INFORMATION COMMUNICATION TECHNOLOGY UTILIZATION AND ITS CONTRIBUTION TO STUDENTS' ACADEMIC ACHIEVEMENT IN PREPARATORY SCHOOLS OF BORENA ZONE, OROMIA REGIONAL STATE

MA THESIS

WAKJIRA GUDETA NIGUSA

APRIL 2017

HARAMAYA UNIVERSITY, HARAMAYA

Information Communication Technology Utilization and its Contribution to Students' Academic Achievement in Preparatory School of Borena Zone, Oromia Regional State

A Thesis Submitted to the College of Education and Behavioral Science, Department of Educational Planning and Management,

Postgraduate Program Directorate

HARAMAYA UNIVERSITY

In Partial Fulfillment of the Requirements for the Degree of

MASTER OF ARTS IN SCHOOL LEADERSHIP

By

Wakjira Gudeta Nigusa

APRIL 2017

Haramaya University, Haramaya

HARAMAYA UNIVERSITY

Postgraduate Program Directorate

We here by certify that we have read and evaluated this thesis titled '*Information Communication Technology Utilization and its Contribution to Students' Academic Achievement in Preparatory School of Borena Zone, Oromia Regional State*' prepared under our guidance by Mr. Wakjira Gudeta. We recommend that it is to be submitted as fulfilling the thesis requirement

Garkebo Basha (PhD) _____ _____

Major Advisor signature Date

Maeregu Biyabeyen(Ass. Prof) _____ _____

Co-Advisor signature Date

As members of the board of examiners of the MA Thesis open defense examination, We certify that we have read and evaluated the Thesis prepared by Wakjira Gudeta and examined the candidate. We recommend that the thesis be accepted as fulfilling the Thesis requirement for the Degree of Master of Arts in school leadership.

Approval of Board of Examiners

_____ _____ _____

Chair Person Name signature Date

_____ _____ _____

Internal Examiner Name signature Date

_____ _____ _____

External Examiner Name signature Date

Final approval and acceptance of the thesis is contingent upon the submission of its final copy to the Council of Graduate Studies (CGS) through the candidate's department or school graduate committee (DGC or SGC)

DEDICATION

This Thesis is dedicated to my dear wife Debube Geleta, my brother Wakuma Roro and my sister Derartu Gudeta who were very kind and supportive to me throughout this study.

STATEMENT O F THE AUTHOR

By my signature below, I declare and affirm that this Thesis is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis and compilation of this Thesis. This Thesis is submitted in partial fulfillment of the requirements for an MA Degree at Haramaya University. The Thesis is deposited in the Haramaya University Library and is made available to borrowers under the rules of the library. I solemnly declared that this Thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

Brief quotations from this thesis may be made without special permission provided that accurate and complete acknowledgement of the source is made. Requests for permission for extended quotation from or reproduction of this Thesis in whole or in part may be granted by the Head of the School or Department or Director of Postgraduate Program directorate when in his judgment the proposed use of the material is in the interest of scholarship. In all other instances, however, permission must be obtained from the author of the Thesis.

Name: Wakjira Gudeta Nigusa Signature

_____

Date of submission: August, 2016

Place: Haramaya University, Haramaya

BIOGRAPHICAL SKETCH OF THE AUTHOR

The author was born in Oromia regional state, Horo Guduru Welega zone, jardega Woreda, on January 08, 1988 G.C. He attended his primary education at Akeyu Elementary school. Then, he joined Shambo Secondary School where he attended grades 9^{th} to12^{th} and he completed his general secondary education in June 2003 and preparatory education in June 2005. Then, he joined Jimma Universty in 2006 and received a bachelor Degree in Physics with Mathematics minor in July 2008. After his graduation, he taught at Tore Secondary School in Borena zone Gelana Woreda as a Physics teacher. He had taught there for three year. He had worked in Borena zone Gelana woreda secondary as a principal for five and he joined Haramaya University, College of Education and Behavioral Science, Department of Educational Planning and Management to study MA program in school leadership in July 2013.

ACKNOWLEDGEMENTS

Most importantly, I would like to acknowledge Almighty God for helping me complete this research work and for all His help throughout my life.

First and for most, my heartfelt gratitude also goes to my major advisor Garkebo BaGarkebo Basha (PhD) and Co-advisor Maeregu Biyabeyen (Ass. prof) for their constructive comments and support from the beginning to the end of the research work. Their valuable advice and constructive comments helped me to a great extent, and their assistance in shaping the paper in its present form.

Secondly, I express my sincere thank and appreciation for my wife Debube Geleta, my brother Wakuma Roro and all my family‟s members; for their moral and financial support, encouragement, and also their efforts to overcome various challenges which affect my work.

Thirdly, I would like to send my heartfelt thanks to Borena zone preparatory school teachers and secondary school supervisors for their material, technical support as well as moral support starting from the initial to the completion of this research work.

At last, but not the least, I am extremely indebted to Borena Zone education office for supporting me in writing letters to woredas to collect data. Again, my thanks also expressed to Gelana woreda education officials for the permission and cover my duty for bearing my long absence from school with love and understanding.

ABBREVIATIONS AND ACRONYMS

ARPA	Advanced Research Projects Agency
CAI	Computer Assisted Instruction
CD-ROM	Compact Disk - Read Only Memory
EICTDA	Ethiopian ICT Development Agency
EMIS	Education Management Information System
FDRE	Federal Democratic Republic of Ethiopia
GEQIP	General Education Quality Improvement Package
HEI	Higher Education Institution
ICT	Information and Communication Technology
ICT4D	Information Communication Technology for Development
ICT4E	Information Communication Technology for Education
IT	Information Technology
LCE	Learner-Centred Education
MCIT	Ministry of Communications and Information Technology
MDG	Millennium Development Goal
MoE	Ministry of Education
NEPAD	New Partnership for Africa's Development
NICTP	National Information Communication Technology Policy
OECD	Organization for Economic Cooperation and Development
OLPC	One Laptop per Child
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PSEP	Post-Secondary Education Project

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

INFORMATION COMMUNICATION TECHNOLOGY UTILIZATION AND ITS CONTRIBUTION TO STUDENTS' ACADEMIC ACHIEVEMENT IN PREPARATORY SCHOOL OF BORENA ZONE, OROMIA REGIONAL STATE

Wakjira Gudeta Nigusa

ABSTRACT

The purpose of this study was to investigate information communication technology utilization and its Contribution to Students' Academic Achievement in preparatory school of Borena zone, Oromia regional state. To conduct the study, a descriptive survey design was employed and qualitative research was used to enrich data. The study was carried out on 4 preparatory schools which were selected through simple random sampling techniques. Then, a total of 196 individuals participated in the study. All the sample respondents were selected through available sampling technique. Questionnaire was used to collect the necessary data regarding the issue. Interview and document analysis were also used to substantiate the data gathered through questionnaires. The analysis of the quantitative data was carried out by using percentage, mean, standard deviation, independent sample t-test and while qualitative data, which were obtained through interview and document analysis, were analyzed using narration. The result of the study revealed that, the extent of ICT utilization such as manipulating graphs or images using graphs software, using the Internet to obtain educational resources, downloading educational materials or software from the Web were not effectively implemented and classroom teachers teach by themselves without opening PTV during classroom instruction in preparatory schools of study area. Unavailability of some ICT tools such as internet connection, laptop, fax machine, printer, projectors and projector screen made ICT more unproductive in improving the quality of teaching-learning. Moreover, the study found out that, ICT highly supported both the teachers and students to making teaching-learning more interesting and positively changed the learning climate in their classroom, teaching-leaching very easy and increased student motivation while there are several factors that hindered the implementation of ICT at the preparatory schools. These include infrastructure problem, Lack of fund, lack short term train and of training facilities, shortage of electric power and resistance of teachers. This in turn negatively affected provision of quality education. To minimize the problems of ICT utilization and to improve quality of teaching-learning, it is recommended that Woreda Education Offices in collaboration with Zonal Educational Offices, and Regional Education Bureau should provide short training programs and facilitate experience sharing for the effectiveness of ICT utilization at the school level, regional, zonal and woreda educational stakeholders need to follow up the progress of school principals' extent (status) of providing their support and arrange special training program for teachers and principals in collaboration with school officials should encourage teachers to use all ranges of active learning methods and have to motivate teachers to utilize appropriate IT materials. Moreover, Woreda Education Offices should be provide the necessary ICT tools and technical supports by participating the community, non-governmental organizations (NGO's) and parents of students.

1. INTRODUCTION

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

1.1. Background of the Study

The use of ICT in education lends itself to more student-centred learning settings. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century. Effective use of ICT for education, along with ICT use in the teaching learning process can enhance quality and accessibility of education; learning motivation and learning environment.

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

In its five years policy action plan (2006 – 2010), the Ethiopian Ministry of Capacity Building stated that the government is committed to addressing the nation's human resource requirements in the area of ICTs through the promotion of mass ICT literacy and training. This is aimed at increasing the use of ICTs in educational institutions as well as implementing initiatives aimed at connecting schools and higher educational

institutions to online resources. ICT related technologies are being deployed to support learning at different levels of the educational system (Getahun, 2006).

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

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

The other instruction in education is progressive or modern instructional education (the education approaches based on development), or alternative education (Beck and Robert, 2009). To use ICT in educational activities, integrating ICT tools into the curriculum and adapting pedagogy according to the social environment are necessary for achieving qualitative improvements in learning (Kremer and Holla, 2008; Sreekumar and Sanchez, 2008; Barret, 2009; Gurumurthy, 2009).

Kremer and Holla argue that pedagogical innovations that work around the distortions in educational systems can improve student achievement at low cost. Technology-assisted learning or standardized lessons can mitigate weaknesses in teaching and substantially improve test scores. The general impression is that integrating ICT in learning and teaching is a very valuable asset in the process of learning, appealing to

many aspects of students‟ learning, and hence, a vital necessity for adoption in education. This impression has been resounded by many scholars and studies.

The various ICT facilities used in teaching-learning process in school according to Babajide and Bolaji (2003), Byers (2004), Bandele (2006) and Ofodu (2007) include: radio, television, computers, overhead projectors, optical fibers, fax machine, CD-ROM, internet, electronic notice board, slides, video/VCD machine and so on. It appears some of the facilities are not sufficient provided for teaching-learning process in secondary school. This might account for why teachers not making use of them in their teaching.

According to Ajayi (2008), the use of these facilities, involves various method which include systematized feedback system computer-based operation /network, video conferencing and audio conferencing, internet/worldwide websites and computer assisted instruction. It must however be stressed that the effective use of the various method of the ICT in teaching-learning depends on the availability of these facilities and teachers' competence in using them.

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

1.2. Statement of the Problem

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

there seems to have been an uncanny lack of influence and far less change than other fields have experienced.

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

The main challenges of ICTs use in African schools, Kessy, Kaembe and Gachoka (2006) report several reasons, which fall into two main camps. The first one is the lack of tangible resources such as technology, money and electricity. These factors point to the need for effective planning in order to make best use of the few resources that can be brought to bear on education. Yet the second problem relates to human resource shortcomings around awareness, competencies and governance, which make such effective planning all the more difficult to achieve.

The reason why the researcher focused in that Ethiopian government recognized that though the government is making strong effort to create education access to all potential students, the quality is becoming deteriorated from time to time and now it has become the critical problem facing the country's educational system .Some studies conducted at school level revealed that school actors have negative perceptions for the utilization of ICT in teaching-learning due to various reasons (Brook 2007; Ali 2005). It is obvious that there can be resistances from teachers, students, principals when such new changes are implemented. Besides the resistance forces mentioned, other challenges like shortage of supportive resources may inevitability occur at least at the beginning. ICT knowledge, skill and change in methodology are some of the challenges that hinder the proper utilization of the technology.

According to study made by Mirressa (2007) on the usage of information communication technology in a higher education institute, there is a common situation

where most of the staff members have the awareness and access towards it. However, he continued to set that his findings come with some doubt whereby the awareness of the staff members does not guarantee the integration of ICT into the teaching-learning system. . However, the findings of above have not indicated the utilization of ICT at preparatory level. Thus, the researcher here felt that, there is a gap which needs in-depth investigation on the utilization of ICT *and* its Contribution to Students' Academic Achievement in preparatory schools of Borena Zone, Oromia. In order to carry out this study, attempts were made to find answers for the following basic questions:

1.3. Research Questions

The following research questions are raised to guide this study.

1. To what extent are the information communication technology facilities available for teaching-learning in preparatory schools of Borena zone?
2. To what extent do teachers and students in preparatory school of Borena zone used information communication technology facilities for the teaching-learning activities?
3. What are the perceived benefits of information communication technology utilization in preparatory schools of Borena zone
4. What are the major challenges in utilization of information communication technology in preparatory schools of Borena zone?

1.4. Objectives of the Study

1.4.1. General objective

The purpose of this was to investigate information communication technology utilization *and* its Contribution to Students' Academic Achievement in preparatory school of Borena zone, Oromia regional state.

1.4.2. Specific objectives

The specific objectives of the study will be to:

1. assess the availability of information communication technology facilities preparatory in school in Borena zone.

2. examine the extent of utilization of information communication technology tools by preparatory school teachers of Borena zone.
3. investigate the perceived benefits of information communication technology in preparatory school of Borena zone
4. identify the major challenges in utilization of information communication technology in preparatory schools Borena zone.

1.5. Significance of the Study

This study was crucial to the improvement of ICT utilization in preparatory schools, since it finds to provide vital information about the contribution of ICT in promoting quality of teaching-learning. This in turns will help the school principals, supervisors, teachers and educational leaders can use the study to solve problems encountering utilization of the ICT in the schools. Accordingly, this study has the following significances: (1) Investigate the extent to which classroom teachers' utiling information communication technology for classroom instruction in the study area. (2) It may provide information for Woreda, Zonal and Regional educational expertise about the utilization of ICT in preparatory schools. (3) Find out the extent to which government support, school climate and teachers characteristics affect ICT in the study area. (4) The findings may hopefully assists in enriching the existing literature on the issue of ICT utilization and may help as a springboard for other researchers who want to conduct further study in the area of information communication technology.

1.6. Scope of the Study

To make the study more manageable, the scope of this study was delimited to four selected woredas‟ of Borena zone, which were thought to be fairly representing the population. The study was also being delimited by the sample size that includes: four selected schools, selected teachers, preparatory school supervisors and students. This has helped the researcher to get relevant information on the utilization of information communication technology in the preparatory schools of the zone that advance the study. As utilization of ICT is a broad system of organization, it includes a lot of activities and functions at different level of educational institution. Therefore, the researcher has limited himself with studying utilization of information communication

technology at preparatory level. Finally, the study was delimited by data gathering tools include questionnaire, interview guides and document analysis

1.7. Limitations of the Study

Even though this study has tried to attain its objective, there were some inescapable limitations. One apparent limitation was that, most of the preparatory school teachers, supervisors and principals were busy and had no enough time to respond to questionnaire and interview. Some of them who have enough time were also reluctant to fill in properly and return the questionnaire as per the required time. However, the researcher was able to minimize some of these problems by openly discussing on the objective of the study. All questionnaires were also returned because some of colleagues helped the researcher by encouraging respondents to fill in the questionnaires and return them. Another limitation was lack of relevant literature on the topic, especially on Ethiopian current contexts. There is acute shortage of books or updated related literature in the area. To minimize this, researcher used all opportunity of searching internet. In spite of these short comings, however, it was attempted to make the study as complete as possible.

1.8. Operational Definition of Key Terms

ICT: Information and communication technology is used as an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services and applications associated with them, such as videoconferencing and distance learning.

Preparatory school: the school that is intermediate in level between secondary school and University that comprises grade 11 to 12.

Utilization: is defined as the process of practical and effective usage of information communication technology

1.9. Organization of the Study

This study has 5 chapters. Chapter 1 contains the introduction parts of the investigation, statement of the problem, objectives of the study, significance of the study, delimitation of the study, limitation of the study and definition of key terms. Chapter 2 states a review of the literature in which different topics was stated; such as the concept of information communication technologies, the roles of information and communication technologies in education, uses and roles of ICT in improving students' learning: pedagogical basic of ICT integration, facilitating factors in using information technologies in education, the roles of teachers, students and school governing bodies in integrating information communication technologies in education, the effective utilization ICT in the classroom teaching-learning process, factors influencing teachers utilization to ICT, challenges to effective utilization of ICT tools in education and information communication technology and student motivation. Chapter 3 explores description of the study, the research design and methods, the collection of data. Various methods have been used in collecting data such as Questionnaire, interviews and document. Chapter 4 presents findings obtained from analysis and interpretation of data generated in the investigation of the study. Data was analyzed and interpreted so that research questions can be answered. Chapter 5 serves as a synthesis of the summary of all the chapters as well as the conclusion with reference to the problem statement. The general recommendations of the study are discussed with specific recommendations for future research, taking into consideration the limitation of the study.

2. REVIEW OF RELATED LITERATURE

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

2.1. The Concept of Information Communication Technology

Anderson and Glen (2003) define ICT as those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (computers and other devices); software applications; and connectivity (access to the Internet, local networking infrastructure, and video-conferencing). According to UNESCO (2002) information and communication technology (ICT) may be regarded as the combination of „Informatics technology" with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio CD ROMs, etc. have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007).

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

ICT can thus be described as a diverse set of technological tools and resources used for creating, storing, managing and communicating information electronically.

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

Generally, ICT is a tool that any sector can use to deliver its services. The ICT revolution has turned the whole planet into a 'Global Village' where communication among people has become independent of physical distance and time. ICTs, especially the Internet in which they all converge as a huge network, are transforming all human activities that depend on information, including library services. In this digital era therefore, the most appropriate technology used by libraries to enhance information provision is ICT. According to different studies above ICT has several definitions depending on the nature of its use and ICT (information and communication technology) is used as an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services.

2.2. Factors Influencing Teachers Utilization to ICT

2.2.1. Personal characteristics

Personal characteristics such as educational level, age, gender, educational experience, with the computer for educational purpose and attitude towards computers can Influence the integration of a technology, Schiller (2003). The attitudes of teachers towards technology greatly influence their integration of computers into their teaching. According to (Russell and Bradley, 1997), anxiety, lack of confidence and competence and fear often implies ICT takes a back seat to conventional learning mechanisms. Therefore, an understanding of personal characteristics that influence teachers' adoption and integration of ICT into teaching is relevant.

2.2.2. Teachers' attitudes and perceptions

To successfully initiate and implement educational technology in school's program depends strongly on the teachers' support and attitudes. It is believed that if teachers perceived technology programs as neither fulfilling their needs nor their students' needs, it is likely that they will not integrate the technology into their teaching and learning. Among the factors that influence successful integration of ICT into teaching are teachers' attitudes and beliefs towards technology (Hew and Brush, 2007; Keengwe and Onchwari, 2008).

Teachers' computer experience relates positively to their computer attitudes. The more experience teachers have with computers, the more likely that they will show positive attitudes towards computers (Rozell and Gardner, 1999). Positive computer attitudes are expected to foster computer integration in the classroom (van Braak, Tondeur and Valcke, 2004). According to (Woodrow, 1992) for successful transformation in educational practice, user need to develop positive attitudes toward the innovation.

2.2.3. Information communication technology competence

Computer competence is defined as being able to handle a wide range of varying computer Applications for various purposes van Braak et *al (* 2004). According to Berner (2003), Na (1993) and summers (1990) as cited in Bordbar (2010), teachers' computer competence is a major predictor of integrating ICT in teaching. Evidence suggests that majority of teachers who reported negative or neutral attitude towards the integration of ICT into teaching and learning processes lacked knowledge and skills that would allow them to make "informed decision" (Al-Oteawi, 2002, as cited in Bordbar, 2010).

Computer self-efficacy research has been conducted on teacher's self-efficacy and reported to have greater effect on their use of ICT. Self-efficacy is defined as a belief in one's own abilities to perform an action or activity necessary to achieve a goal or task (Bandura, 1997). In real meaning, self-efficacy is the confidence that individual has in his/her ability to do the things that he/she strives to do. Thus teachers' confidence refers both to the teachers' perceived likelihood of success on using purposes and on how far the teacher perceives success as being under his or her control (Peralta and Costa,

2007). Teachers' computer self-efficacy is described as a judgment of their capability to use a computer (Compeau and Higgins, 1995).

2.2.4. Teacher workload

Many studies have revealed that the workloads of teachers influence their acceptance of Technology in classrooms. For example, Samarawickrema and Stacey (2007) investigated factors related to the use of learning management system in a large multi-campus urban university in Australia. They adopted case study method and purposive sampling to select 22 participants used web-based methods to teach both on- and off-campus students for the study.

The findings of the research found that increased workload coupled with teaching with technology was critical to the participants of the study. Factors reported to contribute to increased workload were course maintenance and constant upgrades, student emails, the learning of new skills and the continuous search of sustainable strategies. According to Fullan (2003), for teachers to realize the aims of educational system as well as implementing new initiatives, it necessary to lessen the workload of teachers.

2.2.5. Professional development

Teachers' professional development is a key factor to successful integration of computers into classroom teaching. Several studies have revealed that whether beginner or experienced, ICT related training programs develop teachers' competences in computer use (Bauer and Kenton,2005; Franklin, 2007;), influence teachers' attitudes towards computers (Hewand Brush, 2007; and Onchwari, 2008) as well as assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008).Muller and his colleagues (2008) related technology training to successful integration of technology in the classroom.

2.2.6. Accessibility

Access to information communication technology infrastructure and resources in schools is a necessary condition to the integration of ICT in education (Plomp, Anderson, Law, and Quale, 2009). Its effective adoption and integration into teaching in schools depends mainly on the availability and accessibility of ICT resources such as

hardware, software, etc. Obviously, if teachers cannot access to these resources, then they will not use them. Therefore, access to computers, updated software and hardware are key elements to successful adoption and integration of technology. A study by Yildrim (2007) found that access to technological resources is one of the effective ways to teachers' pedagogical use of information communication technology in teaching.

Further a study of 814 faculty members in higher education in Turkey showed that majority of the respondents reported having access to computers and the internet. 82.5% and 81.2% of faculty members had access to computers and internet respectively (Usluel, Askar and Bas, 2008).

2.2.7. Technical support

Jones (2004) reported that the breakdown of a computer causes interruptions and if there is lack of technical assistance, then it is likely that the regular repairs of the computer will not be carried out resulting in teachers not using computers in teaching. The effect is that teachers will be discouraged from using computers because of fear of equipment failure since no one would give them technical support in case there is technical problem. Becta (2004) agreed that "if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns" (p.16).

2.2.8. Leadership support

Though infrastructure support is imperative, school technology leadership is a stronger predictor of teachers' use of computer technology in teaching (Anderson & Dexter, 2005). Yee (2000) believe that a leader who implements technology plans and also shares a common vision with the teachers stimulate them to use technology in their lessons. Schiff and Solmon suggest that for effective utilization of ICT by teachers, there is the need for a strong leadership to drive a well designed technology plans in schools (Lai and Pratt, 2004)

2.3. Challenges to Effective Utilization of ICT Tools in Education

Empirical studies have indicated that even teachers who have competence in the use of ICT do not integrate them in their teaching. Problems of quality and lack of resources are compounded by the new realities faced by higher education institutions battle to cope with every increasing student's numbers. Not only have higher education systems expanded worldwide, the nature of the institution within these systems has also been shifting, through a process of differentiation (World Bank, 2000 as cited by Ololube, Ubogu & Ossai, 2007). According to Pelgrum (2001), obstacles for ICT implementation include the following: Insufficient number of computers, teachers' lack of ICT knowledge/skills, difficult to integrate ICT to instruction, scheduling computer time, insufficient peripherals, not enough copies of software, insufficient teacher time, not enough simultaneous access, not enough supervision staff and lack of technical assistance.

Similarly, Azuh (2013) noted the barriers also to include limited equipment, inadequate skills, minimal support, time constraints and the teacher's own lack of interest or knowledge about computer. Kwacha (2007) also noted that the most common problems associated with the effective implementation of ICT are lack of qualified ICT personnel, cost of equipment, management attitudes, inconsistent electric power supply, inadequate telephone lines, particularly in rural areas and non-inclusion of ICT programmers in teacher's training curricula and at the basic levels of education

2.4. Information Communication Technology and Student Motivation

Cox (1997) studied elementary and secondary school students‟ use of technology and their attitudes towards ICT. The study was grounded in an analysis of the literature relating to motivation, as it indicates that the regular use of ICT for various topics can have a stimulating and beneficial effect on students‟ learning. Students‟ responses showed their increasing commitment to the learning task, reinforcing enjoyment, benefit and feeling of achievement in learning when using ICT, and emphasising their self-esteem. Over 75% of secondary school students stated the response „I agree‟ or „I strongly agree‟ to the statement that the use of computers made the school subjects

more exciting. Also, over 50% of the students showed agreement that the use of ICT helped them understand their topics in a better manner (Cox, 1997).

Bullock (2001) carried out a case study about the effect of ICT use on the student‟s motivation and achievement in learning. Results showed a great improvement in the motivation of the great majority of students. In particular, students were more enthusiastic to start the tasks, and this zeal continued over the period of the task. The questionnaires responses for 88% of the class showed that the use of a various collection of ICT during this year made their lessons more exciting and interesting than was expected.

In the UK, the UK Impact Project studied the effect of ICT on students‟ learning in elementary and secondary schools which included 2300 enrolled students in 19 local educational areas (LEAs). The project concluded that students‟ commitment to work increased after the use of ICT (Watson, 1993). This study suggested the existence of students of „advanced information technology‟ in some study subjects and age ranges and in specific circumstances (depending on access to computer machines and suitable software and a syllabus plan that integrates its use in the lessons) can achieve gains of 5% in general examinations results.

Students who did not enjoy learning can be encouraged through the use of ICT, which possesses the flexibility required to meet the individual needs and abilities for every single student. ICT presents information in new ways that help students to understand. Even difficult ideas become easier to understand when the information technology makes it more visible. Simulation offered by ICT encourages analytic and broader thinking as well as learning activation and stimulation, and it is considered successful specially in attracting the attention of students who have manner and emotional difficulties. Through the use of ICT teachers can have a look at the way they teach and the ways through which students learn. Facilitating teachers‟ easy arrival to ICT sources encourages and improves the use of ICT in syllabi (Pachler, 1999: 5)

2.5. The Roles of ICT in Education

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

Furthermore, the strong connection between education and ICT is seen in the comment about MDGs by the former secretary general of the UN, Kofi Annan.

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

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

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

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

2.5.1. ICT Enhancing Teaching and Learning Process

ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).
Many different types of technology can be used to support and enhance learning. Everything from video content and digital moviemaking to laptop computing and handheld technologies has been used in classrooms. Similarly, new uses of technology such as pod casting are constantly emerging (Marshall, 2002). To Marshal, various technologies deliver different kinds of content and serve different purposes in the classroom. Word processing and e-mail promote communication skills; database and spreadsheet programs promote organizational skills; and modelling software promotes the understanding of Science and Mathematics concepts. It is important to consider how these electronic technologies differ and what characteristics make them important as vehicles for education (Berker, 1994).

Technologies available in classrooms today ranges from simple tool-based applications (such as word processors), to online repositories of scientific data. Others are primary historical documents, handheld computers, closed-circuit television channels, and two-way distance learning classrooms. Prensky (2005) asserts that even the cell phones that many now carry with them can be used to learn. According to Lei and Zhao (2006) each technology is likely to play a different role in students learning. Rather than trying to

describe the impact of all technologies as if they were the same, researchers need to think about what kind of technologies are being used in the classroom and for what purposes. Two general distinctions could then be observed from the literature. Students can learn from computers where technology are used essentially as tutors and serve to increase student's basic skills and knowledge. Moreover, they can learn with computers where technology is used as tool that can be applied to a variety of goals in the learning process and can serve as a resource to help develop higher order thinking, creativity and research skills (Reeves, 1998; Ringstaff and Kelley, 2002).

According to Murphy, et al., (2001), the primary form of student learning from computers is described as Discrete Educational Software (DES), Integrated learning system (ILS), Computer-assisted Instruction (CAI), and Computer-based instruction (CBI). These software applications are also the most widely available applications of educational technology in schools today, along with word-processing software, and have assisted in classroom for more than 20 years (Becker, Ravity and Wong, 1999). Murphy et al., (2001) explains that teachers use DES not only to supplement instruction, as in the past, but to introduce topics, provide means for Self-study, and offer opportunities to learn concepts otherwise inaccessible to students. The software also manifests two key assumptions about how computers can assist learning. First, the users‟ ability to interact with the software is narrowly defined in ways designed specifically to promote learning with the tools. Second, computers are viewed as a medium for learning, rather than as tools that could support further learning.

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

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

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

Complementary approach: Using an ICT resource to empower the students‟ learning, for example by enabling them to improve their class work by taking notes on the computer, or by sending homework by email to the teacher from home, or by word processing their homework. All three approaches can enhance attainment, but the effects may be different. In the integrated approach, students‟ learning is enhanced because they are confronted with challenges to their existing knowledge and given deeper insights into the subject being studied. The enhancement approach could improve students' learning through presenting knowledge in new ways, promoting debates among students, and encouraging them to formulate their own explanations. The complementary approach draws on the approach that suggests that learning can be enhanced by reducing the mundane and repetitive aspects of tasks such as writing essays and homework by hand, freeing the learner to focus on more challenging and subject-focused tasks (Kemmis et al., 1977 in UNESCO, 2004). These different types of use require the teacher to have an extensive knowledge of ICT and to be able to fit its use either into their existing pedagogy or to extend their pedagogical knowledge so they can accommodate ICT effectively in their teaching.

2.5.2. ICT Enhancing the Quality and Accessibility of Education

ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the

quality of learning. In concert with geographical flexibility, technology-facilitated educational programs also remove many of the temporal constraints that face learners with special needs (Moore and Kearsley, 1996). Students are starting to appreciate the capability to undertake education anywhere, anytime and anyplace.

One of the most vital contributions of ICT in the field of education is- Easy Access to Learning. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002). Wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. ICT also allows the academic institutions to reach disadvantaged groups and new international educational markets. As well as learning at any time, teachers are also finding the capabilities of teaching at any time to be opportunistic and able to be used to advantage. Mobile technologies and seamless communications technologies support teaching and learning. Thus, ICT enabled education will ultimately lead to the democratization of education. Especially in developing countries like Ethiopia, effective use of ICT for the purpose of education has the potential to enhance the quality of education.

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

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

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

A great deal of research has proven the benefits to the quality of education (Al-Ansari 2006). Hepp, Hinostroza, Laval and Rehbein (2004) stated that the literature contains many unsubstantiated claims about the revolutionary potential of ICTs to improve the quality ofeducation. They also note that some claims are now deferred to a near future when hardware will be presumably more affordable and software will become at last an effective learning tool.

2.6. Uses and Roles of ICT in Improving Students' Learning: Pedagogical Basic of ICT Integration

Wiken, *et al (*2005); US Department of Education (1995); Lumley(1991); Lewis (2004); McCombs (2000); Dunlap (2002); Wang and Woo (2007); Boster (2004) reveal that the effective integration of ICTs have positive impacts on the students' motivation, interest and engagement in learning and boost up their retention of the contents learnt and improve their achievements. Especially, Wiken, et al (2005) emphasized that technology improves motivation, engagement and interest when students use multimedia and using audio and video technologies brings content to life and stimulates learning. Wiken, et *al* (2005) concluded that effective technology integration has implications for students, teachers and administrators.

The above discussions can be recapped by using Edgar Dale's of experience which illustrates Audio-Visual Methods in Teaching (Dale, 1969). It is self explanatory that one can remember 50% of what he/she learnt through audio and visual methods. Though this figure (percentage) is half-way, it is still better than learning a content in either methods alone. "Saying/talking" and "doing accompanied by saying" constitutes the largest proportion (70% and 90% respectively) of remembering/retention of the contents learned. The implication is that if students are exposed to audio-visual followed by learning by doing (e.g. Biology lab practical's, including presentations and discussions of/on Biological concepts, field works), the best learning environment is created, and thus effective learning can take place.

A study conducted by Boster et *al.* (2002) on teachers' beliefs about the effects of use of multimedia in a classroom shown that it greatly increase interest, attention and curiosity of the students. In the same study, teachers also revealed their beliefs that, the increase in attention leads to increased retention and motivation, which ultimately leads to better learning and improvement in the students' achievements.

2.7. Facilitating Factors in Using Information Technologies in Education

Integrating ICT into curricula with the intent of positively influencing teaching and learning has been in a state of evolution over the past 20 years (Dias and Atkinson,

2001; Dockstader, 1999). Driven primarily by hardware and software evolution, accessibility to computers in educational settings, and popular instructional technology trends, technology integration has covered the continuum from instruction on programming skills, self-directed drill and practice, interactive learning software, online training, testing, instructional delivery augmentation, and Internet-based accessibility to information, communication, and publication (Dias and Atkinson, 2001). According to Flanagan and Jacobsen (2003), ICT integration is meant to be cross curricular rather than become a separate course or topic in itself. ICT should be used as a tool to support the educational objectives such as skills for searching and assessing information, cooperation, communication and problem solving which are important for the preparation of children for the knowledge society (Drent and Meelissen, 2007). And, innovative use of ICT can facilitate student centred learning. Hence, every classroom teacher should use learning technologies to enhance their student learning in every subject because it can engage the thinking, decision making, problem solving and reasoning behaviours of students (Grabe, 2001). These are cognitive behaviours that children need to learn in an information age.

As a classroom tool, the computer has captured the attention of the education community. This versatile instrument can store, manipulate, and retrieve information, and it has the capability not only of engaging students in instructional activities to increase their learning, but of helping them to solve complex problems to enhance their cognitive skills (Jonassen and Reeves, 1996).

Generally, three objectives are distinguished for the use of ICT in education, according to Brummelhuis, and Rapmund (1996), the use of ICT as object of study, the use of ICT as aspect of a discipline or profession; and the use of ICT as medium for teaching and learning. The use of ICT in education as object refers to learning about ICT, which enables students to use ICT in their daily life. The use of ICT as aspect refers to the development of ICT skills for professional or vocational purposes. According to Drent and Meelissen (2007), the use of ICT as medium focuses on the use of ICT for the enhancement of the teaching and learning process. It is a fact that teachers are at the centre of curriculum change and they control the teaching and learning process. Therefore, they must be able to prepare young people for the knowledge society in

which the competency to use ICT to acquire and process information is very important (Plomp et al., 1996).

2.8. The Roles of Teachers, Students and school governing Bodies in Utilizing ICT in Education

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

A case study of ICT-enriched school environment in Rishon Le-zion, Israel (OECD 2001) which analyzed the impact of innovation in teaching learning methods implemented in a school supports the argument that successful implementation of ICT depends mainly on instructors capability to assimilate ICT in teaching and learning processes. The amount and variety of teachers‟ training assured competency of staff regarding ICT implementation in pedagogy. In addition, the wide range usage of ICT in all subject matters, all grades and at all times made ICT a vital and essential means of learning. Students were led by their teachers in an effort to improve their ICT skills and fostering appropriate usage of technology in pedagogical practices.

In the era of technological advancement, we can observer tremendous change in information technology such that now we are an information society, and that has greatly influenced our education. According to Al-Oteawi (2002), information technology has become the backbone of a global society. Furthermore, “Information technology is changing every institution, every business and every individual in a profound way” (Tuller and Oblinger, 1997, p. 33).

One of the major trends of educational reform is geared towards acquiring and using information technology. For example, one of the benchmarks of research studies indicating how technology has benefited the process of education in America is the

1997 nationwide survey of teachers and school superintendents by Jostens Learning Corporation. In the survey, 74% of the general public and 95% of educators indicated that computers had improved the quality of education, teaching, and learning (Earle, 2002). In that regard, technology integration in education poses as one of the crucial elements in educational endeavours nowadays and suggests that it is almost inevitable that governments and institutions strive to adopt and integrate technology in their educational curricula.

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

2.9. The Effective Utilization ICT in the Classroom Teaching-Learning process

It is a time-tested truth that the effective utilization of ICT in classrooms significantly helps students' learning, retention and hence improves their achievements. ICTs also assist teachers. Earle (1992, in Earle, 2002) in one of his studies declared his belief when he states: "ICT does, indeed, hold a remarkable promise for changing the quality of teaching and learning in schools". And he described ICT as the catalyst for transformation.

In connection to this, research evidences (Baylor and Ritchie, 2002), cited in Abdo and Semela (2010) show that teachers' use of instructional media sustain students' attention, increase the meaningfulness of abstract concepts, encourage deep processing, and boosts class performance through increased content acquisition. Valdez *et al. (*2000), in Earle (2002), observed a very strong connection between appropriate teachers' use of ICT and increased student achievement.

Furthermore, a review of research studies and reports compiled in the early years of the past decade (such Sivin-Kachala and Bialo, 1995) reveal the value of technology in enhancing students' achievement, improving their attitudes about themselves and about learning, and changing the learning environment. As pointed out by Cassidy (1982), ICT is concerned with improving the effectiveness and efficiency of learning in educational contexts, regardless of the nature or substance of learning. He further explained that solutions to instructional problems might entail social as well as machine technologies.

Smith (1997) contended that the addition of technology (into a face-to-face traditional learning) modifies face-to-face learning, supports and places the learner at the center of a process that removes the confines of the traditional classroom through access to information, interactions with peers and experts, and opportunities for simulated and real experiences. This concept is consistent with what Tiene and Luft (2001), in Earle (2002), stated as: "Working in an appropriately designed technology-rich environment has the potential of producing a variety of positive outcomes: improved patterns of social interaction, changes in teaching styles, more effective teaching, increased student (and perhaps, the teacher) motivation, and enhanced student learning."

Several studies (Neo, 2007; Rakes, Fields, and Cox, 2006; Sandholtz, Ringstaff, and Dwyer, 1997), cited in Abdo and Semela (2010) have exposed that integration of ICT in school curriculum is believed to bolster the quality of instruction via fostering student-centered pedagogies. In relation to this, Earle (2002) commented that technologies must be pedagogically sound. According to him, ITs must go beyond information retrieval to problem solving; allow new instructional and learning experiences not possible without them; promote deep processing of ideas; increase student interaction with subject matter; promote faculty and student enthusiasm for teaching and learning; and free up time for quality classroom interaction - in sum, improve the pedagogy.

What is more, MoE (2004) in its document: Guidelines on the usage of satellite educational TV programs holds the belief that ICT aided educational provisions open a wide opportunity for students to compete for international accomplishments and emphasizes that the use of ICT in schools enhances students' self-directed learning

opportunity and their confidence as citizens. The other belief is that education through ICT enables students to get access to the international spectra of hobbies and fields of interest. Again, the government (FDRE) sees ICT as a panacea to the entire social, political, educational, cultural and economic conundrums the country has long been submerged in.

Duffield (1997 in Earle, 2002) warns us to remember that technology is not a subject, rather the focus of ICT integration should be on pedagogy - effective practices for teaching and learning. According to him, technology integration is not about technology, it is primarily about content and effective instructional practices. He further highlighted that technology merely involves the tools with which we deliver content and implement practices in better ways. Its focus must be on curriculum and learning. He concluded that integration is not measured by the amount or type of technology used, but by how and why it is used. This corroborates the findings of a study by Bernauer (1995) in which he highlighted that it is not technology per se that results in improved student outcomes, but rather how the technology is used and integrated into instructional processes.

The real purpose of integrating ICT into classroom teaching should be to make the teaching-learning process 'whole', i.e. to equip/ supplement the learning environment with resources which can't be made available by the classroom teacher. The simultaneous presence of the human element (the teacher) plus the non-human element (ICT) help students learn better than they learn by either of the two elements alone. Corroborating this idea, Earle (2002) referred to the very meaning of the term 'Integration' (integration: from the Latin integrate, to make whole) and it includes a sense of completeness or wholeness and incorporates the need to overcome artificial separations by bringing together all essential elements in the teaching and learning process including technology (as one of the elements, not the sole element).

ICT should be understood as an auxiliary tool in enriching learning. It is not a surrogate teacher. It is not per se a panacea to all the problems linked to education. There are research findings which support the idea that ITs are not the sole remedy to problems that arise in the milieu of teaching and learning. One such finding was reported by

Taylor (2000) in which he stated, “Technology is not the ‘silver bullet’ that will solve all of our education problems, but it is certainly a useful tool that enables us to link various learning communities together in new and different ways”. It is not about what technology by itself can do, but what teachers and learners may be able to accomplish using these tools.

3. RESEARCH DESIGN AND METHODOLOGY

This part includes method of the research, sources of data, sample of population and sampling techniques, instruments and procedures of data collection, and methods of data analysis.

3.1. Research Design

The methodological framework of this study was descriptive survey design. A descriptive survey design permits a researcher to gather information or opinion from large sample of respondents quickly and inexpensively (Ary *et.al,* 2002). Moreover Creswell (2003) pointed out that, survey design provides a quantitative description of trends, attitudes, or opinions of a population by studying a sample of the population. The researcher has used mainly quantitative data but qualitative data from interview and document also been used to enrich and substantiate data gathered through questionnaire.

3.2. Description of Research Site

The study was conducted in Oromia Regional state of Borena Zone on the information communication technology utilization and its contribution to students' academic achievement in preparatory school. Borena zone is specifically located at southern parts of Oromia region which has 565 km far from Addis Ababa the capital city of Ethiopia to its capital town of Yabello. The main economic activities of the peoples in the research site were based on traditional, raring cattle and Agriculture, trade. Due to the involved on mixed economic activities, their economic status in a good condition. Borena zone has 14 rural woredas and 2 city administrations. The agro-climate condition of the Borena zone is characterized as mostly *kola*.

3.3. Source of the Data

In this part the researcher has discussed the source of data for the study. The sources of data for this study were Primary sources and secondary sources.

3.3.1. Primary source of data

The primary data was collected from students leaders of one to five (1 to 5), teachers, principals and preparatory school supervisors of the selected preparatory schools.

3.3.2. Secondary sources of data

The secondary data were collected from various documents such as training manuals, ICT documents and download materials that help teaching-learning process.

3.4. Population, Sample Size and Sampling Techniques

3.4.1. Population

Population is any set of people or events from which the sample is selected and to which the study results is generalized (Israel, 1992). Similarly, Castillo (2009) defined research population as welldefined collection of individuals or objects known to have similar characteristics.

Even though scholars defined the concept population differently, it refers to collection of individuals or objects that share common characteristics (behavior) from which **s**amples are taken to conduct the study and to generalize its finding at the end. Therefore, the population of this research included all concerned staffs in all preparatory schools of Borena Zone; specifically, preparatory school teachers (111), Students leaders of 1 to 5 (267), principals (10), and supervisors (10), forming a total of 398.

3.4.2. Sample Size and Sampling Technique.

According to Fellegi (2003), a sample is a subset of a population that is used to represent the entire group as a whole. This means, sample is simply the subset of population that allows the researchers to conduct the study on individuals from the population so that the results of their study can be used to derive conclusions that applies to the entire population. Therefore, the researcher selected 4 woredas from the total of 13 woredas and 2 administrative towns by by using simple random sampling. Accordingly, Tore, Guangua, Gerba and Dugda dawa woredas were selected as a sample. Among the 4 selected woredas; Tore, Guangua, Gerba and Dugda dawa 1, 1, 1 and 1 preparatory school respectively selected. The selected woredas samples have only one preparatory school each. So, the researcher took teachers (61), student leaders of 1 to 5 (127), principals (4), and supervisors (4) of preparatory schools by using available sampling technique. The decision to take only 4 preparatory schools for this study is based on the researcher’s personal judgment to reduce budget cost, reduce field time,

and reduce huge data in to manageable form because the selected amount is sufficient to make generalization based on the finding since it is a 40% of the total schools found in the study area. Regarding this, Cohan and Manion (1994:89-90) noted that, a sample size of 30% from the population is appropriate if the numbers of population is known.

Table1: summery of respondents and sampling

No:	Name of the preparatory Schools	1 to 5 Students Leader			Teachers			Total population		
		Population	Sample	Percentage	Population	Sample	Percentage	Population	Sample	Percentage
1	Tore	40	40	100%	16	16	100%	56	56	100%
2	Guangua	36	36	100%	19	19	100%	55	55	100%
3	Gerba	17	17	100%	9	9	100%	26	26	100%
4	DugdaDawa	34	34	100%	17	17	100%	51	51	100%
Total		**127**	**127**	**100%**	**61**	**61**	**100%**	**188**	**188**	**100%**
	Simple random sampling	Available sampling		Available	Available					

3.5. Data Collection Instruments

To obtain adequate information**,** close ended questionnaire and interview were used to collect primary data and document analysis was used to collect secondary data.

3.5.1. Questionnaire

Questionnaires were prepared to gather data for descriptive survey. Closed questionnaire was prepared in English and distributed to Teachers and translated to afan oromo for students. Accordingly, the respondents have indicated the extent of their engagement to a particular behavior or practice by choosing one of the five Likert scale items ranging from strongly agree (5) to strongly disagree (1), from very high (5) to very low (1) and very good (5) to very poor (1). Because it is more appropriate for large scale surveys as they are quick for respondents to answer and are easy to analysis using statistical techniques. It also helps the respondents to choose one option from the given scales that best align with their views.

3.5.2. Interview Guide

Structured interview guide was the second data gathering tool of this study. This helps to gather data from school principals and supervisors. The interview was prepared in English, because the qualification of preparatory school principals and supervisors is at least 2nd degree.

3.5.3. Documents Analysis

Document analyses also used to identify and investigate some data which strengths the information from the questionnaire and interviews. The trustworthiness of information gathered from the questionnaire and interview was cross checked by this data gathering methods. Specifically, training manuals, printing documents and download materials that help teaching-learning process were observed and analyzed.

3.6. Validity and Reliability of Data Collecting Instruments

Checking the validity and reliability of data collecting instruments before providing it to the actual study subject is important.

3.6.1. Validity

Validity is the extent (degree) to which the instrument measures what it is intended (supposed) to measure (Neville, 2007) and (Adams et al. 2007). According to Phelan and Wren (2005), validity refers to how well a test measures what it is purported to

measure. Thus, to ensure (confirm) the validity of the instruments, the researcher performed the following activities;

The researcher provided it to friends (colleagues) to read it thoroughly and comment (see) if there are any ambiguities which the researcher have not noticed. Finally, the researcher carried out pilot study on Bule hora preparatory school which is complementary to sample preparatory schools to pre-test the instrument. The respondents of the pilot test were not included in the actual study. Thus, it was conducted on 20 teachers and 25 students. The rationale behind conducting pilot test were; first to ensure whether the questionnaire is clear to respondents and it can be completed in the way the researcher wish. Secondly, to check whether there is wording of the questions. The third purpose of pilot test was to check whether the sequence, length and layout of the questionnaire are okay or not. After the distributed questionnaires were returned from pilot study some necessary modifications (improvements) were made on few items. For example, 3 questions which were found unnecessary were completely cancelled (rejected) and 4 unclear questions were modified.

3.6.2. Reliability

Like validity, reliability is also defined differently by different scholars. For example; Reliability is the consistency of instrument across time and different individuals (Creswell, 2009). Similarly, Phelan and Wren (2005), defined reliability as the degree to which an assessment tool produces stable and consistent results. These definitions show us that, the term reliability in research means "repeatability" or "consistency" a measure is considered to be reliable if it gives us the same result again and again. Regarding this, this, George and Mallery (as cited in Jemal, 2013) suggested that, the Cronbatch's alpha result >0.9 is excellent, 0.8-0.9 is good, 0.7-0.8 is acceptable, 0.5-0.6 is questionable, <0.5 is poor. Accordingly, the researcher found the coefficient of Alpha (α) to be 0.95 for teachers and 0.97 for students' questionnaire which is regarded as excellent by George and Mallery(as cited in Jemal, 2013) . The table below indicates the computed reliability coefficient of the pilot test.

3.7. Procedure of Data Collection

To answer the basic research question raised, the researcher has gone through series of data gathering procedures. The expected relevant data was gathered by using questionnaires, interviews and document analysis. In doing so, having letter of authorization from Haramaya University and Borena zone education office; the researcher has gone to four sample woreda education offices and principals of respective schools for consent. After agreement has been made; the researcher has introduced his objective and purposes. Then the questionnaires were administered to sample teachers and students with in selected schools. They were closely assisted and supervised by the researcher to solve any confusion.

On the other hand, the preparatory schools principals and preparatory schools supervisors were interviewed. While interview conducted, to minimize loss of information, the obtained data was carefully recorded with video tape recorder and written in a notebook. In addition, the data available in document forms related to supervision were collected from the sample schools. Finally, the data collected through various instruments from multiple sources were organized and got ready for data analysis.

3.8. Method of Data Analysis

The researcher has collected data using questionnaire and interview from sample respondents. The data obtained from the closed-ended questions of questionnaire was analyzed through descriptive statistics (standard deviation, and mean) which were computed using SPSS (V.20) software to indicate the distribution of the data, to summarize the general nature of the data and for comparison of the values of the variables included in the study. Apart from this, computed t-test was used to check statistical significance difference between the mean scores of the two independent groups of respondents (teachers and students). The existing response differences at df= 186 and at α= 0.05 levels of significances were tested at critical table value (1.96). This level of probability is chosen in accordance with the norm in educational researches. Accordingly, the calculated means were interpreted as: 1) 1-1.49= Strongly Disagree (Very low)(very poor)(very slightly) , 2) 1.50-2.49 =Disagree (Low)(poor)(slightly) , 3)

2.50-3.49 =Undecided/ Medium/ Fairly agree/satisfactory, 4) 3.50-4.49 =Agree /High/good and 5) > 4.5 = Strongly agree/Very high/very good/very extremely (Bluma, 2012).

Finally, the data collected through interview, and document analysis was presented and analyzed by using schematization, centralization and narration. This was used for supplementing the data gathered through close ended questionnaires. The researcher has triangulated and analyzed data from different sources. Based on the data analysis, interpretation was made to reach certain findings. Finally, conclusions and possible recommendations were suggested

4. RESULTS AND DISCUSSIONS

4.1. Characteristics of Respondent

This chapter presents the analysis and interpretation of the data gathered by different instruments, mainly questionnaire and semi-structured interview. It contains five main sections. Section one deal with the background information's of respondents while section two deals with the extent to use ICT which teachers and students for learning-teaching activities and section three deals the extent of availability of ICT facilities in schools. Finally; section four and five respectively deal with the benefits of ICT tools in schools and the major challenges facing the adoption of ICT in preparatory schools

As the researcher mentioned earlier, among various data collecting instruments; questionnaire and semi-structured interview were used to collect necessary or relevant information for this study. Thus, a total of 61 questionnaires containing 29 questions and 127 questionnaires containing 29 items were distributed to preparatory school teachers and students respectively. All questionnaires were properly returned from teachers and students. Among 4 principals and 4 supervisors expected to be interviewed in the study area, the investigator interviewed all principals and supervisors. Thus 100% of principals and supervisors are properly participated and gave necessary information on the issue under investigation. Therefore, the total response rate is sufficient and safe to analyze and interpret the data.

4.2. The extent of availability of ICT tools in preparatory schools

Availability of ICT tools in the preparatory schools can highly affects the implementation of e-learning in the school to improve the quality of education. Having this in mind, teacher and student respondents were asked to indicate the availability of ICT tools in the schools. Their responses were presented in the table below.

Table 3: availability of ICT tools in preparatory schools

No	Items	Respondents	No	Mean	SD	t Value	P Value
1	Computers	Teachers	61	3.64	0.78	-0.25	0.80
		Students	127	3.67	0.75		
2	Printers	Teachers	61	1.13	0.34	-0.05	0.96
		Students	127	1.13	0.34		
3	Internet services	Teachers	61	1.16	0.37	0.86	0.39
		Students	127	1.12	0.32		
4	Laptops	Teachers	61	1.03	0.18	-1.81	0.07
		Students	127	1.15	0.49		
5	Plasma TVs	Teachers	61	3.93	0.36	1.51	0.13
		Students	127	3.81	0.59		
6	Fax machines	Teachers	61	1.10	0.30	-0.25	0.81
		Students	127	1.11	0.31		
7	Projectors	Teachers	61	1.10	0.44	-1.64	0.10
		Students	127	1.25	0.67		
8	Projector screens	Teachers	61	1.12	0.32	0.09	0.93
		Students	127	1.11	0.31		
	Overall scores	**Teachers**		**1.78**	**0.47**		
		Students		**1.80**	**0.48**		

NB: SD=standard deviation, t=t-value at α=0.05 level, critical table value= 1.96 at df=186, N=188, Scales; <1.49 = very poor, 1.5-2.49 = poor, 2.5 – 3.49 = satisfactory, 3.5 – 4.49 = good >4.5 =very good

As it can be seen from table 3 above, the mean score of both teacher and student of respondents differ from item to item. Table 3 above shows that, the mean value of both respondents is greater than 3.5 for item number 1. This indicates that, the availability of computers is good. By supporting this, the data obtained through interview for the above item the access of computers is good. Therefore, it is possible to generalize that, the availability of ICT tools for item number 1 is good.

The response of teachers (mean= 1.13, SD= 0.34) and students (mean=1.13, SD= 0.34) for item number 2 of table 3 shows that, the access of printers are very poor in preparatory schools. The standard deviation of teachers 0.34 and students 0.34 also indicates that, the response of teachers and students is averagely 0.34 units and 0.342 units far from their mean scores respectively. The calculated t-value -0.05 is less than the critical value 1.96 at α=0.05, p=0.96, indicates that, there is no significant difference in the response of both groups.

The teachers and students mean (1.16, SD= 0.37 and 1.12, SD= 0.32) for item number 3 of table 3 shows that, the access of internet service is very poor in preparatory schools. The calculated t-value 0.86 is less than the critical value 1.96 at α=0.05, p=0.39, indicates that, there is no significant difference in the response of both groups of respondents. In opposite that internet, which hosted billions of documents, allow students to have wider source of information for their learning. "Students' hovering over books in the library has given way to reading e-texts on a tablet PC or listening to them on an MP3 player" (Daniels and Pethel, 2005).

The response of teachers (mean=1.03; SD=0.18) and students (mean= 1.15; SD=0.49) for item number 4 of the table 3, indicates that, the access to laptop is very poor or limited in preparatory schools. The calculated t-value -1.81 is less than the critical value 1.96 at α=0.05, p=0.07, indicates that, there is no significant difference in the response of both groups of respondents. This indicates that, the availability of laptop is very poor in Borena zone of preparatory schools. In opposite that Non-governmental initiatives have attempted to integrate ICT into rural and low-income urban schooling (Brewer, et al., 2005) and the much publicized One Laptop per Child initiative (Kraemer, Dedrick, and Sharma, 2009).

Moreover, table 3 above shows that, the mean value of both respondents is greater than 3.5 for item number 5. This indicates that, the availability of plasma TV is good. By supporting this, the data obtained through interview for the above item the access of plasma TV is good. Therefore, it is possible to generalize that, the availability of ICT tools for item number 5 is good.

The mean score of teachers and students (mean= 1.1 and 1.1) for item number 6 of table 3 Shows that, the access of fax machine is very poor in Borena zone of preparatory

schools. The calculated t-value (-0.25) is less than the critical value 1.96 at α=0.05, p=0.81, indicates that, there is no significant difference in the response of both groups of respondents.

With regard to item number 7 of table 3 above, the two groups of respondents rated in the same manner. That means score of teachers and students (1.1, 1.25) Shows that, the access of projectors is very poor in Borena zone of preparatory schools. The calculated t-value (-1.64) is less than the critical value 1.96 at α=0.05, p= 0.1 indicates that, there is no significant difference in the response of both groups of respondents.

The mean score of teachers and students (1.12 and 1.11) for item number 8 of table 3 Shows that, the access of projector screen is very poor in Borena zone of preparatory schools. The calculated t-value (0.09) is less than the critical value 1.96 at α=0.05, p= 0.93 indicates that, there is no significant difference in the response of both groups of respondents.

The overall standard deviation of teachers and students is 0.39 and 0.47 respectively. This indicates that, the response of teachers is averagely 0.39 units far from their overall means 1.78 and students' response is 0.0.47 units far from their overall mean scores 1.79. This in turn indicates that, for items prepared to determine the availability of ICT tools students selected slightly diverse responses than teachers among the five likert scales responses.

By supporting this, data obtained through interview held with principals and supervisors also shows that;

> *We always make effort to fulfil all materials that facilitate the utilization of the ICT program. For example some materials like dividers, remote controls and other cheaper materials can be easily fulfilled by buying it from schools budget. But the issue of generators, projectors, laptops, and printers are difficult to fulfil by using the schools budget because it needs huge amount of money. So, in such situations we inform it to the concerning body and they try to fulfil it.*

Therefore, it is safe to generalize that the availability of ICT tools in the study area is poor. But the availability of ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education as Plomp, Anderson, Law, and Quale, (2009). The utilization of ICT tool in to teaching in schools depends mainly on the availability of ICT resources.

4.3. The extent of teachers and students use of ICTs during the Teaching-learning process.

Table 4: Responses extent of ICT utilization

No	Items/ Indicators	Respondents	No	Mean	SD	T Value	P Value
1	Creating a document using word processor	Teachers	61	2.41	0.56	1.92	0.06
		Students	127	2.26	0.48		
2	manipulating graphs or images using graphs software	Teachers	61	1.44	0.62	0.78	0.43
		Students	127	1.36	0.69		
3	using the Internet to obtain educational resources	Teachers	61	1.46	0.65	0.44	0.66
		Students	127	1.42	0.60		
4	Printing a documents by using printer	Teachers	61	1.98	0.72	13.3	0.00
		Students	127	1.06	0.23		
5	using television for visual and educational purposes	Teachers	61	3.16	0.8	0.50	0.62
		Students	127	3.12	0.47		
6	Downloading educational materials or software from the Web	Teachers	61	1.79	0.52	-1.46	0.16
		Students	127	1.91	0.61		
7	using computer for writing/typing	Teachers	61	1.79	0.76	7.28	0.00
		Students	127	1.18	0.39		
	Overall scores	**Teachers**		**2.01**	**0.66**		
		Students		**1.76**	**0.49**		

NB: SD=standard deviation, t=t-value at α=0.05 level, critical table value= 1.96 at df=186, N=188, Scales; $\leq$ 0.49 =Very low, 0.5 – 1.49=Low, 1.5 – 2.49 =Medium, 2.5 – 3.49 =High, $\geq$ 3.5 = Very high

In item 1 of table 4 above, respondents were requested to rate the extents to which teachers and students create a documents using word processor. Accordingly, teachers (mean=2.41, SD= 0.56) and students (mean=2.26, SD= 0.48) rated that, teachers and students created a documents using word processor was medium. Additionally, the calculated t-value 0.91 is less than the critical value 1.96 at α=0.05, p=0.057, indicates

that, there is no significant difference in the response of teachers and students at 0.05 level.

As item 2 in table 4 indicates, teachers rated as they manipulate graphs or images using graphs software was low with (mean=1.44, SD= 0.62) . Their SD=0.62 also shows that, the response of teachers' is 0.62 units far from their mean score 1.44. Similarly, students response (mean=1.36, SD= 0.67) for the same item shows that, teachers and students manipulated graphs or images using graphs software was low. The calculated t-value 0.78 is less than the critical value 1.96 at α=0.05, p=0.5 indicates there is no statistically significant difference between the response of students and teachers regarding item 2. The implication, thus, is that, teachers and students were manipulated graphs or images using graphs software was low.

With regard to item number 3 of table 4 above, the two groups of respondents rated in the same manner. That means, teachers response with (mean=1.46; SD=0.65) and students response with (mean=1.42; SD= 0.6) rated that, teachers and students used internet to obtain educational resources was low. The calculated t-value 0.44 is less than the critical value 1.96 at α=0.05, p=0.66 indicates that, there is no significant difference among respondents response at 0.05 level. In opposite that internet, which hosted billions of documents, allows students to have wider source of information for their learning. "Students' hovering over books in the library has given way to reading e-texts on a tablet PC or listening to them on an MP3 player" (Daniels and Pethel, 2005)

For item number 4 and 7 in table 4 teachers (mean = 1.99, SD=072) and (mean 1.79, SD= 0.76) respectively and students (mean= 1.06, SD= 23) and (mean= 1.18, SD= 39) respectively. This indicates that, the extent of teachers and students used printer for printing of documents and the extent of teachers and students used computer for writing/typing respectively are teachers moderately (medium) used and students rated low used both item. The calculated t-value 13.3, and 7.3 are greater than the critical value 1.96 at α=0.05, p<0.5 for two of them indicates that statistically significant mean difference in the response of both group of respondents.

Therefore, it was crosschecked by interview response from preparatory school principals and supervisors. One sample preparatory school principal revealed: Teachers

rated medium used printer for printing documents and used computer for writing. However, students rated low used printer for printing documents and used computer for writing. Additionally, during document analysis, the researcher not saw any printed documents except exam paper and grade report of students in the schools of study area.

From the finding obtained, one can concluded that, the extent of teachers and students used printer for printing of documents and the extent of teachers and students used computer for writing/typing respectively are teachers moderately (medium) used and students rated low used both item.

As can be seen from table 4, item 5, respondents were requested to rate the extents to which classroom teachers teach by themselves without opening PTV during classroom instruction. Accordingly, teachers (mean=3.16, SD= 0.8) and students (mean=3.12, SD= 0.47) indicates that, classroom teachers highly teach students without opening PTV. The standard deviation of teachers 0.8 also indicates that, their response is averagely 0.8 units far from their mean score 3.16. The standard deviation of students 0.47 also shows that, students' response is 0.47 units averagely far from their mean value 3.12. Thus teachers response is slightly diverse than students for this item. The calculated t-value 0.5 is less than the critical value 1.96 at α=0.05, p=0.62, indicates that, there is no significant difference in the response of teachers and students at 0.05 level.

By supporting this, data obtained through interview held with principals and supervisors also shows that; teacher's level of utilizing PTV during classroom instruction is low. Therefore, it is possible to infer that, teachers of Borena zone preparatory schools are low utilizing PTV for instructional purpose. In opposite with this, according to Afshari, Baker, Luan, Samah and Fooi (2009) the utilization of PTV in education creates a powerful learning environment and it transforms the learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way because technology can change/alter how people access, gather, analyze, present, transmit, and simulate information.

As the result of teachers response (mean=1.79; SD=0.52) and students response (mean=1.91; SD=0.61) in item 6 of table 4 above indicates, teachers and students medium download educational materials or software from the web. The calculated t-value 0.-1.46 is less than the critical value 1.96 at α=0.05, p= 0.16, indicates that there is

no significant difference in the response of both teachers and students at 0.05 level. In sum, the overall mean score of teachers 2.01 and students 1.76 for the above items indicates that, teachers and students were medium used ICT tools.

The overall standard deviation of both teachers and students is 0.66 and 0.49 respectively. This indicates that, the response of teachers is averagely 0.66 units far from their overall mean 2.01 and students' response is 0.49 units far from their overall mean scores 1.76. This in turn indicates that, teachers' response is slightly more diverse than that of students.

By supporting this, data obtained through interview held with principals and supervisors also shows that;

> *Majority of teachers used computers and printers for grading the result of students and for office work but most of them never used computers during teaching-learning process in the class rooms and most of students' low used computers for different educational activities. Also majority of the teachers and students not effectively used ICT for different activities such as manipulating graphs or images using graphs software, using the Internet to obtain educational resources, downloading educational materials or software from the Web.*

Additionally, *during* document analysis, the researcher not has seen educational material documents that download from internet in all schools of study area. Therefore it is possible to analyze that; ICT utilization is medium in preparatory schools of study area.

4.4. Benefits of the Usage of ICT for Teachers and Students

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

Table 5: Benefits of the usage of ICT in preparatory school

No	Items/ Indicators	Respondents	No	Mean	SD	T Value	P Value
1	ICT helps in making teaching-learning more interesting	Teachers	61	4.57	0.72	-0.01	0.99
		Students	127	4.58	0.67		
2	ICT enhance quality of teaching and learning	Teachers	61	4.38	0.80	-1.77	0.08
		Students	127	4.58	0.67		
3	ICT helps to reach out to colleagues in other part of the country.	Teachers	61	4.46	0.74	-0.24	0.81
		Students	127	4.49	0.82		
4	ICT positively changes the learning climate classroom	Teachers	61	4.15	1.06	-0.2	0.05
		Students	127	4.44	0.88		
5	ICT improves the presentation of material in the classroom	Teachers	61	4.44	0.83	0.89	0.37
		Students	127	4.32	0.96		
6	ICT makes teaching-learning process easy	Teachers	61	3.95	1.12	-0.57	0.57
		Students	127	4.05	1.05		
7	ICT increases motivation to learn and teach	Teachers	61	3.85	1.09	-1.68	0.10
		Students	127	4.13	1.02		
	Overall scores	**Teachers**		**4.30**	**0.90**		
		Students		**4.43**	**0.87**		

NB: SD=standard deviation, t=t-value at α=0.05 level, critical table value= 1.96 at df=186, N=188, Scales**;** <1.49= strongly disagree, 1.5-2.49 = Disagree, 2.5 – 2.49 =undecided, 3.5 – 4.49= Agree, >4.5 = Strongly agree

In item 1 of table 5 above, respondents were requested to the benefit of ICT in making-teaching-learning more interesting. Accordingly, teachers (mean=4.57, SD= 0.720 and students (mean=4.58, SD= 0.67) indicates that, teachers and students strongly agree that ICT making teaching-learning more interesting. The standard deviation of teachers 0.72 also indicates that, their response is averagely 0.72 units far from their mean score 4.57. The standard deviation of students 0.67 also shows that, students' response is 0.67 units averagely far from their mean value 4.58. Thus teachers response is slightly diverse than students for this item. The calculated t-value -0.01 is less than the critical value 1.96 at α=0.05, p=0.99, indicates that, there is no significant difference in the response of teachers and students at 0.05 level.

Similarly, the data obtained from most principals and supervisors through interview supports this *finding*. Therefore, it is possible to infer that, ICT helps teachers and students of Borena zone of preparatory schools in making teaching-learning more

interesting. In line with this Wiken, et al (2005) emphasized that technology improves motivation, engagement and interest when students use multimedia and using audio and video technologies brings content to life and stimulates learning.

As can be seen from table 5, item 2, ICT enhances quality of teaching-learning. That means, teachers response with (mean=4.38; SD=0.8) and students response with (mean=4.58; SD=0.67). Their SD also shows that, the response of teachers' is 0.8 units far from their mean score 4.38 and students response is averagely 0.67 units far from their mean 4.58. Thus, the SD of both groups indicates that, teachers response is slightly diverse than students for this item. The calculated t-value -1.77 is less than the critical value 1.96 at α=0.05, p=0.08, indicates there is no statistically significant difference between the response of students and teachers regarding item 2. The implication, thus, is that, teachers and students are strongly agreed that ICT enhance quality of teaching-learning. Hepp, Hinostroza, Laval and Rehbein (2004) state that the literature contains many unsubstantiated claims about the revolutionary potential of ICTs improve the quality of teaching-leanings.

With regard to item number 3 of table 5, the two groups of respondents rated in the same manner. That means, teachers response with (mean=4.5; SD=0.74) and students response with (mean=4.5; SD=0.82) indicates that, teachers and students strongly agree ICT helps to reach out colleagues in other part of the country. The calculated t-value -0.24 is less than the critical value 1.96 at α=0.05, p=0.81, indicates that, there is no significant difference among respondents response at 0.05 level.

The mean score of teachers for item number 4 in table 5 is (4.2) and mean score of students (4.44). This indicates that, teachers and students agree that ICT positively changes the learning-teaching climate in the classroom. The calculated t-value -0.2 is less than the critical value 1.96 at α=0.05, p>0.05, for the item indicates that there is no significant difference in the response of both group of respondents.

The mean score of teachers for item number 5 in table 5 is (4.4) and mean score of students (4.32). This indicates that, teachers and students agree that ICT improves the presentation of material in the classroom. The calculated t-value 0.89 is than the critical value 1.96 at α=0.05, p>0.05, for the items indicates that there is no significant difference in the response of both group of respondents

With regard to item number 6 of table 5, the two groups of respondents rated in the same manner. That means, teachers response with (mean=3.95) and students response with (mean=4.05) indicates that, teachers and students agree that ICT makes teaching-learning process very easy and it increase motivation to learn and teach respectively. The calculated t-value -0.57 is less than the critical value 1.96 at α=0.05, p>0.05, for the item indicates that there is no significant difference in the response of both group of respondents.

In item 7 of table 5 above, respondents were requested to the benefit of ICT increase motivation to learn and teach. Accordingly, teachers (mean=3.9) and students (mean=4.13) indicates that, teachers and students agree that ICT increase motivation to learn and teach. The calculated t-value -1.68 is less than the critical value 1.96 at α=0.05, p>0.05, for the items indicates that there is no significant difference in the response of both group of respondents.

By supporting this, data obtained through interview from principals and supervisors revealed that;

> *The usage of ICT is important for different educational activities such as positively changing the learning-teaching climate in the classroom, improving the presentation of material in the classroom, making teaching-learning process very easy and increasing motivation to learn. But lack of different training on how to use ICT tools, lack internet connection and electric power supply, lack of fund, inadequate ICT facilities and lack of attention towards the needs of ICT by woreda administrators are the main challenges to get the benefits from the usage of ICTs.*

4.5. The major Challenges in Utilization of ICT in Preparatory Schools

Table 7: Responses on the major challenges in utilization of ICT in preparatory schools

No	Items/ Indicators	Respondents	No	Mean	SD	T Value	P Value
1.	No internet access	Teachers	61	3.82	1.06	-1.39	0.168
		Students	127	4.05	1.05		
2	No short term training on ICT	Teachers	61	3.82	0.96	0.22	0.82
		Students	127	3.79	0.96		
3.	Inadequate facilities to support full application of ICT in the school	Teachers	61	4.26	0.93	1.56	0.12
		Students	127	4.01	1.10		
4.	Reluctance of teachers to use of ICT in teaching-learning process in school	Teachers	61	3.62	1.08	0.20	0.84
		Students	127	3.59	1.04		
5.	Lack of fund	Teachers	61	3.93	1.05	1.44	0.15
		Students	127	3.68	1.19		
6.	Irregular electric power supply.	Teachers	61	4.39	0.90	0.37	0.71
		Students	127	4.34	0.96		
	Overall scores	**Teachers**		**3.97**	**1.00**		
		Students		**3.91**	**1.05**		

NB: SD=standard deviation, t=t-value at α=0.05 level, critical table value= 1.96 at df=186, N=188, Scales; <1.49 – very slightly, 1.5-2.49- slightly 2.5-3.49 – moderately, 3.5-4.49 – highly; >4.5 – very extremely

As can be seen from table 6, the mean score of teachers for item number 1 is (3.82) and mean score of students is (4.05) shows that, no internet access highly affecting ICT utilization in the study area. The calculated t-value -1.39 is less than the critical value 1.96 at α=0.05, p>0.05, indicates that there is no significant difference in the response of both group of respondents.

The mean score of teachers for item number 2 in table 6 is (3.81) and mean score of students (3.79). This indicates that no short training given for teachers is highly affecting ICT utilization in the study area. The calculated t-value 0.22 is less than the critical value 1.96 at α=0.05, p>0.05, indicates that there is no significant difference in the response of both group of respondents.

By supporting this, data obtained through interview from principals and supervisors revealed that;

> *Before 4 years there was timely work shop for teachers but now days it is possible to say there is no training (workshop) for teachers regarding ICT. In rare case workshop is given for only the ICT technician. I think the training given during the work shop is theoretical. As a result the ICT technicians are unable to solve the problems of maintenance service from its grass root. So, some of the PTVs and computers are not functioning well because of lack of maintenance service. As a result of this, we sometimes shift students from one section to the other to provide them fair opportunity for all sections so that they get plasma television lessons.*

From document analysis in sample schools, the researcher not saw any training manual in the schools of study area. Thus, it is possible to analyze that, the issue of training is forgotten by the government and it is highly affecting ICT utilization in the study area.

Towards this, Andoh (2012) stated that, to maximize the benefit of integrating ICT in education schools that utilize ICT need to be provided with the necessary support services such as, supervision (inspection), training, experience share, teachers and students guide, CDs, DVDs and the like from broadcasters and/or associate organizations (regional, zonal or woreda bodies). In similar manner, Shanfu (2013)

On the other hand, teachers response (mean= 4.3) and students response (mean= 4.01) regarding item number 3 of table 6 shows that, inadequate facilities to support full application of ICT highly affecting ICT utilization in the study area. The calculated t-value 1.56, p=0.12 is less than the critical value 1.96 at α=0.05. This indicates that, there is no significant difference in the response of students and teachers for both.

As can be seen from table 6 the mean score of teachers for item number 4 are (3.62) and mean score of students (4.05) shows that reluctance of teachers to use ICT in teaching-learning process highly affecting ICT utilization in the study area. The calculated t-value 0.2 is less than the critical value 1.96 at α=0.05, p>0.05, indicates that there is no significant difference in the response of both group of respondents.

With regard to item number 5 of table 6 teachers response with (mean=3.93) and students response with (mean=3.68) indicates that, lack of fund highly affecting ICT utilization in the study area. The calculated t-value 1.44 is less than the critical value 1.96 at α=0.05, p>0.05, indicates that there is no significant difference in the response of both group of respondents.

On the other hand, teachers response (mean= 4.4) and students response (mean=4.34) regarding item number 6 of table 6 shows that, shortage of electric power is highly affecting ICT utilization in the study area. The calculated t-value 0.37, p=0.71 is less than the critical value 1.96 at α=0.05. This indicates that, there is no significant difference in the response of students and teachers for both items.

In similar manner, principals (P) and supervisors(S) during interview argued that;

> *The issue of shortage of electric power is not the problem of only our school [P1]. Power breaks the most serious problem to use ICT [P2]. We have generators to reduce problems occurring as a result of electric shortage [D3]. Our generator is not on standby mood, until we put on (light) generators, some lessons are commonly interrupted [S1]. Shortage of financial power to buy kerosene is the problem of our school to use generator [S2].*

So, from this discussion, one can recognize that, shortage of electric power is highly affecting ICT instruction.

In general, from the above discussion, one can generalize that, the lack of training (workshops) for teachers, inadequate facilities to support full application of ICT, lack of internet access, lack of short training for teachers, reluctance of teachers to use ICT in teaching-learning process and lack of fund and shortage of electric power are highly affecting ICTutilization in Borena zone preparatory schools.

In line with this Kwacha (2007) also noted that the most common problems associated with the effective implementation of ICT are lack of qualified ICT personnel, cost of equipment, management attitudes, shortage of electric power supply, inadequate telephone lines,

particularly in rural areas and non-inclusion of ICT programmers in teacher's training curricula and at the basic levels of education.

5. SUMMARY, CONCLUSION AND RECOMMENDATION

This part deals with the summary of findings of the study, the conclusions reached at and the recommendations forwarded on the basis of findings.

5.1. Summary of the Findings

The main purpose of this study was to investigate the utilization of information communication technology in government preparatory schools of Borena zone. To address this purpose, the following basic research questions were raised:

1. To what extent are the information communication technology facilities available in preparatory schools of Borena zone?
2. To what extent do teachers and students in preparatory school of Borena zone used information communication technology facilities for the teaching-learning activities?
3. What are the perceived benefits of information communication technology utilization in preparatory schools of Borena zone
4. What are the major factors affecting the adoption of information communication technology in preparatory schools of Borena zone?

To answer these basic questions, the study was conducted in 4 preparatory schools of Borena zone which were selected through simple random sampling technique. A total of 61 teachers, 127 leaders of one to five (1 to 5) students, 4 principals and 4 supervisors were included by using available sampling techniques. Data were obtained from the sample respondents through questionnaire and interview. In doing this, 61 questionnaires were distributed to teachers and 127 questionnaires were distributed to students. All questionnaires from teachers and students were properly returned to the researcher.

In addition, structured interview was conducted with 4 principals and 4 supervisors to enrich data obtained through questionnaire and to gain some additional information's that cannot be obtained through questionnaire. The data collected from teachers and students through closed ended questionnaire was analyzed and interpreted by using different statistical tools like mean, standard deviation and independent sample t-test. The analysis of the quantitative data is performed with the help of SPSS version 20 computer program. The data gathered through structured interview and document was analyzed qualitatively using narration. After analyzing the result of data, the following major findings were identified;

I. Regarding the availability of ICT tools

Majority of the teachers and students responded that, the availability of computers and plasma TVs are good. But the printers, internet connection and laptops are very poor in preparatory schools of study area. Access to fax, projectors and projector screens are also very poor.

II. Regarding the extent of teachers and students to use ICTs during the Teaching-learning:

Based on the quantitative and qualitative data obtained, majority of the teachers and students responded that, the extent of ICT utilization such as manipulating graphs or images using graphs software, using the Internet to obtain educational resources, downloading educational materials or software from the Web were low in preparatory schools of study area.

Majority of the respondents revealed that: Many teachers used computers and printers for grading the result of students and for office work but most of them never used computers during teaching learning process in the class rooms. Regarding students most of students low used computers and printers for different educational activities.

The large number of respondents revealed that classroom teachers highly teach by themselves without opening PTV during classroom instruction.

III. Regarding the benefits of the usage of ICT tools

Both teachers and students agreed that the usage of ICT has benefits for different educational activities such as making teaching-learning more interesting, enhance quality of teaching-learning, to reach out to colleagues in other part of the country, positively changes the learning climate classroom and improves the presentation of material in the classroom. Majority of the respondents also revealed that ICT makes teaching-learning process easy and increases motivation to learn and teach in classroom.

IV. Regarding the major challenges affect the adoption of ICT in preparatory schools

The great number of respondents indicated their agreement that, reluctance of teachers to use ICT in teaching-learning process , no short trainings, Inadequate facilities to support full application of ICT in the school and no internet access were among the major challenges in utilization of ICT in preparatory schools. Again the findings of the study revealed that challenges such lack of fund and Irregular electric power supply were among the major challenges affect the adoption of ICT in schools of study area.

Finally, from interview majority of the respondents confirmed that no strong attempts were made by school leaders and woreda officials to solve challenges against adoption of ICT mentioned above.

5.2. Conclusions

Based on the summary of the findings the following conclusions were drawn;

- It is obvious that, Information and Communication Technologies (ICT) can be an extremely powerful enabler in efforts to increase teachers and student performance. However, the finding reveals that both teachers and students want to use ICT tools more but except computers and plasma TVs, the available of other ICT tools are very poor in the preparatory school of study area. Therefore, it can be concluded that the poor availability of ICT tools hampered the utilization of ICT in the teaching-learning process.

- Regarding the extent of teachers and students to use ICTs during the Teaching-learning, ICT is one of the contemporary factors to transform the nature of teaching-learning, where and how learning takes place and the roles of students and teachers in the learning process. Even though we are living in highly technological era, the finding on the extent of teachers and students to use ICTs during the teaching-learning shows that the teachers and students were low used some ICT tools in their instruction during practice of teaching-learning. Therefore, it can be concluded that the utilization of ICT tools in the target schools was low and it was not able to meet teachers and students need to improve their performance in learning teaching.

- With regard to the benefits of the usage of ICT for teachers and students it concluded that, ICT play vital role for making teaching-learning more interesting, enhance quality of teaching and learning, to reach out to colleagues in other part of the country, positively changes the learning climate classroom and improves the presentation of material in the classroom.

- It was found out that many factors are negatively affecting the utilization of ICT in the study area. Among them lack of relevant short trainings, Inadequate facilities to support full application of ICT in the school and lack of internet access were among the major challenges highly affect the adoption of ICT in the study area. In addition to this, it is also possible to conclude that, lack of fund and Irregular electric power supply are highly affecting the adoption of ICT in the study area. Due to these factors, teachers were unable to discharge their responsibilities as it should be. Moreover students could not get necessary support from teachers that could help them to improve their academic achievement due to these factors. Since there was no well-built attempt being made to improve the existing problems, the challenges are still prevalent and will prevent adoption of ICT in the study area unless relevant measures are taken.

5.3. Recommendations

On the basis of the findings obtained and the conclusions drawn, the following recommendations are forwarded: to improve the utilization of information communication technology for the sake of quality of teaching-learning process in preparatory schools of study area.

- Providing ICT tools for the schools are very important in utilizing ICT in to teaching learning processes in Borena preparatory schools. Therefore woreda education office in collaboration with Zonal Educational Offices, and Regional Education Bureau should be provides the necessary ICT tools and technical supports by participate the community, non-governmental organizations (NGO's) and parents of students.

- Information communication technology utilization should be organized and implemented as a means to meet the individual needs of the teacher and student for the sake of instructional improvement. To this end, it is advised that ongoing professional development need to be provided for teachers to model the new pedagogies and tools for learning with the aim of enhancing the teaching-learning process. Therefore, Woreda Education Offices in collaboration with Zonal Educational Offices, and Regional Education Bureau should provide short training programs and facilitate experience sharing for the effectiveness of ICT utilization at the school level.

- It is found out that, classroom teachers teach by themselves without opening PTV during classroom instruction. Therefore, it is advisable that and woreda educational office in collaboration with zonal ICT centre need to follow up the progress of school principals' extent (status) of providing their technical support for them. In doing so, the technical supporting need to focus on the importance of utilizing instructional television (ITV) for instructional purpose, mechanisms of providing awareness to both teachers and students and mechanisms of fulfilling the require materials for plasma television program instruction(PTVPI).

- School principals in collaboration with school officials should encourage teachers to use all ranges of active learning methods and have to motivate teachers to utilize appropriate ICT materials.

- Finally, it is recommended for the Woreda Education Officials and the preparatory school principals of Borena zone that, they have to allocate adequate budget for the effective implementation of ICT tools in the study area.

6. REFERENCES

Adams, J., Khan, H.T., Raeside, R and White, D. 2007. *Research methods for graduate business and social science students.* New Delhi: Sage Publications Inc

Adeya, N.C. 2002. *ICTs and Poverty:* A Literature Review UNESCO.

Afshari, M., Baker, A. K., Luan, S.W., Samah, A. B., Fooi, S.F. 2009. Factors affecting teachers' use of information and communication technology: International journal of instruction, 2(1). *Retrieved December 12, 2013, from files.eric.ed.gov/full text/ED524156.pdf* .

Ajayi. 2008. Towards effective use of information communication technology for teaching in Nigeria colleges of education. *Asian J. Inf. Technol. 7(5):210-214.*

Al-Ansari, H. 2006. Internet use by the faculty members of Kuwait University. *The Electronic Library* Vol.24, No. (6), Pp; 791-803.

Alemna, A.A., and Sam, J. 2006. Critical issues in information and communication technologies for rural development in Ghana. *Information Development 22(4): 236–239*.

Al-Oteawi, S. M. 2002. The perception of administrators and teachers in utilizing information technology in instruction, administrative work, technology planning and staff development in Saudi Arabia.

Amy A.L., Baylor L., and Ritchie D.D. 2002. What factors facilitate teacher skill, teacher morale and perceived student learning in technology-using classrooms? *Electronic Journal of Computing*.

Anderson, J. and Glen. A . 2003. Building Capacity of Teachers/ Facilitators in Technology-Pedagogy Integration for Improved Teaching and Learning.

Anderson. 2007. "What is Web 2.0? Ideas, technologies and implications for education". *JISC Technology and Standards Watch*.

Anderson, R. E. and Dexter, S.2005. School technology leadership*: An* empirical investigation of prevalence and effect. *Educational Administration Quarterly, vol. 41, no. 1, pp. 49-82.*

Azuh, O.J. 2013. *Challenges of Information and Communication Technology Implementation among Federal Universities in Nigeria: An undergraduate research project, Dept. of Agric.* Education, MOUAU, Abia State.

Babajide VFT.and Bolaji OA. 2003. Perception of lectures and service teachers toward the use of communication media in teaching pure and *applied science related discipline 44th annual STAN conference proceeding pp. 33-36*

Bandura, A. 1997. *Self-efficacy:The exercise of control.* New York: Freeman.

Barret, A M. 2009. *The Education Millennium Development Goals Beyond 2015, Prospects for Quality and Learners*, Edqual Working Paper No. 13, University of Bristol.

Becta. 2004. A review of the research literature on barriers to the uptake of ICT by teachers. *RetrieveJune10,2015,http://partners.becta.org.uk/page_documents/research/barriers.pdf*

Beck, Robert H. 2009. *The Three R's Plus: What Today's Schools are Trying to Do and Why*. U of Minnesota Press. pp. 3–6. ISBN 978-0-8166-6017-9.

Berhanu Abera. 2012. *The Effectiveness of the Practice of the Plasma-channeled ELT in Addis Ababa Preparatory Schools*. (Unpublished Dissertation Report).

Bhattacharya, I. and Sharma, K. 2007. 'India in the knowledge economy an electronic Paradigm'. *International Journal of Educational Manage*ment Vol. 21 No. 6, Pp. 543- 568.

Boster, R.A., Palmer, J.D. and Daugherty, M.K. 2002. 'Students' attitudes toward technology in selected education programs*: Journal of Technology Education, vol. 1, no. 10, pp. 4-18.*

Bottino, R. M. 2003. 'ICT, national policies, and impact on schools and teachers' development' 'CRPIT'03: Proceedings of the 3.1 and 3.3 working groups‟ conference on *International federation for information processing', Australian Computer Society*, Inc., Darlinghurst, Australia, Australia, 3-6.

Brook L. 2005. Plasma television Teachers. where a different reality takes over African Education in Critical educational visions and practices *in Neo-liberal times*; *L dahlstrom* and Mannberg Umea (eds.) *Global south network publishers,University*, Umea, Sweden pp. 71-88

Bryers AP. 2004. Psychological evaluation by means of an on-line computer. *Behaviour Research Method and Instruction 13: 585-587*

Cawthera, A. 2001. *Computers in secondary schools in developing countries: Costs and other issues*, DFID, London.

Chandra, S. and Patkar, V. 2007. 'ICTS: A catalyst for enriching the learning process and library services in India. *The International Information and Library Review Vol. 39, No. (1), Pp; 1-11.*

Cholin, V. S. 2005. 'Study of the application of information technology for effective access to resources in Indian university libraries'. *The International Information and Library Review* Vol.37, No. (3), 189-197.

Cohen, L. and Manion L. 1994. Research Methods in Education (4th ed.).London and New York: Rutledge.

Compeau, D.R.,and Higgins, C.A. 1995. Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, vol.23, no.2, pp. 145-158

Cox, M.J.1997. *The effects of information technology on students motivation, London, UK: King's College, London*. Final Report.

Creswell, J, W 2009. *Research design, qualitative, quantitative, and mixed method approaches.* New Delhi. Sage Publication INC.

Cross, M. and Adam, F. 2007. 'ICT Policies and Strategies in Higher Education in South Africa: *National and Institutional Pathways', Higher Education Policy* Vol. 20, No. (1), Pp; 73-95.

Dale, E. 1969. *The cone of experience:* Retrieved from January 12, 2014 from www2.education.ualberta.ca/.../dalescone.html

Daniels J.S. 2002. "Foreword" in Information and Communication Technology in Education–*A Curriculum for Schools and Program for Teacher Development.* Paris: UNESCO.

Davis, N.E., and Tearle, P. (Eds.). 1999. A core curriculum for telematics in teacher trainingAvailable:*www.ex.ac.uk/telematics.T3/corecurr/tteach98.htm*

Dias, L.B., and Atkinson, S. 2001. Technology Integration: Best Practices Where Do Teachers Stand? *International Electronic Journal for Leadership in Learning, 5(10).*

Dockstader, J. 1999. Teachers of the 21scentury Know the What, Why, and How of Technology Integration. *T.H.E. Journal*, 73-74.

Drent, M., and Meelissen, M. 2007. Which Factors Obstruct or Stimulate Teacher Educators to Use ICT Innovatively? *Journal of Computers and Education*, (ARTICLE IN PRESS)

Duncan. G and Sonail. R. 2012. *Assessment of environmental, institutional and individual leadership capacity needs for the knowledge society in Ethiopia*. African leadership in ICT.

Earle, R. 2002. The integration of instructional technology into public education: promises and challenges. *ET Magazine, 42*(1) 5-13. http://www.bookstoread.com/etp/earle.pdf.

Edyburn, D. 1998. A map of technology integration process. In Closing the Gap: *Computer Technology in Special Education and Rehabilitation*. February/March.

Farrell, G., and Isaacs, S. (Eds.). 2007. *Survey of ICT and Education in Africa: A Summary Report, Based on 53 Country Surveys.* InfoDev/World Bank, Washington, D.C.

FDRE. 2009. Higher Education Proclamation, Federal Negarit Gazeta, Addis Ababa, Birhanina Selam Printing Press.

Fellengi, I. P. 2003. Survey methods and practices. *Retrieved December 30, 2013, from www.statcan.gc.ca.*

Flanagan, L. and Jacobsen, M. 2003. Technology Leadership for the Twenty first Century Principal. *Journal of Educational Administration*, 41(2), 124-142.

Fullan, M. 2003. *Change Forces: Probing the Depths of Educational Reform. London*. The Falmer Press

Getahun, A. 2006, *ICT is Ethiopia"s Number One Priority*, Developing Telecoms.com.

Grabe, M. 2001. *Integrating Technology for Meaningful Learning.* Houghton Muffin Company. USA.

Grace, J. and Kenny, C. 2003. „A short review of information and communication technologies and basic education in LDCs – what is useful, what is sustainable?“, *International Journal of Educational Development*, vol. 23, no. 6, pp. 627 – 636.

Gurumurthy K. 2009. *Computer Learning Programs in Schools: Moving from BOOT Models to an Integrated Approach, Perspective Paper on ICTs in Education,* IT for Change, www.itforchange.net

Herselman and Hay. 2003. *Challenges Posed by Information and Communication Technologies* (ICT) for South African Higher Education Institutions.

Hepp, K. P., Hinostroza, S.E., Laval, M.E., Rehbein, L. F. 2004. "Technology in Schools: *Education, ICT and the Knowledge Society" OECD*.

Hew, K. F.,and Brush, T. 2007. Integrating technology into K-12 teaching and learning: current knowledge gaps and recommendations for future research: *Educational Technology Research and Development,* vol. 55, pp. 223-253.

Jemal Haji. 2013. *Practices and challenges of school improvement program in secondary schools of Assossa zone.* Unpublished MA thesis: Jimma University.

J., Law, N. 2003. *"ICT in Education around the World: Trends, Problems and Prospects "UNESCO*-International Institute for Educational Planning

Jonassen, D. and Reeves, T. 1996. *Learning with technology: Using computers as cognitive*
tools. In D. Jonassen (Ed.), *Handbook of Research Educational on Educational Communications and Technology* (pp 693-719). New York: Macmillan.

Jones, J.F. 2004. CALL, and the responsibilities of teachers and administrators. *ELT Journal*, 55,360-367

Katz, R. N and Rudy J. A (eds.). *1999. Information technology in higher education: Assessing its impact and planning for the future.* San Francisco, CA: 102 Jossey Bass Publishers.

Kessy, D., Kaembe, M. and Gachoka, M., 2006. The Reasons for under use of ICT in education: in the context of Kenya, Tanzania and Zambia, In. *IEEE Fourth International Workshop on Technology for Education in Developing Countries,* 10-12 July 2006, Iringa, Tanzania IEEE, p83 - 87.

K. Robins and K. Webster. 1999. *Times of Techno cultur:* New York and London, Routledge.

Kozma, R.B. 2005. National policies that connect ICT-based education reform to economic and social development. *An interdisciplinary journal of humans in ICT environment 1(2) 117-156*

Kozma, R. 2005. 'National Policies That Connect ICT-Based Education Reform To Economic and Social Development', *Human Technology* Vol.1, No. (2), Pp; 117-156.

Kraemer, K. L., Dedrick, J. and Sharma, P., 2009. One laptop per child: vision vs. reality: *Communications of the ACM,* 52 (6), 66-73.

Kremer M and A Holla, 2008, *Pricing and Access: Lessons from Randomized Evaluations in Education and Health.*

Kwacha, P.Z. 2007. The Imperative of Information and Communication Technologies for Teacher in Nigeria Higher Education. *Merlot Journal of Online Learning andTeaching,3(4).*

Lai, K.W., and Pratt, K. 2004. Information Communication Technology (ICT) in secondary schools: The role of the computer coordinator. *British Journal of Educational Technology*, vol. 35, no. 4, pp. 461-47

Lim, C. P. and Chai, C.S. 2004. an activity-theoretical approach to research of ICT integration in Singapore schools: Orienting activities and learner autonomy', *Computers and Education* Vol**.** 43, No. (3), Pp; 215--236.

Lemke, C., and Coughlin, E.C. 1998. Technology in American schools. Available: *www.mff.org/pnbs/ME158.pdf.*

Marshall, G. 2002. 'Effects of ICT: Do we know what we should know?': *Education and Information Technologies, vol. 12, no. 2, June, pp. 59-70.*

M. Castell.2001. *The Internet Galaxy: Reflections on the Internet, Business, and Society.* Oxford, Oxford University Press, p. 2.

MCIT. 2010. e-Government Strategy and Implementation Plan – Report, January 2011.

Miressa Neme. 2007. *Administrative and Staff Readiness for Potential Use of ICT in Education,* the Case of College of Education, AAU, School of Graduate Studies, Unpublished.

_. 2002. Education Sector Development Program II (ESDPII), MoE, Addis Ababa

Moersch, C. 2001. Next steps: Using LoTi as a research tool. *Learning and Leading with*

Mooij, T. 2007. 'Design of educational and ICT conditions to integrate differences in learning: Contextual learning theory and a first transformation step in early education', *Computers in Human Behavior* Vol. 23, No. (3), Pp; 1499--1530.

Moore, M. and Kearsley, G. 1996. Distance Education: A Systems View. Belmont, CA: Wadsworth.

Mulat Demeke and Tadesse Biru. 2002. *ICT Penetration and Usage in Ethiopia: Baseline Study by Department Of Economics, Faculty of Business and Economics,* Addis Ababa University.

Neville, C. 2007. *Introduction to research and research methods.* University of Bradford.

OECD. 2001. A case study of ICT-enriched school environment at Cramim School, Rishon Le-Zion, Israel, http://www.oecd.org/dataoecd/37/21/2738488.pdf

Ofodu GO. 2007. Nigeria Literary educators and their technological needs in dijital age. *Educ. Focus 1(1): 22-30*

Pachler, N. 1999. *'Theories of learning and ICT', in Learning to Teach using ICT in Secondary School, London, UK*: Routledge.

Pelgrum, W.J. 2001. Obstacles to the integration of ICT in education: Results from worldwide educational assessment. *Computer and Education, 37, 163-178.*

Peralta, H.,Costa, F.A. 2007. Teachers'competence and confidence regarding the use of ICT.

Phelan, C and Wren, J. 2005. *Exploring reliability in academic assessment.* Graduate Assistants, UNI Office of Academic Assessment. Retrieved December 20, 2013, from www.uni.edu/chfasoa/reliabilityandvalidity.htm

Plomp, T.; Pelgrum, W. J. and Law, N. 2007. 'SITES2006-International comparative survey of Pedagogical practices and ICT in education', *Education and Information Technologies* Vol.12, No. (2), Pp.; 83- 92.

Plomp, T., Anderson, R. E., Law, N.,and Quale, A. (Eds.). 2009. Cross-national information and Communication technology. policies and practice in education*: Charlotte, N.C Information Age Publishing*

Plomp, Tj, ten Brummelhis, A.C.A., and Rapmund, R. 1996. *Teaching and Learning for the Future. Report of the Committee on Multi Media in Teacher Training (COMMITT)*. Den Haag: SDU.

Rahel Bekele. 2010. Learning Styles of Information Systems Students: Input for Content Development in Adaptive e-Learning Systems. *The Ethiopian Journal of Education, vol XXX, number 1*

Romiszowski, A. J. 2004. How‟s the E-learning Baby? Factors Leading to Success or Failure of an Educational Technology Innovation *Educational Technology,* January- Volume 44, Number 1

Rozell, E.J.,and Gardner, W.L. 1999. Computer-related success and failure*: a longitudinal Field Study of the factors influencing computer-related performance Computers in Human Behavior, vol. 15, no. 1, pp. 1-10*

Russell, G.,and Bradley, G. 1997.Teachers' computer anxiety:Implications for Professional. Development. *Education and Information Technologies*, vol. 2, pp.17-30.

Sanyal, B. C. 2001. 'New functions of higher education and ICT to achieve education for all', Paper prepared for the Expert Roundtable on University and Technology-for- Literacy and Education Partnership in Developing Countries, *International Institute for Educational Planning*, UNESCO, September 10 to 12, Paris.

Sharma, R. 2003. „Barriers in Using Technology for Education in Developing Countries', IEEE0 -7803-7724-9103.Singapore schools‟, *Computers and Education* Vol.41, No. (1), Pp; 49-63.

Shuldman, M. 2004. Superintendent Conceptions of Institutional Conditions That Impact Teacher Technology Integration *Journal of Research on Technology in Education* 36(4), 319-43 summer 2004.

Smith, H., Higgins, S., Wall, K. and Miller, J. 1997. 'Interactive Whiteboards: Boon or Bandwagon. *A Critical Review of the Literature', Journal of Computer Assisted 9Learning, no. 21, pp. 91-101*

Solomon Areya. 2008. *Policy formulation, curriculum development and implementation in Ethiopia.* The book center. AAU.

Sreekumar T and M.R.Sánchez. 2008. *ICTs and Development: Revisiting the Asian Experience*, Science Technology and Society (13)

Takeuchi, T. 2008. ICTs for Development in Ethiopia, A Case of the School Net Project, A
dissertation submitted to the University of Manchester for the degree of MSc in the Faculty of Humanities.

Tuller, L.,and Oblinger, D. 1997. Information technology as a transformation agent. *Cause/effect*, *20*(4), 33-45.

UN .2004. *UN millennium development goals*, UN.

UNESCO. 2002. Open and Distance Learning Trends, Policy and Strategy Considerations', 14 UNESCO.

_. 2004. *Changing teaching practices using Curriculum Differentiation to Respond to Students Diversity.*

_. 2007. *EFA Global Monitoring Report 2008: Education for All by 2015 – Will we make it?* Oxford University Press, New York.

Watson, D.M. 1993. *Impact--An evaluation of the impact of the information technology on children's achievements in primary and secondary schools, London, UK*: King's College London

Wims, P. and Lawler, M. 2007. „Investing in ICTs in educational institutions in developing countries: An evaluation of their impact in Kenya", *International Journal of Education and Development using Information and Communication Technology*, vol. 3, no. 1, pp. 5-22.

Woodrow, J. E. 1992. The influence of programming training on the computer literacy and Attitudes of pre-service teachers. *Journal of Research on Computing Education*, vol. 25, No. 2, pp. 200-219.

Yildirim, S. 2007. "Current Utilization of ICT in Turkish Basic Education Schools: A Review of Teacher's ICT Use and Barriers to Integration".*International Journal of Instructional Media*,vol. 34, no.2, pp. 171-86.

Young, J. 2002. The 24-hour professor. *The Chronicle of Higher Education*, Vol**.** 48, No. (38), Pp; 31-33.

Yuen, A.; Law, N. and Wong, K. 2003. 'ICT implementation and school leadership Case studies of ICT integration in teaching and learning', *Journal of Educational Administration* Vol. 41 No. 2, Pp; 158-170.

Yusuf, M.O. 2005. Information and communication education: Analyzing the Nigerian national policy for information technology. *International Education Journal* Vol. 6 No. (3), Pp; 316-321

7. APPENDICES

HARAMAYA UNIVERSITY

POSTGRADUATE PROGRAM DIRECTORATE

COLLAGE OF EDUCATION AND BEHAVIORAL SCIENCE

DEPARTMENT OF EDUCATIONAL PLANNING AND MANAGEMENT

7.1. Appendix- I. Questionnaires to be filled by preparatory School teachers

Dear respondent, The main purpose of this study is purely academic and your response will be kept confidential. This questionnaire is carefully designed to collect information /data for the research work regarding "*Information Communication Technology Utilization and its Contribution to Students' Academic Achievement in Preparatory School of Borena Zone, Oromia Regional State*". Therefore, as you're genuine and frank responses have great importance to determine the success of this study, you are kindly requested to fill out this questionnaire as genuinely and frankly as possible.

Thank you in advance for your cooperation!

INSTRUCTION

1. No need of write your name
2. All your responses will be kept confidential and used only for the academic purposes.
3. Failure to complete any of them will negatively affect the overall study result.
4. For multiple choice questions, please put "√ " or "X" in the provided space.

SECTION ONE

1. Personal Information

1.1. Place: Zone _____, Woreda_____, School_____

1.2. Sex: Male ☐ Female ☐

1.3. Age Bracket

a. Under 20 years ☐ c. 31-35 years ☐ e. 41-45 years ☐

b. 25-30 years ☐ d. 36-40 years ☐ f. above 45 ☐

1.4. Number of experience years in the present school

a. Below 2 years ☐ c. 6-8 years ☐ e. 12 years and above ☐

b. 3-5 years ☐ d. 9-11 years ☐

1.5. Qualification a. Grade 11-12 ☐ b. Diplo☐ c. BA/BS ☐ d. ☐ MA/MSc

1.6. Your field of specialization_____

SECTION TWO: The extent to use ICT facilities for the teaching-learning activities.

Please provide appropriate response by using a tick mark "√" or "X" to choose one of the Suggested Liker scales but kindly writes your opinion briefly for the short answer Questions on the space provide

Key 1= Very low (VL) 2 = Low(L) 3= Medium(M) 4= High(H) 5 = Very High(VH)

1. To what extent do you use ICT facilities for the teaching-learning activities in your school?

S/N	Items	1	2	3	4	5
		VL	L	M	H	VH
1	You create a document using a word processor					
2	You manipulate graphics or images using graphics software					
3	You use the Internet to obtain educational resources.					
4	You use printer for Printing of documents					
5	I use television for visual and educational purposes					
6	You download music files or software from the Web					
7	You use computer for writing					

SECTION THREE: The extent of ICT facilities available

Please provide appropriate response by using a tick mark "√" or "X" to choose one of the Suggested Liker scales but kindly writes your opinion briefly for the short answer Questions on the space provide

Key 1=Very poor (VP), 2= Poor(P), 3=Satisfactory (S), 4= Good(G), 5=Very Good (VG)

1. **To what extent are the information communication technology facilities available for teaching in your school ?**

S/N	Items	1	2	3	4	5
		VP	P	S	G	VG
1	Computer					
2	Printer					
3	Internet services					
4	Laptop					
5	Plasma TV					
6	Fax machine					
7	Projectors					
8	Projector screen					

SECTION FOUR: Benefits of ICT utilization in preparatory school

1. What are the perceived benefits of information communication technology utilization in your school?

Key 1=Strongly Disagree (SD), 2=Disagree (D), 3=Undecided (U), 4=Agree (A), 5=Strongly Agree (SA)

S/N	Items	1 (SD)	2 DA	3 (PD)	4 (A)	5 (SA)
1	ICT helps you in making teaching-learning more interesting					
2	ICT enhance quality of students					
3	It helps you to reach out to colleagues in other part of the country.					
4	ICT positively changes the learning climate in your classroom					
5	ICT improves the presentation of material in lessons					
6	ICT makes teaching-leaching very easy					
7	ICT increases your motivation					

SECTION FIVE: The major challenges affecting the adoption of ICT in preparatory school

1. What are the major challenges affect the adoption of ICT utilization in your schools?

Key 1= Very slightly(VS) 2= Slightly(S) 3= Moderately(M) 4= Highly(H) 5= Very extremely(VE)

S/N	Items	1	2	3	4	5
		(VS)	(S)	(M)	(H)	(VE)
1	Poor internet connection					
2	The cost of purchasing computers is high					
3	There are inadequate facing facilities to support full application of the information communication technology in your school					
4	Teachers are very reluctant to adapt to use of ICT in teaching-learning process in your school					
5	Lack of fund hinders your school from embracing ICT					
6	Irregular power supply hinders the use of computers and plasma TV in your school					

Thank You For Your Cooperation

If you have any concerns, please contact, wakjiragudeta@gmail.com

HARAMAYYA UUNIVERSITII

POST GRADUATE PROGRAM DIRECTORATE

College of Education and Behavioral Sciences

Department of Educational Planning and Management

7.1. Appendix- II Gaafannoon kun barattootaa mana barumsa qophaa'inaa godina booranaatiin guutame

Kaayyoon ijoo qorannaa kanaa qulqullina barnootaaf waan ta'eef deebiin kee kan itti amantu ta'uu qabda. Gaafannoon kun kan qophaa'e hojii qorannaa mata duree itti fayyadama ICT fi gumaacha inni gahumsa barattoota mana barumsa qophaa'ina godina boorana irratti odeeffannoo barbaachisu funaannachuufidha. Kanaafuu, deebiin ifa ta,e ati kennitu qorannaa kanaaf baay'ee murteessaa waan ta'eef, amma danda'ametti gaafannoo kana kaka'usaan akka guuttu si gaafadha.

Qajeelcha

1. Maqaa barreessuun hin barbaachisu
2. Deebiinkee hundinuu kan itti amantu ta'uu qaba.
3. Tokkoo isaa osoo hin guutiin dhiisuun qorannicha irratti miidhaa ni fida.
4. Deebii filannoo qabaniif mallattoo "√ "yookiin "X" bakka duwwaa qophaa'e irratti guuti.

KUTAA 1FFAA

1. Odeeffannoo dhuunfaa

1.1. Iddoo: Aanaa_____, Mana barumsaa_____

1.2. Saala: Dhiira ☐ Dhalaa ☐

1.3. Umurii

a. Waggaa 20 gadi ☐ c. waggaa 31-35 ☐ e. waggaa 41-45 ☐

b. waggaa 25-30 ☐ d. waggaa 36-40 ☐ f. waggaa 45 ol ☐

KUTAA 2FFAA: Hanga itti fayyadama meeshaalee ICT hojii baruu fi barsiisuuf

Filannoowwan gabatee armaan gadii tarreeffamaniif deebii sirrii ta'e bakka duwwaa qophaa'e irratti mallattoo "√" yookiin "X" barreessaa.

Ibsa 1=Tasuma(T), 2=Yeroo muraasa(YM) , 3= Darbee darbee(DD) 4=Yeroo Baay'ee(YB) 5=Yeroo Hunda(YH)

1. **Dhimma baruu fi barsiisuuf meeshaalee ICT hammam fayyadamta**?

S/N	Filannoowwan kaa'aman ilaalii mallattoo x kaa'i.	1	2	3	4	5
		(T)	(YM)	(DD)	(YB)	(YH)
1	Word process itti fayyadamuun dokumantii ni qopheeffatta.					
2	Soft ware itti gargaaramuun giraafii fi fakkiiwwan adda addaa ni qopheeffatta.					
3	Interneetiitti fayyadamuun leecalloo barnootaa argachuu ni dandeessa					
4	You use printer for Printing of documents Dookumentii piriintii gochuuf priinteriitti ni gargaaramta.					
5	Dhimma barnootaaf jettee televizyiniitti ni fayyadamta					
6	Muuziqaa fi software adda addaa download ni godhatta					
7	You use computer for writingBarreessuuf kompiiteratti ni fayyadamu.					

KUTAA 3FFAA: Hamma Meeshaalee ICT argaman

1. Mana barumsaa ke keessatti meeshaaleen ICT barsiisuuf gargaaran hammam argamu?

Key 1=Baay'ee xiqqaa (BX), 2= Xiqqaadha (P), 3=Gahaadha (G), 4= Gaaridha(G), 5=Baay'ee Gaariidha (VG)

S/N	Items	1	2	3	4	5
		BX	X	G	G	GG
1	Kompiitera					
2	Piriinterii					
3	Tajaajila Interneetii					
4	Laap toppii					
5	Pilaasimaa TV					
6	Fax mashinii					
7	Projecterii					
8	Iskiriinii proojecterii					

KUTAA 4FFAA: Mana barumsaa keessatti ICT itti fayyadamuun bu'aa qabu

1. Bu'aa ICT fayyadamuun mana barumsaa keessatti qabu maali?

ibsa 1=baay'een morma(MB), 2=mormita (M), 3=Hin murteessitu(HM), 4=Deeggarta (D), 5=Baay'ee deeggarta (BD)

Lakk	Ayiteemota	1	2	3	4	5
		BM	M	HM	(D)	(BD)
1	ICTn , fedhii baruu fi barsiisuu ni dabala.					
2	ICT,n cimina barattootaa ni dabala.					
3	ICT,n jijjiirama positivii atimoosfera barachuu gola keessatti ni fida .					
4	ICT,n meeshaalee deeggarsa barnootaatti gargaaramuun barnoota ibsuu ni fooyyessa.					
5	ICT,n baruu fi barsiisuu ni salphisa.					
6	ICT,n kaka,umsa baruu fi barsiisuu ni dabala.					
7	ICT,n barattootaaf barnoota ni mijeessa.					

KUTAA 5FFAA: Gufuuwwan ijoo hojii irra oolmaa ICT mana barumsa qophaa,ina mul'atan.

1. Wan tootni akka tekinooloojiin mana barumsaa keessatti hin baratamneef gufuu ta'an maali?

Ibsa 1=baay'een xiqqaa(MX), 2=Xiqqaa (X), 3=Giddugaleessa(GG), 4= Ni miidha (M), 5=Baay'ee Miidha (BM)

S/N	Agarsiistota	1	2	3	4	5
		MX	X	GG	M	BM
1	Tajaajilli interneetii dhibuu					
2	ICT irratti dandeettii barsiisotaa cimsuuf leenjii kennuu dhabuu					
3	Hanqina meeshaalee ICT					
4	Kaarikuleemiin Leenjiin ICT barsiisotaa dhibuu.					
5	Barsiisotni ICT itti gargaaramuun baruu fi barsiisuu gaggeessuuf fedhii dhabuu.					
6	ICT babal'isuuf hir'inni fandii mana barumsaa keessaa dhibuu.					
7	Kompuuteraa fi pilaasimaaTV tti fayyadamuuf humni ibsaa ciccitaa ta'uu.					

Waa'ee gargaarsa keessaniif galatoomaa

yoo yaada biraa qabaattan , maaloo, wakjiragudeta@gmail.com kanaan nu dubbisaa

HARAMAYA UNIVERSITY

POSTGRADUATE PROGRAM DIRECTORATE

COLLAGE OF EDUCATION AND BEHAVIORAL SCIENCE

DEPARTMENT OF EDUCATIONAL PLANNING AND MANAGEMENT

7.3 Appendix-III Interview guide Questions to be interviewed for school principals and supervisors

The aim of this study is to obtain information about the "Information Communication Technology Utilization and its Contribution to Students' Academic Achievement in Preparatory School of Borena Zone, Oromia Regional State". Be sure that the information gathered will be used only for the research purpose. Hence you are kindly requested to provide the necessary information which is very helpful to the quality of the research.

1. Personal Information

1.1. Place: Zone _____, Woreda_____, School_____

1.2. Sex: Male ☐ Female ☐

1.3. Age Bracket

a. Under 25 years ☐ c. 31-35 years ☐ e. 41- 45 years ☐

b. 26-30 years ☐ d. 36-40 years ☐ f. above 45 ☐

1.4. Number of experience years in leading the present school

a. Below 2 years ☐ c. 6-8 years ☐ e. 12 years and above ☐

b. 3-5 years ☐ d. 9-11 years ☐

1.5. Qualification BA/ BSc/ BEd ☐ MA/MSc ☐

1.6 . Current position Principal ☐ Supervisor ☐ vice-principa ☐

1.7. Your field of specialization_____

1. How would you describe the learning atmosphere in school? Do teachers and students collaborate or adapt to use ICT in your school?

_____

_____

_____

_____

2. How students understand how ICT can enhance teaching and learning and see the value in using it in your school?

_____

_____

_____

_____

3. Is there sufficient number of computers in your school? If your answer is "No" why?

_____

_____

_____

_____

4. What can you say about software or materials that students use?

_____

_____

_____

_____

5. How easily do Teachers and students find ICT to use in your school? Do they find it complex?

_____

_____

_____

_____

6. What are the perceived benefits of ICT in your school?

_____

_____

_____

7. What are the major challenges facing the adoption of information communication technology utilization in your school?

_____

_____

_____

_____

_____

Is there anything else that you would like to add?

_____

_____

_____

_____