delivery system nor integrate technology into their curriculum. The study also revealed that a number of factors influencing instructors' decisions to use ICT in the classroom. The success of the implementation of ICT is not dependent on the availability or absence of one individual factor, but is determined through a dynamic process involving a set of interrelated factors. The integration of ICTs in SCTE systems has faced various challenges with respect to policy, planning, infrastructure, learning content and language, capacity building and financing. Thus, ICT-enhanced education requires clearly stated objectives, mobilization of resources and political commitment of the concerned bodies. The infrastructure challenge that exists was shortage of electric supply and lack of the different types of ICTs. Because of this, SCTE need to deal with infrastructure related challenges before the planning of ICTs integration to education systems.

In general, the level of the current usage of ICT in Sebeta College of Teachers Education (SCTE) is characterized as available classroom computers are used primarily for teacher productivity (e.g., e-mail, word processing, grading programs). This indicated that the current status and implementation of ICT in SCTE is at its beginning stage. This is because of the challenges to the use of ICT in Sebeta Teachers College of Education. Some of the challenges are low level of confidences among some instructors on the benefits and usage of ICTs, shortage of electric power supply to use ICT tools in the college, inconsistent technology usage (computer virus, poor internet connection) and lack of attention towards the use of ICT by college administrators.

ICT infrastructures in SCTE can serve as a factor in integrating ICT in to teaching-learning process as a way to improve the quality of education by using e-learning. Instructors frequently list obstacles such as inconsistent technology usage, number of computers in a classroom, computer network, internet (access and speed). Thus, perceived adequacy of support (e.g. technical, pedagogical, personnel, resources), as facilitating circumstance has an important impact on applying e-learning to improve quality of education. In order to maximize learning and performance in a student centered situation, effective utilization of instructional materials is highly required. E-learning technologies offer greater diversity of learning goals than the traditional classroom, students' interest and motivation increase substantially. Students are motivated to use e-learning to gain access to higher education. On the other hand, instructors can select pedagogical strategies appropriate to both learning styles and individual needs of students. The following points are the main findings of the study

1. Many instructors used computers for grading the result of students and for office work but most of them never used computers during teaching learning process in the class rooms. Regarding students most of students never or rarely used computers for different educational activities.
2. Most of the time instructors used computer at their home and in their office, but students never used computer at their home because many of them came from rural areas of poor families. Instructors rarely or never used computers in ICT lab of SCTE because they fear the existing virus in desktop computers of the lab. In case of students, many of the students used computers at ICT lab of Sebeta College of teachers' education.
3. Lack of access to computers and lack of knowledge to operate computers are some of the reason of students for not using computers.
4. Regarding the status of computers and other access of ICT tools, the speed of the computers are very good, and except for insufficiency the comfort of chairs and tables are also good. But the internet connection and the electric power supply of the college are poor. Access to printers and scanners are also poor for students.
5. Some instructors were given training on different computer programs such as MS-office word, MS-PowerPoint, internet browsing & E-mail, spreadsheet and database, but students were trained only on some of computer programs like MS-office word and MS-PowerPoint.

6. Both instructors and students agreed that the usage of ICT is important for different educational activities. But lack of different trainings on how to use ICT tools, poor internet connection, poor electric power supply and lack of attention towards the needs of ICT by college administrators are the main challenges to get the benefits from the usage of ICTs in improving the quality of education.
7. Some of ICT related problems that need urgent solutions are unpredictable technology usage like computer virus & poor internet connection, lack of attention towards ICT and instructors' lack of confidence to use the available technology. But the most problem that need urgent solution are computer virus and poor internet connection.
8. Sebeta College of teachers' education has an ICT guideline as a principle on the paper, but not yet used ICT tools in teaching-learning processes.
9. College instructors and administrators have some ICT related skills. Instructors have high experiences on using MS-word application, PowerPoint presentation and access of printers; medium experiences on using databases systems like Microsoft Access, E-mail and search engine; low experiences on using educational CD-ROMs like Encarta encyclopedia, uploading and downloading different materials; and no experiences on using LCD projector for teaching. Administrators also have high experiences on using MS-word application & search engine and access of printers; medium experiences on E-mail, low experiences on using databases systems like Microsoft access.
10. The level of technology implementation in Sebeta College of Teachers' Education is at its initial stage.

## 5.2. Conclusions

ICT is one of the contemporary factors in shaping the global economy and producing rapid changes in the society. It has fundamentally changed the way people learn and communicate. It can transform the nature of education, where and how learning takes place and the roles of students and teachers in the learning process. Even though we are living in highly technological era, the instructors are not using some ICT tools in their instruction during practice of teaching. So the curriculum of teacher education program is not able to make prospective teachers and teacher educators of ICT literate.

ICT integration in education has its merits. Its use not only changes the traditional ways of teaching, but also requires instructors to be more creative in adapting and customizing their own teaching materials and strategies. Among all the teaching methods and strategies, collaborative learning, problem-based learning and the constructivist approach are the most widely used teaching strategies. This corresponds with the suggestion of that technology integration will not have the desired effect without student-centered classroom practices. Therefore, ICT integration in education cannot be implemented in isolation. When it is applied in combination with diverse teaching methods and approaches, especially constructivist practices, learning outcomes can be more successful.

Both instructors and students want to use ICT tools more but they didn't utilize it as much as they want. So it can be concluded that there is an incompatibility between interest level of instructors and students to apply the technology though the provision of ICT tools provided by officials and responsible bodies at different levels is minimal. That is, the low level of ICT infrastructures hampered the integration of ICT in the teaching-learning process. Instructors do not use some ICT tools in the teaching-learning process. The awareness of the instructors to inculcate the technology in teaching the subject matters seen under this study is also found to be low. Lack of access to output devices like scanners and printers had created its own negative impact in discouraging the use of students in using the limited access they have on the computers. Inconsistent electric power supply of the college has another negative effect on the utilization of the available ICT tools. The safety of the available ICT tools like computers is very low because it is affected by the power interruption.

### 5.3. Recommendations

Based on the research findings and conclusions drawn, the following recommendations have been forwarded to SCTE, Education policy makers and other concerned stakeholders to integrate ICT in to teaching learning processes in order to achieve quality of education.

- Providing ICT resources for the college of teachers education; training instructors in new pedagogical approaches; providing training courses in dealing with the new devices, modern technologies and new pedagogical approaches; and providing continued technical support for instructors are very important in integrating ICT in to teaching learning processes in SCTE.
- Providing different trainings on how to use ICT tools, enhancing internet connection, electric power supply and giving attention towards the needs of ICT by college administrators are very important in improving the quality of education in the college.
- Sebeta College of Teachers Education should implement the existing college ICT guideline in teaching-learning processes.
- It is advised that ongoing professional development need to be provided for instructors to model the new pedagogies and tools for learning with the aim of enhancing the teaching-learning process. It is also important for instructor trainers and policy makers to understand the factors affecting effectiveness of different approaches to use ICT in teacher training colleges.
- Education policies have to reflect new teaching paradigms that ICT can offer in terms of providing a more effective and relevant mode of learning for students. It is better for education policies to take into account the reskilling of instructors and incorporating the use of ICTs in education.
- The curriculum of the college needs to be revised according to the global needs. The major objective of the curriculum is that it should enable students and instructors to effectively use ICT in teaching and learning. And the college has attempted to adjust their educational policies to this new phenomenon of ICT.
- ICT integration in education should be parallel with instructor's professional development. The college leadership also plays a key role in the integration of ICT in education because lack of support from the college administration is a big problem. Thus,

for the effectiveness of ICT integration, administrators must be competent and have a broad understanding of the technical dimensions of ICT use in education.

- SCTE should set up incentive programs for instructors to encourage and facilitate the pedagogical integration of ICT in teaching. In general the training given for both instructors and students should be encouraged and the existing gaps should be filled by giving different trainings on new ICT programs for students and instructors to improve quality of education.
- The safety of the available ICT tools of the college like computers should be safeguarded because they might be affected by the power interruptions and the virus.

#### **5.4. Implications for Further Research**

Past research works on the roles of ICTs to achieve quality of education have shown that in spite of the many efforts researchers and educators put over the years in preparing teachers in the educational uses of ICT to improve quality of education, teachers still lack the skills and knowledge needed to be able to teach with ICT tools successfully. There are many problems that hold back the use of ICT tools in educational activities. These problems include lack of national policy for teacher training in the pedagogical integration of ICT, lack of ICT resources for the college of teachers' education and lack of motivation and need among instructors to adopt ICT as teaching tools etc. This research is also part of these studies on the role of Information and Communication Technology (ICT) in education sectors to attain quality of education. To fill some existing gaps other researchers should do much more research about the roles of ICTs, the constraints and the factors that affect the integration of ICT in education to achieve quality of education and many researches should be conducted on this area to realize the desired quality in education.

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## Appendix I

### Uniiveersiitii Finfineeti Inisiituutii Qoranoo Barnootaa

#### *Gaffilee Baratoota Kolleejiifi*

#### *Qajeelfama Waliigalaa*

Kaayyoon gaaffii kanaa qulqullina baruumsaa argamsiisuudhaaf, keessattuu dippartimentii Koolleejjii Barsiistotaa Sabbataa keessatti , itti fayyadamni, dandeettiifi ilaalchi gama shoora ICT tiin taphatuun jiru odeeffannoo walitti qabuufi. Deebii gaaffilee kanniiniif kennamu hundi isaatu akka dhimma barbaadame kanaaf gargaarsa godhameetti fudhatama. Kanaaf namni gaaffi dhiheessu kun deebii isa dhugaa ta'e akka deebistaniif kabajaan isin gaafata. Deebiiwwan gaaffilee kanniiniif kennaman iccitiidhaan kan eeggamaniifi odeeffannoo waraqaa qorannoo aruumsa Maastarsiitiif qofaa hojiirra kan oolan ta'u. Gaaffileedhaaf deebii kennuuf fedha argisiisuun keessan kan isin galatoomsuudha.

#### **Tumsa keessaniif Galatoomaa!**

Yaadannoo. 1. Maqaa keessan hin barreessinaa.

2. Deebii keessan mallattoo “✓” kaa'uudhaan yookiin immoo deebii keessan iddoo isaaf qophaa'etti barreessuu nidandeessu.

#### ***Kutaa I: Odeeffannoo waa'ee keessanii***

1. Umrii:      15-20       21-25       26-30       30 Oli
2. Saala:      Dhiira       Dhalaa

#### ***Kutaa II: Hojimaata ICT***

3. Barsiistonna keessan meeshaalee ICT armaan gadii keessa hammam isaanii yeroo isin barsiisan yeroo hammamiif kutaa keessatti itti fayyadamu?

**Qajeelfamoota:** - Sanduuqa kaa'ameef sana keessa mallattoo (“✓”) kaa'uudhaan waa'ee meeshaalee barsiistonna keessan yeroo isin barsiisan itti fayyadamanii yaada keessan lafa kaa'uu dandeessu.

4 = Yeroo hunda 3 = Yeroo tokkon tokko 2 = Kan murtaa'ee miti

1 = Daarbee darbee 0 = Gonkumaa

Lakk.	Meeshaalee ICT	4	3	2	1	0
1	Kompiitaroota					
2	Projektaroota					
3	Meeshaalee Sagalee					
4	Meeshaalee Vidiyoo					
5	TV					

Kanneen biroo (mee ifa godhaa) \_\_\_\_\_

4. Kompiitaroota ni fayyadamtuu? Eeyyeen  Lakki

5. Lakkoofsa 4f deebiin keessan 'Eeyyeen' yoo ta'e yeroo baay'ee kompiitaroota keessan eessatti fayyadamtu?

**Qajeelfamoota:** - Sanduuqa kaa'ameef sana keessa mallattoo ("✓") kaa'uudhaan waa'ee itti fayyadama kompiitaraa yaada keessan lafa kaa'uu dandeessu.

4 = Yeroo hunda 3 = Yeroo tokkon tokko 2 = Kan murtaa'ee miti

1 = Daarbee darbee 0 = Gonkumaa

Lakk.	Iddoo	4	3	2	1	0
1	Mana					
2	Lab. KBS keessatti					
3	Wirtuuwwan/ kaaffee intarneetii keessatti					

**6. Lakkoofsa 4f deebiin keessan 'Lakki' yoo ta'e, maaliif?**

**Qajeelfamoota:** - Sanduuqa kaa'ameef sana keessa mallattoo ("✓") kaa'uudhaan waa'ee itti fayyadama kompiitaraa yaada keessan lafa kaa'uu dandeessu.

4 = sirrumattin waliigala 3 = waliin gala 2 = Walii hin galus hin mormus 1 = Walii hin galus 0 = Tasuma walii hin galu

Lakk.	Sababoota kompiitarota hin fayyadamneef	4	3	2	1	0
1	Akkamittin akka kompitaratti fayyadamu hin beeku					
2	Kompiitaratti argachuu hin danda'u					
3	Kompiitaratti fayyadamuudhaaf yeroo hin qabu					
4	Kompiitaratti fayyadamuu hin barbaadu					

Sababni kan biraa jiraachuu yoo jiraate ifa godhaa mee \_\_\_\_\_

7. Kutaa itti barattanis ta'ee labiraatorii kompiitaraa kolleejichaa keessatti kompiitaroota fayyadamaa jirtu yoo ta'e qajeelfamoota armaan gadiitiif sadarkaa kennaa.

**Qajeelfamoota:** - Sanduuqa kaa'ameef sana keessa mallattoo (“✓”) kaa'uudhaan waa'ee itti fayyadama kompiitaraa yaada kutaa keessaas ta'ee laabiraatoriiwwan kolleejichaa keessaa yaada keessan lafa kaa'uu dandeessu.

4 = Baay'ee bay'ee gaarii    3 = Bay'ee Gaarii    2 = Gaarii    1 = Homaa hin jedhu  
0 = Gaarii miti

Lakk.	Ibsa	4	3	2	1	0
1	Saffisa Kompiitarootaa					
2	Gaarummaa teessoowwanii fi minjaalotaa					
3	Konneekshiinii intarneetii					
4	Humna ibsaa					
5	Piriintarii argachuu					
6	Itti fayadama iskaaneerii					

8. Kompiitara nifayyadamtu yoo ta'e dhimma maaliif fayyadamtu? (Mee wantoota fayyadamtaniif hunda isaanii mirkaneeffadhaa)

**Qajeelfamoota:** - Sanduuqa kaa'ameef sana keessa mallattoo (“✓”) kaa'uudhaan waa'ee maaliif akka compiita fayyadamtanii yaada keessan lafa kaa'uu dandeessu.

4 = Yeroo hundaa    3 = Yeroo baay'ee    2 = Yeroo tokko tokko    1 = Darbee darbee    0 =  
Gonkumaa

Lakk.	Hojiilee hojjetaman	4	3	2	1	0
1	Hojiilee manaa ittiin hojjechuu					
2	Barsiisota keessanii fi barattoota kan biroo waliin wal qunnamuuf					
3	Intarneetiifi Imeeylii					

Kan biroo yoo jiraatan (Mee ifa godhaa) \_\_\_\_\_

9. Wantoota armaan gadii kana leenjitaniirtuu? (Kanneen dandeessan hunda isaanii lafa kaa'aa)

2 = Eeyyee      1 = Lakki

Lakk.	Sagantaalee	2	1
1	Kompiitaraan barreessuu		
2	Pirazanteeshinii Paawar Pooyint		
3	Itti faayyadama Intarneetiifi Imeeylii		

Kan biroo yoo jiraatan ifa godhaa \_\_\_\_\_

10. Lakkoofsa 9f deebii keessan eeyyee yoo ta'e, mee eessarraa leenjii akka argattan iddoo isaa maqaa dhahaa.

Lak.	Iddoo	Kompiitaraa n barreessuu	Pirazanteeshinii Paawar Pooyint	Itti faayyadama Intarneetiifi Imeeylii	Leenjiiwwan biroo (Mee ifa godhaa)
1	Koolleejjii Barsiistotaa Sabbataatti				
2	Wirtuuwwan Leenjii Dhuunfaatti				
3	Ofiifan of leenjise				

Kan biroo yoo jiraatan ifa godhaa \_\_\_\_\_

11. Sadarkaa baruumsaa wanta barattu keessatti bu'aawwan itti fayyadama ICT ykn kompiitaraa hammam akka ta'e mee sadarkaadhaan lafa kaa'aa?

**Qajeelfamoota:** - Sanduuqa kaa'ameef sana keessa mallattoo (“✓”) kaa'uudhaan waa'ee bu'aa itti fayyadama kompiitaraa yaada keessan lafa kaa'uu dandeessu.

4 = Sirrumattin waliigala 3 = Waliin gala 2 = Walii hin galus hin mormus 1 = Walii hin galus 0 = Tasuma walii hin galu

Lakk.	Bu'aawwan	4	3	2	1	0
1	Wantoota barannu bay'ee akka namatti tolu godha					
2	Wantoota barannu baay'ee salphaafi kan hubataman godhu					
3	Waa'ee wantoota barannuu filannoo kan biraa akkan beeku nataasisa					
4	Matadureewwan namaaf hingalle karaa kompiitaraatiin furmaata akkan kennuuf nagargaara					

12. Rakkoowwan yeroo baruumsa keessanitti kompiitaratti, intarneetiitti fi meeshaalee ICT kan birootti fayyadamuuf isin rakkisaniifi wantoota ta'uu danda'an tokkoon tokkoo isaa mee tarreessaa.

Lakk.	Rakkoowwan jiran	Furmaatota ta'uu kan danda'an
1		
2		
3		
4		
5		

## Appendix II

Addis Ababa University

Institute of Educational Research

### *QUESTIONNAIRES FOR COLLEGE STUDENTS*

#### *General Directions*

The purpose of this questionnaire is to gather information regarding the usage, skill and attitudes towards the role of ICT in achieving quality of education, primarily the uses of ICT in all departments at Sebeta College of Teachers Education. The response for each item in the questionnaire could be of great help to the intended purpose. Therefore, the researcher kindly requests your honesty reply. Responses to the questionnaire will be kept in confidence and the information required for this study will only be used for masters' thesis of educational research. Your willingness to answer all of the questions would be appreciated.

**Thank You for Your Cooperation!**

Note. 1. Do not write your name.

2. Please respond by putting “✓” mark or by writing your responses on the space provided.

#### *Part I: Background Information*

1. Age:            15-20             21-25             26-30             Above 30

2. Sex:            Male             Female

3. Stream \_\_\_\_\_

#### *Part II: ICT Application*

3. How often do your instructors use any of the following ICT tools in your class?

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint about the usage ICT tools of your instructors during teaching process

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

N <sup>o</sup>	ICT tools	4	3	2	1	0
1	Computer					
2	Projectors					
3	Audio materials					
4	Video materials					
5	TV					

Others (please specify) \_\_\_\_\_

4. Do you use computers? Yes  No

5. If your response to question number 4 is 'yes', where do you use computer more often?

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint about the usage of computer

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

N <sup>o</sup>	Place	4	3	2	1	0
1	Home					
2	Computer lab of SCTE					
3	Internet Center/café					

6. If your response to question number 4 is 'No', why?

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint

4 = strongly agree 3 = Agree 2 = neither agree nor disagree 1 = Disagree 0 = strongly disagree

N <sup>o</sup>	Reasons for not using computers	4	3	2	1	0
1	I don't know how to operate computers					
2	I don't have access to computers					
3	I don't have time to use computers					
4	I don't need to use computers					

Please specify if there is any other reason \_\_\_\_\_

7. If you are using computers in the classroom or in computer labs of the college, please rate the following descriptions.

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint about the usage computers in

the classroom or in computer labs of the college

4 = Excellent 3 = Very Good 2 = Good 1 = Fair 0 = Poor

N <sup>o</sup>	Description	4	3	2	1	0
1	Speed of computers					
2	Comfort of chairs and tables					
3	Internet connection					
4	Electric power supply					
5	Access to printers					
6	Access to scanners					

8. If you use a computer, for what do you use it? (Please check all that apply)

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint about for what do you use computer

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

N <sup>o</sup>	Activities	4	3	2	1	0
1	Doing assignments					
2	Communicate with my teachers and other students					
3	Internet and E-mail					

If others (Please specify) \_\_\_\_\_

9. Have you ever received training on how to use the following programs? (Check all that you apply)

2 = Yes    1 = No

N <sup>o</sup>	Programs	2	1
1	Word processing		
2	PowerPoint Presentations		
3	Internet browsing and E-mail		

If others specify \_\_\_\_\_

10. If your answer is yes for question number 12, please mention where you have taken the training.

N <sup>o</sup>	Place	Word processing	PowerPoint Presentations	Internet browsing and E-mail	Other courses (specify please)
1	At Sebeta College of Teachers' Education				
2	At a private training center				
3	Trained myself				

If others specify \_\_\_\_\_

11. Rate your degree of agreement about the benefits of the usage of ICT or computer in your field of Study?

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint about benefits of using computer.

4 = Strongly Agree    3 = Agree    2 = neither agree nor disagree    1 = Disagree    0 = Strongly Disagree

N <sup>o</sup>	Benefits	4	3	2	1	0
1	It makes the subjects more Interesting					
2	It makes the subjects easy to understand					
3	It gives me another option to learn about the subject matter					
4	It help me to internalize complicated topics through computerized simulations					

12. Please list down the constraints that you have encountered in general when you comes to the usage of computers, internet and other ICT tools in your field of study and the possible solutions for each.

N <sup>o</sup>	Constraints observed/faced	Suggested solutions
1		
2		
3		
4		
5		

### Appendix III

Addis Ababa University

Institute of Educational Research

### *QUESTIONNAIRES FOR COLLEGE INSTRUCTORS*

#### *General Directions*

The purpose of this questionnaire is to gather information regarding the usage, skill and attitudes towards the role of ICT in achieving quality of education, primarily the uses of ICT in all departments at Sebeta College of Teachers Education. The response for each item in the questionnaire could be of great help to the intended purpose. Therefore, the researcher kindly requests your honesty reply. Responses to the questionnaire will be kept in confidence and the information required for this study will only be used for masters' thesis of educational research. Your willingness to answer all of the questions would be appreciated.

**Thank You for Your Cooperation!**

Note. 1. Do not write your name.

2. Please respond by putting “✓” mark or by writing your responses on the space

Provided.

#### *Part I: Background Information*

1. Age:      21-30       31-40       41-50       Above 51

2. Sex:      Male       Female

3. Qualification:

Certificate    Diploma       Bachelor    Masters    Doctorate

If others (please specify) \_\_\_\_\_

4. Name of your college \_\_\_\_\_

5. Stream \_\_\_\_\_

6. Work experience in years: \_\_\_\_\_

**Part II: ICT related skills**

**Directions:** Please read the items in the table below and put an ‘✓’ in the box that best describes your computer related skills.

4=High - I have good experience on it.

3= Medium - I have some experience on it.

2=Low - I have seen how people use it.

1= None - I have no experience on it or I don’t know the item

Nº	Description	4	3	2	1
1	Using word-processing applications like Microsoft Word				
2	Using spreadsheet applications like Microsoft Excel				
3	Using databases systems like Microsoft Access				
4	Using E-mail				
5	Using search engine (like Google, yahoo)				
6	Using online teaching and learning materials				
7	Uploading and downloading different materials				
8	Using educational CD-ROMs like Encarta or encyclopedia				
9	Using PowerPoint presentation				
10	Using LCD projector for teaching				
11	Using printers				

**Part III: Instructors’ attitude towards Information communication technologies. (Please indicate your answer by putting “✓ ” mark)**

9. To what extent do you agree with this statement?

**My College encourages instructors to incorporate ICT into instruction?**

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

**Part IV: Integration of Information Communication Technology**

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint about the usage of ICT tools

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

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

N <sup>o</sup>	ICT Tools	4	3	2	1	0
1	Computer					
2	Projectors or LCD					
3	Audio materials (e.g. Castes and MP3 files )					
4	Video materials (e.g. Movies or VCD, DVD, VHS)					
5	Television					

If others (please specify) \_\_\_\_\_

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

11. Do you use computers in your teaching learning activities? Yes  No

12. If your answer for question number 10 is yes, where do you use computer more often?

**Directions:** Please read the items in the table below and put an '✓' in the box that best describes your computer related skills.

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

N <sup>o</sup>	Place	4	3	2	1	0
1	Home					
2	Office					
3	Classroom					
4	Computer lab of SCTE					
5	Internet Center or cafe					

If other, please specify \_\_\_\_\_

13. If your answer for question number 10 is No, what is the reason for your not using computers?

**Directions :-** (Please indicate your answers using a tick "✓" mark, more than one answer is possible)

Nº	Reasons for not using computers	
1	I don't know how to operate computers	
2	I don't have access to computers	
3	I don't have enough time to use computers	
4	I don't know the significance of using computers	

If other, Please specify \_\_\_\_\_

14. If you use a computer, for what purpose do you use it?

**Direction:** - Please check all that apply and indicate your answers using an “✓” mark; more than one answer is possible.

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

Nº	Use	4	3	2	1	0
1	Organizing my teaching material					
2	Teaching in the classroom					
3	Internet					
4	Grading of results					
5	For Research					
6	Office work					

15. How often do you use internet?

Always  Usually  Sometimes  Rarely  Never

16. For what purpose do you use the Internet?

**Direction:** - Please check all that apply and indicate your answers using an “✓” mark

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

Nº	Purposes	4	3	2	1	0
1	E-mailing					
2	Social networks					
3	For research					
4	To communicate with my students					

If other, please specify it \_\_\_\_\_

17. Items that measure ICTs usage, skill and attitudes towards the role of ICT in achieving quality of education.

**Direction:** - Please check all that apply and indicate your answers using an “✓” mark

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

Nº	Description	4	3	2	1	0
1	I know how to solve my own technical problems.					
2	I can learn technology easily.					
3	I keep up with important new technologies. .					
4	I frequently play around with the technology.					
5	I know about a lot of different technologies.					
6	I have the technical skills I need to use technology.					
7	I have had sufficient opportunities to work with different technologies.					

**Part V: Trainings given on Preparation and Use of ICT.**

18. Have you ever received any training on the following programs? (Check all that apply)

**Direction:** - Please check all that apply and indicate your answers using an “✓” mark

2 = yes      1 = No

Nº	Programs	2	1
1	Word processing		
2	Spreadsheet		
3	Database		
4	PowerPoint Presentations		
5	Internet Browsing and E-mailing		

If others (please specify) \_\_\_\_\_

19. If you have marked any of the above ‘yes’ where have you taken the training?

**Direction:** - Please check all that apply and indicate your answers using an “✓” mark

4= Trained myself    3= At SCTE    2 = In another college    1= At a computer training center    0= From MoE

Nº	Programs	4	3	2	1	0
1	Word processing					
2	Spreadsheet					
3	Data base					
4	PowerPoint Presentations					
5	Internet Browsing and E-mailing					
6	Prepare E-lessons					

If others, please specify \_\_\_\_\_

20. How do you approve the following statements?

**Direction:** - Please check all that apply and indicate your answers using an “✓” mark

4 = Strongly Approve 3 = Approve 2 = Undecided 1 = Disapprove 0 = strongly disapprove

Nº	In the case of my subject area...	4	3	2	1	0
1	The usage of ICT is important					
2	The usage of ICT will raise the students interest to learn					
3	Computer simulations can help me to explain some lessons better					
4	I can save and use more time in class if I use E-lessons					

***Sebeta College of Teachers Education's Tools of ICT Infrastructure***

21. How do you rate your access to computers and related devices and applications in your college?

**Direction:** - Please check all that apply and indicate your answers using an “✓” mark

4 = Excellent   3= Very Good   2 = Good   1 = Fair   0 = Poor

N <sup>o</sup>	Devices, and applications	4	3	2	1	0
1	Computer					
2	Internet					
3	Printer					
4	Scanner					

## 22. Levels of Technology Implementation in Sebeta College of Teachers Education

**Directions** :- (Please indicate your answers using a tick “✓” mark, that describes your viewpoint about Levels of Technology Implementation in Sebeta College of Teachers Education.

4 = strongly agree 3= Agree 2= Neutral 1= Disagree 0= strongly disagree

Levels	Descriptions	4	3	2	1	0
0 (Non-Use)	A perceived lack of access to technology-based tools and existing technology is predominantly text - based (e.g. chalkboard).					
1 (Awareness)	Available classroom computer(s) are used primarily for teacher productivity (e.g., e-mail, word processing, grading programs).					
2 (Exploration)	Technology-based tools serve as a supplement to existing instructional program (e.g., tutorials, educational competitions, simulations).					
3 (Infusion)	The use of the technology reinforces higher cognitive skill development and complex thinking skills such as problem-solving, reasoning, decision-making, and scientific inquiry (e.g., science kit experiment using spreadsheets or graphs to analyze results).					
4 (Integration)	The use of outside resources and/or interventions aid the teacher in developing challenging learning experiences using available classroom computers. (e.g., multimedia, databases, spreadsheets, word processors) is perceived as a tool to identify and solve authentic problems relating to an overall concept.					
5 (Expansion)	Teachers actively use technology and information from outside entities to expand student experiences directed at problem solving, issues resolution, and student action (e. g. contacting research institutions, directed at problem solving, and student activism surrounding a major theme or concept.					

**Appendix IV**

**Addis Ababa University**

**Institute of Educational Research**

***QUESTIONNAIRES FOR COLLEGE ADMINISTRATORS***

**General Directions**

The purpose of this questionnaire is to gather information regarding the usage, skill and attitudes towards the role of ICT in achieving quality of education, primarily the uses of ICT in all departments at Sebeta College of Teachers Education. The response for each item in the questionnaire could be of great help to the intended purpose. Therefore, the researcher kindly requests your honesty reply. Responses to the questionnaire will be kept in confidence and the information required for this study will only be used for masters' thesis of educational research. Your willingness to answer all of the questions would be appreciated.

**Thank You for Your Cooperation!**

Note. 1. Do not write your name.

2. Please respond by putting “✓” mark or by writing your responses on the space provided.

**Part I: Background Information**

1. Sex: Male

Female

2. Age:  21-30

31-40

41-50

Above 51

3. Educational Level:

Diploma

Bachelor

Masters

Doctorate

4. Name of your college \_\_\_\_\_

5. Working experience \_\_\_\_\_

**Part II: ICT Related Policy and Skills (choose by putting “✓”) mark**

6. Does your college have an ICT policy?

- Yes       No       I don't know

7. If your answer for Question number 6 is yes, does this policy or any other policy at your college specify anything regarding e-learning or e-lesson?

- Yes       No       I don't know

8. If your answer for Q6 is yes, how e-learning mentioned in the policy?

- E-learning is considering in the college as very essential  
 E-learning is the preferred option  
 I don't know

9. What is your computer related skills? (Please choose by putting “✓”) mark)?

**Description:**

4=High and I have good experience on it.

3= Medium but I have some experience on it.

2=Low but I have seen how people use it.

1= None and I have no experience on it or I don't know how to use the item

N <sup>o</sup>	Descriptions	4	3	2	1
1	Using word-processing applications like Microsoft Word				
2	Using spreadsheet applications like Microsoft Excel				
3	Using databases systems like Microsoft Access				
4	Using e-mail				
5	Using search engine (like Google, yahoo)				
6	Using online teaching and learning materials				
7	Uploading and downloading different materials				
8	Using educational CD-ROMs like Encarta encyclopedia				
9	Using PowerPoint presentation				
10	Using LCD projector for teaching				
11	Using printers				

10. What is the number of computers used by students for academic activities? \_\_\_\_\_

11. Is your establishment connected to the internet? Yes  No

12. Does your college have?

Electricity in the classrooms

Electricity in the offices

13. If you unexpectedly received a lot of money for your College, what priority areas would you address first?

Provide electrical access

Purchase audio visual materials

Purchase Information technology equipment

14. How many of the computers (if more than 1) have access to the internet (www) for instructional or educational purposes? \_\_\_\_\_

**The current status, awareness and attitude consideration of the institute regarding E-learning.**

(Please choose by putting “✓” mark)

15. To what extent do you agree with this statement

**My College encourages instructors to incorporate ICT into instruction?**

Strongly agree

Somewhat agree

Neither agrees nor disagrees

Somewhat disagree

Strongly disagree

**Information Communication Technology Application**

**Directions:** - Please Tick (“✓”) in the box that describes your viewpoint about

16. How often do you use any of the following ICT tools in your Administration?

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

Nº	ICT Tools	4	3	2	1	0
1	Computer					
2	Projectors or LCD					
3	Video materials					
4	Audio materials					
5	Television					

Others (please specify) \_\_\_\_\_

17. If you don't use any of the ICT tools, specify your reason.

\_\_\_\_\_

\_\_\_\_\_

18. Do you use computers in your administration activities? Yes

No

**Questions based on ICT Integration in teaching learning process**

19. What is ICT integration in learning or teaching process?

\_\_\_\_\_

\_\_\_\_\_

20. What are the benefits of using ICT in teaching - learning process?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

21. Do you believe that computers are great tools to improve the quality of learning?

Yes     No

If your answer is Yes, How? Explain

---

---

---

22. Are there enough computers in class or lab or college for students use?  Yes  No

23. Are students accessible to computers all time they need it? Yes  No

24. Does your college administration have an ICT plan?  Yes  No

If yes, how does that plan help instructors in preparing and implementing ICT integration in teaching-learning process?

---

---

What strategies do you use to do that? \_\_\_\_\_

25. What are the content of the ICT Plan? Who participates in preparing the plans?

---

---

---

26. Are there teacher development programs for technology/ICT integration?

Yes     No

Have you attended any?    Yes     No

27. How do they help the teachers to improve his/her teaching with ICT?

---

---

28. What are the challenges do the administrations experience in using ICT?

---

---

29. What would you suggest to be done so as to improve the quality of education by using ICT in teaching-learning process in this teachers' education college?

---

---

---

Thank you for your time!

## **Appendix V**

### **Interview guideline for the ICT department head**

1. How do you describe the status of the computers in ICT department?
2. Is there any budget given to your department to enhance the ICT standard of the department?
3. How much is it important in helping you to upgrade the status of ICT in the department specifically and in the college in general?
4. Is there a problem encountered in the department?
5. How is the status of the usage of antivirus and availability of maintenance?
6. How is the ICT usage level of other departments' instructors and students?
7. Is there any accessible scanner or printer to be used by the instructors or students?
8. What suggestions do you have towards the improvement of the current situation of ICT?

## **Appendix VI**

### **Interview guidelines to education stream heads of the College**

1. How do you think ICT will help in the teaching-learning process of the Sebeta College of Teachers' Education?
2. Is there any support for the use of ICT in the Sebeta College of Teachers' Education?
3. Have you ever had any training on the use of ICT for the teaching-learning process?
4. Are there infrastructures available for enhancing ICT use in the college?
5. How many of the computers are connected to the internet?
6. Do you believe the current available infrastructure is enough to make the whole College computer based?
7. Are there infrastructural problems encountered with regard to the use of ICT?

## **Appendix VII**

### **Interview guidelines for Sebeta College of Teachers Education administrations**

1. Is there any budget allocated to improve the ICT standard of the college?
2. What are the problems encountered in the process of integrating ICT in to teaching learning processes in the college?
3. What are the short or long term plans the college has related with ICT in its education system?

## **Appendix VIII**

### **Interview guidelines for the education bureau officials**

1. Is there any effort made to enhance the ICT?
2. Is there any gap or problem encountered in the process?
3. Is there any short or long term plans?

## **Appendix - XI**

### **Declaration Letter**

I, Belay Ejigu, confirm by my signature that this thesis is my original work and has not been presented for a degree in any other university, and that all sources of material used for the thesis have properly acknowledged.

Name of Student: \_\_\_\_\_

Signature: \_\_\_\_\_