



**MASTER OF SCIENCE IN TECHNICAL EDUCATION
(COMPUTER SCIENCE AND ENGINEERING)**

**A Study of Difficulties Faced By Teachers in Using ICT in Classroom Teaching-
Learning in Technical and Higher Educational Institutions in Uganda**

Taban Habibu
Student No: **103602**
MSc.TE (CSE)

DEPARTMENT OF TECHNICAL AND VOCATIONAL EDUCATION
ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
THE ORGANIZATION OF ISLAMIC COOPERATION (OIC)
DHAKA-BANGLADESH

SEPTEMBER, 2012

**MASTER OF SCIENCE IN TECHNICAL EDUCATION
(COMPUTER SCIENCE AND ENGINEERING)**

**A Study of Difficulties Faced By Teachers in Using ICT in Classroom Teaching-
Learning in Technical and Higher Educational Institutions in Uganda**

Taban Habibu
Student No: **103602**
MSc.TE (CSE)

**DEPARTMENT OF TECHNICAL AND VOCATIONAL EDUCATION
ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
THE ORGANIZATION OF ISLAMIC COOPERATION (OIC)
DHAKA-BANGLADESH**

SEPTEMBER, 2012

A Study of Difficulties Faced By Teachers in Using ICT in Classroom Teaching-
Learning in Technical and Higher Educational Institutions in Uganda

Thesis Submitted in Partial Fulfillment of the Requirements of the Degree of **Master of
Science in Technical Education** with Specialization in **Computer Science and
Engineering**

Taban Habibu
Student No: **103602**
MSc.TE (CSE)

DEPARTMENT OF TECHNICAL AND VOCATIONAL EDUCATION
ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
THE ORGANIZATION OF ISLAMIC COOPERATION (OIC)
DHAKA-BANGLADESH

SEPTEMBER, 2012

RECOMMENDATION OF THE BOARD OF EXAMINERS

The thesis titled “**A Study of Difficulties Faced by Teachers in Using ICT in Classroom Teaching-Learning in Technical and Higher Educational Institutions in Uganda.**” Submitted by **Taban Habibu**, Student No. **103602** of Academic year **2011-2012** has been found as satisfactory and accepted as partial fulfillment of the requirement for the Degree of Master of Science in Technical Education (MSc.TE) with Specialization in Computer Science and Engineering (CSE) on September, 2012.

BOARD OF EXAMINERS

1.
Dr. Che Kum Clement
Supervisor and Professor
Head, Dept, of TVE, IUT
Chairman
(Supervisor)

2.
Dr. Khushi Muhammad
Visiting Professor
Dept.of TVE, IUT
Member

3.
Dr. Md. Abdul Awal Khan
Visiting Professor
Dept.of TVE, IUT
Member

4.
Dr. Md. Mohsin Uddin
Adviser of Training and Research
Bangladesh Open University
Member
(External)

DECLARATION

This is to certify that the work presented in this thesis is the result of original research carried out by **Taban Habibu** under the supervision of **Prof. Dr. Che Kum Clement**, and Co-supervisor **Md. Abdullah-Al-Mamun** in the Department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT), the Organization of the Islamic Cooperation (OIC) Dhaka, Bangladesh. It is hereby declared that this work has not been submitted for any other degree or award in any other university or educational establishment.

.....
Dr. Che Kum Clement
Supervisor and Professor
Head, Dept, of TVE, IUT

.....
Taban Habibu
Student No: 103602
Academic Year: 2011-2012

DEDICATION

**DEDICATION TO MY BELOVED WIFE NAIMA, FAMILIES, LATE
PARENTS, BROTHERS AND SISTERS
MAY ALLAH REWARD YOU ALL ABUNDANTLY**

ACKNOWLEDGEMENT

First and foremost, I thank the almighty Allah for giving me wisdom, strength and healthy to enable me finish my course of Masters and thesis successfully, despite my trying times.

I wish to extend my deepest heartfelt appreciation to OIC Members state for the scholarship without which I would not have been able to attend this eye opening course of masters at IUT.

I am extremely grateful to my supervisor Professor Dr. Che Kum Clement and Co-supervisor Md. Abdullah-Al-Mamun for their guidance and ideas, this study would not be possible without their contribution.

I convey my deep gratitude and appreciation to the members and staffs of IUT especially in TVE Department Prof. Dr. Khushi Muhammad, Prof. Dr. Md. Abdul Awal Khan, Dr. Faruque Ahmed Haolader, Mr. Shamim and Mr. Md. Rezaul Karim for their guidance and valuable suggestions regarding this study.

To my employer, the Rector IUIU Dr. Ahmad Kawesa Ssengendo, it would have been impossible to undertake this course if he had not accord me study leave and support during the course.

To my brothers and sisters especially Ustadh Badru Khamis, Ali, Ramadhan, Ratibu, Ismail, Mustafa, Zura and Salam for laying a foundation in my education and your support, care, love, advice, encouragement and prayers during my course of the study, May almighty Allah reward you all abundantly.

I also owe my gratitude to my course mates, colleagues especially Ugandan Community at IUT and friends for their company and encouragement through this course of study.

To my volunteers especially Rashid Shaban, Nasur Abdul, Siraj Ratib, Said, Wathum Abubakar for their support and assistance in collecting the data despite the inconvenience I caused during their working hours thank you all for your time and support.

Last but not least, I owe invaluable gratitude to my beloved wife Naima who tolerated years of distance during our early year's together. You were always there for me even when I felt I needed to fly over. I can't measure your support, care, love, advice, encouragement and understanding. May almighty Allah reward you the best.

Taban Habibu

TABLE OF CONTENTS

Chapter	Topic	Page
I	INTRODUCTION	1
	1.1 Background of the Study	1
	1.2 Statement of the Problem	4
	1.3 Objectives of the Study	4
	1.4 Significance of the Study	4
	1.5 Research Questions	5
	1.6 Delimitation	5
	1.7 Assumptions	6
	1.8 Definitions of Terms	6
II	LITERATURE REVIEW	8
	2.1 Introduction	8
	2.2 The Education System in Uganda	8
	2.2.1 Rationale for the Formation of the ICT Policies in Uganda	10
	2.2.2 Overview of ICT Policies in Uganda	11
	2.2.3 The Importance of using ICT in classroom Teaching-Learning Process	14
	2.2.4 Problems to Integration of ICT into Classroom Teaching-Learning	16
	2.2.5 Classification of the Problems	16
	2.2.6 Teacher-Level Problems	18
	2.2.7 Institution-Level Problems	22
III	RESEARCH METHODOLOGY	31
	3.1 Design of the Study	31
	3.2 Population	31
	3.3 Sampling	31
	3.4 Tools of Research	33
	3.5 Data Collection Procedure	34
	3.6 Techniques of Data Analysis	35

IV	DATA ANALYSIS AND INTERPRETATION	36
4.1	Introduction	36
4.2	Present Status of the Technical and Higher Educational Institutions	36
4.2.1	The Existing Technologies of Teaching-Learning Aids and their Usage	38
4.2.2	Opinion of Administrators on Teacher’s Skills Improvement For Effective Teaching	39
4.2.3	Opinion of the Administrators about the Use of Local Area Network (LAN)	40
4.2.4	Teachers Opinion about the Purpose of Using Computers	41
4.2.5	Teachers Opinion about the Purpose of Using the Internet	42
4.2.6	Factors that makes Difficulties in the Use of ICT in Teaching-Learning	42
4.3	Analysis Based on Likert Type Scale	46
4.4	Constraints of Using ICT in Educational Institutions	50
4.4.1	Constraints Related to the Teachers	50
4.4.2	Factors Related to Administrators	52
4.4.3	Other Remarkable Constraints	53
V	SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS	
5.1	Summary	54
5.2	The Major Findings Based On the Quantitative and Qualitative Analysis	54
5.3	Conclusion	59
5.4	Recommendation	59
	BIBLIOGRAPHY	63
	APPENDICES	68
	Appendix-A Questionnaire for Teachers/Lecturers	68
	Appendix- B Questionnaire for Administrators	72

LIST OF TABLES

Table No.	Title	Page
3.1	Distribution of Population from the Five Selected Institutions	31
3.2	Details of the Sample Size for the Teachers	32
3.3	Details of the Sample Size for the Administrators	33
3.4	Interpretation of the Weighted Average	35
4.1	Overall ICT Status of the Five Institutions	36
4.2	Administrators Opinion Regarding the Use of Technologies of Teaching-Learning Aids	38
4.3	Present Condition of the Institution in Terms of ICT Service	46
4.4	Teachers Opinion about the ICT Existence in Teaching-Learning Process	47
4.5	Opinions of Administrators Regarding ICT Services in the Institution	49
4.6	Possible Implications for Administrators and Teachers for the Integration of ICT into Teaching-Learning Process	52

LIST OF FIGURES

Figure No.	Title	Page
4.1	Skill Improvement of the Teachers for Effective Teaching	39
4.2	Usage of LAN	40
4.3	Purpose of Using Computers	41
4.4	Purpose of using Internet	42
4.5	Factors that limit the Use of ICT in Teaching-Learning Process	43

LIST OF ACRONYMS

ICT	Information and Communication Technology
IT	Information Technology
ISP	Internet Service Provider
IUIU	Islamic University in Uganda
IMSAT	Institute of Management science and Technology
UNCST	Uganda National Council of Science and Technology
USA	United States of America
UNESCO	United Nations Education Scientific Cultural Organization
MoES	Ministry of Education and Sports
NCDC	National Curriculum Development Centre
UNISE	Uganda National Institute for Special Needs Education
IICD	International Institute of Communication and Development
DUIIAP	Developing a Uganda Information Infrastructure Agenda Program
RCDF	Rural Communication Development Fund
SPSS	Statistical Package for Social Science

ABSTRACT

The use of Information and Communication Technology (ICT) in the classroom is very important for providing opportunities for students to learn to operate in an information age. Studying the obstacles to the use of ICT in educational institutions may assist educators to overcome these barriers and become successful technology adopters in the future. In this regard, the study aims at finding out the difficulties faced by teachers in using ICT in classroom teaching-learning in technical and higher educational institutions in Uganda. Chi square test and weighted average using Statistical Package for Social Science (SPSS) software were used to analyze and interpret the data. The findings of this study indicate that teachers had a strong desire to integrate ICT into teaching-learning process; but they encountered many barriers regarding the ICT integration. It reveals that the major barriers were lack of sufficient training, lack of learning equipment tools, teacher's reluctance to change, lack of skilled personnel, lack of limited time, lack of confidence, lack of knowledge, low internet speed, virus threat, power problems, lack of motivation to encourage the use of ICT from the administration, teachers' attitudes towards computers, poor funding, poor administrative support, and poor course curriculum etc. However, it is suggested that ongoing professional development must be provided for teachers to model the new pedagogies and tools for learning with the aim of enhancing the teaching-learning process. Nevertheless, it is important for teacher trainers and policy makers to understand the barriers and cost-effectiveness of integrating ICT use in teacher training so that training strategies can be appropriately explored to make such changes viable to all.

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Information and Communication Technology (ICT) is an ‘electronic means of capturing, processing, storing, communicating information, manufacture and assembly’. ICT’s are based on digital information and comprise computer hardware, software and networks. The use of ICT in the classroom teaching-learning is very important for it provides opportunities for teachers and students to operate, store, manipulate, and retrieve information, encourage independent and active learning, and self-responsibility for learning such as distance learning, motivate teachers and students to continue using learning outside school hours, plan and prepare lessons and design materials such as course content delivery and facilitate sharing of resources, expertise and advice. This versatile instrument 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 (Plomp, Ten Brummelhuis, & Rapmund, 1996): the use of ICT as object of study; refers to learning about ICT, which enables students to use ICT in their daily life. The use of ICT as aspect of discipline or profession; refers to the development of ICT skills for professional or vocational purposes. The use of ICT as medium for teaching and learning; focuses on the use of ICT for the enhancement of the teaching and learning process (Drent, Meelissen, 2007). It is a fact that teachers are at the center of curriculum change and they control the teaching and learning process. Therefore, they must be able to prepare young people for the knowledge society in

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

ICT plays various roles in learning and teaching processes. According to Bransford et al (2000), several studies have reviewed the literature on ICT and learning and have concluded that it has great potential to enhance student achievement and teacher learning. Wong et al. (2006) point out that technology can play a part in supporting face-to-face teaching and learning in the classroom. Integrating technology into curricula with the intent of positively influencing teaching and learning has been in a state of evolution over the past 20 years (Dias & Atkinson, 2001; Dockstader, 1999). Driven primarily by hardware and software evolution, accessibility to computers in educational settings, and popular instructional technology trends, technology integration has covered the continuum from instruction on programming skills, self-directed drill and practice, interactive learning software, online training, testing, instructional delivery augmentation, and Internet-based accessibility to information, communication, and publication (Dias & Atkinson, 2001). According to Flanagan and Jacobsen (2003), technology integration is meant to be cross- curricular rather than become a separate course or topic in itself. Technology should be used as a tool to support the educational objectives such as skills for searching and assessing information, cooperation, communication and problem solving which are important for the preparation of students for the knowledge society (Drent & Meelissen 2007).

In fact, innovative use of ICT can facilitate student centered learning (Drent, 2005). Hence, every classroom teacher should use learning technologies to enhance their student learning in every subject because it can engage the thinking, decision making, problem solving and reasoning behaviors of students (Grabe & Grabe, 2001). These are cognitive behaviors that students need to learn in an information age.

Despite successful efforts to acquire computer hardware and to raise the student to computer ratio to 5:1 (World Almanac, 2002), there has been less success identifying, which computer skills should be taught in institutions and how computers can be used for teaching and learning (Dooling, 2000). Thus, current attention has turned to what is actually happening in the classroom with computer technology. Although ICT may facilitate independent self-paced learning, the potential of ICT may not be optimized if there is no shift in the learning and teaching paradigm (Bangkok, 2004). In fact, teachers play an important role in the teaching/learning paradigm shift. They must understand the potential role of technology in education. Also, they should become effective agents to be able to make use of technology in the classroom.

Due to ICT's importance in society and possibly in the future of education, identifying the possible obstacles to the use of ICT in technical and higher educational institutions would be an important step in improving the quality of teaching and learning. Balanskat, Blamire, and Kefala (2006) argue that although educators appear to acknowledge the value of ICT in institutions, difficulties continue to be encountered during the processes of adopting these technologies such as inadequate qualified teachers, lack of teacher's confidence, Lack of teacher's competence, Resistance to change & negative attitudes, Lack of effective training, Lack of accessibility to resources, and Lack of technical support. This study therefore aimed to bring together the findings and the key points from a review of a significant part of the available literature associated with problems teachers face in using ICT in classroom teaching-learning process. Identifying the fundamental problems may assist teachers and educators to overcome these problems and become successful technology adopters.

1.2 Statement of the Problem

The study is aimed to identify various problems faced by teachers in using ICT in classroom teaching-learning in technical and higher educational institutions in Uganda.

1.3 Objectives of the Study

The objectives of the study are to:

- identify the nature of the problems faced by teachers in using ICT in classroom teaching-learning process in technical and higher educational institutions in Uganda.
- investigate the reasons behind various problems faced by teachers in using ICT in classroom teaching-learning environment.
- recommend measures to overcome these problems as suggested by the respondents.

1.4 Significance of the Study

ICT plays various roles in learning and teaching processes. According to Bransford et al. (2000), several studies have reviewed the literature on ICT and learning and have concluded that it has great potential to enhance student achievement and teacher learning. Wong et al. (2006) point out that technology can play a part in supporting face-to-face teaching and learning in the classroom. Many researchers and theorists assert that the use of computers can help students to become knowledgeable, reduce the amount of direct instruction given to them, and give teachers an opportunity to help those students with particular needs. It can help the teachers enhance their pedagogical practice and to equip them with the knowledge and skills to use different computer technologies to access, analyze, interpret process and disseminate information to learners. It can also help the educational institutions to provide ICT capacity (resources) to ensure that all

teachers and students have immediate access to all software's that are required to support the curriculum and adequate support to implement its use in classroom teaching-learning process without any difficulties. Furthermore it can also help to enhance the quality of education by increasing learner motivation and engagement, facilitating the acquisition of basic skills and enhancing teacher training and promote the shift to a learner-centered environment.

1.5 Research Questions

The following Research questions will guide the researcher to collect the necessary data to achieve the objectives of the study.

- What are the problems teachers are facing in the use of ICT in classroom teaching- learning process?
- What are the reasons behind the problems that are hindering the use of ICT in teaching-learning process?
- What are the possible measures to improve the teaching-learning process incorporating ICT?

1.6 Delimitation

The study is conducted only in Uganda. The data shall be collected from three (03) out of 35 technical institutions and two (2) out of 27 universities in Uganda. Because of the limited time frame, this study is delimited to these five institutions only.

1.7 Assumptions

The researcher assumes that, there are many problems that exist in using ICT by the teachers in teaching-learning. The researcher also assumes that the problems vary from institution to institution depending on the facilities available to them. Teachers are well aware of the problems and they can provide sufficient information.

1.8 Definitions of Terms

ICT stands for information and communication technologies and is defined, as a “diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information.” These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony.

Teaching-learning process is a planned interaction that promotes behavioral change that is not a result of maturation or coincidence.

Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources.

Learning environment is the sum of the internal and external circumstances and influences surrounding and affecting a person's learning. Or is a term used in connection with a range of quite specific areas of education, as well as to convey some broad ideas about learning.

Pedagogy is the art and science of how something is taught and how students learn it. Pedagogy includes how the teaching occurs, the approach to teaching and learning, the way the content is delivered and what the students learn as a result of the process.

Distance education or **distance learning** is a field of education that focuses on teaching methods and technology with the aim of delivering teaching, often on an individual basis, to students who are not physically present in a traditional educational setting such as a classroom. It has been described as "a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both.

Digital media is a form of electronic media where data is stored in digital (as opposed to analog) form. It refers to the technical aspect of storage and transmission (example hard disk drives or computer networking) of information or to the end product, such as digital video.

Network is a group of two or more computers interconnected by cable or some other media, enabling them to share information and resources. Networks make it more efficient to share information and resources than stand-alone computers.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature that relates to the problems faced by teachers in using ICT in classroom teaching-learning process, the education system and ICT policies in Uganda and the use of ICT for teacher's effective teaching in classroom environment in technical and higher educational institutions.

2.2 The Education System in Uganda

The education system of Ugandan is based on an initial seven years of primary education. Students who successfully complete primary schooling have the option of enrolling in four years of ordinary level secondary education or taking a three-year craft course in technical institutions. Those who successfully complete the ordinary level secondary education may then choose to enroll in the two-year advanced level secondary education programme after which they may progress to university studies or a technical-vocational program. ICT 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. As Uganda adopts ICT in education, it faces the same challenges as most developing economies poorly developed ICT infrastructure, high bandwidth costs, an unreliable supply of electricity, and a general lack of resources to meet a broad spectrum of needs. However, with the rapid emergence of wireless network capacity and the ubiquitous growth of

mobile phones, the context of the infrastructure is changing. A national ICT policy is in place and an education sector ICT policy is before the Ministry of Education and Sports.

The Ministry of Education and Sports is taking steps to co-ordinate ICT development and has allocated resources to support implementation of its ICT strategy. It has been argued that ICT is a principal driver of economic development and social change worldwide (Kozma, 2005; Leech, 2008). In many countries, the need for economic and social development is used to justify investments in educational reform and in educational ICT. Another notable argument to this effect is by Kelles-Viitanen (2003) who referring to developing countries in general, commented that ICT plays a major role in all aspects of national life: in politics, in economic life, as well as in social and cultural development. She further argued that ICT is rapidly transforming the way people do business, access information and services communicate with each other and even entertain themselves. The UN ECOSOC Ministerial Declaration (2000) provided special attention to the application of ICT for development, for which urgent and concerted actions at the national, regional and international levels have been suggested.

A Microsoft Corporation (2007) report on its ICT initiatives in Africa acknowledged that technology alone does not drive development but enables it. In the report, while noting that 300 million Africans live on less than \$1 per day, it is asserted that:

ICTs offer special opportunities to stimulate growth and increase innovation in every local setting, thereby enabling individuals and institutions to interact more productively with the global economy and the wider world. But to realize their potential, technologies must be part of a mix of productive changes and supporting capabilities. Resources must be matched by resourcefulness combined with other initiatives by local leaders, educators and entrepreneurs

to achieve individual and institutional objectives. “ICT Development” is therefore an effort to distinguish the most constructive opportunities to apply technologies for growth and poverty reduction. (p. 4).

2.2.1 Rationale for the Formation of the ICT Policies in Uganda

It has been noted by Jones and Kozma (2003) that national ICT policies can serve several important functions. Firstly, ICT policies provide a rationale, a set of goals, and a vision of how education systems work if ICT is introduced into teaching and learning, and they can benefit students, teachers, parents and the general population of a given country. Secondly, ICT policies are expected to provide guidance, and failure to do so means that individual institutions, and classroom innovations would be unlikely to be sustained. Additionally, individual efforts are less likely to be felt across the country unless there is a shared vision clearly laid out in the policy (ibid).

Education has been identified as one of the public sectors most influenced by technological developments (Kozma, 2005).

The improvement of educational systems and increased educational attainment is primary to countries’ preparation for global, technology-based changes in all sectors (OECD, 1999).

The formation of ICT policies in education, although embedded in the national ICT policies of the country, is seen to be crucial as ICT plays an important role in preparing individuals in institutions for the workplace (Were, Rubagiza, Denley and Sutherland, 2007). ICT, if carefully integrated in education, has a potential to facilitate the acquisition of relevant life skills that buttress the development process in the prevailing economic and information order (ibid).

2.2.2 Overview of ICT Policies in Uganda

In Uganda, the national ICT policy development process was initiated in 1998 by the Uganda National Council of Science and Technology (UNCST) (Torach, Okello and Amuriach, 2006). Five years later in 2002 the UNCST submitted a draft national ICT policy document on ICT in the Education Sector to the Ministry of Education and Sports which was approved the following year. The policy framework document recognized that Uganda would need to embrace the goal of lifelong education for all (Farrell, 2007). Secondly the policy addresses literacy improvement and human resource capacity-building with strategies that include:

- Integrating ICT into mainstream educational curricula as well as other literacy programmes to provide for equitable access for all students regardless of level.
- Developing and managing ICT centres of excellence to provide basic and advanced ICT training.
- Setting up mechanisms that promote collaboration between industry and training institutions to build appropriate human resources capacity.
- Promoting the twinning of training institutions in Uganda with those elsewhere to enhance skills transfer.

The policy is based on the premise that ICT use is a key skill required for a rapidly increasing range of jobs, and developing good ICT skills in young people can help them find employment. Furthermore, the presence of a workforce with good ICT skills can help in attracting a growing industry and increasing employment.

The birth of ICT policies in Uganda was thought to be in 1998 when a number of international organizations from USA, Norway, Germany, Ireland and Sweden approached the Uganda

National Council for Science and Technology (UNCST) were given an opportunity to develop ICT policies based on different sectors (Uganda. MoES 2005: Draft Policy for ICT). According to the draft policy, the UNCST was a council mandated by the government of Uganda to coordinate, formulate and manage explicit national policies in respect to science and technology. The council was thus commissioned to oversee the integration of technology in the socio-economic process and provide the government with appropriate technical advice. Makerere University was identified by the Swedish and Norwegian organizations to support the use of ICT in infrastructures and for human development. In 1999, UNESCO and UNCST agreed to initiate a process that would lead to the development of sectoral policies. The policy is based on the premise that ICT use is a key skill required for a rapidly increasing range of jobs, and developing good ICT skills in young people can help them find employment. Furthermore, the presence of a workforce with good ICT skills can help in attracting a growing industry and increasing employment. In other words, the policy states that the absence of ICT skills can be a barrier to development, and recognizes that Uganda would need to embrace the goal of lifelong education for all (Farrell, 2007).

The ICT policy is based on four stated principles. First, it sets a framework of curriculum and teacher training that will facilitate and guide the development of ICT with the view to gaining the best advantage to the country as a whole. This is from the view that ICT policy cannot be implemented in one full swoop due to the financial constraints related to it. A step-by-step approach is thus implied in this principle. The second principle is the balancing of ICT applications and computer science. This suggests the provision of opportunities for the development of computer application skills to many people while at the same time providing

ways of developing more technical skills to a smaller number of people who have a specific interest in the area. These people will be the personnel required to install and maintain equipment and networks. The third principle proposes that the key focus should not be on the provision of equipment but on the teachers, trainers, lecturers and on the curriculum that they are expected to follow. The final principle focuses on equity where the Ministry of Education and Sports believes that access to ICT should be spread as equitably as possible: ICT should be equally accessible not only in urban and rural Uganda, but in private and public institutions as well.

Critical to the success of the ICT policy as mentioned in the draft policy is the co-ordination between the different strands outlined in the policy and cooperation between all the implementing bodies. For example, teachers have to be given training that matches the curriculum and should be offered before the ICTs are provided to institutions and colleges.

In addition, the training of trainers should also be carefully undertaken and should be of high quality. The trainers should, for example, be given opportunity to develop sufficient ICT skills themselves and appropriate methods for teaching ICT and should develop an awareness of the roles of ICT in their areas of specialization to avoid focusing on generic skills. Moreover, the ICT curriculum design has been singled out as an important factor and should be made practical in providing relevant ICT skills and experiences. The draft policy also suggests a constant update to the curriculum design to keep up with rapidly changing technology and a periodic monitoring and evaluation of the ICT in education policy. Monitoring and evaluation will make sure that the policy remains responsive to the needs, aspirations and the dynamics of the global trends in ICT.

Notable debates and arguments have been made about whether students learn about, with or through ICT. The Uganda ICT policy, for example, recognizes that the issues are not so much issues of having ICT as issues of what is done with ICT (Uganda. MoES Draft Policy, 2005). It further notes that strategies driven by equipment provision may easily result in underused technology. The draft policy thus suggests that the Ministry of Education should encourage the use of technology to support teaching either by production of teaching materials or by use of technology with students. The guidelines should be produced for institutions to show how this can be done. The draft policy further observes that computer awareness should be introduced into the training of institutions teachers on a phased basis, so that newly qualified teachers are equipped to make use of ICT as it becomes available. Besides, having acquired some ICT skills at the institution level through pedagogy, this is expected to be executed through a subjects such as computer studies, Computer science and information technology, taught in the institutions that have sufficient equipment, and assessed at institution level. The teacher training institutions should provide as many teachers as possible with computer awareness, basic skills, and enough experience to make use of ICT in lesson preparation and in making teaching materials. This will help improve the quality of technical and higher educational institutions.

2.2.3 The Importance of Using ICT in Classroom Teaching-Learning Process

Several studies argue that the use of new technologies in the classroom is essential for providing opportunities for students to learn to operate in an information age. It is evident, as Yelland (2001) argued that traditional educational environments do not seem to be suitable for preparing learners to function or be productive in the workplaces of today's society. She claimed that organizations that do not incorporate the use of new technologies in institutions cannot seriously

claim to prepare their students for life in the twenty-first century. This argument is supported by Grimus (2000), who pointed out that “by teaching ICT skills in technical and higher educational institution the students are prepared to face future developments based on proper understanding” (p. 362). Similarly, Bransford et al. (2000) reported that “what is now known about learning provides important guidelines for uses of technology that can help students and teachers develop the competencies needed for the twenty-first century” (p. 206).

ICT can play various roles in learning and teaching processes. According to Bransford et al. (2000), several studies have reviewed the literature on ICT and learning and have concluded that it has great potential to enhance student achievement and teacher learning. Wong et al. (2006) point out that technology can play a part in supporting face-to-face teaching and learning in the classroom. Many researchers and theorists assert that the use of computers can help students to become knowledgeable, reduce the amount of direct instruction given to them, and give teachers an opportunity to help those students with particular needs (Iding, Crosby, & Speitel, 2002; Shamatha, Peressini, & Meymaris 2004; Romeo, 2006). While new technologies can help teachers enhance their pedagogical practice, they can also assist students in their learning. According to Grabe and Grabe (2007), technologies can play a role in student skills, motivation, and knowledge. They claim that ICT can be used to present information to students and help them complete learning tasks.

According to Becta (2003, p. 10), five factors influence the likelihood that good ICT learning opportunities will develop in institutions: ICT resourcing, ICT leadership, ICT teaching, institution leadership, and general teaching. Becta (2003) also indicated that the success of the integration of new technology into education varies from curriculum to curriculum, place to

place, and class to class, depending on the ways in which it is applied.

Due to ICT's importance in society and possibly in the future of education, identifying the possible obstacles to the use of ICT in technical and higher educational institutions would be an important step in improving the quality of teaching and learning. Balanskat, Blamire, and Kefala (2006) argue that although educators appear to acknowledge the value of ICT in institutions, difficulties continue to be encountered during the processes of adopting these technologies such as inadequate qualified teachers, lack of teacher's confidence, Lack of teacher's competence, Resistance to change and negative attitudes, Lack of effective training, Lack of accessibility to resources, and Lack of technical support. This study therefore aimed to bring together the findings and the key points from a review of a significant part of the available literature associated with problems teachers face in using ICT in classroom teaching-learning process. Identifying the fundamental problems may assist teachers and educators to overcome these problems and become successful technology adopters.

2.2.4 Problems to Integration of ICT into Classroom Teaching-Learning

The act of integrating the use of ICT into teaching and learning is a complex process and one may encounter a number of difficulties. These difficulties are known as "problems" (Schoepp, 2005). A problem is defined as a condition that makes a situation difficult to progress or to achieve an objective. (WordNet, 1997, as cited in Schoepp, 2005, p.2).

2.2.5 Classification of the Problems

Different categories have been used by researchers and educators to classify the problems in use of ICT in educational system and several studies have divided the problems into two categories: extrinsic and intrinsic problems. Ertmer (1999) referred to extrinsic problems as first-order and

cited access, time, support, resources and training and intrinsic problems as second-order and cited attitude, beliefs, practices and resistance; whereas, Hendren (2000,as cited in Al-Alwani,2005) saw extrinsic problems as pertaining to organizations rather than individuals and intrinsic problems as pertaining to teachers, administrators, and individuals.

Another classification found in the literature is teacher-level problems versus institution-level problems. Becta (2004) grouped the problems according to whether they relate to the individual (teacher-level problems), such as lack of effective training to solving technical problems and lack of access to resources. Similarly, Balanskat et al.(2006) divide them into micro level problems, including those related to teachers attitudes and approaches to ICT, and meso level problems, including those related to the institutional context. The latter added a third category called macro level (system-level problems), including those related to the wider educational framework.

Another perspective presents the obstacles as pertaining to two kinds of conditions: material and non-material (Pelgrum,2001).The material conditions may be the insufficient number of computers and copies of software's. The non-material obstacles include teacher's insufficient ICT knowledge and skills, the difficulty of integrating the use of ICT in instruction, and insufficient teacher time. However, since the purpose of the research is to find the present and future problems in use of ICT, this study focuses on the teacher-level and institution-level problems.

2.2.6 Teacher-Level Problems

Lack of teacher confidence: Several researchers indicate that one problem that prevents teachers from using ICT in their teaching is lack of confidence. Dawes (2001) sees this as a contextual factor which acts as a problem. According to Becta (2004), much of the research proposes that this is a major problem to the uptake of ICT by teachers in the classroom. Some studies have investigated the reasons for teachers' lack of confidence with the use of ICT. For example, Beggs (2000) asserted that teachers' "fear of failure" caused a lack of confidence. On the other hand, Balanskat et al. (2006) found that limitations in teachers' ICT knowledge makes them feel anxious about using ICT in the classroom and thus not confident to use it in their teaching. Similarly, Becta (2004) concluded their study with the statement: "many teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of students who perhaps know more than they do" (p. 7).

Lack of teacher Competence: Another problem, which is directly related to teacher confidence, is teachers' competence in integrating ICT into pedagogical practice (Becta, 2004). In Australian research, Newhouse (2002) found that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices. Current research has shown that the level of this problem differs from country to country. In the developing countries, research reported that teachers' lack of technological competence is a main problem to their acceptance and adoption of ICT (Pelgrum, 2001; Al-Oteawi, 2002). In Syria, for example, teachers' lack of technological competence has been cited as the main problem (Albirini, 2006). Likewise, in Saudi Arabia, a lack of ICT skills is a serious obstacle to the integration of technologies into

classroom teaching and learning (Al-Alwani, 2005; Almohaissin, 2006). Empirica (2006) produced a report on the use of ICT in European institutions. The data used for the report came from the Head Teachers and Classroom Teachers Survey carried out in 27 European countries. The findings show that teachers who do not use computers in classrooms claim that “lack of skills” are a constraining factor preventing teachers from using ICT for teaching. Another worldwide survey conducted by Pelgrum (2001), of nationally representative samples of institutions from 26 countries, found that teachers’ lack of knowledge and skills is a serious obstacle to using ICT in technical and higher educational institutions. The results of a study conducted by Balanskat et al. (2006) have shown that “in Denmark many teachers still chose not to use ICT and media in teaching situations because of their lack of ICT skills rather than for pedagogical/didactics reasons” while “in the Netherlands teachers’ ICT knowledge and skills is not regarded any more as the main problem to ICT use” (p. 50). Hence, lack of teacher competence may be one of the strong problems to the integration of technologies into education.

Teachers Resistance to change: Much research into the problems to the integration of ICT into education found that teachers’ resistance to change were a significant problem. Watson, an Australian researcher, (1999) argued that integrating the new technologies into educational settings requires change and different teachers will handle this change differently. According to him considering different teachers’ attitudes to change is important because teachers’ beliefs influence what they do in classrooms. Becta (2004) claims that one key area of teachers’ attitudes towards the use of technologies is their understanding of how these technologies will benefit their teaching and their students’ learning. Schoepp’s study (2005) found that, although teachers felt that there was more than enough technology available, they did not believe that they

were being supported, guided, or rewarded in the integration of technology into their teaching. According to Empirica (2006), teachers who are not using new technology such as computers in the classroom are still of the opinion that the use of ICT has no benefits or unclear benefits. Resistance to change seems not to be a problem itself; instead, it is an indication that something is wrong. In other words, there are reasons why resistance to change occurs. According to Earle (2002), the change from a present level to a desired level of performance is facilitated by driving (encouraging) forces such as the power of new developments, rapid availability, creativity, Internet access, or ease of communication while it is delayed by resisting (discouraging) forces such as lack of technical support, teacher expertise, or time for planning. In their study, Cox et al. (1999) found that teachers are unlikely to use new technologies in their teaching if they see no need to change their professional practice. They showed that teachers who resist change are not rejecting the need for change but lack the necessary education in accepting the changes and are given insufficient long-term opportunities to make sense of the new technologies for themselves. Obviously, not all communities have this problem. In Europe, for example, Korte and Hüsing (2007) state that only very few teachers can be regarded as fundamentally opposing the use of ICT in the classroom. Only a fifth of European teachers believe that using computers in class does not have significant learning benefits for students (Korte & Hüsing, 2007).

Questioning professional practice: There are many studies which have shown that teachers are "not given to questioning their professional practice" (Underwood, 1997). Once they have finished their initial training they do not expect to need much further training therefore do not take the initiative to improve their practice and learn new skills. Desforges (1995), in a literature review of the shift from novice to expert teachers, found that "many teachers are perfectly well

satisfied with their practices and are unlikely to question prevailing educational processes" (Feiman-Nemser & Buchanan (1985) in Desforges (1995)). In order for teachers to make changes to their professional practice, according to Desforges "a considerable effort is necessary to create the possibilities of restructuring knowledge (about teaching and learning) in the face of experience. In regard to old knowledge we can speculate that the impact of new experience (example using ICT) will be severely attenuated if it is in conflict with teachers' basic ontological categories, example their beliefs about the nature of their job or the nature of early days". Therefore if teachers see no need to change or question their current professional practice they may not accept the use of ICT in their teaching.

Teachers Attitude towards Computer: Drent and Meelissen (2007) conducted a study about problems which stimulate or limit the innovative use of ICT by teacher educators in the Netherlands. The study used questionnaires for 210 teachers and interviews for 4 of those teachers who had responded. Their findings showed that several problems such as a student-oriented pedagogical approach, a positive ICT attitude, computer experience, and personal entrepreneurship of the teacher educator have a direct positive influence on the innovative use of ICT by the teacher. In addition, educational theorists and researchers have realized that a problem in the implementation of computers is users' acceptance, which is in turn influenced by their attitudes towards these media (Koochang, 1989). Teachers' attitudes have been found to be major predictors of the use of new technologies in instructional settings (Almusalam, 2001). The successful use of technology in the classroom depends to a large extent on the teachers' attitudes toward these tools (Lawton & Gerschner, 1982). In fact, it has been suggested that attitudes towards computers affect teachers' use of computers in the classroom and the likelihood of their

benefiting from training (Kluever, Lam, Hoffman, Green & Swearinges, 1994). Positive attitudes often encourage less technologically capable teachers to learn the skills necessary for the implementation of technology-based activities in the classroom. Harrison and Rainer (1992) found that participants with negative computer attitudes were less skilled in computer use and were therefore less likely to accept and adapt to technology than those with positive attitudes. They concluded that changing individuals' negative attitudes is essential for increasing their computer skills. Therefore, if teachers want to successfully use technology in their classes, they need to possess positive attitude to use technology. Such attitude is developed when teachers are sufficiently comfortable with technology and are knowledgeable on its use.

2.2.7 Institution-Level Problems

Availability of Vision and Plan about the Contribution of ICT to Education: Teachers need to know exactly how ICT is used as a teaching and learning tool. Many researchers have pointed out that institution's ICT vision is essential to effective ICT integration (Anderson & Dexter, 2000). Bennett (1996, p. 60) stressed the importance of a "well-defined mission that describes technology's place in education". In line with this idea, Ertmer (1999) wrote, "A vision gives us a place to start, a goal to reach for, as well as a guidepost along the way" (p 54). Also, Means and Olson (1997) recommend that teachers and institutions must develop a vision before they make substantial investments in hardware and software. In other words, users of technology must have a fundamental belief in the value of innovation or the innovation is doomed to failure. Teachers must have opportunities to study, observe, reflect, and discuss their practice, including their use of ICT, in order to develop a sound pedagogy that incorporates technology (Kearsley & Lynch, 1992). Hence, the vision should not be created by a single person or through a top-down process

starting from the MOE (Minister of Education). It is crucial to involve those who have a stake in the outcomes, including teachers, parents, students, and the community, and allow them to assist in the creation of the vision by contributing their knowledge, skills, and positive attitudes. Therefore, a clear vision of ICT integration in institutions that is shared by all members of the institution community promotes effective use of ICT in the classroom.

Once the vision has been successfully created and accepted, the next step is to articulate an ICT integration plan, spelling out how the teachers are expected to integrate technology in their lessons (Strudler & Wetzel, 1999). In fact, an ICT master plan that is formulated according to institution's vision and its socio- cultural setting assures effective integration of ICT (Bangkok, 2004). Gulbahar (2005) conducted a study to illustrate how technology planning process was carried out in a private K-12 institution in Turkey. Data were collected from 105 teachers, 25 administrative staff, and 376 students. Findings of this study indicated that educational institutions must develop a technology plan in order to use technology in an effective and efficient manner for teaching, learning and administrative purposes. Also, some issues that should be considered include staff and student development in ICT-related skills, curriculum and assessment ICT facilities and resources and support teams (both technical, administrative and pedagogical). Therefore, an ICT integration plan provides a detailed blueprint of the steps and methods needed to translate the institution ICT vision into reality. Developing ICT integration plans is no doubt a complex and time- consuming task, but they are usually well worth the time required to put them together.

Lack of availability of Time, to Experiment, Reflect and Interact: Several recent studies indicate that many teachers have competence and confidence in using computers in the classroom, but

they still make little use of technologies because they do not have enough time. A significant number of researchers identified time limitations and the difficulty in scheduling enough computer time for classes as a problem to teachers' use of ICT in their teaching (Al- Alwani, 2005; Becta, 2004; Beggs, 2000; Schoepp, 2005; Sicilia, 2005). According to Sicilia (2005), the most common problem reported by all the teachers was the lack of time they had to plan technology lessons, explore the different Internet sites, or look at various aspects of educational software. Becta's study (2004) found that the problem of lack of time exists for teachers in many aspects of their work as it affects their ability to complete tasks, with some of the participant teachers specifically stating which aspects of ICT require more time. These include the time needed to locate Internet advice, prepare lessons, explore and practice using the technology, deal with technical problems, and receive adequate training. Recent studies show that lack of time is an important factor affecting the application of new technologies in ICT education (Al-Alwani, 2005). According to Al- Alwani (2005), lack of time is a problem affecting the application of ICT in Saudi Arabia because of busy schedules. He indicated that because Saudi teachers work from about 7.00 a.m. until 2.00 p.m. and the average number of class sessions taught by science teachers is 18 per week, both teachers and students have a limited number of hours during the day to work on integrating ICT. Similarly, in Canada, Sicilia (2005) concluded that teachers take much more time to design projects that include the use of new ICT than to prepare traditional lessons.

Lack of effective training for teachers and institution Principals: The problem most frequently referred to in the literature is lack of effective training (Albirini, 2006; Balanskat et al., 2006; Beggs, 2000; Özden, 2007; Schoepp, 2005; Sicilia, 2005; Toprakci, 2006). One finding of

Pelgrum's (2001) study was that there were not enough training opportunities for teachers in the use of ICTs in a classroom environment. Similarly, Beggs (2000) found that one of the top three problems to teachers' use of ICT in teaching students was the lack of training. Recent research in Turkey found that the main problem with the implementation of new ICT was the insufficient amount of in-service training programs for teachers (Özden, 2007), and Toprakci (2006) concluded that limited teacher training in the use of ICT in Turkish institutions is an obstacle.

According to Becta (2004), the issue of training is certainly complex because it is important to consider several components to ensure the effectiveness of the training. These were time for training, pedagogical training, skills training, and an ICT use in initial teacher training. Correspondingly, recent research by Gomes (2005) relating to ICT education concluded that lack of training in digital literacy, lack of pedagogic and didactic training in how to use ICT in the classroom, and lack of training concerning the use of technologies in specific areas were obstacles to using new technologies in classroom practice. Some of the Saudi Arabian studies reported similar reasons for failures in using educational technologies: the weakness of teacher training in the use of computers, the use of a "delivery" teaching style instead of investment in modern technology (Alhamd, Alotaibi, Motwaly, & Zyadah, 2004), as well as the shortage of teachers who are qualified to use the technology confidently (Sager, 2002).

Providing pedagogical training for teachers, rather than simply training them to use ICT tools, is an important issue (Becta, 2004). Cox et al. (1999a) argue that if teachers are to be convinced of the value of using ICT in their teaching, their training should focus on the pedagogical issues. The results of the research by Cox et al. (1999a) showed that after teachers had attended professional development courses in ICT they still did not know how to use ICT in their classrooms; instead they just knew how to run a computer and set up a printer. They explained

that this is because the courses only focused on teachers acquiring basic ICT skills and did not often teach teachers how to develop the pedagogical aspects of ICT. In line with the research by Cox et al. (1999a), Balanskat et al. (2006) indicated that inappropriate teacher training is not helping teachers to use ICT in their classrooms and in preparing lessons. They assert that this is because training programmes do not focus on teachers' pedagogical practices in relation to ICT but on the development of ICT skills.

However, beside the need for pedagogical training, according to Becta (2004), it is still necessary to train teachers in specific ICT skills. Schoepp (2005) claims that when new technologies need to be integrated in the classroom, teachers have to be trained in the use of these particular ICTs. According to Newhouse (2002), some initial training is needed for teachers to develop appropriate skills, knowledge, and attitudes regarding the effective use of computers to support learning by their students. He argued that this also requires continuing provision of professional development to maintain appropriate skills and knowledge.

Fundamentally, when there are new tools and approaches to teaching, teacher training is essential (Osborne & Hennessy, 2003) if they are to integrate these into their teaching. However, according to Balanskat et al. (2006), inadequate or inappropriate training leads to teachers being neither sufficiently prepared nor sufficiently confident to carry out full integration of ICT in the classroom. Newhouse (2002) states that "teachers need to not only be computer literate but they also need to develop skills in integrating computer use into their teaching-learning programmes" (p. 45). According to Newhouse (2002), teachers need training in technology education (focusing on the study of technologies themselves) and educational technology (support for teaching in the classroom). Similarly, Sicilia (2005) found that teachers want to learn how to use new

technologies in their classrooms but the lack of opportunities for professional development obstructed them from integrating technology. Other problematic issues related to professional development in ICT are that training courses are not differentiated to meet the specific learning needs of teachers and the sessions are not regularly updated (Balanskat et al. 2006). Pre-service teacher education can also play a significant role in providing opportunities for experimentation with ICT before using it in classroom teaching (Albirini, 2006). Lack of on ICT focus in initial teacher education is a problem to teachers' use of what is available in the classroom during teaching practice (Becta, 2004). Where training is ineffective, teachers may not be able access to ICT resources.

Lack of accessibility to the ICT Infrastructure: The various research studies indicated several reasons for the lack of access to technologies. In Sicilia's study (2005), teachers complained about how difficult it was to always have access to computers. The author gave reasons like "computers had to be booked in advance and the teachers would forget to do so, or they could not book them for several periods in a row when they wanted to work on several projects with the students" (p. 50). In other words, a teacher would have no access to ICT materials because most of these were shared with other teachers. According to Becta (2004), the inaccessibility of ICT resources is not always merely due to the non-availability of the hardware and software or other ICT materials within the institution. It may be the result of one of a number of factors such as poor organization of resources, poor quality hardware, inappropriate software, or lack of personal access for teachers (Becta, 2004). The problem related to the accessibility of new technologies for teachers are widespread and differ from country to country and institutions to institutions. Empirica's (2006) European study found that lack of access is the largest problem

and that different problems to using ICT in teaching were reported by teachers, for example lack of computers and lack of adequate material. Similarly, Korte and Hüsing (2007, p.4) found that in European institutions there are some infrastructure problems such as broadband access.

They concluded that one third of European institutions still do not have broadband Internet access. Pelgrum (2001) explored practitioners' views from 26 countries on what were the main obstacles to the implementation of ICT in technical and higher educational institutions.

He concluded that four of the top ten problems were related to the accessibility of ICT. These problems were insufficient numbers of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient simultaneous Internet access. Toprakci (2006) found that low numbers of computers, oldness or slowness of ICT systems, and scarcity of educational software in the institution were problems to the successful implementation of ICT in Turkish institutions. Similarly, Al-Alwani (2005) found that having no access to the Internet during the institution day and lack of hardware were impeding technology integration in Saudi institutions. Recent research on Syrian institutions indicated that insufficient computer resources were one of the greatest obstacles to technology integration in the classroom (Albirini, 2006).

According to Balanskat et al. (2006), the accessibility of ICT resources does not guarantee its successful implementation in teaching, and this is not merely because of the lack of ICT infrastructure but also because of other problems such as lack of high quality hardware, suitable educational software, and access to ICT resources. Newhouse (2002) asserts that poor choices of hardware and software and lack of consideration of what is suitable for classroom teaching are problems facing many teachers. Similarly, Cox et al. (1999) found that the majority of teachers agreed that insufficient ICT resources in the institution and insufficient time to review software prevent teachers using ICT. According to Osborne and Hennessy (2003), the limitations on

access to hardware and software resources influenced teachers' motivation to use ICT in the classroom.

Lack of available technical support to Computer-Using Teacher in the institutions: Without both good technical supports in the classroom and whole-institution resources, teachers cannot be expected to overcome the problems preventing them from using ICT (Lewis, 2003). Pelgrum (2001) found that in the view of technical and higher educational institution teachers, one of the top problems to ICT use in education was lack of technical assistance. In Sicilia's study (2005), technical problems were found to be a major barrier for teachers. These technical problems included waiting for websites to open, failing to connect to the Internet, printers not printing, malfunctioning computers, and teachers having to work on old computers. "Technical problems impeded the smooth delivery of the lesson or the natural flow of the classroom activity" (Sicilia, 2005, p. 43). Korte and Hüsing (2007) argued that ICT support or maintenance contracts in institutions help teachers to use ICT in teaching without losing time through having to fix software and hardware problems.

The Becta (2004) report stated that "if there is a lack of technical support available in institution, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns" (p. 16). Many of the respondents to Becta's survey (2004) indicated that technical faults might discourage them from using ICT in their teaching because of the fear of equipment breaking down during a lesson.

In ICT teaching, several studies indicated that lack of technical support is a main problem to using technologies. According to Gomes (2005), ICT integration in teaching needs a technician and if one is not available the lack of technical support can be an obstacle. In Turkey, Toprakci

(2006) found that the lack of technical support was one of two significant problems to the integration of ICT into teaching-learning education in institutions and might be considered “serious”. In Saudi Arabia, science teachers would agree to introduce computers into classroom teaching, except that they believe they will encounter problems such as technical service or hardware problems (Almohaissin, 2006). Sicilia (2005) argued that whatever kind of technical support and access teaching staff have and whether they have twenty years of experience or are novices to the profession, technical problems generate barriers to the smooth delivery of ICT lessons by teachers.

Although lack of technical support can prevent teachers from successfully integrating ICT into education, recent research indicates that in some countries (such as the United Kingdom, the Netherlands, Latvia, Malta and the Czech Republic), institutions have recognized the importance of technical support to assist teachers to use ICT in the classroom (Korte and Hüsing, 2007).

In general, several studies have identified a range of the following or similar factors as widespread problems: lack of computers, lack of quality software, lack of time, technical problems, teachers’ attitudes towards computers, poor funding, lack of teacher confidence, resistance to change, poor administrative support, lack of computer skills, poor fit with the curriculum, lack of incentives, scheduling difficulties, poor training opportunities, and lack of skills in how to use ICT in classroom teaching-learning in technical and higher educational institutions.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Design of the Study

This chapter presents the method and procedure used in conducting the study. The researcher used descriptive and quantitative method.

3.2 Population

The population of the study comprised of teachers and administrators of the five (05) identified institutions in Uganda who participated in delivering their views about the problems teachers are facing in the use of ICT in classroom teaching-learning process. The following table shows the distribution of population from the five selected institutions in Uganda.

Table 3.1: Distribution of Population from the Five Selected Institutions

Institutions	Number of Teachers	Number of Administrators	Total Population
Islamic University in Uganda (IUIU)	250	70	320
Nile University	200	50	250
Mombasa Polytechnic	165	35	200
IMSAT	100	25	125
Elgon Technical	85	20	105
Total Population	800	200	1000

3.3 Sampling

The researcher used sample of 150 teachers and 75 administrators from the five (05) selected technical and higher educational institutions in Uganda who participated in giving their views about the problems faced by the teachers in using ICT in classroom teaching-learning process. The researcher used stratified random sampling technique for selecting the sample size and

collected the data from two proportional groups (strata) based on the criteria of profession-teachers and administrators. The researcher used the following formula for sample estimate to determine the sample size for each five (05) selected Institutions:

—

Where:

: Sample size estimated. Proportion

h : The number of strata in the population

: The number of observations in stratum of the population

: The total number of observations in the population

: The true proportion in stratum h of the population

The following table shows the proportion of the teachers taken as sample by the above formula-

Table 3.2: Details of the Sample Size for the Teachers

Institutions	Total of teachers	—	Sample Size ()
Islamic University in Uganda	250	= 250/800*150	47
Nile University	200	= 200/800*150	37
Mombasa Polytechnic	165	= 165/800*150	31
IMSAT	100	= 100/800*150	19
Elgon Technical	85	= 85/800*150	16
Total Population	800	= 800/800*150	150 Teachers

The same procedure was applied to administrators.

Table 3.3: Details of the Sample Size for the Administrators

Institutions	Total of Administrator	—	Sample Size ()
Islamic University in Uganda	70	= $700/200*75$	26
Nile University	50	= $50/200*75$	19
Mombasa Polytechnic	35	= $35/200*75$	13
IMSAT	25	= $25/200*75$	9
Elgon Technical	20	= $20/200*75$	8
Total Population	200	= $200/200*75$	75 Administrators

3.4 Tools of Research

The researcher used questionnaire for gathering information regarding the opinions of teachers and administrators about the problems teachers are facing using ICT in the teaching-learning process. The questionnaires involved both structured and unstructured questions. The questions were emerged from the current problems faced by teachers. There were two questionnaires designed for gathering data from teachers and administrators of the technical and higher educational institutions for quantitative analysis. The questionnaires were developed by the researcher under a close guidance of the supervisor and co-supervisor. The questionnaires were validated with expert's opinions. The experts were requested to provide their views and opinions on the different aspects of the questionnaires. The validity of the questionnaires were confirmed through expert's opinions, the questionnaires were analyzed and modified. The modifications were done by making small changes for better explanation of some terms.

The questionnaire had mainly two parts the first part contained direct questions with yes/no and multiple choices answer and sometimes it requires teachers' and administrators' views and ideas of the respondents for qualitative analysis. The second part contained the questions regarding

the opinions of the respondents on different aspects of ICT used in their institutions which were to be answered on five point's Likert type scale. The questionnaires were written in simple language for easy understanding and to avoid ambiguity.

3.5 Data Collection Procedure

Data were collected mainly through volunteers whom the researcher knew very well and were willingly to help in carrying out the questionnaires to the respondents to various institutions and other questionnaires were mailed directly to the respondents whom the researcher had a contact with, especially the Principals and Directors of the institutions and the respondents mailed back the questionnaires. The questionnaires were mailed to the volunteers of those selected technical and higher educational institutions and were asked for their help in distributing the questions and also the researcher helped the volunteers by clarifying some of the points which were not clear in order for the volunteers to provide the necessary guidance to the respondents on the point that were not clear to them.

The researcher also responded to the respondents through phone by calling the volunteers of the different institutions regarding teachers' and administrator's responses in order to mail back the available questionnaires for analysis. The instructions about the questionnaires were very clear. The researcher also got some responses of the principals through mobile contact to whom the researcher had known before in order for clarification if they needed it. The helping teachers administered the questions and were able to respond positively towards the questionnaires.

3.6 Techniques of Data Analysis

Chi square test and weighted average using SPSS (Statistical Package for Social Science) software version 15.0 Evaluation production mode were used to analyze and interpret the data. The data from the questionnaires were tabulated in the form of the frequencies and percentages. Weighted average and chi-square test were calculated from the raw data gathered in the last part of the questionnaires.

Chi square test was used in finding out whether the opinions of the respondents were statistically significant or not. The significant value was compared with the critical value at 0.05 levels.

Table 3.4: Interpretation of the Weighted Average

Weighted Average	Weighted Average Interpretation
Weight Average ≥ 4.5	Very high
4.5 $WA \geq 3.5$	High
3.5 $W.A \geq 2.5$	Moderate
2.5 $W.A \geq 1.5$	Low
1.5 $W.A \geq 0$	Very low

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the analysis and interpretation of data. The data from the questionnaires were tabulated in the form of the frequencies and percentages. Separate tables and graphs were drawn for different parts of the questionnaires. Each table and graph was followed by its interpretation.

A quantitative approach using different statistical method was used for analyzing the data collected from the structured questionnaire.

Weighted average and chi-square test were calculated from the raw data gathered in the last part of the questionnaires where researcher made comments to provide a clear, meaningful and sense-making interpretation.

4.2 Present Status of the Technical and Higher Educational Institutions

The five technical and higher educational institutions were undertaken for this study.

The following table shows the overall ICT status of the five institutions.

Table 4.1: Overall ICT Status of the Five Institutions

ICT Equipments	IUIU	Nile University	Mombasa Polytechnic	IMSAT	Elgon
OHP (Over Head Projector)	5	2	2	1	1
Computer lab	10	5	5	2	3
Computer	350	200	170	75	50
Multi-media projector	20	10	3	2	1
Printer	10	5	2	1	1
Scanner	5	2	1	1	1
Digital camera	5	1	1	1	0

Television	5	2	2	0	0
Lab cleaning tool	2	1	1	1	1
Local Area Network (LAN)	3	1	1	1	1
Interactive whiteboard	20	10	3	2	1
Laptop	5	2	1	2	1
Projector Pointer	5	2	1	1	1
Lab maintenance tool kit	5	1	1	1	1
Cisco switch	10	2	1	1	0
Router	10	1	1	1	0
Programmable calculator	10	2	1	1	1
Photo copy	5	1	1	1	1

From table 4.1, the overall ICT status of the five institutions is clearly viewed and it states that the present ICT status is not up to date to fulfill the institutional demands as each of the institutions run with more than thousand students including many teachers and administrators.

To consider the main indicator of ICT, there is lack of inadequate computers in the computer laboratories to fulfill the demands of the institutions as well as students at large. Only Islamic University in Uganda has 350 computers which is more than 200, whereas Nile University has 200, Mombasa Polytechnic 170, IMSAT (Institute of Management Science and Technology) has 75, and Elgon technical has only 50 computers.

Another main indicator of ICT is the unstable/unreliable internet, which is very much limited to use for the teachers and students and most of the time the network is slow and at times off.

The Multi-media projector, printers, software problem, scanner and photo copy are not much available for access for the teachers and students as their numbers are very less.

4.2.1 The Existing Technologies of Teaching-Learning Aids and their Usage

Table 4.2 below shows the opinion of the administrators on the proper use of existing technology utilized by teachers/lecturer in their teaching-learning process.

Table 4.2: Administrators Opinion Regarding the Use of Technologies of Teaching-Learning Aids
(Figures in the parenthesis indicate percentages)

Existing Technology	Administrators Opinion	IUIU	Nile University	Mombasa Polytechnic	IMSAT	Elgon	Total
Proper use of Existing technologies	Yes	16 (61.5)	14 (73.7)	8 (61.5)	3 (33.3)	4 (37.5)	45
	No	10 (38.5)	5 (26.3)	5 (38.5)	6 (66.7)	4 (62.5)	30
Availability of ICT Teaching-Learning Aids	Yes	16 (61.5)	13 (68.4)	7 (53.9)	4 (44.4)	2 (25)	42
	No	10 (38.5)	6 (31.6)	6 (46.1)	5 (55.6)	6 (75)	33

Table 4.2 reveals that most of the administrators of the three institutions IUIU, Nile University and Mombasa Polytechnic were in a view that the existing technology of teaching-learning is properly used by teachers/lectures. The administrators of IMSAT and Elgon institution said that the existing technology is less used because most of the teachers/lecturers have inadequate training to manage the ICT skills in teaching-learning process.

Whether the teaching-learning aids are available in the institution or not, a question was raised to administrators regarding the availability of ICT teaching-learning aids in their institution.

According to the table 4.2 above, the administrators of IUIU, Nile University and Mombasa Polytechnic agreed that they have enough computers to meet the demands of the institution exclusion of the two institutions IMSAT and Elgon technical which says that there is inadequate funds to purchase computers to meet the need of the institution.

4.2.2 Opinion of Administrators on Teacher's Skills Improvement for Effective Teaching

A question was asked to the administrator whether teachers/lecturers have enough skills to use the existing technology.

Figure 4.1: Skill Improvement of the Teachers for Effective Teaching

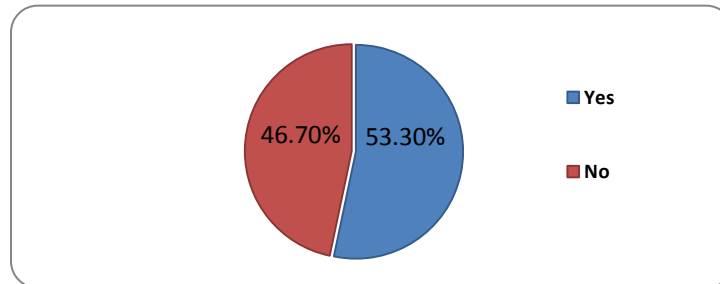


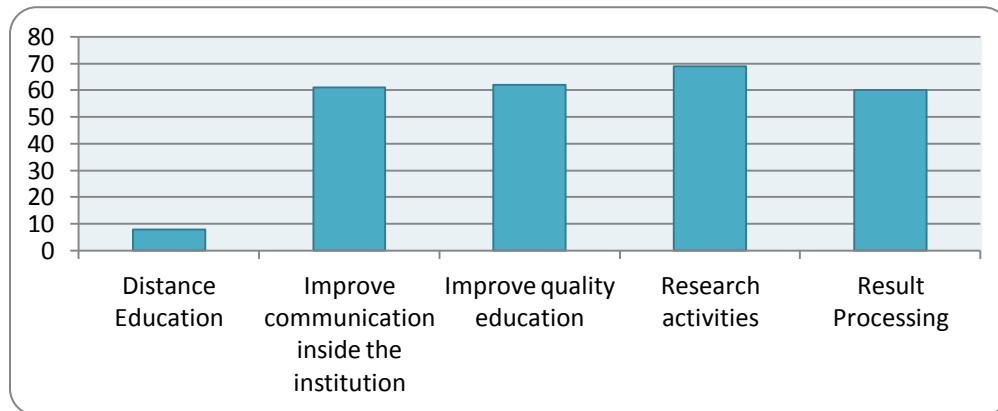
Figure 4.1 reveals that 53.3 % of the administrators were sure about the need and importance of ICT training programme for the teachers and staff of the institution. Therefore the researcher concludes that there is need for the ICT training programme for the teachers in order to have ICT skills in their effective teaching-learning process. An initiative is required for the first step to be given the proper training to the teachers on ICT skills.

Only 46.7% of the administrators are against the need and importance of ICT training noticing that the teachers were skilled enough to use the ICT materials for making the teaching effective in the classroom situation. One of the problems is that there are few equipment which are rarely used by the students and the teachers are reluctant in the use of those materials. Also there is lack of constant maintenance of the equipment and lack of motivation by administrators towards teachers to encourage them to use these equipments in teaching-learning process.

4.2.3 Opinion of the Administrators about the Use of Local Area Network

A question was raised to the administrator's about the difference the LAN made in their organization with regard to overall educational process. Figure 4.2 clearly indicates the differences that the LAN made in the various institutions.

Figure 4.2: Usage of LAN



Institutions have varying usage for the Internet, and this is usually determined by their core values and activities. Figure 4.2 depicts Internet usage by administrators of the institutions.

It is clear that most administrators use the Internet mainly for research activities inside the institution, quality education, communication within the institution and result processing.

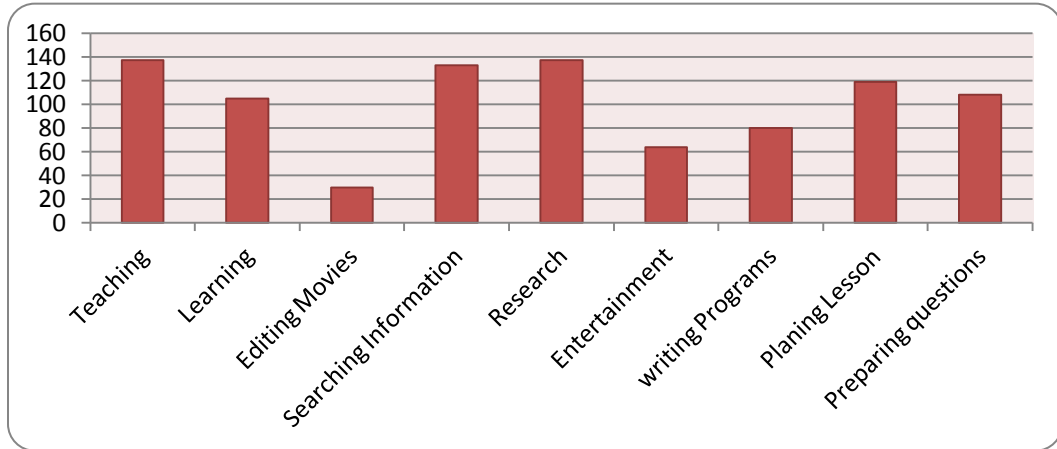
The least number of respondents says that distance education is not mostly used in their institutions because they do not have the requirements to facilitate the students and the teacher.

The researcher therefore conclude that there is need for institutional administrators to purchase the requirements that can enable them to offer distance education in their institution in order to improve the effective use of ICT in teaching-learning process.

4.2.4 Teachers Opinion about the Purpose of Using the Computers

Multiple answers were chosen from the respondents concerning the purpose of using computers by the teachers.

Figure 4.3: Purpose of Using Computers



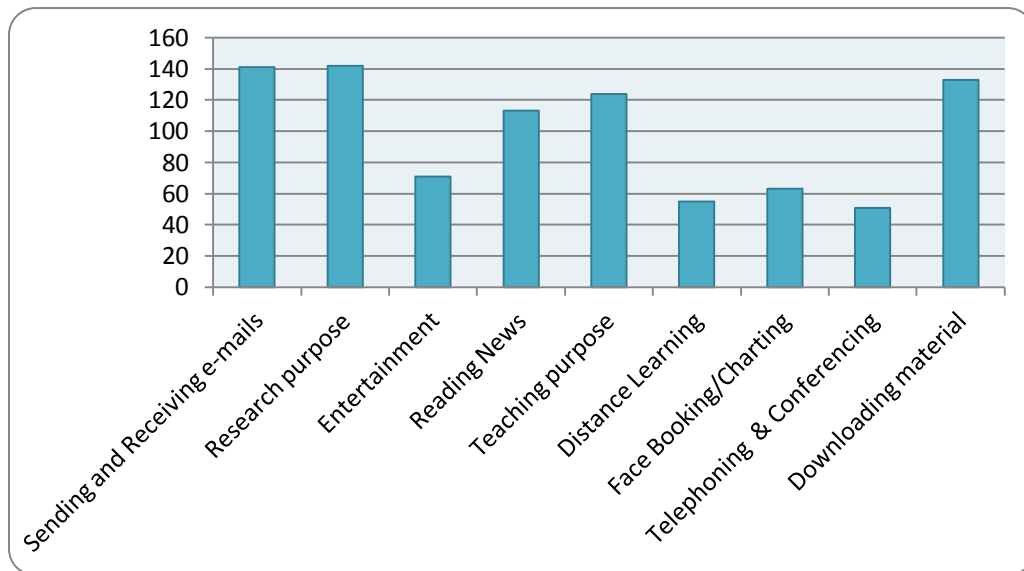
The computers support different functions, and in the process improve effectiveness in teaching-learning process. Figure 4.3 depicts how computers are used by most of the teachers.

Despite the fact that computer diffusion has been there for a long time, its usage is still minimal in most institutions. While a large majority of the teachers use computers for teaching and research purpose, searching for information, planning their lesson, preparing questions and assessment to students, learning purpose, writing computer programs. The least number of the teachers use computers for entertainment and for editing movies which indicates that they have less time for funs. The smaller institutions are still lagging due to limited technical capacity and resources to understand, adopt and invest in computer usage. Teachers needs to involve much of their time in adopting the skills of using the computers in order to gain more experiences as they consider how to best present curricula content in ways that are meaningful to learners.

4.2.5 Teachers Opinion about the Purpose of Using the Internet

Multiple answers were chosen from the respondents for the purpose of using internet

Figure 4.4: Purpose of using Internet



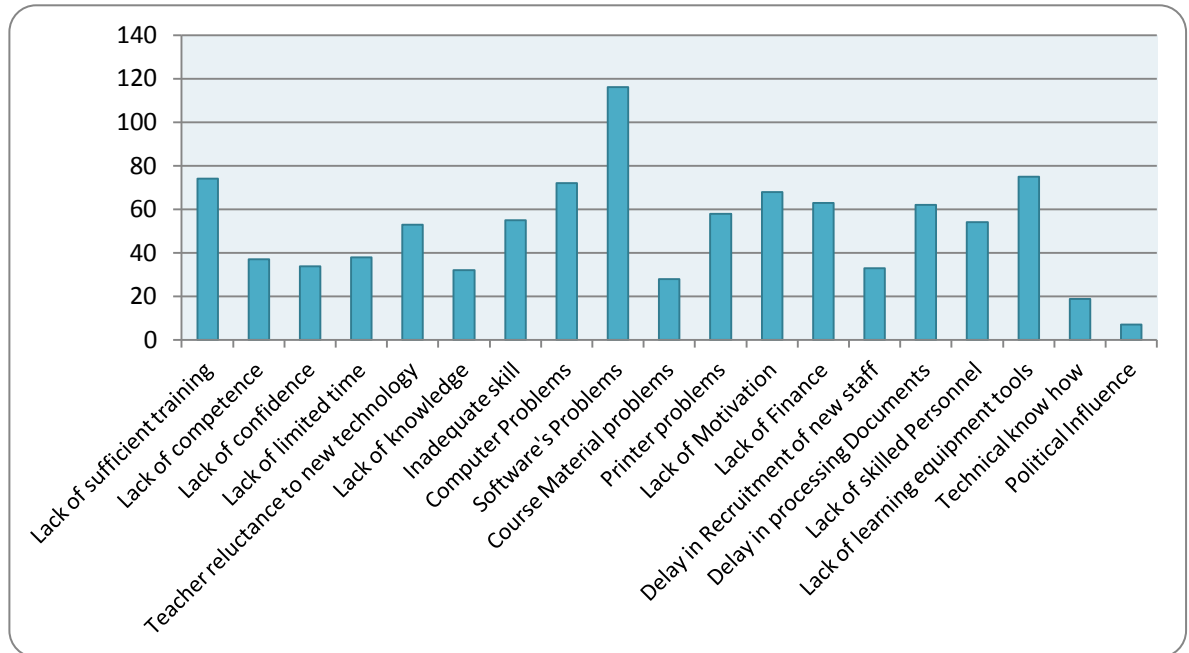
The internet is changing the way teachers effectively teach in the classroom situation. Some teachers embrace the internet technology very seriously, while others take it lightly due to lack of appreciation of its benefits. Figure 4.4 clearly depicts the usage of internet by different teachers. The majority of teachers used internet for research purpose in sending and receiving e-mails, downloading teaching-learning materials, teaching purpose, reading news, entertainment, face booking/charting with their friends, distance education and telephoning over the internet or video conferencing in order to social network with different people in the global.

4.2.6 Factors that make Difficulties in the Use of ICT in Teaching-Learning

With respect to barriers to computer and ICT usage, figure 4.5 below reveals that no factor has the supreme majority for limiting the use of ICT in teaching-learning process in technical and

higher educational institutions in Uganda. This means all factors depicted below have the greater role for limiting the use of ICT in educational institutions in Uganda.

Figure 4.5: Factors that limit the Use of ICT in Teaching-Learning Process



However, according to the figure 4.5, the researcher categorizes the problems into three levels.

a) top level, b) middle level and the c) lower level problems and these problems are analyzed below-

- a) In the top level problems the researcher identifies lack of software, lack of sufficient training, lack of learning equipments and computer problems.

Lack of software problem: It is one of the major factors that make difficulties in use of ICT. There are unreliable and pirated software's that had been frequently changed in the computer labs which were difficult to use properly in teaching-learning process. And in majority cases it had been found that the ICT facilities are limited to use for both the teachers and students and they had to share the facilities with other teachers.

Lack of sufficient training: Most of the teachers lack the skill to use the ICT in teaching-learning process because they did not get enough training opportunities. Teachers in the use of ICTs in a classroom environment were rarely seen as most of them were reluctant to use the new technology in the classroom situation. New technologies need to be integrated in the classroom and teachers have to be trained in the use of these particular ICTs. In this regard some initial training is needed for teachers to develop appropriate skills, knowledge, and attitudes regarding the effective use of computers to support learning.

Lack of learning equipment tools and resources: It was found that most of the institutions had computers. But the computers were very few and most of the time they were being used by students who were offering computers science and IT leaving the rest of the students and teachers in dilemma. In other words, a teacher would have limited access to ICT materials because most of these were shared with both students and other teachers. Teachers identified lack of insufficient numbers of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient simultaneous internet access as the main obstacles to the implementation of ICT in educational institutions.

- b) In the mid-level problems, the researcher identified teachers reluctant to new technology, lack of motivation, lack of finance, delay in processing documents, lack of skilled personnel and lack of limited time.

Teachers' reluctance to new technology: One of the problems in the implementation of computers is teachers' acceptance, which is in turn influenced by their attitudes towards these media. Teachers' attitudes have been found to be major predictors of the use of new technologies in instructional settings; the successful use of new technology in the classroom depends largely

on the teachers' attitudes toward these tools. In fact, teachers' attitudes towards computers affect their use of computers in the classroom and the likelihood of their benefiting from training.

Lack of skilled personnel: It has been observed that the teachers were lacking in the knowledge and skills; and they were reluctant about the changes and incorporation of extra learning associated with computers into their teaching practices. According to the findings, teachers who do not use computers in classrooms claim that "lack of skills" is a constraining factor preventing them from using ICT. It was also found that teachers' lack of knowledge and skills is a serious obstacle to using ICT in technical and higher educational institutions.

Lack of limited time: The research findings reveals that many teachers have skills in using computers in the classroom, but they still make little use of technologies because they do not have enough time. A significant number of teachers identified time limitations as one of the difficulties in scheduling enough computer time for classes as a problem in their use of ICT in their teaching-learning.

- c) In the lower level problems, the researcher identified lack of confidence, lack of knowledge, course material and political influence.

Lack of confidence: One of the problems that prevent teachers from using ICT in their teaching is lack of confidence. The researcher investigated the reasons for teachers' lack of confidence with the use of ICT and found that due to 'fear of failure' many teachers do not consider themselves to be well skilled in using ICT in front of a class.

Lack of knowledge: Another problem, which is directly related to teacher confidence, is teachers' lack of knowledge in integrating ICT into pedagogical practice. The research revealed that teachers' lack of knowledge and skills is a serious obstacle to using ICT in teaching-learning process.

4.3 Analysis Based on Likert Type Scale

From table 4.3 given below, around 48.7 % of the teachers think that they can use the ICT very well in the teaching-learning process with sound confident and 51.3% of the teachers said that they are skilled enough to use ICT in the teaching-learning process. That's why the weighted average of the teachers shows high confidence of 4.49 about the use of ICT in the teaching-learning process which is neither uncertain nor poor. The chi square value is 0.744 which is greater than critical value 0.05 which means null hypothesis is accepted and the opinion of teachers were rejected which is statistically insignificant because most of the teachers lack skill in using the ICT in the classroom teaching-learning process.

Table 4.3: Present Condition of the Institution in Terms of ICT Service

(Figures in the parenthesis indicate percentages)

Questions	Opinion	Very Well	Well	Uncertain	Poor	Very Poor	WA	(Sig. value)
How well do you think that ICT system will be managed by your institution if it is introduced?	Teachers	73 (48.7)	77 (51.3)	0 0	0 0	0 0	4.49	.744
	Administ rators	13 (17.3)	44 (58.7)	18 (24)	0 0	0 0	3.93	.000
Overall opinion of the quality of ICT service that your institution receives up to now.	Teachers	8 (5.3)	59 (39.3)	81 (54.0)	2 (1.3)	0 0	3.49	.000
	Administ rators	0 0	35 (46.7)	40 (53.3)	0 0	0 0	3.47	.564

While on the side of administrators the weighted average of 3.93 is moderate which means their confidence in managing their institution depends upon the ICT skills of the teachers and the chi square shows 0.00 which is less than the critical value 0.05 meaning null hypothesis is rejected and accepts the administrators opinions as statistically significant.

Over 50% of the teachers and the administrators were in a view that the quality of ICT service they receive in their institutions were somehow average because of the many factors that were discussed earlier about the difficulty in the use of ICT in teaching-learning process such as lack of skilled personnel, teachers' reluctant to new technology and lack of sufficient training.

The weighted average value of 3.49 and 3.47 about the quality of ICT services received in the institution is moderate while the chi square value of the teachers is 0.00 which is less than the critical value of 0.05 meaning the null hypothesis is rejected and the opinions are accepted which is statistically significant. While the chi square value of 0.564 concerning opinion of the administrators is greater than critical value 0.05 which means it is rejected and the null hypothesis is accepted and is statistically insignificant.

Table 4.4: Teachers Opinion about the ICT Existence in Teaching-Learning Process

(Figures in the parenthesis indicate percentages)

Questions	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	WA	(Sig. value)
Do you think the existing audio visual aids are properly used for teaching-learning purpose?	0 0	83 (55.3)	37 (24.7)	30 (20)	0 0	3.35	.000
ICT tools are technically too complicated to use	5 (3.3)	27 (18)	34 (22.7)	57 (38)	27 (18)	2.51	.000
Proper ICT training related to teachers effective teaching.	107 (71.3)	43 (28.7)	0 0	0 0	0 0	4.71	.000

Regarding the proper use of the existing audio visual aids, table 4.4 reveals that 55.3% of the teachers agreed with the statement. The weighted average of 3.35 is moderate while the chi square value of 0.00 is less than critical value 0.05 which means that teachers opinions regarding proper use of the audio visual aids in the teaching-learning process is accepted and statistically significant and the null hypothesis is rejected.

However regarding the complication on the use of ICT tools in teaching- learning process, table 4.4 depicts that 38% of the teachers disagreed with the statement that ICT tools are complicated to be used in teaching-learning process. The weighted average value of 2.51 indicates low opinions of the teachers regarding ICT tool complication while the chi square value of 0.00 is less than critical value 0.05 which means the null hypothesis is rejected and the teacher's opinions are accepted which is statistically significant. Teachers have sufficient knowledge in the use of ICT in classroom teaching-learning but they lack the resources that are required in the classroom laboratories for effective teaching and practical demonstration to student.

While regarding the teachers getting proper ICT training related to their teaching, table 4.4 reveals that 71.3% of the teachers strongly agree with the statement. That's why the weighted average of 4.71 indicates very high confidence towards proper ICT training related to teacher's effective teaching while the chi square value of 0.00 is less than the critical value 0.05 which means the opinion of teachers regarding proper ICT training is accepted which is statistically significant and the null hypothesis is rejected.

Table 4.5: Opinions of Administrators Regarding ICT Services in the Institution

(Figures in the parenthesis indicate percentages)

Questions	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	WA	(Sig. value
How well do you think that teachers can make the best use of ICT?	26 (34.7)	44 (58.7)	5 (6.4)	0 0	0 0	3.96	.000
The availability of ICT staff with technical skill.	4 (5.3)	44 (58.7)	5 (6.7)	0 0	22 (29.4)	3.40	.000
The availability of up-to-date ICT equipments and resources.	5 (6.7)	57 (76)	0 0	0 0	13 (17.3)	3.72	.000

From table 4.5, 58.7 % of the administrators agreed that teachers can make the best use of ICT in their institutions. That's why the weighted average of 3.96 shows high confidence towards the teacher's best use of the ICT while the chi square value of 0.00 is less than the critical value of 0.05 means null hypothesis is rejected and the administrators opinions are accepts which is statistically significant.

Regarding the availability of ICT staff with technical skill, table 4.5 reveals that 58.7% of the administrators agreed with the statement. That's why the weighted average of 3.40 is moderate while the chi square value of 0.00 is less than the critical value of 0.05 means the null hypothesis is rejected and the opinions of administrators regarding the availability of ICT staff with technical skill are accepted which is statistically significant. Therefore teachers' need to utilized the resources availability and be prepared well before joining the teaching profession.

However on the availability of up-to-date ICT equipments and resources, table 4.5 reveals that 76% of the administrators agreed with the statement. That's why the weighted average of 3.72 indicates high confidence while the chi square value of 0.00 is less than the critical value of

0.05 means we reject the null hypothesis and accept the opinions of the administrators which is statistically significant. Plan to provide multiple incentives such as workload reduction, recognition and reward in faculty evaluations, increased research allocations to encourage use of ICT in teaching, and compensation for those providing educational or technological assistance to others.

4.4 Constraints of Using ICT in Educational Institutions

The respondents expressed their opinions in some open ended questionnaires, where many factors that limit the use of ICT in the educational institutions, that seem to be noteworthy to a meaningful conclusion for this study. It has been found that there are many barriers related to teachers and administrators.

4.4.1 Constraints Related to the Teachers

Many teachers who wanted to use computers for teaching-learning purpose said that there were inadequate computers in the classrooms. However the content of the programmes are appropriate but resource material required to teach the courses both in soft and in hard form needs to be available to assist the students. More computers should be procured and laboratories established so that teachers and students can easily get access to use the facilities. It is found that though the numbers of computers at the institution are less and due to their own initiative some teachers use their own personal laptops for better teaching-learning. Many teachers claim that if facilities are available then they can use those facilities and some are really ready to do so. Low internet speed, lack of computers skills, virus threat, lack of proper training, lack of skilled personnel, software problems, power problems, lack of motivation to encourage the use of ICT from the administration side, shortage of training, shortage of proper equipments and

delay to purchase of equipments are the remarkable causes that makes difficulty in the use of ICT in the teaching-learning process.

There is need for more practical courses to be given to students than theory. Availability of resources such as projectors, white boards and many others need to be put in all lecture rooms. Lecturers need to be provided with computers for planning their lessons in order to make the best use of the ICT in teaching-learning process. Some software's are very complicated to be used by some of the teachers/lecturers who have limited skills of the ICT usage. Hence appropriate training should be frequently provided. Lack of motivation on students is also a significant factor to limit the use of ICT. Students are reluctant to use the online resources to help them in the academic process. Some students are weak and do not want to practice using computers.

Excessive course load was given to teachers due to the shortage of teachers. It is found from the structured question that most of the teachers had excessive class loads and were approximately over 30 hours per week which put much pressure on the teachers. Though some of the teachers expressed interest on the use of ICT in preparing their teaching-learning materials but due to the excessive teaching load they do not get enough time to do that. Due to circumstance they feel depressed about the use of ICT.

The other great reason behind the failure of teachers in the use of modern technology for effective teaching-learning process is that of job dissatisfaction. Their initiative, creativity and inventiveness become indolence because of job satisfaction. Many teachers of these institutions are of the same status and are unhappy with their salary position as they have not been getting

any promotion for a long period of time due to wrong policies in the educational institutions and due to personal wrath of some administrators. As the teachers are very upset about their job career, they are not motivated to do any new changes in the institution.

4.4.2 Factors Related to Administrators

Many institutions in Uganda are lacking in ICT materials and well skilled professional instructors literally conversant with the use of ICT in teaching-learning process.

Poor network providers, unreliable and slow internet speed are some barriers that make difficulties to use ICT and hence affect the teaching-learning process. For example handling programmes like CISCO which requires constant network stability. Unreliable power supply and too much of power fluctuation also interrupts the teaching-learning process and it is worse to the students especially when it comes to practical lesson. It was also found that the lack of proper knowledge on the importance of using ICT by administrators is one of other factors that limits the use of ICT.

Table 4.6: Possible Implications for Administrators and Teachers for the Integration of ICT into Teaching-Learning Process

Problems	For Administrators	For Teachers
Lack of genuine software	Purchase of more genuine software's which is user friendly and can last for a longer period without any change	Updating softwares at a regular interval for secured usage
Lack of technical support	Providing continued technical support	Ease of accessing those available support provided by the administrators
Unstable and unreliable internet	Purchase high bandwidth of internet with high speed	Provide teachers with easy accessibility to internet
Resistance to change	Provide training in new pedagogical approaches	Being open minded towards new ways of teaching and adapt with new changes

Lack of ICT equipment	Providing ICT resources including hardware and software	Taking advantage of resources offered at educational institutions
Lack of available time	Providing sufficient time: reducing the administrative loads and course loads to the teachers	Acquiring skills of self-organization and time managements
Lack of training expertise in ICT tools usage	Providing training courses in dealing with the new devices, modern technologies, and new pedagogical approaches	Taking up opportunities for training offered at institutions Knowing how to access to resources

4.4.3 Other Remarkable Constraints

In general, several other barriers have been identified by the respondents. Among them a range of the following factors: teachers' attitudes towards computers, poor funding, lack of teacher confidence, poor administrative support, lack of computer skills, poor course curriculum, lack of incentives, scheduling difficulties, lack of training opportunities, and lack of skills in how to integrate ICT in education.

Teachers need to take advantage of ICT resources offered at schools. They need to be prepared well before joining the teaching profession. Where training is absent, teachers can prepare themselves by enrolling in private sessions or by self-training. They should be open-minded towards new approaches of teaching. Where support is lacking, they need to find ways to be able to solve problems involving their use of ICT in Institutions. Finally, teachers should acquire skills of self-organization which will help them a great deal in conducting their classes when using ICT.

CHAPTER V

SUMMARY, DISCUSSION ON FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The purpose of this chapter is to identify the level of ICT use in technical and higher educational institutions in Uganda and the problems which affects the utilization of the use of ICT in educational institutions.

A simple questionnaire was designed and divided into two parts. The first part contained direct questions with yes/no and multiple choice answers and sometimes it required teachers' and administrators' opinions for qualitative analysis. The second part contained the questions regarding the different aspects of ICT use in the institutions based on five point's Likert-type scale. The validity of the questionnaires was confirmed through supervisor's opinion and the questionnaires were analyzed and modified after their opinion. Chi square test and weighted average were used to analyze and interpret the data through SPSS (Statistical Package for Social Science) software.

5.2 Discussion on the Major Findings

The purpose of this research was to find out the present and future barriers that teachers were facing in integrating ICT in their classroom teaching-learning process. This study focused on the teacher-level barriers and institutional-level barriers only. The findings reveal that teachers were willing to integrate technology into their teaching-learning process. However, even though they realize the benefits of ICT integration, a lot of teachers seem reluctant to integrating technologies. This is due to several factors that were revealed through the findings such as

software problems, lack of sufficient training, lack of learning equipment tools, teacher's reluctance to new change, lack of skilled personnel, lack of limited time, lack of confidence and lack of knowledge.

The Software problem was one of the major factors that make difficulties in use of ICT. There were unreliable and pirated software's that had to be changed frequently in the computer laboratories which really made it difficult for teachers to use the ICT properly in teaching-learning process. And in majority cases it had been found that the ICT facilities were limited to use for both the teachers and students because they had to share the facilities with other teachers.

Lack of sufficient training was another major barrier because most of the teachers did not get enough training opportunities and are lacking in skill to integrate ICT in teaching-learning process. Teachers use of ICTs in a classroom environment were rarely seen as most of them were reluctant to use the new technology in the classroom situation. New technologies need to be integrated in the classroom and teachers have to be trained to use these particular ICTs. In this regard some initial training is needed for teachers to develop appropriate skills, knowledge, and attitudes for the effective use of computers to support learning.

Lack of learning equipment tools and resources was found to be another major barrier. Most of the institutions had very few computers and those few were being used by students who were offering computers science and IT leaving the rest of the students and teachers in dilemma.

In other words, a teacher would have limited access to ICT materials because most of these were shared among students and other teachers. Teachers identified lack of insufficient numbers of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient

simultaneous internet access as the main obstacles to the implementation of ICT in educational institutions.

Teachers' reluctance to new technology was another major problem in the implementation of ICT in their teaching-learning process. Teachers' attitudes have been found to be the major predictors of the use of new technologies in instructional settings. The successful use of new technology in the classroom depends largely on the teachers' attitudes toward these tools. In fact, teachers' attitudes towards computers affect their use of computers in the classroom and the possibility of benefiting from it.

Lack of skilled personnel was another barrier. It was observed that the teachers were lacking in the knowledge and skills and they were reluctant about the changes and incorporation of extra learning associated with computers into their teaching practices. According to the findings, teachers who do not use computers in classrooms claim that "lack of skills" is a constraining factor that prevented them from using ICT. It was also found that teachers' lack of knowledge and skills is a serious obstacle to using ICT in technical and higher educational institutions.

Lack of limited time was another barrier in the integration of ICT in teaching-learning process. The research findings reveals that many teachers have skills in using computers in the classroom, but they still make little use of the technologies because they do not have enough time.

A significant number of teachers identified time limitations as one of the difficulties in their use of ICT in their teaching-learning due to excess teaching load.

Lack of confidence was another major problem that prevented teachers from using ICT in their teaching-learning process. The researcher investigated the reasons for teachers' lack of confidence with the use of ICT and found that due to 'fear of failure' many teachers do not consider themselves to be well skilled in using ICT in front of a class.

Lack of knowledge was another barrier, which is directly related to teacher confidence.

The research revealed that teachers' lack of knowledge and skills is a serious obstacle to using ICT in teaching-learning process.

It was also found that some softwares were very complicated to be used by some of the teachers/lecturers who had limited skills of the ICT in teaching-learning process. Hence appropriate training should be frequently provided. Lack of motivation on students is also a significant factor that limits the use of ICT. Students are reluctant to use the online resources to help them in the academic process. Some students were weak and do not want to practice using computers.

Excessive course load was another barrier to teachers due to the shortage of teachers. It is found from the structured question that most of the teachers had excessive class loads and were approximately over 30 hours per week which put much pressure on the teachers. Though some of the teachers expressed interest on the use of ICT in preparing their teaching-learning materials but due to the excessive teaching load, they do not get enough time to do that because they feel depressed about the use of ICT.

In general, several other barriers have been identified by the respondents. Among them a range of the factors are as follows: low internet speed, virus threat, power problems, lack of motivation to encourage the use of ICT from the administration side, teachers' attitudes towards computers, poor funding, poor administrative support, and poor course curriculum were the major remarkable barriers that makes difficulty in the use of ICT in the teaching-learning process.

One can see that it is much easier to remove barriers by resolving and reducing the reasons for the occurrence of these barriers. Educators, teachers, directors and institutional principals need to collaborate to overcome these obstacles and break down the above mentioned barriers so that a meaningful integration of ICT into teaching-learning process could be done.

Institutions need to provide training courses for teachers to gain experience in dealing with the new devices, modern technologies, and new pedagogical approaches. Technical support needs to be provided in institutions. Additionally, institutions must provide teachers with the necessary ICT resources including hardware and software. It is important for administrators to cooperate with teachers by providing sufficient time to implement new technologies in the classroom. For example, an institution can reduce the teacher's number of lessons or increase the daily lesson length.

5.3 Conclusion

Integrating Information and Communication technology (ICT) in teaching-learning processes is a time-consuming task, but one may yield valuable results. Knowing how educational technology changes teaching practices as well as the ways in which students learn, is fundamental for evaluating its effectiveness and for developing better tools. The findings of this study indicate that teachers have a strong desire for the integration of ICT into education but they encountered many barriers to it. These findings therefore have implications for training the teachers to become regular users of ICT focusing on acquiring basic IT skills. Since confidence, competence and accessibility have been found to be critical components for technology integration in institutions, ICT resources including software and hardware, effective professional development, sufficient time, proper training and technical support need to be provided to teachers. No component in itself is sufficient to produce good teaching. However, the presence of all components increases the probability of excellent integration of ICT in teaching-learning process. Therefore the training of teachers in the pedagogical issues should increase if teachers are to be convinced of the value of using ICT in their teaching-learning process.

5.4 Recommendation

One of the goals of this research was to provide recommendations with regard to the difficulties that teachers are facing in using ICT in their classroom teaching-learning process in technical and higher educational institutions in Uganda and to set a benchmark that can be used for further research and comparison between countries or regions in developing countries. In order to aid the endeavors of teachers in integrating technologies, more robust professional development programs need to be developed that would continuously provide support in order

for teachers to be able to overcome the fore mentioned problems and challenges faced when integrating the technology.

The capacity to manage technologies is a key in the usage of ICTs in educational institutions. The supply of qualified personnel in ICT remains small, and the reason for this is high labour costs. There is need for policy makers to develop policies that will increase the number of qualified ICT personnel, such as encouraging many institutions to start ICT related courses, and tertiary institutions working hand-in-hand with higher educational institutions and other stakeholders to develop an ICT curriculum that provide appropriate ICT skills relevant to the teaching and meet the current and future needs of the institutions.

The use of ICT has been hampered by the high costs of ICT equipments and software problems. Governments and donors must be encouraged to support software development activities and in particular the capacity development of skilled labours in ICT applications, and thereafter encourage institutions to adopt ICT applications in their operations. Donors and governments must promote awareness campaigns on the benefits associated with ICT and in particular ICT for the success of institutions.

In order to improve ICT facilities and the skills of teachers, the Ministry of Education should make investments, providing in-service training and providing accessibility to resources. Besides, the Ministry of Education should plan a project to provide each teacher with his/her own laptop computer. These kinds of innovations will support all teachers in Uganda to becoming competent teachers in terms of ICT usage.

Support and investment in teacher training is important for the adoption of ICT in teaching-learning process. Administrators should provide a variety of both formal and informal teacher training systems, so that trainees can take advantage of the methods which suit them best.

Nevertheless, national and international partnerships across public and private sectors need to be formed to share resources, knowledge, and experiences in providing effective and efficient ICT teacher training. International collaborations made by organizations in ICT teacher training will give advantages and benefits of using ICT to teachers in their teaching process.

Constant maintenance and service equipments tools should be put in place instead of having them in rooms when they are not working. Make Internet service providers (ISP) accountable to providing basic services. If institution pays for a monthly service, the service should be continuous throughout the month otherwise this will limit both students and lecturers access from seeking more information.

The Institutions and universities needs to expose students to more computer skills in all faculties because most students do not know how to use the computers. Simplified user manuals with diagrams should accompany with the software's to make it easy for students and teachers to learn the new technology. ICT should be fully initiated in teaching colleges and universities for all teachers and students. This can only be achieved by purchase of more computers in order to make teaching-learning interested to students and help them concentrate more on practical aspects of life rather than theoretical aspects.

The government should extend IT to lower levels like primary and secondary level. The government should also provide IT equipment so that it can encourage teaching-learning process.

The department of ICT should be in position to provide enough support in terms of software, maintenance of the systems, installation of projectors and white boards in all classrooms. This can be achieved through buying more computers, projectors and white boards and make proper use of them.

Further research in this topic is necessary as the findings were based on a relatively small sample that may have influenced the nature of results that were obtained. There is need to expand on the sample size and carry out similar research in other countries. The descriptive analysis that was used is always not sufficient to draw conclusions on a phenomenon, and to provide adequate information that can be used for policy development.

Teachers need to take advantage of ICT resources offered at institutions. They need to be prepared well before joining the teaching profession. Where training is absent, teachers can prepare themselves by enrolling in private sessions or by self-training. They should be open-minded towards new approaches of teaching. Where support is lacking, they need to find ways to solve problems involving their use of ICT in Institutions. Finally, teachers should acquire skills of self-organization which will help them a great deal in conducting their classes when using ICT.

BIBLIOGRAPHY

- Al-Alwani, A. (2005). *Barriers to Integrating Information Technology in Saudi Arabia Science Education* Doctoral dissertation, the University of Kansas, Kansas.
- Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education*, 373-398.
- Al-Oteawi, S. M. (2002). *The perceptions of administrators and teachers in utilizing information technology in instruction, administrative work, technology planning and staff development in Saudi Arabia*. Doctoral dissertation, Ohio University, Ohio.
- Almohaissin, I. (2006). *Introducing computers into Saudi Arabia secondary school science teaching: Some problems and possible solutions*. Unpublished paper.
- Almusalam, S. N. (2001). Factors related to the use of computer technologies for professional tasks by business and administration teachers at Saudi technical colleges. (Doctoral Dissertation, the Ohio State University, 2001). *ProQuest Digital Dissertations* (UMI No. AAT 3011019).
- Anderson, R. E., & Dexter, S.L. (2000). *School Technology Leadership: Incidence and Impact* (Teaching, Learning, and Computing: 1998 National Survey Report#6). Irvine, CA: Center for Research on Information Technology and Organizations, University of California, Irvine.
- Balanskat, A., Blamire, R., & Kefala, S. (2006). *A review of studies of ICT impact on schools in Europe*: European Schoolnet.
- Bangkok, U. (2004). *Integrating ICTs into Education*. Retrieved May 12, 2007, from ICT in Education: <http://www.unescobkk.org/index.php?id=1793>
- Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology using classrooms? *Computers & Education* 39, 395–414.
- Becta (2004). *The impact of information and communication technologies on learning and attainment – Full report, March 2003*. Downloaded from *pupil learning and attainment – Full report, March 2004*. <http://www.becta.org.uk/research/reports/impact2/>
- Beggs, T. A. (2000, April 9-11, 2000). *Influences and barriers to the adoption of instructional technology* Paper presented at the Proceedings of the Mid-South Instructional Technology Conference, Murfreesboro, TN.
- Bennett, C. (1996), “Schools, Technology and Educational Leadership: A Framework for Change”, *NASSP Bulletin*, Vol. 80 No. 577, pp. 57-65.
- Bennis, W. (1990). Why leaders can't lead: *The Unconscious Conspiracy Continues*. Francisco: Jossey-Bass.

- Bielaczyc, K., & Collins, A. (1999). Learning Communities in Classrooms: A Reconceptualization of Educational Practice. In: C. Reigeluth (Ed.) *Instructional-design theories and models. A new paradigm of instructional theory*, (vol. 2, pp. 269–292). Mahwah, NJ: Lawrence Erlbaum Associates.
- Benzie, D. (1995). IFIP Working Group 3.5: Using Computers to Support Young Learners. In J.D.Tinsley & T.J. van Weert (Eds.), *World Conference on Computers in Education VI: WCCE' 95 Liberating the Learner* (pp. 35-42). London: Chapman & Hall.
- Bransford, J., Brown, A. L., & Cocking, R. R. (Eds.). (2000). *How people learn: brain, mind, experience, and school* (2nd ed.). Washington, D.C.: National Academy Press.
- Cox, M., Preston, C., & Cox, K. (1999a). *What factors support or prevent teachers from using ICT in their classrooms* Paper presented at the British Educational Research Association Annual Conference. Retrieved August 2, 2008, from <http://leeds.ac.uk/educol/documents/00001304.htm>
- Dawes, L. (2001). What stops teachers using new technology? In M. Leask (Ed.), *Issues in teaching using* (pp. 61-79). London: Routledge.
- Demetriadis, S., Barbas, A., Molohides, A., Palaigeorgiou, G., Psillos, D Vlahavas, I., Tsoukalas, I., & Pombortsis, A. (2003). “Culture in negotiation”: teachers’ acceptance/resistance attitudes considering the infusion of technology into schools. *Computers & Education*, 41, 19–37.
- Desforges, C. (1995) (British Journal of Teacher Education? BERJ?
- Devos, G., Bouckenoghe, D., Engels, N., Hotton, G., & Aelterman, A. (2007). An Assessment of Well-Being of Principals in Flemish Primary Schools, 45, 33–61.
- Dillon, A., & Morris, M. G. (1996). User Acceptance of Information Technology: Theories and Models. *Annual Review of Information Science and Technology*, 31 , 3-32
- Dias, L.B., & Atkinson, S. (2001). Technology Integration: Best Practices Where Do Teachers Stand? *International Electronic Journal for Leadership in Learning*, 5(10). Retrieved July 24, 2005, from: <http://www.ucalgary.ca/~iejll/volume5/dias.html>
- Dockstader, J. (1999). Teachers of the 21st century Know the What, Why, and How of Technology Integration. *T.H.E. Journal*, 73-74., January
- Dooling, J. O. (2000). What Students Want to Learn about Computers. *Educational Leadership*, 53, 20-24.
- Drent, M., & Meelissen, M. (2007). Which Factors Obstruct or Stimulate Teacher Educators to Use ICT Innovatively? *Journal of Computers & Education*, (ARTICLE IN PRESS).

Empirical (2006). *Benchmarking access and use of ICT in European schools 2006: Final report from Head Teacher and Classroom Teacher Surveys in 27 European countries*. Germany: European Commission.

Ertmer, P. (1999). Addressing first-and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47 (4), 47-61.

Farrell, G.M. and C. Wachholz, eds. 2003. *ICT in Education: Meta-Survey on the Use of Technologies in Asia and the Pacific*. UNESCO. www.unescobkk.org/index.php?id=1225

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

Gülbahar, Y. (2005). Technology Planning: A Roadmap to Successful Technology Integration in Schools. *Journal of Computers & Education*, (ARTICLE IN PRESS)

Grabe, M., & Grabe, C. (2007). *Integrating technology for meaningful learning* (5th ed.). Boston, NY: Houghton Mifflin.

Grimus, M. (2000, 21 - 25 Aug). *ICT and multimedia in the primary school*. Paper presented at the 16th conference on educational uses of information and communication technologies, Beijing, China.

Harrison, A. W. & Rainer, R. K. (1992). The Influence of Individual Differences on Skill in End-User Computing. *Journal of Management Information Systems*, 9 (1), 93-111.

Hruskocy, C., Cennamo, K. S., Ertmer, P. A. & Johnson, T. (2000). Creating a Community of Technology Users: students become technology experts for teachers and peers, *Journal of Technology and Teacher Education*, 8, 69-84.

Iding, M., Crosby, M. E., & Speitel, T. (2002). Teachers and technology: Beliefs and practices. *International Journal of Instructional Media*, 29 (2), 153-171.

ISTE Nets Project, (2000-2002). Essential Conditions for Teacher Preparation Retrieved June 21, 2006 from http://cnets.org/teachers/t_esscond.html

Jonassen, D.H., & Reeves, T.C. (1996). Learning with Technology: Using Computers as Cognitive Tools. In D.H Jonassen (Ed.), *Handbook of research for educational communication and technology* (pp. 693-719). New York. Simon and Schuster.

Kluever, R. C., Lam T. C., Hoffman, E. R., Green, K. E., & Swearinges, D. L. (1994). The Computer Attitude Scale: Assessing Changes in Teachers' Attitudes toward Computers. *Journal of Educational Computing Research*, 11(3), 251-261.

- Koohang, A. (1989). A Study of Attitudes Toward Computers: Anxiety, Confidence, Linking, and Perception of Usefulness, *Journal of research on computing in education*, 22, 137-150.
- Korte, W. B., & Hüsing, T. (2007). Benchmarking access and use of ICT in European schools 2006: Results from Head Teacher and A Classroom Teacher Surveys in 27 European countries. *ELearning Papers*, 2 (1), 1-6.
- Lawton, J., & Gerschner, V. T. (1982). A review of the Literature on Attitudes towards Computers and Computerized Instruction. *Journal of Research and Development in Education*, 16 (1), 50-55.
- Leach, J. (2008). Do new information and communications technologies have a role to play in the achievement of education for all? *British Educational Research Journal*, 34(6), 783-805.
- Lewis, S. (2003). Enhancing teaching and learning of science through use of ICT: Methods and materials. *School Science Review*, 84 (309), 41-51
- Means, B., Olson, K. (1997). *Technology and Education Reform: Studies of Education Reform*. Washington, DC: U.S. Government Printing Office.
- National Information and Communication Technology Policy. 2003. Ministry of Works, Housing and Communications. <http://www.ucc.co.ug/nationalIctPolicyFramework.doc>
- Newhouse, P. (2002). *Literature review: The impact of ICT on learning and teaching*, Perth, Western Australia: Department of Education.
- Osborne, J., & Hennessy, S. (2003). *Literature review in science education and the role of ICT: Promise, problems and future directions*. London: Future lab.
- Özden, M. (2007). Problems with science and technology education in Turkey. *Eurasia Journal of Mathematics, Science & Technology Education*, 3 (2), 157-161.
- Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computers & Education*, 37, 163-178.
- Plomp, Tj., ten Brummelhis, A.C.A., & Rapmund, R. (1996). *Teaching and Learning for the Future*. Report of the Committee on Multimedia in Teacher Training (COMMITT). Den Haag: SDU.
- Schoepp, K. (2005). Barriers to technology integration in a technology-rich environment. *Learning and Teaching in Higher Education: Gulf Perspectives*, 2 (1), 1-24.
- Sicilia, C. (2005). *The Challenges and Benefits to Teachers' Practices in Constructivist Learning Environments Supported by Technology*. Unpublished master's thesis, McGill University, Montreal.

Strudler, N.B., & Wetzel, K. (1999). Lessons from Exemplary Colleges of Education: Factors Affecting Technology Integration in Pre-service Programs. *Educational Technology Research and Development*, 47 (4), 63-81.

Toprakci, E. (2006). Obstacles at integration of schools into information and communication technologies by taking into consideration the opinions of the teachers and principals of primary and secondary schools in Turkey. *Journal of Instructional Science and Technology (e-JIST)*, 9 (1), 1-16.

UNESCO. (2008). *ICT Competency Standards for Teachers - Implementation Guidelines, Version 1.0*. Retrieved 28th September 2009. from <http://www.unesco.org/en/competency-standards-teachers>

Watson, G. (1999). *Barriers to the integration of the Internet into teaching and learning: Professional development*. Paper presented at the Asia Pacific Regional Internet Conference on Operational Technologies.

Wong, A. F. L., Quek, C.-L., Divaharan, S., Liu, W.-C., Peer, J., & Williams, M. D. (2006). Singapore students' and teachers' perceptions of computer-supported Project Work classroom learning environments. *Journal of Research on Technology in Education*, 38 (4), 449-479.

World Almanac and Book of Facts. (2002). *Students Per Computer in U.S. Public Schools* (p. 233). New York: World Almanac Books

Yelland, N. (2001). *Teaching and learning with information and communication technologies (ICT) for numeracy in the early childhood and primary years of schooling*. Australia: Department of Education, Training and Youth Affairs.

Zhang, P., & Aikman, S. (2007). Attitudes in ICT Acceptance and use. In J. Jacko (Ed.), *Human-Computer Interaction, Part I* (pp. 1021-1030). Syracuse, NY: Springer-Verlag Berlin Heidelberg.

APPENDICES

Appendix-A

Dear Sir/Madam,

For the analysis of “A Study of Difficulties Faced by Teachers in Using ICT in Classroom Teaching-Learning in Technical and Higher Educational Institutions in Uganda”, your ideas, opinions, responses and cooperation are highly essential. These data will be used for the research purpose only and your responses will be kept confidential.

Thanking you in advance,

Part A (Questionnaire for Teachers/Lecturers)

Please some _____) in the boxes that best describe to your response. (If necessary you can use a separate sheet).

1. Name:.....

2. Designation:

<input type="checkbox"/> Teacher	<input type="checkbox"/> Teaching Assistant	<input type="checkbox"/> Assistant Lecturer	<input type="checkbox"/> Head Teacher
<input type="checkbox"/> Lecturer	<input type="checkbox"/> Head of the department	<input type="checkbox"/> Senior Lecture	<input type="checkbox"/> Lab Attendant
<input type="checkbox"/> Professor	<input type="checkbox"/> Dean	<input type="checkbox"/> Deputy Dean	<input type="checkbox"/> Technician

3. Name of the Institution:.....

4. Department:.....

5. Which of the following facilities does your institution provide to support teaching learning?

<input type="checkbox"/> Computers	<input type="checkbox"/> DVD Multimedia projector	<input type="checkbox"/> OHP	<input type="checkbox"/> whiteboard
<input type="checkbox"/> CD Writer	<input type="checkbox"/> Digital Camera	<input type="checkbox"/> Printer	<input type="checkbox"/> Television
<input type="checkbox"/> Scanner	<input type="checkbox"/> Black board	<input type="checkbox"/> Audio Tools	<input type="checkbox"/> Internet
<input type="checkbox"/> Photocopier	<input type="checkbox"/> Maintenance tools	<input type="checkbox"/> Maker	<input type="checkbox"/> Chalks
<input type="checkbox"/> If others, please specify.....			

6. For what purpose do you use computers? **(Please tick all the appropriate ones).**

- Teaching Research planning lesson
 Learning Entertainment preparing question/assessment
 Editing movies writing a computer programs
 Searching information others, please specify.....

7. Which of the following computer-related teaching learning materials have you prepared, at home, work or elsewhere? **(Please tick all the appropriate ones).**

- Lesson plan, Lectures Seminar Presentation Project Design
 Preparing questions writing a computer Program Simulation
 Student's assessment Research work Others, specify.....

8. Does your institution have internet facility to support teaching learning process?

- Yes No

9. For what purpose do you use the internet? **(Please tick all the appropriate ones)**

- Sending and Receiving e-mails Distance learning
 Research Purpose Face booking/Charting
 Entertainment Telephoning over the internet /Videoconferencing
 Reading News Downloading learning -teaching material
 Teaching Purpose if others, please specify.....

10. What are the factors that make difficulty in the use of ICT in your teaching learning process? **(Please tick all the appropriate ones).**

- Academic problems** **Resource Problems** **Administration problems**
 Lack of sufficient training Computer problems Lack of Motivation
 Lack of competence Software's problems Lack of Finance
 Lack of confidence Course materials Delay in recruitment of new staff
 Lack of limited time Printers Problem Delay in processing Documents
 Teacher reluctance to technology Political influence
 Lack of Knowledge **Technical support Problems** Lack of skilled personnel
 Inadequate skill lack of learning equipment tools
 If others, please specify Technical know how

11. What problems need to be addressed in the areas of ICT and content for teaching?

.....

12. What recommendation do you have, to make ICT more accessible to education especially in teaching-learning process in institution sectors in Uganda?

.....

Part B

Please put tick mark () expressing your opinion in the relevant figure below. The following likert type scaling gives the value of importance as given below.

	Rank	weight
Maximum	5	Very high
	4	High
	3	Moderate
	2	poor
	1	Very poor
Minimum		

1. How well do you think that ICT system will be managed by your Institution if it is introduced?

Very well 5	Well 4	Undecided 3	Poor 2	Very poor 1
-------------	--------	-------------	--------	-------------

2. How well do you think that ICT can meet the needs of your Institution?

Very well 5	Well 4	Undecided 3	Poor 2	Very poor 1
-------------	--------	-------------	--------	-------------

3. Are you satisfied with the existing teaching learning equipments (aid) of your institution?

Strongly Satisfied 5	Satisfied 4	Undecided 3	Dissatisfied 2	Strongly Dissatisfied 1
----------------------	-------------	-------------	----------------	-------------------------

4. Do you think the existing audio visual (aids) in your institution are properly used for teaching learning purpose?

Very well 5	Well 4	Undecided 3	Poor 2	Very poor 1
-------------	--------	-------------	--------	-------------

5. ICT tools are technically too complicated to use in teaching learning process.

Strongly Agree 5	Agree 4	Undecided 3	Disagree 2	Strongly Disagree 1
------------------	---------	-------------	------------	---------------------

6. If the teachers get proper ICT training related to their teaching, it can help them to teach more effectively

Strongly Agree 5	Agree 4	Undecided 3	Disagree 2	Strongly Disagree 1
------------------	---------	-------------	------------	---------------------

7. There is lack of understanding about the need of ICT training among the teachers.

Strongly Agree 5	Agree 4	Undecided 3	Disagree 2	Strongly Disagree 1
------------------	---------	-------------	------------	---------------------

8. Please give your overall opinion of the quality of ICT service that your institution receives up to now.

Excellent 5	Good 4	Average 3	Poor 2	Very Poor 1
-------------	--------	-----------	--------	-------------

Appendix-B

Dear Sir/Madam,

For the analysis of “**A Study of Difficulties Faced by Teachers in Using ICT in Classroom Teaching-Learning in Technical and Higher Educational Institutions in Uganda**”, your ideas, opinions, responses and cooperation are highly essential. These data will be used for the research purpose only and your responses will be kept confidential.

Thanking you in advance,

(Questionnaire for Administrators)

1. Name:.....

2. Designation:

Principal Deputy Principal Director Technician
 ICT Manager Head of the department Computer Lab Officer Dean/D-Dean

3. Name of the Institution:.....

4. Department:.....

Part A

Please some of the questions require text comments and others require ticks () in the boxes that best describe to your response. (If necessary you can use a separate sheet).

1. Do you have any ICT laboratories (Computer Lab) within your institution?

Yes No

2. Do you think that your institution has enough computers to meet the institutional needs?

Yes No If No, explain why.....

3. Do you think that the existing technologies of teaching-learning aids of your institution are properly used by your teachers/lecturers?

Yes No If No, explain why.....

4. Do you think that your teachers/lectures have enough skills to use ICT?

Yes No If No, please specify the reason?.....

5. Is there any training programme on ICT that has been provided to teachers/lecturers before in your institution?

Yes No If No, explain

6. Did you receive any change among your teachers/lectures after the training?

Yes No If No, explain why.....

7. What type of internet (Network) connection does your Institution/ organization has?

LAN WAN MAN

8. What difference has this network made to your organization with regard to the following?

Improve communication inside the institution Research Activities
 Result processing Distance Education
 Improve quality education others please specify.....

9. What are the problems you think are on the use of ICT in general the Institutions are facing in Uganda.

.....

10. What are the Factors Affecting Teachers' Use of (ICT) Information and communication technology in your institution?

.....

11. What recommendation do you have, to make ICT more accessible to education especially in teaching-learning process in institution sectors in Uganda?

.....

12. Does your institution have the following equipments?

Equipments	Yes	No	If Yes, how many?
OHP (Over head projector)			
Computer lab			
Computer			
Multi-media projector			
Printer			
Scanner			
Digital camera			
Television			
VCR/VCD			
Video Cassette/Audio cassette			
Lab cleaning Tool			
Internet connection			

Interactive whiteboard			
Black board			
Duster			
Laptop			
Projector Pointer			
Software applications/Programmes			
Lab maintenance tool kit			
Hardware components			
Network Tool			
Cisco switch			
router			
Cables e.g Cat5,Cat6,Fibre cable			
RJ-45			
Programmable calculator			
Photo copy			
Any other audio visual equipment			

Part B

Please put tick mark expressing () your opinion in the relevant figure below. The following likert type scaling gives the value of importance as given below.



1. How well do you think that ICT system will be managed by your Institution if it is introduced?

Very well	5	Well	4	Undecided	3	Poor	2	Very poor	1
-----------	---	------	---	-----------	---	------	---	-----------	---

2. How well do you think that ICT can meet the needs of your Institution?

Very well	5	Well	4	Undecided	3	Poor	2	Very poor	1
-----------	---	------	---	-----------	---	------	---	-----------	---

3. How well do you think that your teachers can make the best use of ICT in your Institution?

Very well	5	Well	4	Undecided	3	Poor	2	Very poor	1
-----------	---	------	---	-----------	---	------	---	-----------	---

4. The availability of ICT staff with technical skill that support your institution.

Strongly Satisfied 5	Satisfied 4	Undecided 3	Dissatisfied 2	Strongly Dissatisfied 1
----------------------	-------------	-------------	----------------	-------------------------

5. The availability of up-to-date ICT equipments and software of your institution.

Strongly Satisfied 5	Satisfied 4	Undecided 3	Dissatisfied 2	Strongly Dissatisfied 1
----------------------	-------------	-------------	----------------	-------------------------

6. There is lack of understanding about the need of ICT training among the teachers/lecturers.

Strongly Agree 5	Agree 4	Undecided 3	Disagree 2	Strongly Disagree 1
------------------	---------	-------------	------------	---------------------

7. Please give your overall opinion of the quality of ICT service that your institution receives up to now.

Excellent 5	Good 4	Average 3	Poor 2	Very Poor 1
-------------	--------	-----------	--------	-------------