HAWASSA UNIVERSITY, INSTITUTE OF TECHNOLOGY

FACULTY OF INFORMATICS, DEPARTMENT OF INFORMATION TECHNOLOGY

Information and Communication Technology adoption for improving the quality of educational service delivery: The case of selected Teachers Education Colleges

By: Chala Taye Wakjira

Hawassa, Ethiopia

January 9, 2023

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Advisor: Tegegn Gobana (Assistant professor)

A Thesis submitted to faculty of Informatics, Hawassa University, Institute of Technology, in Partial Fulfillment of the Requirements for the Award of Master of Science Degree in Information Technology

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Declaration

I, Chala Taye, confirm by my signature that this thesis titled "Information and Communication Technology adoption for improving quality of educational service delivery: The case of selected Teachers Education College", is my original work and has not been presented for a degree in any other university/institutions and that all sources of material used for the thesis have properly acknowledged.

Candidate: Chala Taye Signature:_____Date_____

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Name of advisor:_____signature_____Date_____

Acknowledgement

First of all, I would like to give my thanks to the creator of this world Almighty God for the gift of life, taught me patience and love me in any situation, at any time and anywhere with me each and every activity of my life.

I would like to thank my advisor Tegegn Gobana (Assistant Professor) for his support, suggestion and comments throughout the research process. His comments and advice has helped me in maintaining the right direction for my study. Thank you so much!!

My father(Taye Wakjira), you show me the way to a better life in difficult situations, thank you so much my best father. I appreciate my mother(Degitu Debela), your life was my first school and taught me how to work hard when you are on this earth. I know my success makes you happy my lovely mom but you can't see this event because you are passed from this earth. Thank you!!

I am also very thankful to my six brothers and my sisters, Lalise Bekele and Tsion Tesfaye. You were with me in each and every process of my job. My Special thanks to my brother Tolera Taye. Thank you, bro!

Lastly I thanks to all staff administrators of Hawassa and Sebeta Teachers Education Colleges for your cooperation as I collect data for my thesis in your college, thank you very much all of my questionnaire respondents for your cooperation.

List of Tables

List of Figures

List of Appendices

Acronyms

ICT	Information and Communication Technology
IT	Information Technology
MoE	Ministry of Education
MoSHE	Ministry of science and higher education
ICT4E	Information and Communication Technology for education
ICT4D	Information and Communication Technology for development
AST	Adaptive Structuralist Theory
CART	Complete, Accurate, Relevant, and Timely
GSM	Global system of mobile communication
GEQIP	General education quality improvement Programme
ESDP	Education sector development Programme
CD	Compact Disks
MCIT	Ministry of Communications and Information Technology
ILO	International Labor Organization
HCTE	Hawassa College of Teachers Education
SCTE	Sebeta College of Teacher Education
TAM	Technology acceptance model
PU	Perceived Usefulness
PEOU	Perceived Ease of Use
HCAFEDD	Hawassa City Administration Finance and Economy Development and Data collection
UNESCO	United Nations Educational, Scientific and Cultural Organization
GSM	Global system of mobile communication

ABSTRACT

Information and Communication Technology (ICT) is a critical for colleges/higher education institutions and support to improve quality delivery service of education. In this 21st century ICT tool is very important to make education more attractive and easy to access at any time, any where without any distance problem. In developing countries there are many problems to improve quality delivery service of education, so, the best solution is adoption of information communications technology (ICT) especially for Teachers Education Colleges. Hawassa and Sebeta Teacher Education College is a lot of drawbacks in new technology integration occasioned by many factors which could only be solved if actually teacher educators should adopt technology integration at all.

The adoption of Information and Communication Technology has shown to improve businesses performance since ICT is known as a tool that improves business competitiveness.The objective of this study is to investigate Information and Communication Technology (ICT) adoptions to deliver quality of educational services by Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges. The study focuses on two aspects of ICT adoption: quality delivery service of education and utilization of ICT. Mixed research method approach was employed in the study. In order to collect data/get information questionnaires, interviews and direct observation was used on the current practice of ICT adoption HCTE and SCTE. As the findings of the study showed, low level of awareness on adoption of newer technology that made individuals resistance to change. Moreover, the result of the study revealed that there are several challenges adoption of ICT at college level. These includes lack of ICT skill, lack of ICT facilities such as computer lab, not sufficient in service training on integrated ICT and expensive ICT materials. Finally proposed frame work was developed and evaluated by ICT experts.

Keywords*: ICT adoption for improve quality delivery service of education, ICT use*

UNIT ONE

1. INTRODUCTION

Information and Communication Technology (ICT) is so important in the world today that it makes it imperative for every person to be competent in the use of ICT for the many tasks that one will have to accomplish. As series Galaxy of Information and Communication Technology define it the term ICT or IT has become a major part in almost every aspect of our daily life. Information and Communication Technology (ICT) refers to technology that provides access to information through telecommunications (the transmission of signals over long distances). It focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication media.

Information and Communication Technology (ICT) includes computers, the Internet, and electronic delivery systems such as radios, televisions, plasma, satellite and projectors among others, and is widely used in today's education field. Aboderin (2009) also explain the term as embrace the broad fields of information and communications Technology by means of computer and telecommunication; tools that are being progressively used for organization or personal information processing in all sectors of economy and the society as a whole. So, ICT is significant impact on the social, economic, political and cultural dimensions development of the societies across the globe.

The Information and Communication Technology (ICT) brings all the citizen on the earth planet close together and makes the world small village. Modern Information and Communication Technologies have created a "global village", in which people can communicate with others across the world, as if they were living next door. For this reason ICT is often studied in the context of how modern communication technologies affect society. Education is conceived as a powerful agency, which is helpful in bringing about the desired changes in the social, economic and cultural life of a community. The sustainable development of developing or developed country has positive linkage with education, because education is one of the most important factors for the well-being of a country. "Education enables individuals and society to make all

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

Despite the improvements in the access to and utilization of ICT around the world, there is evidence which suggest that a persistent digital divide between and within countries. ICT increases the flexibility of service delivery of education so that learners and any person can access knowledge anytime and from anywhere.

ICT is further viewed as the combination of computer and telecommunication system to improve the quality of communication, teaching and learning process through its gathering, processing, storing, connecting, analyzing data functions and dissemination of information. Information and communication Technology has successfully make changes in the way and manner many people do business activities and also communicate, Teachers Education Colleges.
According to (Getahun, 2006) as quoted by (Alemu, 2017) ICT related technologies are being deployed to support learning at different levels of the educational system.

ICT in the word of Kent and Facer (2004) cited by (Carvalho & Paulo, 2014), identifies that education sector/institution is an essential environment in which students participate in a huge range of computer activities, while the home serves as a complementary site for regular engagement in a narrower set of computer activities. Increasingly, ICT is being applied successfully in instruction, learning, and teaching processes. ICT is considered a powerful tool for quality delivery service of educational change and reform. ICT tends to expand access to education that can occur anytime and anywhere by any one. Through the ICT Online course materials can be accessible in daily within 24 hours a day.

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. The utilization of ICT effectively in teacher education for teaching and learning processes can motivate the learner and attractive the learning environment as-well as improve the quality of educational service delivery.UNESCO aims to ensure that all countries have access to the best educational facilities necessary to prepare young people to play full roles in modern society and to contribute to knowledge nation. ICT is importance to the future industrial and commercial

health of a country that investment in the equipment, teacher education, and support improvement of Educational quality services necessary for the effective delivery.

Ouma et al (2009) outline that, the quality of education information is essential to all people. The factors that are of significance in the provision of quality education system include timeliness, student centered, efficiency, effectiveness, equity and safety.The Government of the Federal Democratic Republic of Ethiopia has also invested in the ICT to support teaching, learning, research and management at higher education. The Government has developed an education sector strategic road map with the intention to promote access, equity, quality, and relevance of higher education centered on better student outcomes (MoSHE 2020).

Consequently, MoSHE made a ten-year (2021- 2030) ICT policy for Universities, to lead students to the standard of 21st-century education demands. ICT Directorates of Universities should be responsible for the well-functioning of ICT enabled education in three dimensions, teaching-learning, researching, and administering. As Ethiopian government stated in the Ethiopia Vision, provision of education is key to achieving the millennium development goals. Information Technology has been identified as one of the pillars that will help Ethiopia achieve its millennium development goal.

The Ministry of Education has identified ICT as one of its reform strategy to ensure effectively support service delivery. The Government of Ethiopia has placed importance on Information and Communication Technology for Education (ICT4E) for national development. Both the national Information and 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 people (Hare, 2007) and for facilitating educational delivery and training at all levels.

Successful IT adoption deals with how well a system is accepted, and how it fits the necessary specification and fulfills the expectations of the stakeholders in an organization, including the ongoing benefit of using a system over predicted periods of time (Debrabander_&_Edstrom,1977 as quoted by (Nyakowa, 2014). The world is now in the age, brought on by Information Communication Technologies (ICT).

According to (AMUTHA, 2010), The ICT is an umbrella that includes any communication device or application, encompassing, radio, television, cellular phones, computer, and network hardware and software, satellite system and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning. Such technologies are used for educational purposes, namely to support , improve the learning and teaching process and develop learning environments. ICT can be considered as a sub field of educational technology.

With information creation, access, processing and sharing becoming quicker and simpler, society is now being shaped these processes, so much so that to be called the Information Society. Participating in this society requires the development of new skills as well as an understanding of how these processes are impacting justice and equity in society. It is the responsibility of the education system to respond to this by bringing into school education, an understanding of ICT, the impact of ICT and society, the possibilities for learning through ICT. While at the same time building skills in students that will make them capable of functioning and responsive to a society shaped by ICT.

- **Connecting with the world**: Technology is providing new ways for us to access information and learn. Along with this, evaluating information and using it appropriately become skills to be developed. This theme will focus on accessing the internet, evaluating resources available and creating meaningful personal digital libraries for self-learning.
- **Connecting with each other**: A related dimension of connecting through ICT is in possibilities for learning in communities from each other. The focus of this theme will be on how to interact and learn in peer learning settings and through online, virtual forums. Collaborating learning is a key learning expectation from this curriculum.
- **Interacting with ICT**: Building skills and aptitudes in a technology environment is an important expectation of this curriculum. The theme will focus on building a more proactive approach to engaging with technology, evaluating appropriate technology choices, maintaining ICT infrastructure and becoming critical users of technology, being aware of the social and economic implications of technology.
- **Creating with ICT**: This is a theme that focuses on building computing and creating skills in students and teachers using various ICT applications.

- These include data analysis and processing, creating graphics, creating audio visual communications, working with mapping applications, creating resources with specific school subject related applications and programming.

Education is a very social activity, with high-quality education traditionally associated with good personal performance of qualified teachers communications. The use of Information and Communication technology (ICT) in training opens the way for more learning opportunities for educates to distance learning, online learning and interactive learning. But as the "world moved rapidly to digital media and information, the role of the ICT in education is becoming more essential and will proceed to grow and develop in the 21st century" (Noor-Ul-Amin, 2013; Malik, 2018).

Herselman and Greunen (2009) stated that developed countries have embraced the use of information system within the universities and colleges. A few examples of the use of ICT include computerization of student records, electronic scheduling for annual programs, and use of the Internet for the purposes of communication as well as for online learning and grade release.

Rapid development in Information and Communications Technology (ICT) to improve teaching and learning in colleges/higher education, especially with the recent COVID-19 pandemic in many parts of the globe have obligate many nations to adopt the use of ICT in teaching and learning process (Gwangwazo, 2021).

Studies of teaching and learning in schools around the world are supported by ICT for quality service delivery of education effectively and efficiently. Teachers Training Colleges (TTC) education system faces a challenge in under staffing of teaching staff, lack of knowledge to be active on the usage of information communication technology and late reporting and inadequate integration between departments.

This research intends to explore the adoption of ICT in teaching and learning processes in quality of educational service delivery in the Hawassa Teachers Education College and Sebeta Teachers Education College. The adoption of information communication technology has shown to improve businesses performance since ICT is known as a tool that improves business competitiveness (Niang, 2009).

Hence, this study focuses on the adoption of Information Technology in Hawassa and Sebeta Teacher Education Colleges and set the direction to prepare a quality of education service delivery.

1.1 Statement of the problem

According to study made by (Ziemba, 2017), in past years, the pace of the advancement of society has been enhanced by continual growth in the spread of information and communication technologies and in ICT uptake by citizens, institutions, and public organizations, as well as the increasing purpose of information in all spheres of life.

Now a day the world is rapid developments in technology. So it is very important to keep pace with these developments and introduce the latest technology in all areas of life. In education, Ethiopian Ministry of education starts to focus on the investments in information and communications technology in order to enhance quality delivery service of education.

When Information and communication Technology (ICT) changes the life of society from traditional to modernization, share information, support sustainable development of the country and power to connect community in the world, Hawassa and Sebeta Teachers Education Colleges tried to sustain the use of ICT make the development as its one of strategic priorities. Those selected Teachers Education Colleges launched several applications that help students and teachers to get information easily and quickly including web portal ,for example www.hcte.edu.et. This website is developed by Hawassa Teachers Education Colleges for community of the college.

In fact there is many limitation integration of ICT infrastructure and skill gap on new technologies in education sector. Hawassa and Sebeta Teachers Education Colleges have some limitations of developing ICT applications; for example they have lack of grade releasing system that helps students and teachers to access online. Because of this the ICT adoption is very important to change the culture of Teachers Education College organization and improve quality service delivery of education. Since ICT has great role in organizations success, Hawassa and Sebeta Teachers Education Colleges have to pay more attention to Information and Communication Technology implementation to be beneficial in teaching and learning process to improve quality of education delivery services. But, Hawassa and Sebeta Teachers Education

Colleges are invested on different kinds of technology to get over all changes of the organization, but the technology is not used well by its users and it cannot provide its conscious utilization and still behind to use the ICT infrastructure properly.

The impact of ICT in teaching and learning is an interesting point which must be known to find the output (Pandey & Pandey, 2020; Bariu, 2020). Keeping pace with technological development and the changing competencies required of both students and their teachers requires a state-of the- art curriculum and appropriate teacher development. ICT is the essential one to improve quality delivery service of education in 21st century of the information society, it is requires urgent attention in Hawassa and Sebeta Teachers Education Colleges.

(Ifegbo et al., 2015) are stated that, "Current educational technologies are to contribute immensely towards addressing the challenges facing instructional and learning design in this 21st century as regards to use of technology". Unfortunately, Hawassa and Sebeta Teacher Education College is a lot of drawbacks in new technology integration occasioned by many factors which could only be solved if actually teacher educators should accept adopt technology integration at all.

According to the studies made by Kirsti (2005) as quoted by (M. Kaur, 2019), "the students today find it simple to pick up any available new electronic device and learn how to communicate with it easily". This is however somewhat contrary to what is happening in Hawassa and Sebeta Teachers Education Colleges where such ICT electronic devices are inadequate. Taking an example of teacher of education colleges where am well versed with most of the students/learners and teachers are computer illiterate, it is very surprising that majority students do not work with MS words application, even if they cannot create the folder on the computer; that includes the instructors those who holder of first degree do not know how to use computers properly.

As the report of Hawassa Teachers Education College (2016), most of the worker is not well trained on the system in order to prevent under utilization of the system. The most common problem recorded was that of individual resist technology to change.

Hawassa and Sebeta Teachers Education Colleges, somehow staff members, Teachers and students needs the easy and old technologies which are adapted and they do not want to delay

their time in knowing new technology. So, new technologies will remain without users. In general, how effectively using ICT in teaching and learning process for improving quality of educational service delivery had been employed. Therefore, in this study an attempt had been made to assess the overall effectiveness of the practices of ICT in teaching and learning process for improving quality of education and challenges which hold back the use of ICT and adoption of ICT for improving quality delivery service of education in Hawassa and Sebeta Teachers Colleges of Education.

1.2 Research question

To address the said problem, this research has set out the below research questions for investigation and find a solution.

- What is current information and Communication Technology (ICT) adoption is suitable to enhance education service delivery?
- What are the suitability of ICT adoption to improve quality of educational services in Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges?
- What are the factors that affecting the ICT adoption for improving the quality of educational service delivery in Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges?

1.3 Objective of the Study

1.3.1 General Objective

The General objective of this research is to investigate Information and Communication Technology (ICT) adoptions to deliver quality of educational services in case of Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges.

1.3.2 Specific Objectives

- To analyses current suitability of ICT adoption in delivery of educational service in Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges.
- To identify critical problems of ICT adoption in Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges.

- ☞ To propose ICT adoption for effective quality of educational service delivery in Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges.

1.4 Scope and Limitation of the Study

The function of ICT adoption in education in this study is utilization of Information and Communication Technology or adoption of ICT for quality of educational service delivery.

The Information and Communication Technology is transforming educational service delivery that is effective and easy learning and teaching processes in the Colleges.

The scope of this study is limited to the Information and Communication Technology to delivery service quality of education in Hawassa Teachers Education College and Sebeta Teachers Education College.

Specifically focus on the current ICT adoption, skills, and interests of access integrated technology. The boundary of this study is only in Hawassa Teachers Education College and Sebeta Teachers Education College.

1.5 Significance of the Study

The main purpose of this study is providing quality of educational service deliver in teaching and learning process.

And also Hawassa and Sebeta Teachers Education Colleges will benefits from this study for improving students performances, to promote students engagements in teaching and learning process electronically and reducing educational cost to delivery of education traditionally as well as to transform quality of educational service delivery.

The study will serve as a source and have a benefit for practitioners, staffs, managers, students and instructors to search more by providing a better understanding of ICT adoption and make their future works easy in Hawassa Teachers Education College and Sebeta Teachers Education College.

And also the significance of this study is very high in Hawassa and Sebeta Teachers Education College to deliver quality of education during the covid-19 pandemics and any other pandemic disease may happen in society.

The study will also help the federal Ministry of Education and a policy maker to enact ICT adoption laws to enhance effective educational service delivery in any critical situations.

1.6 Organization of the Study

This study has organized in to five (5) chapters.

Chapter One: the first chapter includes introduction part of the study, statement of the problem, objectives of the study, research questions, scope and limitations of the study, significance of the study, finally presents operational definitions of the term.

Chapter Two : second chapter focuses on relevant related literature review of Ethiopian education system, concepts of ICT, Information and Communication Technology in education in Ethiopia, ICT improves teaching and learning quality, Strategy of ICT for the Education Sector in Ethiopia, Goal of ICT in education sector, purpose of ICT policy in education, Information and Communication Technology (ICT) adoption in Education, Technology Acceptance Model (TAM) and Conceptual Model of the study.

Chapter Three: the third chapter of the study is research design and methodology that includes description of the study area, qualitative research method, quantitative research method, population, sample and sample size of the study, sampling technique, data collection method and procedure, data analysis, validity, ethical consideration.

Chapter Four: the fourth chapter of the study deals the data analysis and interpretation of the results or findings of the research study.

Chapter Five: the last chapter of the study covers the summary, conclusions, recommendations and implications for future research.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

Many countries in the world are conscious of the important roles current technologies can play in their education systems, hence the heavy spending of governments on their acquisition. Ethiopia is a developing country and the use of these technologies is imperative in educational policy [Yusuf, M. O. (2005)].

The education has been traditionally associated with strong teachers having high level of degree professions of personal contact with learners to deliver quality of education, and also it is social oriented activity.

(Abraha, 2011) stated that "the use of ICT in education contribute itself to more student-centered learning settings". The world moving rapidly into digital media and information, the role of ICT in education is becoming the most essential that will continue to grow up and sustainable develop in this 21st century.

Digital technology facilitates the development of education and enables individuals, group of peoples and countries to meet the challenges presented by the knowledge and information age. In this 21st century education is based on student centrism education. So the teacher should prepare to cope up with different technology for using them in the classroom for making teaching and learning more interested. In Adaptive Structuralist Theory (AST) it is outlined that people adapt systems to their particular work needs, or they resist them or fail to use them at all; and there are wide variances in the patterns of computer utilization and consequently their effects on decision making and other outcomes. According the study made by Chiristiani (2008) and Uwadia, C. (2009) stated that "technology not only provides information processing mechanism for organizations but technology also change the basic way of how an organization operate".

This implies Information and communication technology is not only automating the institutional operational process but also changing the very base of the operation itself. When the usefulness of Information and communication technology (ICT) get recognize by an organization it is more likely that ICT will be included into an organizational strategic plan.

To meet the ICT strategic plan and the organizational strategic plan in general, it is essential that institutions have a well thought procedure for the ICT implementation.

There is no one definite source of ICT implementation failure or success since organizations have limited knowledge of what contribution to the success or failure of IT practices. Although IT industries and enterprises are capable of building systems, they often have difficulties in building systems that meet end users' needs and does not always deliver what business expects of them.

In general, to get the full benefit of ICT and the success factors of a satisfactory system, one has to have a successful institutional ICT practice starting from the initiation to the overall implementation. Information is what is conveyed or represented by a particular arrangement or sequence of things (Terry ,2005). Further, Terry defines information as facts provided or learned about something. Castell (2000) cited by (Priestnall et al., 2020) observes that" information age is here with us and this has led to a shift in the global economy's focus from physical resources to the way information is manipulated". In information age, peoples are literacy must be to handle and understand the valuable information from huge one. All the information is not helpful to a business or an organization. It might be detailed, but has been obtained for too much cost. Better information means information that is summarized in the acronym "CART" complete, accurate, relevant, and timely.

The Ethiopian government can use it to determine the literacy rate in the country. Government can use the information in making important decisions such as to improve literacy rate and implement ICT. Ethiopian Ministry of Education planned five years action (2006-2010) that are Capacity building is outlined the government is committed to addressing the nation's human resource requirements in the area of ICT through the promotion of mass ICT literacy and training. Complex projects require one or several systems analysts. The analyst's job is to study the information and communications needs of an organization and determine what changes are required to deliver better information to people who need it.

Pejova (2000) stated that "without information literacy, developing nations may continue to under utilize the technology that is provided and this may result in a waste of resources with potentially serious repercussions for development". According to Light, D. (2009) is outlined that information literacy as the ability to access and utilization information from a variety sources of information. Almost all the countries of the world, including Ethiopia, have

recognized ICT as very important source to promote computer literacy and improve the overall knowledge level of students in higher education. The application and usage of basic computer literacy is accessed by widening ICT culture and awareness through universal education. Therefore information literacy is properly use of information in all level of the business organization (Sangadah & Kartawidjaja, 2020).

According to the study done by(Nyakowa, 2014) identified the significant factors influencing the information technology adoption higher education. According to series Galaxy of Information and Communication Technology (ICT) is the process of gathering, creating, processing, and storage of information by using hardware, software, as well as the internet and global system of mobile communication (GSM). “However, the communication aspect of ICT is assuming more importance now than ever before, hence, it is now more appropriate to use the expression ICT rather than specified information technology which has become the back bone of the new information based global economy” [Quarshie,(2015)].

ICT can help students to become independent learners and self-reliance capable of developing critical thinking, skills and problems-solving strategies, motivation to work hard (Sangadah & Kartawidjaja, 2020). According to (Sangadah & Kartawidjaja, 2020) outlines ICT allows for information searches, team-work, online discussion, e-learning, brain-storming and revision. According to the study done by Quarshie (2015), Teachers can use computers to make learning experiences more effective, attractive and to offer students access to a variety of learning tools, expert opinions and alternative viewpoints. Many of the researcher believe that the effect of modern technologies are less a function of the technologies themselves than how they are utilized by users (Huber, 1990, Huseman and Miles, 1988). I concur with Huber et al argument, the impact of technology can only be realized the interaction between technological tools and the peoples are effective; it is not only technology itself that brings change in the institutions.

The government is committed to the use and application of digital technology for educational development, particularly in the training and development of teachers, and is working to ensure that ICT is equally available across all levels of the school system (Government of Ethiopia, 2016). So, digital technology can play a great role to accessibility and improvement of quality of education.

Law (2003) explained 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 (Law, 2003).

2.1 Concepts of Information and Communication Technology (ICT)

The term Information is the data that is organized, meaningful and useful for making a decision. Computers process data to create information. Information and Communication Technology has make world become greatly interconnected and interdependent without any borders. That means ICT are changing the world rapidly, creating a distance-less and border less world of instantaneous communication that create global village.

ICT are making dynamic changes in society that are utilization and accessibility of information through telecommunication technologies. ICT is influencing all aspects of life in day to day activity of the human beings. ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data. ICT a collection of tools and devices used for particular tasks, e.g., publishing, course delivery, transaction processing. ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example, personal computers, digital television, email. (Uwadia, 2009) outlined that ICT serves as a tool for increases productivity and effective decision making. Information and Communication Technology (ICT) has become, within a very short time, one of the basic building blocks of modern society.

According to Aboderin (2009), “ICT also encompasses the broad fields of information and communications by means of computer and telecommunication; tools that are being increasingly utilized for organization or personal information processing in all sectors and the society as a whole”. Information and Communication Technology (ICT) refers to technology that provides access to information through telecommunications (the transmission of signals over long distances). It focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication media. Information and Communications Technology (ICT) refers to the concept of using technology to get information.

ICT involves the use of computers and other electronic devices to access information easily and quickly.

Anderson and Glen (2003) explained ICT as those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The term Technology is the usage and knowledge of tools, crafts, techniques, or systems, or methods of organizations. Technology focuses on making things happen. It is begun to influence human beings as soon as people began using tools. Now-a-days, technology is an integrated part of lives of human beings. For example, the technology in communications such as mobile phones helps us to connect with the other people easily. Technology has a simple but important role in our life now-a-days. But Information Technology (IT) refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that work with these technologies. The advances in technology and reductions in costs have made ICT suitable for developing countries.

2.2 Information and Communication Technology (ICT) in Education in Ethiopia

ICT in Ethiopia at present is at the very early stage of development. As defined by Light (2009) the term "ICT is quite often used to describe variety ways IT related technologies are utilized or intermediate in the learning and teaching process".

Information and Communication Technologies (ICTs) are making visible changes in economic and social sustainable development and they acknowledged the fact that the Education organization of course is at the core of learning in society (Carvalho and Paulo, 2014). ICT is therefore praised for support and increasing literacy education and also for facilitating educational delivery service and training at all levels of the organizations. ICT can enhance the quality of education in several ways: by increasing learners motivation and engagement, by facilitate the acquisition of basic skills ICT, and by enhancing instructors training. Victoria (2002) cited by (Sani, 2013), stated that ICT are also transformational tools, when used appropriately, can promote the shift to a learner-centered environment. ICT facilitates the development of education and enables individuals, organizations and also countries to meet the challenges presented by the knowledge and information age.

Now a days in the world, computer is no longer a specialized tool used only by scientists but an instrument now been extended to education, commerce, governance, agricultural and health organization to mention a few. In Ethiopia, ICT is pertinent to say that computer studies have been introduced into the school curriculum. The ICT in Education Implementation Strategy and its action plan are components of a wider Ethiopian national electronic education initiative.

This initiative forms one of the pillars of the ICT for Development 2010 Plan.
The strategy is built on three main streams:

- Ethiopian National School Net Initiative
- The National ICTs in Higher Education Initiative
- The National ICT Education, Training and Awareness Initiative

These three streams form the basis for the implementation of the strategy across the education sectors. The National School Net initiative, for instance, is aimed at the deployment and the exploitation of ICT to facilitate the teaching and learning process within primary, secondary, technical and vocational schools.

Ministry of Education was mentioned that 300 schools across the country are benefiting from digital technology introduced to promote delivery quality education through the GEQIP IIproject. In March 2018, the Ministry of Education, in partnership with the World Bank, introduced digital technology into 300 schools across the country, where by students use technological devices such as tablets with the overall aim of increasing efficiency in their educational activities. The idea that ICT can help in overcoming teacher shortages has been entertained by several researchers (Moges Alemu, 2017; Hussein 2018; Temtim 2017), with the general argument being that technology should act as a complement to teachers rather than a replacement. Temtim (2017), for instance, argues that instructors are not replaceable and technology is not a panacea for all problems; the emphasis should rather be on enhancing human capability to use ICT as a tool to solve educational challenges. Technology as a tool should support and enable better teaching and learning quality delivery service

The utilization of digital technology in instruction can potentially overcome issues of cost, teacher shortages, poor-quality education and time and distance barriers, but the use of digital

technology in educational settings on its own may not bring about all predicted changes (Kim and Gebeyehu 2014, 85). ICT is specifically identified in ESDP III (2005) in relation to the government's plan to embark on a fully fledged ICT capacity-building programme, including ICT for education. The programme aimed to provide fiber cable institutional networking in higher education institutions and the necessary ICT infrastructure to enable secondary schools to receive satellite education transmissions.

The ICT in Higher Education Initiative focuses on deploying ICT within the universities, colleges, and research institutions. Finally, the National ICT Education, Training and Awareness initiative promotes ICT awareness and literacy, lifelong and adult education, and distance and virtual education learning. The strategy also identifies strategic goals and draws up a programme and activities for each initiative.

Both the national ICT4D 2010 Plan and the ICT in Education Implementation Strategy recognize ICT as an enabler for widening access to education for the Ethiopian population, for supporting literacy education, and for facilitating learning delivery and training at all levels.

2.2.1 Improve Teaching and Learning quality

According to (Lowther et al,2008) cited by (Jo Shan Fu & Fu, 2013) have outlined that there are "three important characteristics are needed to develop better quality teaching and learning with ICT: autonomy, capability, and creativity".

Autonomy means that learners take control of their learning through their use of ICT. In this way, they become more confident of working by themselves and in collaborations. Instructors can also empower learners to complete certain tasks individually or with in groups. Through collaborative learning with ICT, the learners have more opportunity to build the new knowledge and creativity onto their background knowledge, and become more self-confident to take risks and learn from their mistakes and overcome it.

(Serhan, 2009) concluded that ICT adoptive autonomy by allowing learners to create their own material, thus providing more control over course content than is possible in a traditional classroom setting. With regard to capability, the learners are more confident in learning

processes, they can develop the capability to apply and transfer knowledge while using new technology with efficiency and effectiveness.

By the utilization of ICT, learners creativity can be optimized. They may discover new multimedia tools and create materials in the styles readily available to them through games (Gee 2007, 2011), CDs, and television. With a combination of learners autonomy, capability, and creativity, the utilization of ICT can improve both teaching and learning quality of education.

2.2.2 Strategy of ICT for the Education Sector in Ethiopia

The Ethiopian Government acknowledges education and training as the cornerstone of social progress and economic development, as undertake in the 2020 National ICT Policy and Strategy (Government of Ethiopia 2020). Thus, the human resource development should be supported and accelerated by applying ICT.

ICT facilitates the development of education and enables both individuals and countries to meet the challenges presented by the knowledge and information age. As the vast majority of Ethiopian population lives in remote areas and gets low quality of education, ICT is crucial in addressing access and quality of education. Therefore, the Government commits itself to the exploitation and application of ICT for educational development in the context of the following are some strategies.

- Upgrade schools curricula to include ICT education in colleges and universities.
- Achieve a critical mass of computer literate ICT teachers by availing training to teachers, as well as, improving their working conditions.
- Link academic institutions and libraries electronically so as to enable both teachers and students access recent knowledge and information resources.
- Expand the on-going electronic education program to embrace all levels of education and training across the country.

2.2.3 Goal of ICT in education sector

Ensure that ICT is an integral part of the educational and training system at all levels, and wherever possible, ICT shall be used to extensively deliver education.

2.3 Purpose of ICT policy

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.

Yusuf, M. O. (2005) stated that a policy is a principle that guide decisions and aids in accomplishing rational outcome. Policy is a statement of intent or a commitment towards something to accomplish at present or in the future. The policy defines the responsibilities of users of the colleges or University's ICT Infrastructures and services deter unacceptable ICT use by declaring the punitive actions, foster better service quality and fair use (MoSHE, 2020).

The purpose of the ICT policy is to:

- Promote ICT use for teaching, learning, research and administration.
- Provide impetus for ICT application in libraries.
- Guide the process of enhancing user utilization of ICT resources through training .
- Standardize the ICT procurement and maintenance process.
- Enforce and ensure minimum information and network security standards to prevent any misuse from its own users and outsiders.
- Promote good ICT governance, management, and support.

- Standardize ICT Infrastructure and application of the University.
- Strengthen and institutionalization of ICT academy and Collaboration.
- Provide ICT Training, Consultancy and Research.

2.4 Information and Communication Technology (ICT) adoption in Education

ICT adoption in education is a common term refers to the utilization of ICT in teaching, learning, and administration aimed to strengthen the achievement of education goals, priorities, and strategies. There is encouraging evidence that ICT can be an effective tool in supporting teaching and learning.

Ethiopia has embraced the use of ICT in learning and has recognized ICT as an enabler for widening access to education, supporting literacy education and facilitating educational delivery and training at all levels, as undertake in the 2016 National ICT Policy and Strategy (Government of Ethiopia 2016). There is a common believe among education policy makers in various countries that the necessary condition for effectively introducing technology into higher education are mainly the availability and accessibility of ICT resources.

The resources are including: computer hardware, software, communications infrastructure, digital content, technical as well as finance support for ICT operation and maintenance.

Some researchers found that one of the greatest challenges in ICT use in education is balancing educational goals with economic conditions. ICT in education programs require large capital investments. Some special attention should be paid to areas in less developed countries due to the digital divide.

According to Wang F and Zhou C (2013) outlined to achieve a greater development of ICT supported education systems will require new approaches to teaching and learning, and new types of technologies to support those new approaches in schools.

That is why designing an ICT policy in education is a far more complex task than merely deploying hardware in the colleges.

The integration of ICT into the learning and teaching process in the school systems through the establishment of ICT networks in higher education. Despite its economic constraints and limited infrastructure facilities, Ethiopia has made rapid investments in technology based learning.

The International Labor Organization (ILO) and GIZ/BMZ, is part of a larger project focusing on five Eastern African countries, including Ethiopia.

This project is focused on the following ideas:

- How teaching and learning processes are adapting to the new paradigm of education in light of the future of work.
- How new digital technologies are impacting the way learners learn.
- How teachers exercise their profession in the Ethiopian context.

2.4.1 Information and Communication Technology (ICT) Adoption

An ICT adoption is a decision to utilize an ICT. Adoptions are made by decision makers, who have resources and the decision rights to use/utilize resources and change operational practices. Roger (2009) explained adoption as, "making full use of a new idea as the best course of action available". In relation to this, Rogers (2017) explained pro innovation bias as a tendency to assume that adoption of the innovation should be carried out by all possible adopters.

2.5. Information Needs and Information Flows in Higher Education

Frackmann (2007) identifies the flow of information in higher education institutions he said that one might regard higher education as an exchange process according to a market model. There is a service provider, the higher education institution providing services for the service receiver, i.e. the student. In exchange for the services the service provider receives funds from the service receiver.

There seem to be three identifiable flows of information involved in the exchange process:

Ex-ante information (information that flows before the service is provided):

• the service provider has to inform the potential service receiver about the services (e.g. information about the study program) and he has to collect information in designing and shaping the services (curriculum) according to the needs (of society and labor market)

• the service receiver (students) might collect information about the institutions, the study programs and the respective teachers for his/her institution and program choice decisions

Accompanying information (information that accompanies the provision of the services):

• Besides the fact that the service itself in the case of education is an information transfer, the accompanying information consists of contract information (application, enrollment, registering for courses and exams, student records) and user manuals (i.e. the curriculum plan)

Ex-post information (information that flows and is handled after the service provision)

• Both sides might evaluate the service processes and results in order to decide whether they continue or make changes and adjustments with regards to the services (study programs).

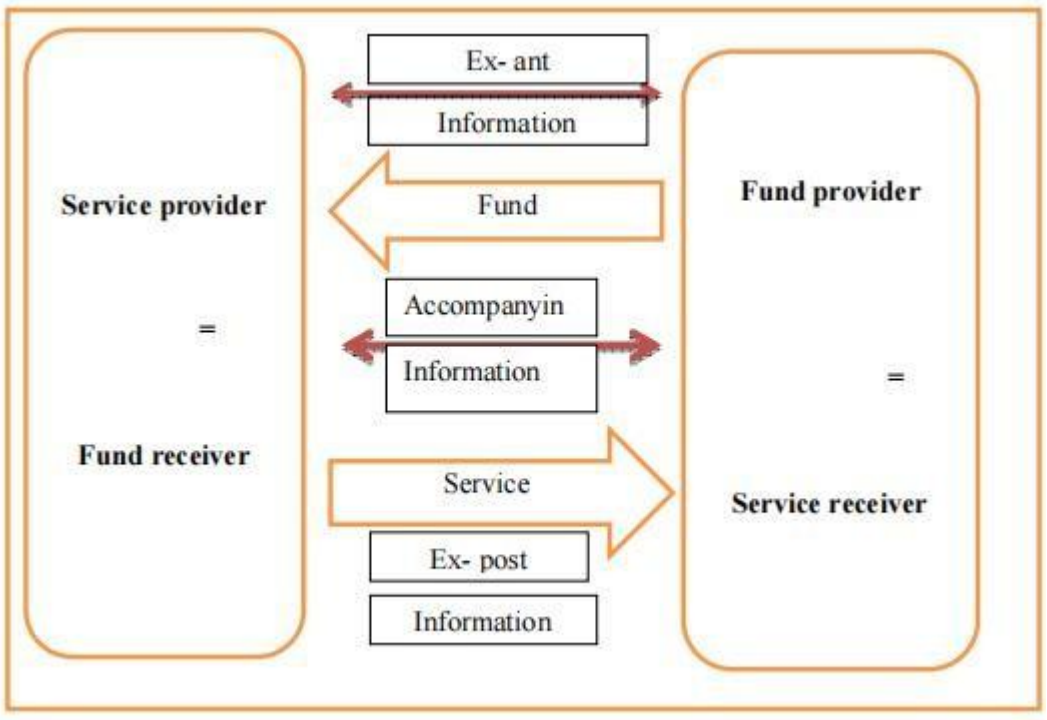

Figure 2.1 Exchange process model for higher education adopted from (Frackmann, 2007).

2.6. 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 learners 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).

According to the assumption is that learning is about how information is received and processed, as well as started in these memory components. Under the framework of behaviorism and cognitivist the major roles of the teacher is as information provider and the students 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 learners 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 tutors role, the computer may be used to deliver education, 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 learner skills. The instructional materials have been prepared by teachers who have undergone training under the education technology department in developing multimedia interactive modules. Instructors 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 instructors 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 utilized as a tool or providing access to instructional materials. When integrated with lessons, a instructors can use technology as an informative tool in order to provide information for the students to manipulate and from which knowledge can be constructed. Learners utilize the informative tools such as multimedia encyclopedia or resources available on the Internet (Pusat Perkembangan Kurikulum, 2001). During the knowledge construction process, learners 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 students centered education of the world over in the past few years contributes to the utilization 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 improve quality of education service delivery 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 21st century.

2.6 Research Gaps

Based on the literature review and related works that presented earlier, ICT adoption is very important for the success of the organizations. Still now, the ICT adoption and its utilization are differ from organization to organization. Therefore, the reason to conduct ICT adoption for quality of educational service delivery is undertaken in the Hawassa and Sebeta Teachers Education Colleges. However, the research addresses the Information and Communication Technology adoption in Hawassa and Sebeta Teacher Education College, which is not addressed in earlier works.

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Overview

The research methodology section of this study outlines how an investigation has taken place and a research method and design typically including how data has been collected, what instruments employed, how the instruments used and the intended means for analyzing data was conducted. In addition to these, sample selection, techniques, research setting, populations of the study and participants as well as data collection tools were established.

3.2 Description of the study area

The Location of this study is situated in Hawassa and Sebeta town. Hawassa is located in the Sidama region and Capital city of Sidama Region the shores of Lake Hawassa in the Great Rift Valley; 273 km south of Addis Ababa via Bishoftu and 1,125 km north of Nairobi. The city lays on the Trans-African High Way which is an international road that starched from Cairo (Egypt) to Cape Town (S. Africa). Geographically the City lays between 703' latitude North and 380 28' longitudes east (HCAFEDD, 2011).Hawassa city is bounded by Lake Hawassa in the West, Oromia Region in the North, Wendogenet woreda in the East and Shebedino woreda in the south.

Hawassa College of teacher education is one the government educational institution found in Sidama region, Hawassa city. Hawassa college of teacher education is one of the higher colleges found in Hawassa city and it has its own structural background and a mission of fulfilling the government's due policy in training. The college has got its name in the year 1988 E.C. Before recognized by this name, the college was known as vocational and technical education training center so that it was establishing the training applications in small and narrower aspects. Starting from the year 1990 up to 2014 E.C the college had graduated about more than 55,000 students by regular, extension/evening, summer and weekend programs.

Hawassa College of Teachers Education has five (5) education streams. Social science stream includes History, Geography and Civics departments; natural science education stream that contains Biology, Physics, Chemistry and Mathematics departments; Language education stream that includes Sidamu afoo, Amharic and English; Aesthetics education streams that contains HPE, Art and Music; Educational streams contains Education Curriculum, Psychology, ICT, special need, preschool and adult departments exist in this college.

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 Research design

Research design is the blue print for the collection, measurements, and analysis of data. Research design should be relevant and economical. It should also contain research resources, time, quality and enough data access. According to Kothari (2008) define the research design is also the "conceptual structure within which research conducted"; it contains the mechanisms of data collections, variable measurement and analysis.

The research design used for this study was a mixed method research approach. According to the study done by Creswell & Plano Clark (2011), a mixed methods research design is a procedure for collecting, analyzing, and mixing both quantitative and qualitative methods in a research study or a series of studies to understand a research problems. Mixed research methods can give a better understanding of the problem and yield more complete evidence to the investigator gains both depth and breadth.

To achieve the intended purpose and to answer the basic questions of the study was descriptive research design has been employed. Descriptive research is to describe a phenomenon and its characteristics. This research is more concerned with what rather than how or why something has happened. Therefore, observation and survey tools are often used to gather data (Nassaji, 2015). As the study of (Nassaji, 2015) explained, in such mixed research approach, the data is collected qualitatively, but it is often analyzed quantitatively, using frequencies, percentages, averages, or other statistical analyses to determine relationships. A mixed that means qualitative and quantitative approach was used to collect the relevant data in this study. Mixed method approaches have been used to collect the relevant data. The integration of both qualitative and quantitative approach have been intended to formulate the researchers 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.

3.4 Methodology

Methodology refers to how researchers go about doing research as they can select the methods to be used based on the topic under study. Research methodology is the way through which researchers crack to show Problems that require investigation and how the research would proceed (Personal & Archive, 2017). Research methodology is the heart of the research.

3.4.1 Qualitative research method

Kothari (2004) stated that the "qualitative approach of research will concern with subject assessment of attitudes, opinions, and behavior and researches in this situation is a function of researcher's understandings and impressions". It involves dealing with few individuals to get in-depth information. Qualitative ("qual") research is often used for exploring the study. It helps researchers gain an understanding of underlying reasons, opinions, and motivations.

The qualitative data are not amenable to count or measure. Qualitative data are often textual observations that represent attitude, perceptions or Intentions. Qualitative data like quantitative data is based on empiric investigations and evidence. A qualitative research technique includes observations, small group discussions, individual interviews to seek views will focus topic or with key informants for background information or an organizational perspective. Qualitative research approach focuses on words rather than numbers, depth rather than breadth.

They seek to unearth the opinions, thoughts and feelings of respondents. It is most commonly used to help inform new concepts, theories and products.

For the qualitative study, the researcher used the interview questionnaire and purposive sampling technique was used. Such technique gives the opportunity for the researcher to determine key informants who are believed to provide the required information.

The researcher has applied this means of acquiring facts and information about the ICT adoption for improvement quality of educational service delivery. A specific tools of data collection employed under qualitative approach of this research is explained in detail under the subtitle application of data collection instruments.

3.4.2 Quantitative Research method

Kothari (2004) outlined the "quantitative is a type of research method which roots on the measurement of quantity". Quantitative research approach methods are characterized by the collection of information which is analyzed numerically, the results of which are typically presented using statistics, tables and graphs.

In this study researcher used type of research method uses tools like questionnaires and structured interviews to generate statistical data. It is assumed that in this type of fact finding researcher could get more people and contact with these people quicker than it may happens in qualitative one. Researcher used SPSS software to analyzed quantitative data.

3.4.3 Population, sample and sample size of the study

According to the study done by Zikmund (2003), explain the term "population as any complete group of people, companies, hospitals, stores, college students or the like, that share some set of characteristics".

Population of this study were Hawassa and Sebeta Teachers Education College; however in line with purpose of the study, target participants of the study were college instructors, college administrators, education bureau officers, ICT experts stream heads and selected students of Hawassa and Sebeta Teachers Education Colleges. Totally there are 2000 students and 78 instructors in Hawassa and Sebeta College of teachers education.

To determine the sample size among the total population of teachers and students, the researcher selected 30% of them for the study. According to the study done by A. Navarro Sada and A. Maldonado(2007), Have noted that a sample size of 25-30% from the total population is appropriate if the number of population is known.

Accordingly, 19 instructors from 78 instructors and 141 students' from 2000 were chosen as a sample using convenience sampling while 6 college administrators, 2 education bureau officers, 2 system administrator, 2 lab assistant and two stream heads were chosen using purposive sampling.

3.4.4 Sampling Technique

The researcher was used purposive sampling technique to select Hawassa and Sebeta Teachers Education Colleges. To select the required sample, the researcher was used purposive sampling and convenience sampling technique. In this study purposive sampling is used to select the interviewee, college administrators, stream heads, education bureau officers and ICT experts. The reason why the researcher purposively select is that they are familiar with the colleges ICT adoption and utilization of ICT in the colleges.

They can justify the teaching and learning process easily deliver to learners. So, to get relevant information about ICT adoption those population are preferable. The Hawassa and Sebeta Teachers Education College students, Instructors, college administrators and staff members may have better knowledge on ICT adoption in that organization.

3.5 Data collection Method and Procedure

The following data collection methods was use to gather the required information for the study. Those are two types of instruments, namely: interview and also questionnaire.

3.5.1 Questionnaires

A questionnaire is one of the research instrument consisting of a series of questions for the purpose of gathering data from respondents/participants of the study. Questionnaires provide a relatively quick and efficient way of obtaining large amounts of information from a large sample of respondents.

Since questionnaires were the most proper means to gather the necessary information from larger sample size within a short period of time, it was used to collect information from instructors, selected students, ICT experts and College administrators. Often a questionnaire uses both open and closed questions to collect information. Closed questions means it is structure the answer by only allowing responses which fit into pre- decided categories. The category can be restricted to as few as two options, i.e., dichotomous (e.g., 'yes' or 'no,' 'male' or 'female'), or include quite complex lists of alternatives from which the respondent can choose. Closed questions can also provide ordinal data (which can be ranked). This often involves using a continuous rating scale to measure the strength of attitudes or emotions. For example, strongly agree , agree , neutral , disagree , strongly disagree, unable to answer. So the researcher used both open and closed questions to collect data. The questionnaires are prepared as such a 5 point Likert scale (Likert, Rensis 1932), questionnaires which are design to obtain reliable information from concerned person; that are focused on clarity, completeness, compatibility, correctness and applicability.

Moreover, the use of the questionnaire was found to be important to draw out information on respondent's attitudes and beliefs towards the ICT adoption in improving quality of service delivery for education. The purpose of the questionnaires was to collect the responses of these subjects regarding the situation of ICT adoption in Teachers Education College and in general which were related to the utilization and integration of ICT in teaching and learning process. The questionnaires also sought to produce respondents opinion about the adoption of ICT in teaching and learning process.

The questionnaire basically covered background knowledge of the participants, ICT related adoption skills and activities of teachers/instructors and students in the teaching and learning process, respondents perceptions and attitudes towards instructional technologies, integration of ICT in education, reasons for why not using computers, training given on the use of ICT, tools of Information and Communication Technology Teachers Education Colleges are used and implementations of the colleges and constraints observed and suggested solutions.

The questionnaire for students was initially prepared in English language. But students in Sebeta colleges of teacher education they were assumed that most of the students are more skillful in Afaan Oromo than they are in English language; so, the questionnaire was translated into Afaan

Oromo language. The translation of language from English language to Afaan Oromo language was done to avoid the problem of language barrier which might interfere to get the necessary information in Sebeta Teachers Education College. The respondents of the questionnaire in each item, the selected students and instructor participants are advised to carefully go through the sections in the questionnaires and to ask for clarification on points they might not be understand.

3.5.2 Interview

It is the second tools of gathering data when data gathered through questionnaire is not satisfying and require some personal explanation. An interview is generally a qualitative research technique which involves asking open-ended questions to converse with participants of the study and collect elicit information about a subject. Interview questions are delivered in a face to face communication by an interviewer and respondents.

Interview is like an oral communication and has the purpose of obtaining information relevant to a particular research topic. According to (Abiy et al, 2009), It is initiated by the researcher and is focused on specific content. The interviewer in most cases is the subject matter expert who intends to understand respondents/participants opinions in a well-planned and executed series of questions and answers. Interviews were conducted to see the quality and implementation level of ICT adoption in solving educational problems of the selected teacher education colleges. Interview was held with ICT experts, stream heads, college administrators and education bureau officers with face to face basis of interviewee and they exhibit is their conversational tone. Each interview was made by the participant permission. Probing questions were also asked to the interviewees to capture in depth and detail information. Researcher notes that the primary goal behind interview is to produce personal views and opinions from the respondents. In this research an interview is used for collection information so as to render some flexibility.

3.6 Data Analysis

Data collected from interview and questionnaires was analyzed in qualitative approach and quantitative approach ways. Respondents were give responses that are non-quantifiable (qualitative) data through interview, open ended questionnaires. These responses were composed,

organized and analyzed in descriptive words (narration).The qualitative data was analyzed using thematic analysis method.

But data collected through close ended questionnaires were analyzed in quantitative (numerical ways).

The data were obtained through questionnaire was analyzed through employ basic statistics, including mean and percentage by using Statistical Package for Social Sciences (SPSS) software. The quantitative analysis that are used descriptive analysis. The researchers used descriptive analysis to analyze the frequency and percentage of the overall population in the demographic background. Besides, it is also used to determine the mean, standard deviation, frequency and percentage to identify the adoption of ICT for improving the quality delivery service of education.However, the data obtained through interview will analyzed thematically and descriptively. The analyzed data was presented in the form of tables and word analysis under each table. Finally based on the results of interpretation was done, conclusion and recommendation were drawn.

3.7 Reliability

Reliability measures internal consistency of the subjects in the survey items. The method of determining the reliability of a test by internal consistency is Cronbach's alpha. This is a single correlation coefficient that is an estimate of the average of all the correlation coefficients of the items within a test. If alpha is high (0.70 or higher), then this suggests that all of the items are reliable and the entire test is internally consistent. If alpha is low, then at least one of the items is unreliable, and must be identified via item analysis procedure (Hirut, 2011). The items and their Cronbach's alpha of the questionnaire are presented as follow in the following table:

Table 3.1 : Reliability statics of Items in the Questionnaires

Name of respondents	**Cronbach's Alpha**	**N of Items**
Instructors	0.924	21

students	0.818	12
Administrators and ICT experts	0.741	8

3.8 Validity

According to Hutchinson and Wilson (1994),outlined to increase the validity of the research, they adhered to criteria set out. So, during the interview, the interviewer tried to be open minded and to avoid showing any possible emotions and most importantly to not express any personal opinion so as to not mislead the interviewees. The interviewer also avoided to ask the questions in a way that would drive the interviewee towards specific answers/responses. The meetings were scheduled the time period it was convenient for the interviewees, in order to avoid any feelings of influence and for the interviewee to be relaxed. Finally, the transcripts were sent back to the interviewees in order to avoid any misinterpretations of their statements by the interviewer which can in turn cause biased data. And also the validity of a measure is the extent to which it measures what it intends to measure.

"To improve the validity of the data collection instrument, it was used to measure the variables precisely; steps were being taken to do so"[(Abraha, 2011)]. According to (Abraha, 2011) outlined that 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 answers would untruthful due to influence from friends; the use of a self-administered questionnaire also contributes to the generation of valid data.

Validity can be seen as the core of any form of assessment that is trustworthy and accurate or free from error that reflects the concept the researcher is actually looking (Bond, 2003). There are some forms of validity that differ in their method of assessment: content validity, criterion-related validity, construct validity, and face validity. As with other measures, a questionnaire must have validity if it is to be useful; that is, it must measure what it is intended to measure. Of these forms of validity, content validity, construct validity, and criterion-related validity apply to a questionnaire (Rogers, 1995).

3.9 Ethical consideration

The attachment letter was provided from Hawassa University, Institute of Technology, faculty of Informatics, department of Information Technology. So, the attachment letter is given to the organization and the concerned bodies of the organization give permission and voluntary support to access relevant data and information smoothly. This research study was conducted by taking all ethical issues of research study into consideration.

Participants of the study was briefed about the purpose of the study and asked were provided with written consent (informed consent) to participate in the study. The participants were told that over all the data gathered from the questionnaire and interview do not expose the identity of the participants/respondents. The interview was conducted separately and in private and all information(data) that was provided by respondents kept confidentially by researcher.

3.10 Conceptual Model of the study

The rapid spread of e-communications has the capacity to affect the quality delivery service of education and efficiency of basic education throughout the world in dramatic ways positively (Abraha, 2011). The straightforwardness with which instructors and students/learners 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 instructors in one country can be made available to students/learners across many countries. Indicators of the adoption and access to relatively newer forms of Information and Communication Technologies in education (personal computers, server computers, mobiles, wireless networks, internet, cloud computing etc.) are important; and access to the oldest technologies such as transistor radios or analogue television cannot be ignored. In many developing countries like Ethiopia these technologies still play a great role such as providing access to learning in remote area location.

The two classifications cover students and Teachers contexts of the Teachers Education College, internal environment and external environment. The former addresses aspects of the college environment such as infrastructure, instructors adoption and use of ICT, the college

administrators, and most importantly students adopt the new technology and access integrated ICT. Each of these categories is examined from the perspective of adoption to ICT and the utilization of ICT by students and their instructors to improve the quality service delivery 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 institution are reviewed and examined.

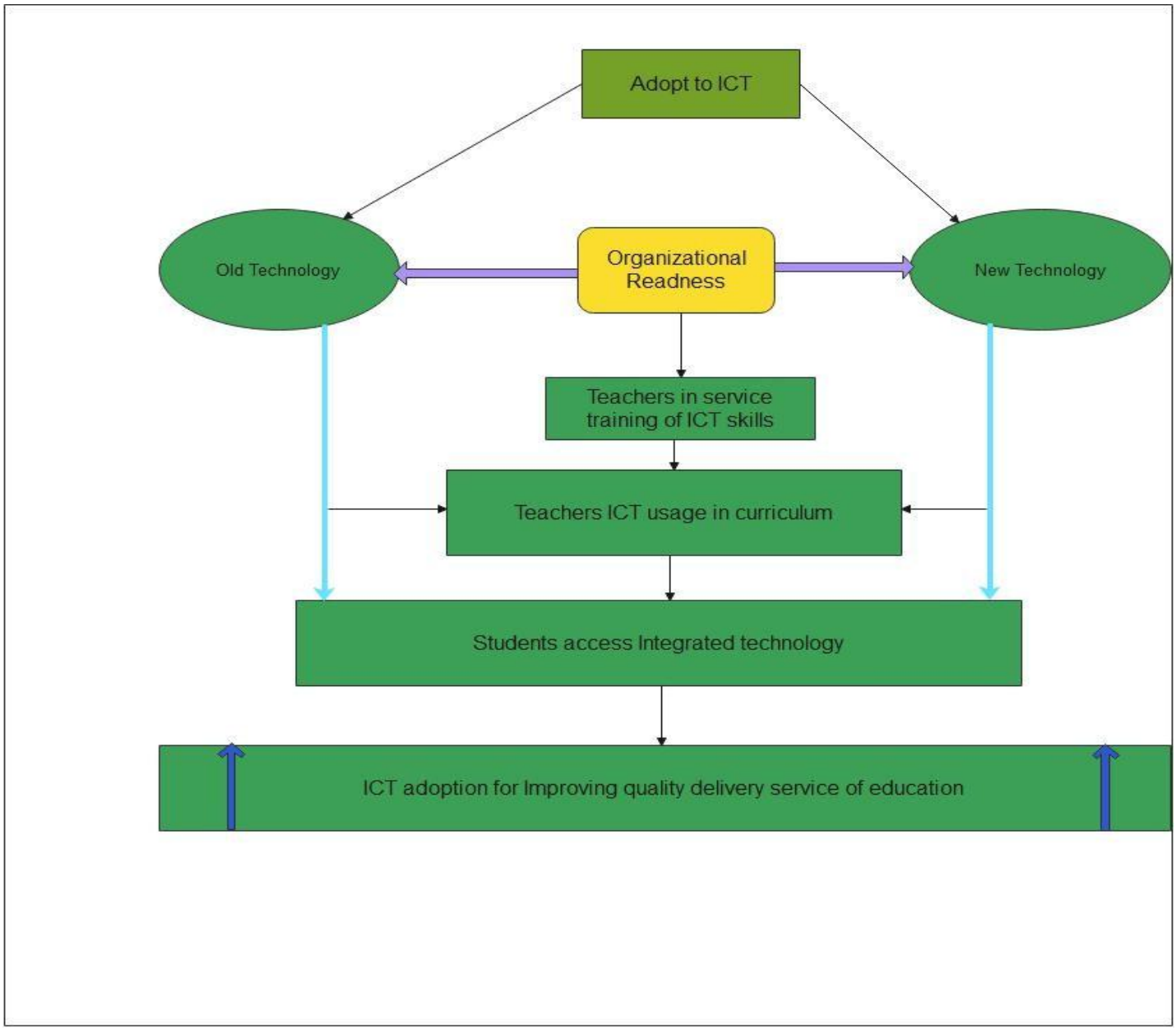

Figure 2. Conceptual framework of the study. (source : my own field survey)

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter deals with analysis of the data. The data was gathered from five streams of education and colleges administrative in two Teachers Education Colleges namely Hawassa and Sebeta Teachers Education Colleges. It was obtained through questionnaires, interviews, document reviews and direct observation. As it was discussed in the third chapter of this study, the researcher collected data related to ICT adoption for improving quality of educational service delivery: the case of Selected Teachers Education Colleges; a different form of tables, figures and charts are used.

Data gathered from the sources were analyzed by frequency, percentage, Mean and standard deviation if it is necessary. The final outputs of the result were presented in tabular form and graphs, and under each table and graph it is analyzed by word.

4.1.1 Personal Information

To form the basis under which the research can rightly judge the responses, it was important for the study to identify their background information. In addition, the study employed survey approach in research that sought to investigate the study variables without manipulating or tampering with them in an attempt to determine how ICT adoption to improve the quality of education service delivery in selected teachers education colleges. These effects are embedded in the general background of the respondents.

4.1.2 Characteristics of students respondents

The respondents' biographic information which is sex, age and education stream is depicted in table 4.1.2.

Table 4.1.2. Students participants

Education Streams						
	Natural	Social	Language	Aesthetics	Educational	Total
Item	N %	N %	N%	N %	N %	N %
Male	29(20.6)	29(20.6)	19(13.5)	11(7.8)	16(11.3)	104(73.8)
Female	8(5.7)	7(5.0)	15(10.6)	4(2.8)	3(2.1)	37(26.2)
Total	37(26.3)	36(25.6)	34(24.1)	15(10.6)	19(13.4)	141(100)
Age						
20-25	15(10.5)	17(12)	16(11.2)	11(7.7)	10(7)	69(52.4)
26-30	20(14.5)	18(12.6)	17(12)	3(2.1)	8(5.6)	66(46.8)
31-35	2(1.4)	1(0.7)	1(0.7)	1(0.7)	2(1.4)	7(4.9)

N=number of participants

The total number of students respondents are 141. From this the number of male students are 104 and 37 female students were participated in this study. Based on the table 4.1.2. that contains the data gained from student respondents, the age of students respondents in this study were presented with in range from 20 up to 35.The age of students are presented in detail with percent, that means the age range from 20-25 were 69(52.4%) range from 26-30 were 66 (46.8%) participants and the range from 31-35 age were 7 participants (4.9%) respectively.

The students participation's based on their education streams, from 141 total respondents were 29 male students (20.6%) and 8 female students (5.7%) from Natural science education streams, 29 male students (20.6%) and 7 female students (5.0%) from social science education stream,19 male respondents (13.5%) and 15 female respondents (10.6%) from language education streams,11 male students (7.8%) and 4 female students (2.8%) from Aesthetics education

streams, 16 male respondents (11.3%) and 3 female respondents (2.1%) from Educational stream were involved in this study.

4.1.3 Characteristics of Instructor Respondents

The respondents' biographic information which is sex, age ,education stream and educational background is depicted in table 4.1.3.

Table 4.1.3. Instructor participants

	Education Stream					
	Natural	Social	Language	Aesthetics	Educational	Total
Item	N %	N %	N%	N %	N %	N %
Sex						
Male	3(15.8)	5(26.2)	4(21)	1(5.3)	1(5.3)	14(73.8)
Female	3(15.8)	-	-	1(5.3)	1(5.3)	5(26.4)
Total	6(31.6)	5(26.2)	4(21)	2(10.6)	2(10.6)	19(100)
Age						
25-30	5(26.4)	2(10.5)	-	-	1(5.3)	8(42.1)
31-35	1(5.3)	2(10.5)	3(15.8)	1(5.3)	1(5.3)	8(42.1)
36-40	-	1(5.3)	1(5.3)	1(5.3)	-	3(15.8)
Total	6(31.7)	4(15.8)	4(21.1)	2(10.5)	2(10.5)	19(100)
Educational background						
Degree	1(26.3)	2(15.8)	-	2(10.5)	-	5(26.3)
Masters	5(5.3)	3(10.5)	4(21.1)		2(10.5)	14(73.7)
PHD and above	-	-	-	-	-	-

Total	6(31.6)	5(26.3)	4(21.1)	2(10.5)	2(10.5)	19(100)

N=number of participants

According to table 4.1.3. nineteen instructors are participated in this study, from those 14(73.8%) were male instructors and 5(26.4%) female instructors were involved. The above table also shows the age of instructors respondents that ranges between 25 to 30 were 8(42.1%), ranges between 31 to 35 were 8(42.1%) and 36-40 were 3(15.8%) respectively. The figure 3, below shows the age of instructors participants.

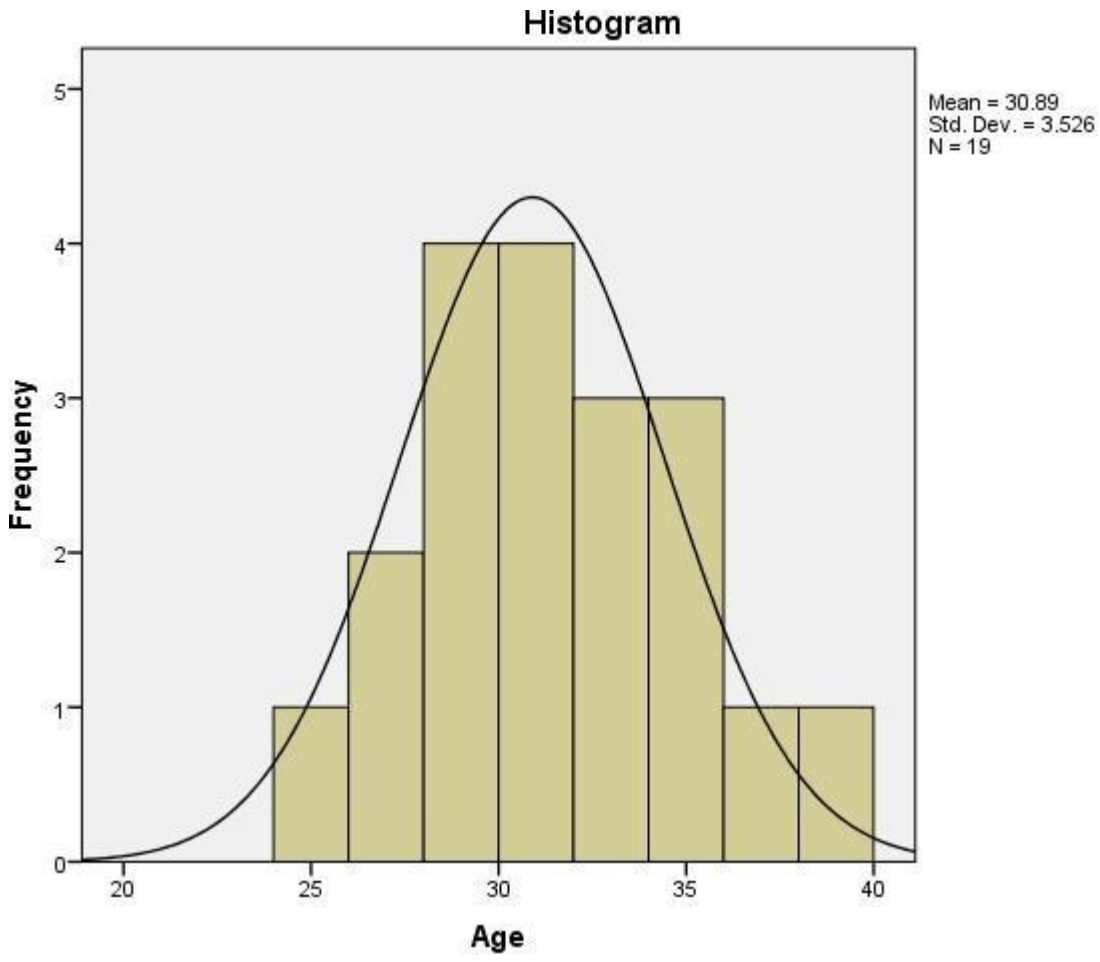

Figure 3: Age of Instructor respondents

And also the Educational background of instructors are mentioned in the table 4.1.3, It shows (26.3%) of instructors hold bachelor degree and (73.7%) of respondents hold masters degree.

4.1.4 Characteristics of Administrator and ICT Expert Respondents

The respondents' biographic information which is sex, age and education background is depicted in table 4.1.4.

Table 4.1.4. Administrator and ICT Expert participants

	HRM administration	System Administrator	Lab assistant	Stream head	Total
Item	N %	N%	N%	N%	N%
Sex					
Male	4(33.3)	1(8.3)	2(16.7)	2(16.7)	9(75)
Female	2(16.7)	1(8.3)	-	-	3(25)
Total	6(50)	2(16.6)	2(16.7)	2(16.7)	12(100)
Age					
25-30	-	1(8.3)	2(16.7)	-	3(25)
31-35	3(25)	1(8.3)	-	1(8.3)	5(41.7)
36-40	3(25)	-	-	1(8.3)	4(33.3)
Total	6(50)	2(16.7)	2(16.7)	2(16.7)	12(100)
Educational Background					
Diploma	-		2(16.7)		2(16.7)
Degree	4(33.3)	2(16.7)	-	-	6(49.9)
Masters	2(16.7)	-	-	2(16.7)	4(33.4)
Total	6(50)	2(16.7)	2(16.7)	2(16.7)	12(100)

Regarding to table 4.1.4, Colleges administrator and expert participants for this study are males and females; 8(75%) are male administrator and 3(25%) are female administrator respondents were participated in the study. The figure 4, shows the gender of participants in percent.

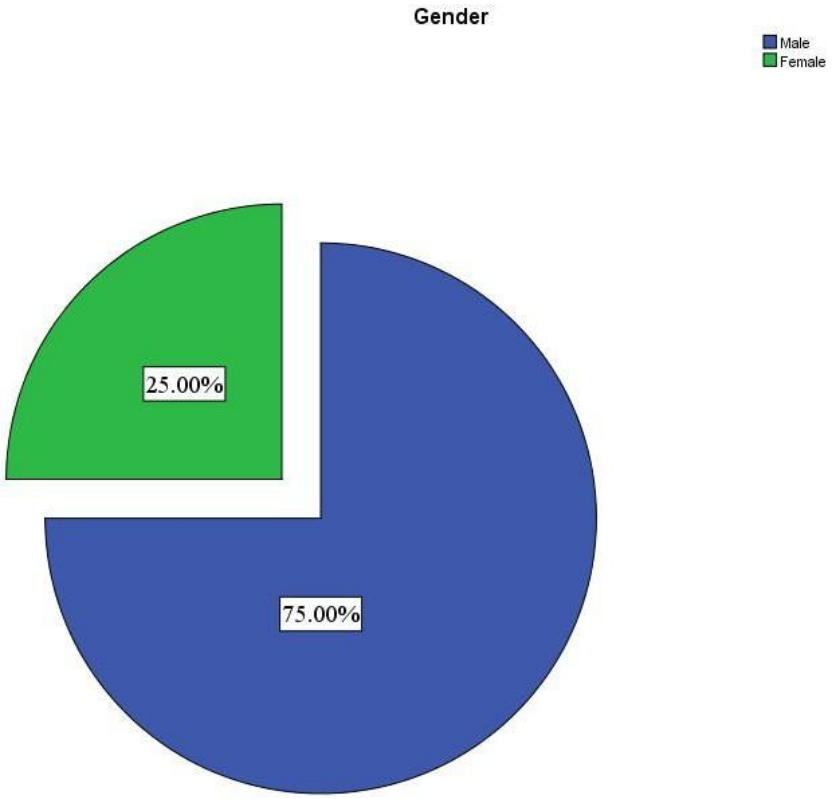

Figure 4: Gender of administrative respondents

The number of female colleges administrator participants were low when compared with males administrator respondents, that means there are some females on the position of the colleges administrator or management. Based on the age of administrator respondents the table 4.1.4.3 above shows the age grouped between 25 to 30 is 3(25%), grouped between 31-35 is 5(41.7%) and 36-40 is 4(33.3%) respectively.

Additionally the figure 5, shows the age of office administrators and experts respondents those are participated in this research study.

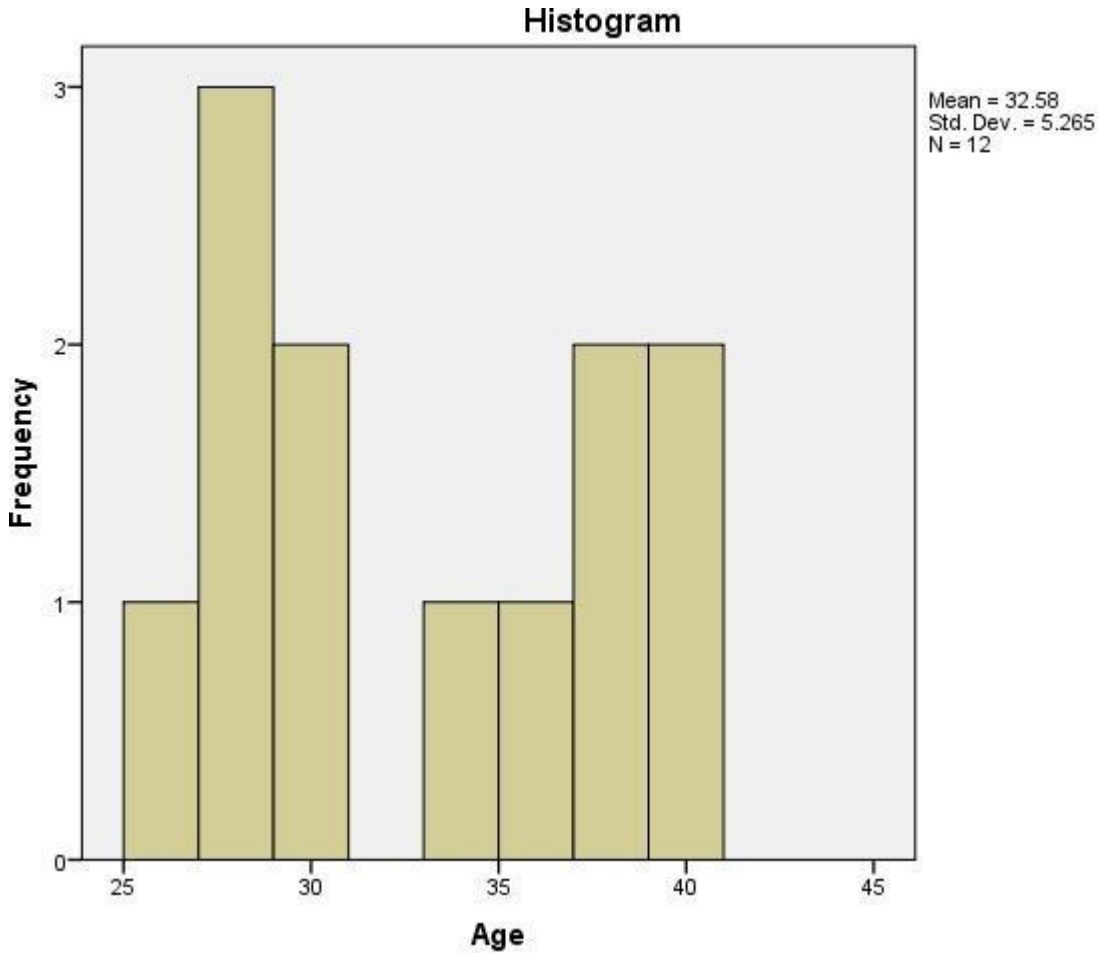

Figure 5: Age of administrative and experts respondents

In additionally the table 4.1.4.3 shows the Educational background of colleges administrator and ICT expert respondents of this study, 2(16.7%) are diploma holder, 6(49.9%) are degree holder and 4(33.4%) were masters respectively. The educational level of administrator and ICT expert respondents are additionally showed in figure 6, below.

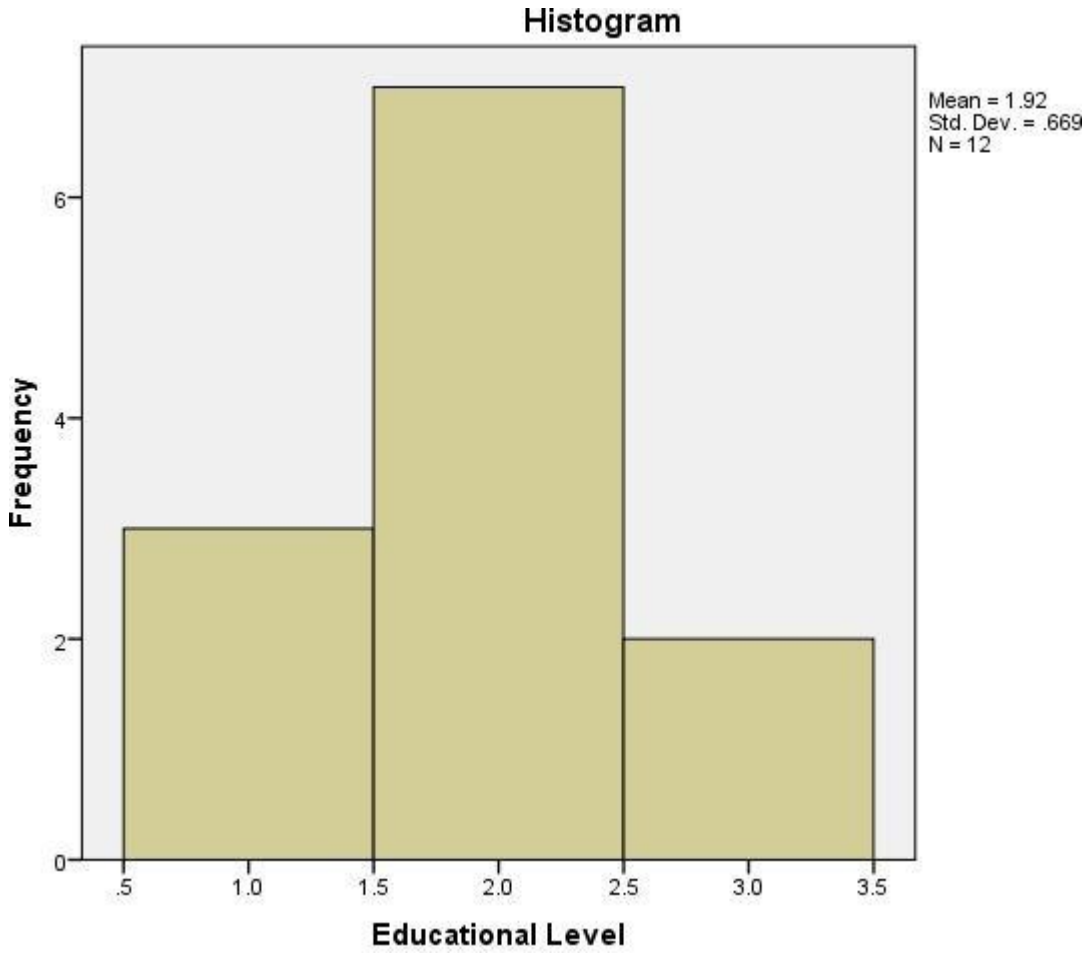

Figure 6: Educational level of administrative and ICT expert respondents.

4.2 Instructors skills and utilization of access technology

The skills and access of technology by the college instructors can highly affects in the colleges to improve the quality of education service delivery. The instructors skills of technology is very important to access technology. Having this in mind, instructor respondents were asked to indicate the skills and utilization of accessing technology tools in the College. Their responses were presented in the table 4.2 below.

Table 4.2. Instructors skills and utilization of access technology.

Item	Agree		Strongly agree		Neutrals		Disagree		Strongly disagree	
	F	%	F	%	-	-	F	%	F	%
I use of ICT tool prepare scheme of work and lesson plan	6	31.6	1	5.3	-	-	7	36.8	5	26.3
Instructor have ability to use Internets access to find online documents	12	63.2	3	15.8	-	-	4	21.1	-	-
I am able to identify digital content that can support Teaching and Learning activities	6	31.6	1	5.3	-	-	10	52.6	2	10.5
Have sufficient knowledge to integrate ICT in Teaching and Learning process	6	31.6	1	5.3	-	-	8	42.1	4	21.1
The ability to select and use ICT facilities to support teaching and learning effectively	6	31.6	2	10.5	-	-	8	42.1	3	15.8
Have skill to maintain basic computer trouble shouting	5	26.3	2	10.5	-	-	10	52.6	2	10.5

Teachers has ICT skills in teaching students	7	36.8	1	5.3	-	-	8	42.1	3	15.8
The skill and knowledge of old technologies	11	57.9	3	15.8	-	-	5	26.3	-	-
I improve knowledge, accept new technology in my daily activity	6	31.6	-	-	-	-	11	57.9	2	10.5

As indicated in table 4.2, the instructor participants were requested their views regarding the skill and utilization access of technology or Information and Communication Technology tools in teaching and learning processes.

The result shows that 31.6% of instructor respondents are agreed and 5.3% of respondents are strongly agreed that use the ICT tools for prepare scheme of work and lesson plan of daily activity to improve quality of education delivery services, 36.8% of respondents are disagreed and 26.3% of respondents were strongly disagree use of ICT tool for prepare scheme of work and lesson plan in teaching and learning process that means as the more respondents are explained they have lack of skill and also lack of sufficient materials to do so .

According to table 4.2 above, majority of instructor respondents confirm that they ability to use Internets access to find online documents; that means searching the handouts, fundamental books and video lectures that support students to understand course easily. So, 63.2% of participants was agreed, 15.8% was strongly agreed; 21.1% was disagree. That means those are raise as they have lack of skill to access search engines to improve quality delivery service of education by using ICT tools. Despite the little knowledge they have on internet use, some teachers are not using the internet for academic or educational purposes, but they use it for their social life issues communicate with their friend or relatives one through face to face ,messenger and video calling communications, so they need more in service training to integrate ICT in teaching and learning.

As mentioned in above quotes some instructors are not access the internet for the purposes of academic issues, but they use for personal and social communications such as charting and

sharing different materials online. And also they waste their time on the using internet for personal purpose and entertainment through the internet. So, it makes sense to argue that some instructors lacked a clear vision and understanding on what the internet can do in enhancing their professional learning and teaching activities.

The above table 4.2, describes some instructor respondents was identify the digital content that support teaching and learning activities, 31.6% of respondents were agreed and 5.3% were strongly agreed, Moreover, more instructors respondents in this study raised as they cannot identify digital contents that supports students learning achievement because in Hawassa and Sebeta Teachers Education Colleges was not giving in-service skill training, the colleges focused more giving training on the subject matter. So, 52.6% respondents were disagreed and 10.5% are strongly disagreed.

Regarding to the above table 4.2**,** 31.6% of Instructor respondents were agreed and also 5.3% of participants were strongly agreed on attained sufficient knowledge to integrate ICT in teaching; however 42.1% of instructor participants disagreed and 21.1% of Instructor respondents are strongly disagreed, as the respondents mentioned integrating ICT in teaching is very important to deliver the quality of education but it requires special training on skill of how to use ICT tool and its integration in teaching and learning processes.

With regarding to table 4.2 shows that 31.6% of respondents were agreed and 10.5% was strongly agreed the ability to select and use ICT facilities to support teaching and learning effectively are vital. However more respondents 42.1% was dis agreed and 15.8% instructors were strongly disagreed during the researcher observe the colleges most of the participants are mentioned the lack of skill and ability to select and utilization of ICT facilities to support teaching and learning effectively. In addition to that the colleges have limitations of facilities.

The responses obtained responded in table 4.2 above, most of the respondents are identifies the lack of skill to solve basic computer trouble shouting, that means the minor problems are confuse the user of the computer. Moreover 52.6 % disagreed and 10.5% strongly disagreed have skill to maintain basic computer trouble shouting, some respondents 26.3% was agreed and 10.5% were strongly agreed that have basic computer trouble shouting.

According to table 4.2 above, 36.8% of respondents agreed and 5.3% were strongly agreed on teachers has ICT skills in teaching students. That means few instructors have integrate ICT in teaching and learning.

In fact, 42.1% and 15.8% of Instructor respondents disagreed and strongly disagreed with the above idea respectively. Moreover, Instructor respondents indicated that they did not have ICT skills for teaching students using technology. Majority of the instructors in Hawassa and Sebeta Teacher Education Colleges do not have adequate skills and knowledge of using ICT in teaching and learning activities that can enable integrate effectively in the process of teaching andlearning.

The lack of training ICT giving for all stream Instructors are the major challenge because the collages are focus training on subject matter; even if there is not enough resources to invite professional experts during many technological opportunity today. Some instructors which skills of ICT usage may have acquired through personal practices in day to day struggle. From the above responses, it can be proved that, lack of well-trained instructors in ICT application has been recognized as major obstacles in the adoption of ICT in teachers education colleges to improve quality for educational delivery services.

The table 4.2 above shows 57.9% participants agreed and 15.8% respondents strongly agreed as they have skill and knowledge of old technologies, that means they familiar with the oldest technology because they access easily without any confusion; 26.3% disagreed with the above ideas respectively; in fact majority of instructor respondents 57.9% disagreed and 10.5% strongly disagree to improve knowledge, accept new technology in their daily activity because they fear of security and time consume to adapt new technology and some respondents have no interest to use new technology. As the researcher observed the new technology tools are available without user; 31.6% respondents agreed with the above statement.

Instructors have positive attitudes somehow to accept newer technology but they have lack of awareness on new ICT platforms opportunities and fear to try out the new ICT applications and also innovations in teaching, learning process. Instructors have the capability and the responsibility to influence the improvement, modification/alteration, acceptance, rejection of newer technology. Instructors to make important decisions, they need to understand and how to

use these technologies, and also benefits and the utilization of ICT in teaching ,learning and leading the colleges or educational organization, just like any other innovation**.**Almost all members of the Hawassa and Sebeta Teacher Education Colleges are uninterested to use the new technology that is applied in the colleges.

According to the above results, it makes sense to summarize that there was low level of technological awareness and skills in supporting the curriculum implementation as well as professional development. This shows that ICT adoptions in selected teachers educations colleges are very minimal.

4.2.1 Instructors ICT adoption for delivery of education

Instructors ICT adoption is very important for improve quality delivery service of education.The interest level and skill of using computers of peoples are differs a lot. Few people excelled in the applications of computers and related functions where as some others refrain from using computers for fear of failure of computer software and hardware still others don't make efforts because of lack of basic skills.

The following table 4.2.1 shows instructors accept and utilization of ICT tools to delivery of education.

Table 4.2.1. Instructors ICT Adoptions for delivery of educations

Item	Agree		Strongly agree		Neutral		Disagree		Strongly disagree		Total	
Instructors ICT adoption	F	%	F	%		-	F	%	F	%	F	%
I use Microsoft word regularly for preparing course materials.	11	57.9	4	21.1	-	-	4	21.1	-	-	19	100
I use Microsoft excel always to capture	10	52.6	-	-	-	-	9	47.4	-	-	19	100

students marks and doing grades												
I access the internet using browsers such as Google chrome, opera	15	78.9	4	21.1	-	-	-	-	-	-	19	100
The general use of ICT in teaching and learning process is more attractive and interesting the lessons	8	42.1	-	-	-	-	9	47.4	2	10.5	19	100
I use online platforms E- learning provide online educations	-	-	-	-	-	-	12	63.2	7	36.8	19	100
I communicate with students through e-mail and telegram	8	42.1	-	-	-	-	8	42.1	3	15.8	19	100
I use presentation software in the class	10	52.6	3	15.8	-	-	6	31.6	-	-	19	100

According to the table 4.2.1 shows that, 57.9% of respondents instructors agreed and 21.1% respondents of instructors strongly agreed the statements on I use Microsoft word regularly for preparing course materials. Most of the instructors are adopt Microsoft word in regularly for preparing course materials, handouts, exams etc. in teaching and learning. However 21.1% of instructor participants are disagreed use Microsoft word regularly for preparing course materials. As participants are reply during the interview there is skill gap to use ICT tool properly and

effectively because of this some of the instructors accept the ICT tool theoretically but they do not have used practically.

In table 4.2.1 above regarding to the use of Microsoft excel always to capture students marks and doing grades more than half which is 52.6% of instructors respondents agreed that as they use spread sheet software to record students continues assessments and also doing the students grade easily on spread sheet software application. ICT become a major part in almost every aspect of our daily life that makes the life easily (ICT series Galaxy, 2005). According to above quotes using the spread sheet software application minimize the burden of instructors to do students results and grade. While the remaining 47.4% of participants disagreed the use of spread sheet software to capture students mark and grade. It indicates there is a problem on ICT adoption yet.

Table 4.2.1 above showed that regarding to the statement I access the internet using browsers such as Google chrome, opera and Fire fox,78.9% of respondents are agreed and 21.1% of respondents are strongly agreed, it indicates that very good to access the internet as the respondents are replied.

Based on the table 4.2.1 above that indicates the general use of ICT in teaching and learning process is more attractive and interesting the lessons, 42.1 % of respondents agreed as the use of ICT more attractive and interesting the lessons ,the students are easily understand what they learn. However 47.4% respondents disagreed and 10.5% respondents strongly disagreed. That indicates still yet there is lack of ICT adoption and skill gaps in Teachers Education Colleges. Access to ICT by instructors in selected teachers education colleges were limited, especially to computers and the internet, which makes it difficult to assume that educators can integrate ICT into their teaching and learning process.

According to the table 4.2.1 above the statement said I use online platforms E- learning provide online educations all of the instructors respondents are not agreed to implement it. While 63.2% of participants disagreed and 36.8% strongly disagreed ,because the instructor participants mentioned the lack of sufficient expert, financial problem, lack of ICT facilities and the administration of the colleges not encourage them well. This is a great problem to accept ICT properly in teaching and learning process.

ICT is about the new ways in which people can communicate, inquire, make decisions and solve problems (Moges Alemu, 2017). Regarding to the table 4.2.1 above to show some instructors that means less than half of the percent communicate with students through e-mail and telegrams, 42.1% respondents agreed; 42.1 participants disagreed and 15.8% are strongly disagreed. Because as the respondents are said problem is both with in teacher and students lack of awareness to use ICT application for teaching and learning, lack of skill to use ICT applications even if some students do not know which application is used for communication and they have no email account, lack of facilities to access online communications such as laptops computers and smart phones.

The table 4.2.1 above represents 52.6 % of participants and 15.8 % of participants strongly agreed the use of presentation software in the class; it indicates most of the instructors use presentation software in the class for teaching students. While 31.6 % of respondents were disagreed to use presentation software.

The above response shows that gap of knowledge to use ICT application tools are the major problem to adopt ICT.

4.2.2 Instructors accept and utilize ICT devices in Teacher education colleges

The electronic devices such as printers, LCD projector, and computers is widely used in today's education sector. Thus, schools and colleges are important environment in which students and their instructors used these tools in order to improve the quality of education. The instructors adopt and use of ICT tools are very important to improve quality delivery service of education.

Table 4.2.2 Instructors accept and utilize ICT devices in Teacher education colleges

Item	Frequency	Percent
LCD projector	3	15.8
Server computer	1	5.3
Laptop computers	6	31.6
desktop computers	5	26.3
Printer	4	21.1

Total	19	100.0

According to above table 4.2.2, instructors acceptance and utilize of ICT devices in Hawassa and Sebeta teacher education collages, 3(15.8%) instructor respondents use LCD projector in the class room, 1(5.3%) respondents access server computers and manage other computers, 6(31.6%) use laptops computers in the class room,5(26.3%) utilize desktop computer, 4(21.1%) access the printer for printing materials.

4.3 Students skills to access integrated technology

Students skills to access integrated technology can highly affects the delivery service of education in the college to improve the quality of education. The student respondents were requested to indicate the skills of accessing technology tools in the Colleges. Their responses were presented in the table 4.3 below.

Table 4.3. Students skills to access integrated technology

Item	Agree		Strongly agree		Neutral		Disagree		Strongly disagree		Mean	S.D
	F	%	F	%	F	%	F	%	F	%		
students have confidence to access integrated technology	40	28.4	10	7.1	-	-	67	47.5	24	17.0	2.53	1.079
students has basic ICT skills to access integrated technology	41	29.1	-	-	-	-	77	54.6	23	16.3	2.96	.974

students has skill to communicate with teacher through using ICT tools	33	23.4	2	1.4	-	-	77	49.6	36	25.5	2.77	1.078
Computer literate using application software in teaching and learning process	28	19.9	12	8.5	-	-	72	51.1	29	20.6	2.72	1.008
I have access to colleges websites	33	23.4	-	-	-	-	73	51.8	35	24.8	2.99	.941
Students access online materials	29	20.6	5	3.5	-	-	85	60.3	22	15.6	2.71	.968

Table 4.3 above students has basic ICT skills to access integrated technology, most of students respondents 47.5% disagreed and 17.0 % strongly disagreed. While the remaining 28.4% agreed and 7.1% respondents are strongly agreed. It indicates there is a problem on integrated technology access for students; so, that makes the new technology or existed technology without user.

Table above 4.3 regarding to students has skill to communicate with teacher through using ICT tools, 23.4 % of students respondents agreed and 1.4% of respondents strongly agreed; that means as students respondents replied the answer as some students are communicate with their teachers through email, telegram. while more than half of students respondents 49.6% of participants disagreed and 25.5% participants strongly disagreed, as the researcher observe during the study and respondents are reply most of the students not use communication tools except face book that they are used for the purpose for personal case such as entertainment and chat with friends about personal or social life but not focus on delivery of education through it, they communicate with teacher by using cell phone dial through their representatives. It indicates the adoption of ICT to improving quality service delivery for education is very minimal.

According to table 4.3 above the statements Computer literate using application software in teaching and learning process, 19.9% students participants agreed and 8.5% participants strongly agreed; more than half of students participants 51.1% disagreed and 20.6 % strongly disagreed . It indicates the adoption of ICT to improving quality service delivery for education is very minimal.

Table 4.3 above indicates that, about the majority of the participants, on the statement I have access to colleges website, 51.8 % of participants disagreed and 24.8% strongly disagreed ,as the respondents was reply the answer during the study they said that most of the students have not skill and knowledge of access colleges websites. While 23.4% of the respondents agreed as on the statement I have access to colleges website. 20.6% participants agreed and 3.5% of participants strongly agreed on the view of Students access online materials but 60.3% respondents disagreed and 15.6 % respondents strongly disagreed with this stand.

From the above responses, it shows that, lack of well-trained students in ICT applications, lack of skill and knowledge background of utilization of ICT has been recognized as the major obstacle in the adoption of ICT in Teachers Education Colleges for improve education quality delivery service of teaching and learning.

4.3.1 Challenges faced to Adoption of ICT in Teachers Education Colleges

The utilization of Information and Communication Technology in teaching-learning process is the essential one to delivery of education. There are many challenges faced to adopt ICT to improve quality delivery service of education in teacher education colleges. This study aimed at finding out the factors influencing adoption of ICT and its utilization to make teaching learning effective in Hawassa and Sebeta Teachers Education Colleges.

Table 4.3.1 Challenges faced to Adoption of ICT in Teachers Education Colleges

Item	Agree		Strongly agree		Disagree		Neutral		Strongly disagree		Mean	S.D
	F	%	F	%	F	%	F	%	F	%	-	-

lack of knowledge and skills of ICT	92	65.2	20	14.2	29	20.4	-	-	-	-	1.55	0.814
Lack of ICT facilities such as computer lab	79	56.0	21	14.9	38	27.0	-	-	3	2.1	1.75	0.927
Not giving sufficient in service training on integrated ICT	101	71.6	20	14.2	20	14.2	-	-	-	-	1.43	0.729
expensive ICT materials	85	60.3	10	7.1	43	30.5	-	-	3	2.1	1.74	0.967
High number of students in the lab during teaching	88	62.4	8	5.7	45	31.9	-	-	-	-	1.70	0.925
Lack of computers and smart phone	80	56.7	16	11.3	36	25.5	-	-	9	6.4	1.82	1.025

The above table 4.3.1 shows that challenges faced to adoption of ICT in teacher education training colleges. There are many challenges of adoption technology in teacher education colleges; the respondents mentioned the major problems to adopt ICT in education. According to table 4.3.1 above the statements lack of knowledge and skills of ICT, 65.2% participants agreed and 14.2 % participants strongly agreed.

Most of the respondents reply that the challenges faced to ICT adoption is lack of knowledge and skills of ICT is one of the major challenges that makes as the user resist especially newer technology. But 20.4% of respondents disagreed with this stand. Some respondents mentioned argued that the lack of knowledge and skills of ICT is not the major problem; the greatest challenge is lack of awareness and internal motivations. 56.0 % respondents agreed and 14.9% respondents strongly agreed, lack of ICT facilities such as computer lab were challenges to adopt technology, while 27.0% respondents disagreed and 2.1% respondents strongly disagreed with this stands.

Barriers to effective technology integration from a teacher perspective is a lack of in-service training on the use of ICT (Yildirim 2007). Most of the respondents more than half 71.6% respondents agreed and 14.2 % respondents strongly agreed on the idea not giving sufficient in service training on integrated ICT is one of the challenges of adopt to ICT in education. Training is only given for experts and lab technicians, the instructors and students have lack of knowledge and skills on integrated technologies that makes the users are interest less and lack of awareness. It indicates the level of ICT adoption is very low. While only 14.2% of respondents disagreed with this idea, as they reply students and teachers got the knowledge and skill of ICT through day to day practice by itself, there is no need of special training.

Table 4.3.1 above showed that regarding too expensive ICT materials 60.3 % participants agreed and 7.1% participants strongly agreed, 30.1% participants disagreed and 2.1% respondents strongly disagreed on the above statements. In a baseline survey conducted by the Ministry of Education, it emerged that most universities and institutions of higher learning in Ethiopia have computers. However, these computers are few and, therefore, shared at a student-computer ratio of 10:1 in most cases. Most of universities and higher education in Ethiopia computers. However, these computers are few and, therefore, shared at a student-computer ratio of 10:1 in most cases (MoE, 2010).

One of the challenges of effective technology integration from a teacher perspective is Classroom management with large class sizes (Tezci 2011a); 62.4% respondents agreed and 5.7 % respondents strongly agreed high number of students in the lab during teaching is challenges to adopt ICT because the number of computer in the lab class and the number of students mismatch that means most of the students low chance to practice what they learn. 31.9% participants disagreed with this stand. 56.7% students respondents agreed and 11.3% students respondents strongly agreed the statement the lack of computers and smart phone were one of the challenges faced to the adoption of ICT to improve quality educational delivery service. The researcher observe during the study and also respondents reply their responses as most of the students have not smart phone and laptop computers to access integrated technology. This is the highest obstacles and critical problems to adopt technology.

Table 4.4 College administrators and ICT experts are accept ICT policy and support college

Item	Yes		No		I don't know		Total	
	F	%	F	%	F	%	F	%
Is the collage managers or administrative agree to support financially to facilitate ICT infrastructure	7	58.3	5	41.7	-	-	12	100
Collage managers or administrative accept ICT policy	6	50.0	4	33.3	2	16.7	12	100
Is Providing a support for training, Procurement of ICT, follow up on the implementation of policies?	6	50.0	4	33.3	2	16.7	12	100
Does the Collages have rules and processes in place for ICT services and other internal assets by maintaining or changing intended capacity ,and these rules and processes are effectively implemented	3	25.0	6	50.0	3	25.0	12	100

Table 4.4 above shows that 58.3 % respondents had yes response to the question, is the collage managers or administrators agree to support financially to facilitate ICT infrastructure, 41.7% respondents had said No, that means as their response the administrators don't agreed to support financially to facilitate ICT infrastructure when it is needed at the right time. 50.0 % participants

yes and 33.3 % participants said No,16.7% participants don't know about the Collage managers /administrative accept ICT policy or not.

Most of the respondents had said yes 50.0% and 33.3% respondents reply No, 16.7% respondents don't know about the question, is Providing a support for training, Procurement of ICT, follow up on the implementation of policies. 25.0 % participants reply Yes and 50.0 % reply No, 25.0% don't know about the does the Collages have rules and processes in place for ICT services and other internal assets by maintaining or changing intended capacity, and these rules and processes are effectively implemented.

4.5 Qualitative study

Response Rate

The member of ICT expert groups, stream heads, education bureau officers, College administrators of the Hawassa and Sebeta Teachers Educations colleges were selected purposely for interview on this research. Almost all were available and interviewed as per a schedule that is suitable for participants . The selected respondents have being work for improving quality of delivery service of learning and teaching process activities in most of their daily jobs.

Furthermore, they have better positions to know about ICT adoption in education system, current suitability of integrated technology to delivery service of education, benefits of ICT in education, create awareness about ICT adoption for improve the quality of education and they knew its challenges. Most of the respondents gave a constructive response about the colleges accept ICT policy, providing in service training, support financially to facilitate ICT tools, support technically and factors that affects ICT adoption in the colleges and suitability of ICT adoption to improve quality delivery service of education. Generally, the response rate of the interview was successful.

One of the research question was about the College managers or administrative accept ICT policy and ICT adoption in organization to improve quality delivery service of education. One of the major findings in both the observation and interview assessment has been lack of comprehensive policy that ensures a full-fledged Information and Communication Technology adoption and use of IT service properly in colleges. The findings showed that there is no ICT

acceptable use policy in Hawassa and Sebeta Teachers Education Colleges. Some of the interviewer said that colleges are accepting ICT policy but the problem is lack of awareness follow up implementation of ICT policy. The other management question asked was ICT experts, is Providing a support for training, Procurement of ICT service, follow up on the implementation of policies?

One of the interviewee notes that in terms of top managements and ICT expert group concerned ICT training, procurement of ICT services were not environmental friendliness, rather ensure business continuity. That means when the organization investigate procuring services look at past experiences and consider which services have been not important and which services have lasted long, which of this services were meeting the business requirements are the main concerns. The participants said that when the ICT departments propose training, the top management has been helpful with giving the go-ahead as part, expert group and users have been given different training. However utilization of ICT easily to be given attention.

4.6 The main challenges for ICT adoption

There are many challenges that were provided by respondents during the interview. The finding of this study showed that the major challenges for ICT adoption in Hawassa and Sebeta Teachers Education Colleges were six main challenges, namely: the lack of ICT skill, lack of ICT facilities such as computer lab, insufficient in service training on integrated ICT, expensive ICT materials, high number of students in the lab during teaching, lack of computers and smart phone. According the finding above, because of this challenges both instructors and students have low level of awareness and motivation to adopt new technologies that made individuals resistance to change. According to (Ifegbo et al., 2015) explained as the utilization of computers affect teaching and learning process. This result could be attributed the number of computers laboratories mismatch with number of students in selected Teachers Education Colleges and poor state of the computers and computers laboratories in colleges with computers laboratories. Accordingly, the findings of the study shows that the organization is not implemented Information and Communication Technology in appropriate manner and the ICT adoption critical problem factors are identified.

4.7 Framework Requirements

Based on the discussed challenges affecting the ICT adoption for improving the quality of educational service delivery identified via interview, questionnaire and direct observation help the researcher to generalize the research findings and develop framework.

Regarding to the factors researcher propose the effective ICT adoption and utilization in the Hawassa and Sebeta Teachers Education Colleges to improve quality delivery service of educations, the following identified:

- Competitiveness of an organization
- Old technology
- New digital technology/emerging technology
- User involvement
- Users motivation to use technology

The requirements below in table 4.5 were generated for the framework design and development in this study.

Table 4.5 The requirements for utilization and adoption of ICT

General term	Required
Environmental Theme	Competitiveness of an organization
	• Government regulations and support • Infrastructure and resource support • Competition inter colleges and higher education • ICT usage in curriculum
Organizational readiness Technology	**Old technology**
	• Radio • Television

theme	**New digital technology or emerging technology**
	● Server computers ● Internet connectivity ● LCD Projector ● Satellite ● E-library databases or Digital library ● Cloud Computing ● Smart Mobile phones and Tablets
	User involvement
	● Users access integrated services ● Technical expert staff
User motivation Technological theme	● Simplicity ● Perceived usefulness by users ● Perceived easy of use by users ● Attitude towards usage of ICT ● Actual use of technology

The latest updated Ethiopian ICT Policy and Strategy (Government of Ethiopia 2016) takes education as one of its strategic pillars for transforming the Ethiopian economy, including through the use of ICT. The latest reform initiative put in place in this regard is the Ethiopian Education Development Road map for 2018–2030. The document contains several proposed reforms and suggested paradigm shifts in the education system. The Road map mentions ICT as one of the cross-cutting areas that is generally overlooked in the education sector. In relation to the use of ICT in teacher preparation and development, the Road map underscores that per

service teachers should be trained not only on how to use a computer, but also on how to design high-quality, technology-enhanced lessons. It states that both student teachers and teacher educators should have access to ICT infrastructure (Government of Ethiopia 2018a, 47).

In this research conduct ICT adoption for improving quality service delivery of education were proposed colleges readiness with in adoption of newer and oldest technology for delivery service of education. Technology on education has continues to have impact on higher education. The use of educational technology influenced the universities or higher education nowadays on offering programs through face to-face (f2f) to online learning globally (Technology, 2012).

Based on this statement technology is very important to transform education from traditional one to modernized education. According to (Moges Alemu, 2017) outlined ICTs are also transformational tools which, when used appropriately, can promote the shift to a student-centered environment. ICTs, especially computers and Internet technologies, enable new ways of teaching and learning process rather than chalk and talk in the class room.

ICT helps to taught students easily and classes were more attractive and interesting. So researcher suggested that ICT adoption, especially the latest technology is very vital to improve quality delivery service of education; the newer technology must supported by in service training from time to time. So, the newer technology acceptances play a great role to support quality delivery service of education in Hawassa and Sebeta colleges. For instance internet connectivity is one of the newer technologies that are suitable access the quality of education and also help for delivery services of education with in any time 24 hour every day and everywhere without restriction of distance.

4.8 Proposed Framework

The proposed Framework model of successful ICT adoption for educational service delivery in Hawassa and Sebeta Teacher Education Colleges is described below according to the order of its impact on successful ICT adoption for educational service delivery are colleges environmental theme, organizational readiness of technology theme and user motivation technological theme respectively.

4.8.1 Environmental theme:

In the environmental theme which indicates that the factors have been identified as competitiveness of an organization. An organization with a competitive or/and partnership sense has more probability in ICT adoption. In this case competitiveness is expressed in a sense of coping up with an international partner organization. So, to be able to work with their partners that are more advanced in the technology Hawassa and Sebeta Teachers Education Colleges tend to adopt ICT. In the environmental theme, four major factors have been identified as influential for successful ICT adoption, these are Infrastructure and resource support, competition inter universities, colleges and governmental regulations and support and ICT usage in curriculum.

4.8.2 Organizational Readiness Technology Theme

In the organizational readiness technology theme, three major factors have been identified as influential for successful ICT adoption, these are old technology, user involvement and modern technology. Old technology has two main factors have been identified as for successful ICT adoption in education, these are radio, television. Those old technology does not reject for the success of ICT adoption. In the second major factors of organizational technology theme which is the user involvement is also found to be more important when users access integrated technology, technical expert staff in giving system training for other user's that will have positive perception towards system's usefulness, when user's knowledge of ICT is available, experience and users active participation is needed.

In the third major factors of organizational readiness technology theme which is the modern technology that have been identified as influential for successful ICT adoption. It have seven attributes, these are server computers, Internet connectivity, LCD Projector, Satellite, digital library, cloud computing, smart mobile phones and tablets. The latest technology is play a great role for successful of ICT adoption for improving the quality delivery service of education. The latest technology changes the traditional education that talk and chalk to the modern education, that create self independent learner and innovators.

4.8.3 User motivation Technological Theme

The proposed frame work user motivation technological theme to be adopt has simplicity attribute character. These simplicity will help the users perceive the ICT system as easy to use. User's good perception on the technology in regard to perceived ease of use and perceive usefulness will make better impact on user's attitude towards usage of the technology and the final and ultimate goal of the technological attribute is actual use of technology. To get positive perceived ease of use or perceived usefulness both the ICT adoption must have simplicity character. The framework also shows perceived ease of use and perceived usefulness are dependent on each other while attitude towards usage is dependent factors and the result of good perception of both perceived ease of use and perceived usefulness.

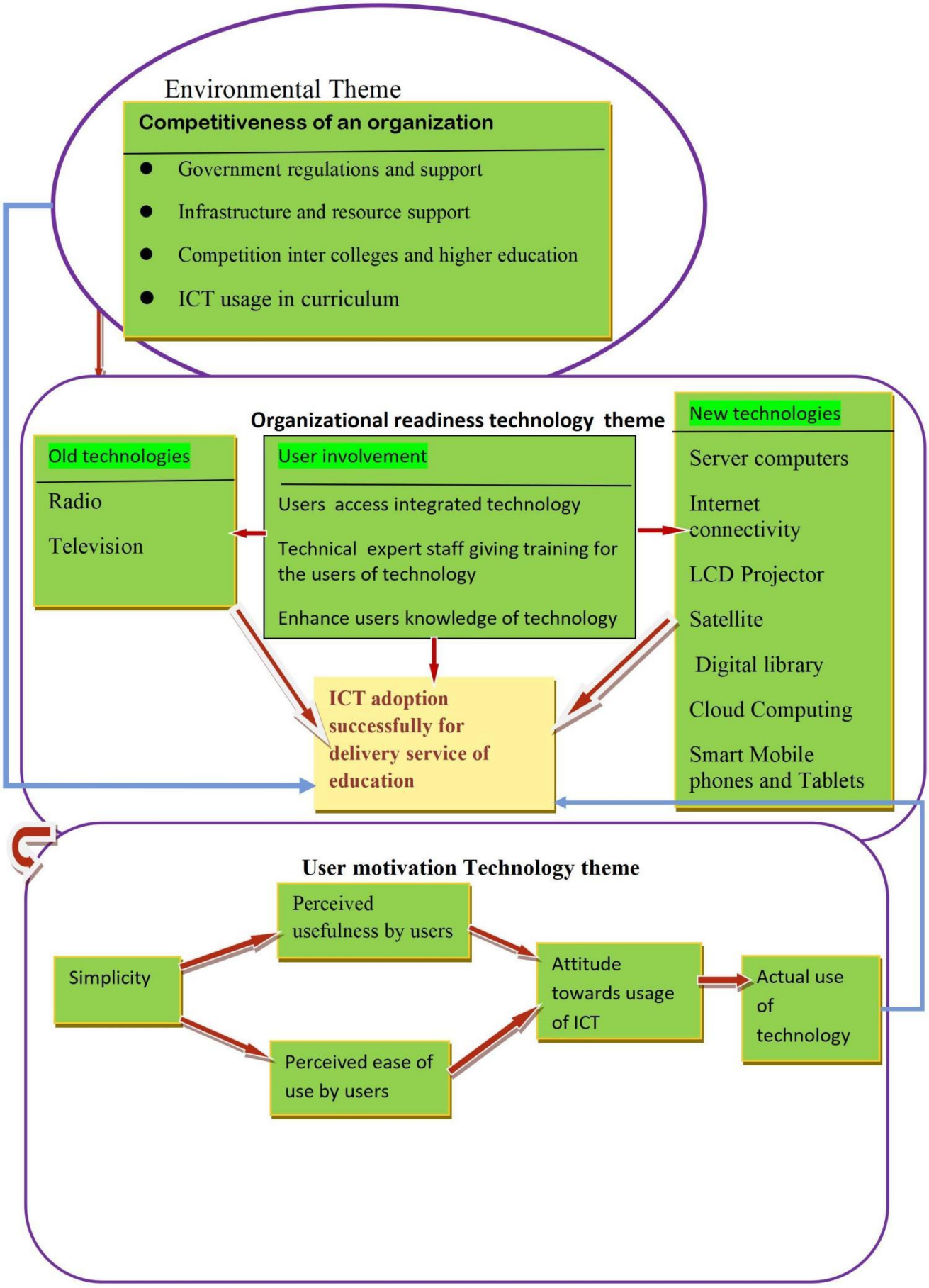
Environmental Theme
Competitiveness of an organization
Government regulations and support
Infrastructure and resource support
Competition inter colleges and higher education
ICT usage in curriculum
Organizational readiness technology theme
Old technologies
Radio
Television
User involvement
Users access integrated technology
Technical expert staff giving training for the users of technology
Enhance users knowledge of technology
New technologies
Server computers
Internet connectivity
LCD Projector
Satellite
Digital library
Cloud Computing
Smart Mobile phones and Tablets
ICT adoption successfully for delivery service of education
User motivation Technology theme
Simplicity
Perceived usefulness by users
Perceived ease of use by users
Attitude towards usage of ICT
Actual use of technology

Figure 4.7. ICT adoption proposed Frame work: source my own field survey.

The proposed frame work is descriptive frame work that describes what should happen in practice.

4.9 Evaluation of the proposed Frame Work model

The interview and questionnaires were conducted by this study as means of data collection. Based on the responses the model of ICT adoption was created and sent to experts who have adopted ICT for testing, so as to evaluate the effectiveness of the model, the respondents from Hawassa and Sebeta Teachers Education Colleges of ICT experts and administrators staff are participated.

Table 4.6. Mean and standard deviation(Std. deviation) of the Framework Evaluation Survey (Evaluation criteria adapted From Elsa (2015) evaluation guideline)

Descriptive Statistics					
Evaluation criteria	N	Minimum	Maximum	Mean	Std. Deviation
The proposed frame work is comprehensive in terms of coverage as well as to improve quality delivery service of education	12	3	5	4.61	.745
The proposed frame work components are clear and complete	12	3	4	3.63	.465
The implementation of proposed frame work is suitable with in the colleges	12	3	4	3.67	.441
The proposed frame work will contribute towards adoption of ICT to improve quality delivery service of education	12	4	5	4.75	.462
The proposed frame work is suitable and understandable	12	4	5	4.76	.461

The proposed frame work is relevant for deliver service of education	12	4	5	4.79	.418
The applicable of proposed frame work can improve adoption of ICT for the success of quality delivery service of education	12	4	5	4.75	.462
The proposed frame work is comprehensive to the improvement of the organization strategic goal	12	4	5	4.24	.461
Valid N (list wise)	12				

Source : Field survey, 2022

Based on the evaluation result of descriptive Statistics of the study, relevance for deliver service of education of the framework has the highest aggregate mean value of 4.79 indicating that the respondents agree the framework is relevant, fits the deliver service of education and is useful for ICT adoption. The proposed frame work is suitable and understandable manner with scored second high aggregate mean value of 4.76, its applicability and contribute towards adoption of ICT to improve quality delivery service of education frame work mean value of 4.75 which again demonstrates respondent's strong agreement on this matter. By comparison the content framework has the lowest mean value of 3.63 suggesting possible areas of improvement to ensure its components are clear and completeness.

4.10 Predictable Outcomes for the ICT adoption Proposed Model

As participants of the study told to researcher the expected output from ICT adoption are several: Education learning and teaching process becomes easier with the help of this model, ICT adoption will be more helpful to access study materials easily. Students will get their study material without any delay, Communication between teachers and students will become easier with the help of this model, teachers will also upload their lectures, study material, lesson plans

by using ICT tools. This model will play a vital role in our educational system to improve quality delivery service of education.

4.11 Challenges of Implementing the Model

There are some challenges are there in the implementation of the proposed ICT adoption model in the selected teacher education colleges. Some of the challenges are: Lack of skilled man power in the effective use of technology tool (technician support), Lack of ICT facilities, Lack of awareness, ICT illiteracy in the colleges and lack of knowledge and skills to use ICT infrastructures were the main factor affecting to adoption of ICT for quality service delivery of education in selected teachers education colleges.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. Introduction

This chapter presents the conclusion of the study and recommendation are put forward with the implications for further research.

5.2. Conclusion

Technology is play a great role in education to transform from traditional teaching to modernize teaching and learning process. ICT can affect the quality delivery service of education and enable wider access to the teaching and learning process. The objective of this research is to investigate Information and Communication Technology (ICT) adoptions to deliver quality of educational services in case of Hawassa Teachers Education Colleges and Sebeta Teachers Education Colleges. This literature revealed the adoption of ICT (Information and communication Technology) is the key transformation of quality education delivery service in this 21st century.

A literature show that Information and communication Technology(ICT) is not implemented well at colleges/higher education organizations. And also the integrated technology is under utilized or the system without user, the case is lack of skills, knowledge, poor management of the system; that made individuals resist new technology. The solution is the colleges/higher education institutions are adopt the ICT to improve quality delivery service of education and facilitate training for staff members. Ethiopia has one of the developing countries, where the government embraced the use of ICT in education and determined to expand ICT across the country, one of the most important is to make adoption and utilization of ICT. This is what the study attempted to address by taking Hawassa and Sebeta teachers education colleges as its cases.

The results of the conducted study provided by both the quantitative and qualitative research approach analysis that obtained will be exposed especially regarding those aspects which are related to adoption of ICT to improve quality delivery services of education. As the literature

revealed that by the help of ICT delivery service quality of education in any situation, at any time or with in 7/24 each day and any where without any problem of location boundary.

As part of data collection interview, questioner, observation and document review were employed. The purpose to evaluate the current ICT uses were used and consequently yielding factors affecting utilization of ICT and adoption. The following are some main findings of the research that provided ICT adoption to improve quality service delivery:

The instructor participants were requested their views regarding the skill and utilization access of technology or Information and Communication Technology tools in teaching and learning processes. As the result revealed that some of instructors in this study agree that use the ICT tools for prepare scheme of work and lesson plan of daily activity to improve quality of education delivery services, most of instructors are disagreed on the idea because lack of skill and also lack of sufficient materials to do so. This shows the adoption of ICT is very minimal in Hawassa and Sebeta Teachers Education Colleges

The result of the study showed that most of the instructors are agree the ability to use internet access to find online documents that support students to understand course easily, however some teachers have lack of skill to access search engines to improve quality delivery service of education by using ICT tools and also lacked a clear vision and understanding on what the internet can do in enhancing their professional learning and teaching activities. So, the finding of the study showed that the ability to access the internet for academic purposes is limited. Instructors and students have positive attitudes somehow to accept newer technology but they have lack of awareness on new ICT platforms opportunities and fear to try out the new ICT applications and also innovations in teaching, learning process.

Majority of the instructors in Hawassa and Sebeta Teacher Education Colleges do not have adequate skills and knowledge of using ICT in teaching and learning activities that can enable integrate effectively in the process of teaching and learning. As the result revealed that most of the students are lack of basic skills to access technology, it indicates there is a problem on integrated technology access for students; so, that makes the new technology without user.

The findings of the study showed that most of the respondents reply that the challenges faced to ICT adoption is lack of knowledge and skills of ICT is one of the major challenges that makes as

the user resist especially newer technology. In additionally some of the respondents are agreed the main challenges of ICT adoption is lack of awareness and internal motivations. And also as the result revealed that most of the respondents mentioned some challenges of ICT adoption , those are: lack of sufficient in service training, lack of ICT facilities, expensive ICT materials and number of students in the lab during teaching is challenges to adopt ICT because the number of computer in the lab class and the number of students mismatch that means most of the students low chance to practice what they learn.

Hence to solve the identified challenges in the study proposed a framework for ICT adoption for quality of educational service delivery that can be used as a guide. As the factors identified were different in impact and need every staff member engagement, the solution needed to be framed accordingly to address it. Therefore, the design of the framework was done to attain that goal.

5.3 Recommendation

Based on the findings of the study and conclusions drawn, the following recommendations have been forwarded on how to adopt and use ICT in Hawassa and Sebeta Teachers Education Colleges considering the major issues that this study addressed.

- There are in service training, create awareness, skill and practices gaps among user, for better implementation of ICT, the staffs members should come on board. Hence sharing the experience and knowledge of ICT and capacity building tasks should be conducted.
- Providing ICT infrastructure for the college of teachers education; provide in service training for instructors in modern technologies and providing support instructors technically are very important to improve quality delivery service of education and adoption of ICT in Hawassa and Sebeta teachers education colleges.
- The adoption of ICT and utilization is require ICT infrastructure/resources readiness.
- Information and Communication Technology adoption for Hawassa and Sebeta Teachers Education Colleges are fairly new concept and as many educational institutions which are capital intensive started working in Ethiopia, their readiness assessment need to be studied.

- Hawassa and Sebeta College of Teachers Education should implement the existing colleges ICT guidelines in education.

5.4 Recommendation for Further studies

In this research, potential areas for further study have been identified. Here below to fill some existing gaps the researcher suggestions for future research conduct. The researcher recommended that further research can be held to enhance this research mainly focused on the components of developed an appropriate frameworks to improve quality delivery service of education is required details for Hawassa and Sebeta Teachers Education Colleges to ICT adoption successfully.

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Appendixes
Hawassa University

Institute of Technology

Faculty of Informatics, Department of Information Technology

Appendix I

Uniiveersiitii Hawassati, Inisiituutii Qoranoo Barnoota Tekinoolooji

Gaffiwwan Baratoota Kolleejiifi

Qajeelfama Waliigalaa kan gaafficha.

Kaayyoon gaaffiiwwan kanaa tekinooloojii fayyadamuun ykn Information and Communication Technology fayyadamuun barnoota qulqullina qabu baratoota biraan gahuuf shora ICT'n taphatu Koolleejjii Barsiistotaa Sabbataa keessatti odeeffannoo walitti qabuuf kan qopha'ee dha.

Deebiin gaaffiwwan armaan gadiitti dhiyaatan kanaf kennamu hundi isaatuu akka dhimma barbaadame kanaaf gargaarsa godhameetti fudhatama. Kanaafuu qorataan gaaffii dhiheessu kun deebii isa dhugaa/sirrii ta'e akka deebisuun irratti hirmachuun akka gargartan kabajaan isin gaafata. Deebiiwwan gaaffiwwan armaan gadii kanaf kennaman iccitiidhaan kan eeggamanidha. Akkasumas odeeffannoo waraqaa qorannoo baruumsa Maastarsiitiif digirii 2^{ffaa} qofaaf hojiirra kan oolan ta'u kabajaan isiin beeksisna. Yeroo keessan qaalii irra gaaffiwwan kana deebisuuf fedha qabaachuu keessaniif guddaa isin galateffanna.

Hirmaanna keessaniif Galatoomaa!

Yaadannoo:

- Maqaa keessan barreessuu hin barbaachisu
- Deebii keessan mallattoo "√" kana kaa'uudhaan yookiin immoo deebii keessan iddoo isaaf qophaa'etti barreessuun ni danda'ama.

Kutaa I: Odeeffannoo waa'ee keessanii guuta.

Umurii 20-25 ☐ 26-30 ☐ 31-35 ☐

Saala Dhiira ☐ dhala ☐

Kutaa II: Hojimaata ICT

Qajeelfamoota: - Bakka sanduuqa kaa'ameef sana keessa mallattoo "√" kaa'uu dhaan waa'ee fayyadama ICT mana barumsaa keessan keessatti bu'ureffamee jiruu yaada keessan guutuudandeessu.

No	Ibsa	Waliin gala	Sirrumattin walii gala	Walii hin galus hin mormus	Walii hin galu	Tasuma walii hin galu
1	Barattootni technology fayyadamuu irratti ofitti amanamumma ni qabuu					
2	Barattootni ICT fayyadamuuf dandeetti ni qabu					
3	Barattootni tekinoloojii gargaaramuudhan barsiisaa sanii waliin dubbachuu ni danda'u					
4	Beekumsa appilikeeshinoota sooftiweerii ni qabu, deemsa baruu fi barsiisuu milkessuuf					

5	Weebsitii kollejjii keessanii fayyadamuu ni dandeessa					
6	Barattootni online(interneeta) irraa kitaabotaa fi wantoota biroo					
	barnoota isaaniif isaan barbachisan fayyadamuu ni danda'u					

Yaadni kan biraa jiraachuu yoo jiraate ifa godhaa mee_____

KutaaIII: hanqina ICT fayyadamuuf jiru

Qajeelfamoota: - Bakka sanduuqa kaa'ameef sana keessa mallattoo "√" kaa'uu dhaan waa'ee ICT mana barumsaa keessan keessatti fayyadamuuf wantoota nama rakkisan/danqan yaada keessan guutuu dandeessu.

No	Ibsa	Waliin gala	Sirrumattin walii gala	Walii hin galus hin mormus	Walii hin galu	Tasuma walii hin galu
1	ICT fayyadamuuf hanqina beekumsaaf dandeetti ni jiraa					
2	Hanqinni meeshaalee ni jiraa fkn kutaa kompiyuuteraa/computer lab					

3	Barnoota ykn hojii keessatti leenjii gahaan ICT fayyadamuuf isiin gargaaru ni kennamaa					
4	Qaalayiinsa meeshaalee					
	ICT					
5	aayinni barattoota kutaa kompiyuuteraa wajjiin kan wal hin madallee tahuu					
6	Hanqinaa kompiyuuteraa fi bilbiloota smart jiru					

Sababni kan biraa jiraa yoo tahee ifa godhaa/nuuf eera_____

Galatoomaa!!

Hawassa University

Institute of Technology

Faculty of Informatics, Department of Information technology

Questionnaires for teacher education college instructors

Appendix II: QuestionnaireGeneral Directions

Dear respondent, this questionnaire is intended to collect data on ICT adoption for quality delivery service of education: case of Hawassa and Sebeta Teachers education Colleges.The data is going to be used as an input for the research to be conducted with the aim of fulfilling the requirements for MSC degree in Information Technology. With your active participation, the outcome of this study would lead to sound recommendations.

The researcher here by assures you that the in formation you provide is going to be reported in aggregate and utmost care and will be taken for its confidentiality.

Thank You for Your Cooperation!

Note:

- Do not write your name.
- Please respond by putting "√" (tick mark)or by writing your responses on the space Provided.

Part I : Background of information

1. Age 25-30 ☐ 31-35 ☐ 36-40 ☐

2. Sex Male ☐ Female ☐

3. Educational level

Certificate ☐ **Diploma** ☐ **Bachelor** ☐ **Masters** ☐ **PHD**

If any other qualifications(please specify) _____

4. Name of your college _____

5. Stream _____

***Part II: ICT related* skills and utilization of access technology**

Directions: Please read the items in the table below and put an "√" (tick mark) in the box that best describes your ICT related skills and use of access technology.

No	Description	Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	The use of ICT tool prepare scheme of work and lesson plan					
2	The ability to use Internets access to find online documents					
3	I am able to identify digital content that can support Teaching and Learning activities					
4	Have sufficient knowledge to integrate ICT in Teaching and Learning process					
5	The ability to select and use ICT facilities to support teaching and learning effectively					
6	Have skill to maintain basic computer trouble shouting					
7	he skill and knowledge of old technologies					

8	I improve knowledge, accept new technology in my daily activity					

Part II: **Instructors views of ICT adoption for delivery service of education.**

Directions: Please read the items in the table below and put an "√" (tick mark) in the box that best describes your views of ICT adoption for delivery service of education.

No	Description	Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	I use Microsoft word regularly for preparing course materials.					
2	I use Microsoft excel always to capture students marks and doing grades					
3	I access the internet using browsers such as Google chrome, opera					
4	The general use of ICT in teaching and learning process is more attractive and learning process is more attractive and interesting the lessons					
5	I use online platforms E-learning provide online educations					
6	I communicate with students					

	through e-mail and telegram					
7	I use presentation software in the class					

Directions: - Please list down the ICT tools /devices you accept and utilize delivery service of educations in your colleges.

No	ICT tools/devices	Suggestions
1		
2		
3		
	Total	

Hawassa University

Institute of Technology

Faculty of Informatics, Department of Information technology

Questionnaires for teacher education college students

Appendix III: QuestionnaireGeneral Directions

Dear respondent, this questionnaire is intended to collect data on ICT adoption for quality delivery service of education: case of Hawassa and Sebeta Teachers education Colleges.The data is going to be used as an input for the research to be conducted with the aim of fulfilling the requirements for MSC degree in Information Technology. With your active participation, the outcome of this study would lead to sound recommendations.

The researcher here by assures you that the in formation you provide is going to be reported in aggregate and utmost care and will be taken for its confidentiality.

Thank You for Your Cooperation!

Note:

- Do not write your name.
- Please respond by putting "√" (tick mark) mark or by writing your responses on the space Provided.

Part I : Background of information

1. Age 20-25 ☐ 26-30 ☐ 31-35 ☐
2. Sex Male ☐ Female ☐
3. College name_____
4. Stream _____

***Part II: ICT related* skills to access integrated technology**

Directions: Please read the items in the table below and put an "√" (tick mark) in the box that best describes your *ICT related* skills and access of technology.

No	Description	Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	students have confidence to access integrated technology					
2	students has basic ICT skills to access integrated technology					
3	students has skill to communicate with teacher through using ICT tools					
4	Computer literate using application software in teaching and learning process					
5	I have access to colleges websites					
6	Students access online materials					

Please specify if you have any other skills to access integrated technology

_____

_____

_____

Part III: Challenges faced to Adoption of ICT in Teacher Education Colleges

Directions: Please read the items in the table below and put an "√" (tick mark) in the box that best describes your ICT related skills and access of technology.

No	Description	Agree	Strongly agree	Neutral	Disagree	Strongly disagree
1	Lack of knowledge and skills of ICT					
2	Lack of ICT facilities such as computer lab					
3	Not giving sufficient in service training on integrated ICT					
4	Expensive ICT materials					
5	High number of students in the lab					
6	Lack of computers and smart phone					

Please specify if you have any other skills to access integrated technology

_____

What are the challenges affecting ICT adoption in your colleges?

_____

_____

_____

_____

Hawassa University

Institute of Technology

Faculty of Informatics, Department of Information Technology

Questionnaires for teacher education college administrators

Appendix IV: QuestionnaireGeneral Directions

Dear respondent, this questionnaire is intended to collect data on ICT adoption for quality delivery service of education: case of Hawassa and Sebeta Teachers education Colleges. The data is going to be used as an input for the research to be conducted with the aim of fulfilling the requirements for MSC degree in Information Technology. With your active participation, the outcome of this study would lead to sound recommendations.

The researcher here by assures you that the in formation you provide is going to be reported in aggregate and utmost care and will be taken for its confidentiality.

Thank You for Your Cooperation!

Note:

- Do not write your name.
- Please respond by putting "√" (tick mark) mark or by writing your responses on the space Provided.

Part I : Background of information

1. Age 25-30 ☐ 31-35 ☐ 36-40 ☐

2. Sex Male ☐ Female ☐

3. Educational level

Certificate ☐ **Diploma** ☐ **Bachelor** ☐ **Masters** ☐ **PHD** ☐

If any other qualifications(please specify) _____

4. Name of your organization _____

Part II: ICT Related Policy and facilitate infrastructures choose by putting "√" (tick mark)

5. Collage managers or administrative are accept ICT policy in teachers educations colleges?

Yes ☐ No ☐ I don't know ☐

6. Is the collage managers or administrators agree to support financially to facilitate ICT infrastructure?

Yes ☐ No ☐ I don't know ☐

7. What would you suggest to be done so as to improve the quality delivery service of education by using ICT in your sector of educations?

_____

_____

_____

_____

Hawassa University

Institute of Technology

Faculty of Informatics, Department of Information technology

Questionnaires for teacher education colleges ICT expertAppendix V: Questionnaire

General Directions

Dear respondent, this questionnaire is intended to collect data on ICT adoption for quality delivery service of education: case of Hawassa and Sebeta Teachers education Colleges.The data is going to be used as an input for the research to be conducted with the aim of fulfilling the requirements for MSC degree in Information Technology. With your active participation, the outcome of this study would lead to sound recommendations.

The researcher here by assures you that the in formation you provide is going to be reported in aggregate and utmost care and will be taken for its confidentiality.

Thank You for Your Cooperation!

Note:

- Do not write your name.
- Please respond by putting "√" (tick mark) or by writing your responses on the space Provided.

Part I : Background of information

1. Age 25-30 ☐ 31-35 ☐ 36-40 ☐

2. Sex Male ☐ Female ☐

3. Educational level

Certificate ☐ **Diploma** ☐ **Bachelor** ☐ **Masters** ☐ **PHD** ☐

If any other qualifications(please specify) _____

4. Name of your organization _____

Part II: ICT Related Policy implementation choose by putting "√" (tick mark)

5. Is Providing a support for training, Procurement of ICT, follow up on the implementation of policies?

Yes ☐ No ☐ I don't know ☐

6. Does the Collages have rules and processes in place for ICT services and other internal assets by maintaining or changing intended capacity ,and these rules and processes are effectively implemented .

Yes ☐ No ☐ I don't know ☐

7. What is the main challenges encountered the adoption of information and communication technology?

_____

_____

_____

Thank you!!

Part VIII*:* Evaluation of proposed frame work

Directions: Please read the items in the table below and put an "√" (tick mark) in the box that best describes the evaluation of proposed frame work of ICT adoption for delivery service of education.

Evaluation criteria	Agree	Strongly agree	Neutral	Disagree	Strongly disagree
The proposed frame work is comprehensive in terms of coverage as well as to improve quality delivery service of education					
The implementation of proposed frame work is suitable with in the colleges					
The proposed frame work components are clear and complete					
The proposed frame work will contribute towards adoption of ICT to improve quality delivery service of education					
The proposed frame work is suitable and understandable					
The proposed frame work is relevant for deliver service of education					
The applicable of proposed frame work can improve adoption of ICT for the success of quality delivery service of education					
The proposed frame work is comprehensive to the improvement of the organization strategic goal					

Appendix VI

Interview guideline for the education stream heads of the colleges.

1. What do you think in your stream, is it adopt Information and communication technology to improve quality delivery service of education in your college ?

2. How do you think ICT will help in the education, that means to improve quality delivery service of education in your college of teachers education?

3. Is there any support and encouragement for the adoption and utilization of ICT in your Colleges of Teachers Education?

4. Is there a problem encountered in your stream to accept ICT in teaching and learning processes?

Appendix VII

Interview guideline for the ICT experts of the colleges.

1. What is your suggestions towards the improvements of ICT currently in your colleges of teachers education?

2. Is it support instructors and students to accept and access of integrated technology?

3. Is it providing in service training for instructors of your colleges?

4. Is the top managers of ICT support financially to maintain and facilitate ICT resources in your colleges?

5. Do you think all ICT staffs have enough skills and knowledge to perform initiatives and diagnosis the problem and management of over all ICT system.

Appendix VIII

Interview guidelines for the education bureau officers

1. What do you think to enhance adoption of ICT in teachers education college?

2. What is the critical problem encountered in process?

3. What is your feature plan ?

Appendix VIIII

Interview guidelines for Colleges of Teachers Education administrators

1. Is it accept ICT policy , providing in service training, support financially to facilitate ICT tools ?

2. Is there any budget allocated the improvement of the Information and Communication Technology standards of the colleges?

3. What are the currently critical problems encountered in the adoption of ICT in to teaching learning processes in the college?

Thank you!!!