ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

ASSESSMENT OF ICT IMPLEMENTATION PRACTICE IN HIGHER EDUCATION INSTITUTIONS: THE CASE OF ADDIS ABABA UNIVERSITY

BY

EDEN GOSHU

ID: SGS/0217/2011A

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A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

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APPROVED BY BOARD OF EXAMINERS

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ACRONYMS

AACEB	Addis Ababa City Education Bureau
AAU	Addis Ababa University
ICTs	Information and Communication Technologies
IT	Information Technology
ICT4E	Information and Communication Technology for Education
ICT4D	Information and Communication Technology for Development
QoS	Quality of Service
MCIT	Ministry of Communication and Information Technology
MOE	Ministry of Education

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ABSTRACT

Information and communication technologies (ICT) have become commonplace entity in all aspects of life. The purpose of this study is to assess the existing practices, challenges and prospects of ICT in Addis Ababa University. The *main research questions raised is assessment of extent of ICT implementation in the institution, based on the perceptions of students', instructors' and institutional leadership. The research utilized a quantitative research method and a descriptive survey research design was used to analyze. From available sampling methods, Proportionate sampling method was employed to determine size of each subgroup from the selected sample population. The study used both primary and secondary data sources to gather input for the study. The researcher collected data from instructors, students, institutional leaders from AAU. The major data collection instruments include Questionnaires and document analysis. The major findings of the study are lack of infrastructure and teaching learning aid shortage in the institution. This study showed additional ICT training has to be arranged to equip instructors and students with required level of operational skill. And on the other hand, there was good perception on use of ICT in educational process. Lastly, the study revealed that the implementation of ICT in Addis Ababa University is being tested with various challenges. These challenges include absence of operational design or model as well as arrangement of ICT infrastructure, lack of training for instructors and limited ICT knowledge and skills with both students and the instructors; limited technical support during teaching and learning process, and lack of proper ICT policies in AAU. There is a gap in institutional leaders owning facilitation and improvement of continuous support, monitoring and evaluation of ICT Policies. Hence, the research concluded that the inadequate practice, poor perception and the above-mentioned challenges hindered a well-versed implementation of ICT in the institution.*

Key Words: *AAU, ICT, ICT Policy, Implementation, Challenges, Prospects.*

CHAPTER ONE:

INTRODUCTION

1.1 Background of the Study

ICT implementation in higher education means teaching and learning by the use of ICT. Information and communication technologies (ICTs) are currently being used in education to assist students to learn more effectively by providing instructors with access to a wide range of new pedagogy (Harris, 2002). These technologies are also being used to enable instructors to do administrative tasks more efficiently. Information and communication technology (ICT) can complement, enrich and transform education for the better. Undoubtedly, teachers and students have benefited from the influx of information and communication technologies (ICT) as part of the pedagogical tools to make teaching and learning more interesting and relevant (Flecknoe, 2002).

The implementation of ICT infrastructures and policies of higher education institutes in both the developing and developed world have long been oriented towards teaching learning process growth, facilitation and ease of access. ICT Development is a complex phenomenon that does not fit into a neat implementation policy. (Sen, 1991) helped to create a framework for its implementation through his capability and functioning approach, which provided conceptual clarity and is also amenable to statistical comparisons. As (Sen, 1991) points out, the objective of ICT implementation in higher education institutes is to enhance the quality of teaching learning process by expanding the range of things that an individual performs as part of the curriculum policy to provide and receive a broad and balanced teaching learning process. Through such implementation it's easy to provide learning opportunities that enable all participants and to make progress. The related study by (Habib and Ghulam, 2017) stated that ICT is a very crucial resource at the 21st century teaching and learning activity in higher learning institutions. It is important to place of higher education in the context of development and to recognize the scope of ICT implementation by reinforcing the role of higher education in its development process.

Globalization and technological changes have accelerated in tandem over the past several years and have created a new global economy "powered by technology, fueled by information and driven by knowledge." The emergence of this new global economy has serious implications for the nature and purpose of educational institutions. Information and communications technologies (ICTs) have been touted as potentially powerful enabling tools for educational changes and reform.

Information and communication technology (ICT) have the potential to increase access to information; make learning available anytime, anywhere; and make learning more enjoyable for learners, thereby improving participation rates and learning outcomes. Use of ICT can also improve the quality of teaching, enable the creation of more relevant and stimulating learning materials, improve education management, enhance the provision of educational services and make such services more cost-effective. students can learn from computers where technology is used essentially as tutors to increase students' basic skills and knowledge, and second, they can learn with computers where technology is used as tools applied to a variety of goals in the learning process and being a resource to help develop higher order thinking, creativity and research skills (Resta, 2002;Olakulehin, 2007).

The Ethiopian Government also needs to pay particular attention to availability, QoS, reliability, security, and affordability of the broadband network, which is critical to national competitiveness and improved delivery of public services to citizens (Adam, 2012).

Education is fundamental for the overall development of a country. Due to this, a country invests huge capital to effectively use human resources that in turn ascertain economic and social development. And indeed, education is a major instrument that is used to develop human skills and knowledge.

According to (Todaro, 1989), states that the principal institutional mechanism for developing human skills and knowledge is the formal education system. In this regard, Information Communication Technology plays a major role.

Information and Communication Technologies' (ICTs) role is a powerful mechanism in every aspect of education: teaching and learning; teacher training, local-language instruction, monitoring and assessment of student performance, education-systems management, coaching and mentoring, and preparing students for a world in which Information and Communication Technology (ICT) is a necessity for successfully navigating their future careers and lives and contributing to their national economies.

1.2 Statement of the Problem

Lack of awareness of the benefits of ICT is a major hindrance to its adoption, especially within the education sector. ICT skills are still low in Ethiopia, which creates multiple problems of usage and utilization of ICTs.

ICT refers to technology that is used for the creation, processing, and distribution of data and information using any computing equipment and software, telecommunications, and digital electronics. ICT has become an enablement tool for any activity and business process of an organization as well as education centers (Feridun, Mete; Karagiannis, Stelios 2009).

The implementation of educational technology and the preparation and utilization of ICT is an important component. It is important to understand that computer-assisted technologies provide students with some readiness to learn, where by using ICT tools is one of the methods or materials used to bridge the existing gap and promote independent and active learning.

ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by instructors. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of learning (Moore & Kearsley, 1996). It can improve the quality of teaching-learning and thus contribute to the development of Ethiopia in the ICT as well as education sector (ICT4D) policy document. Nowhere is the ICT gap more evident than in the education system and policies.

This study assesses ICTs in supporting educational policies of Ethiopia for transforming into a knowledge and information-based society and economy. It also focusses on the benefits that ICT implementation in education system can provide, right from breaking time and distance barriers to facilitating collaboration and knowledge sharing among instructors and students.

The role of ICT in transforming teaching and learning seeks to explore how its implementation has effect on the way programs will be offered and delivered in the universities of the future. The role of the instructor is utterly critical here. Yet a primary barrier to instructors' readiness and confidence in using ICT, despite general enthusiasm and belief in benefits for learners, is their lack of relevant preparation, either initially or in-service (UNESCO-UIS, 2015). This has resulted in demonstrably low proficiency in using ICT, and a general lack of knowledge about technology in teaching and learning.

The act of implementation of ICT into teaching and learning is a complex process and one may encounter a number of difficulties. Different categories have been used by researchers and educators to classify the problems in implementation and use of ICT in higher educational institutions and several studies have divided the problems into extrinsic and intrinsic categories. (Ertmer, 2015) referred to extrinsic problems as first-order and cited access, time, support, resources and training and intrinsic problems as second-order and cited as attitude, beliefs, practices and resistance. Whereas, we saw extrinsic problems to institutions rather than individuals and intrinsic problems pertains to instructors, administrators and leadership individuals. Another perspective from the student's side is the obstacles in the use of ICT in educational institutions as pertaining to material and non-material conditions. The material conditions may be insufficient number of hardware, software and access given to them. The non-material obstacles include instructor's insufficient ICT knowledge and skills, the difficulty of integrating the use of ICT in instruction, and insufficient instruction time. However, since the purpose of the research is to find the present and future problems in implementation of ICT at institution level.

Implementing ICT in the education sector at different levels is a challenging task and failure to address the obstacles leads to a widening of the gap in knowledge between developed and developing countries. (Mikre, 2011) and (Fathima, 2013), note that the same is true in Ethiopia because ICT is not implemented and integrated as required, in the higher education or general education systems in Ethiopia. On the other hand, in the developed world ICT is contributing to the expansion of their business, education, social and other aspects of life but in the developing and underdeveloped countries the benefit of ICT is unknown and/or hardly used (Mansell, 1999). In Ethiopia, a developing country, the implementation of ICT in teaching and learning in higher learning institutions is not anywhere near the level of the developed countries, as shown in the findings of the studies cited in this paper. There is a gap suggested for the implementation of ICT into higher education pedagogical practices in Ethiopia.

The development of ICT competencies, which are part of the set of the so-called '21st century competencies', is increasingly becoming an integral part of the goals of compulsory education. However, in a knowledge economy driven by technology, people who do not master these competencies may suffer from a new form of digital divide that may affect their capacity to fully integrate the knowledge, economy and society. (Williams et-al, 2000) emphasize that appropriate training in terms of skills, knowledge, delivery, ready access to ICT resources, ongoing support and advice are essential for effective ICT implementation in teaching and learning. (Pelgrum and Law, 2003) point out access to computers, network and Internet; appropriate training of instructors, resources for ICT-based curriculum and technical support for the academic staff as essential conditions to successfully implement ICT into the teaching and learning process. The Office of Technology Assessment in (Cradler, 1995) and (Bridgforth, 2002) emphasizes that i) suiting technology to education goals and standards, ii) having a vision for the use of technology to support curriculum, iii) providing both in-service and pre-service training for instructors, ensuring access to appropriate technology, providing administrative support for technology use, allowing time for instructors to plan and learn how to implement the technology and iv) ensuring ongoing technical support are some of the requirements for effective use of technology in education.

1.3 Research Questions

1. What areas of ICT need improvement in AAU to perceive the benefits by students and instructors?
2. How are the implemented ICT Policies practiced in the institution at present time?
3. What are the Challenges in attitudes towards ICT?
4. To what extent students are satisfied with implemented ICT infrastructures?

1.4 Objectives of the study

1.4.1 General Objectives

The general objective of this study is to assess the implementation of ICT practice in Addis Ababa university.

1.4.2 Specific Objectives

The specific objectives of this study are to:

1. To identify areas of ICT that need improvement in AAU?
2. To identify the implemented ICT Policies practiced in the institution at present time?
3. To investigate the Challenges in attitudes towards ICT?
4. To examine the level of student's satisfaction with implemented ICT infrastructures?

1.5 Significance of the Study

This study serves a background for educational policy makers to act and take action on the situations which hamper development of ICT in the education sector. The research also serves as the basis for problem solving for ICT. The findings of the study are offer profile of the ongoing realities of using ICT for education for further research on the area.

The research is believed to go a long way in helping to shape ICT for education related to harnessing policies. The study is thus expected to be helpful in planning, designing, developing, implementing and evaluating instructional system design.

This study used as source for further studies also add to the existing knowledge regarding to ICT development and guide policy makers for planning purpose.

1.6 Scope of the study

The study is delimited on assessment of ICT implementation practice in higher education institutions in Addis Ababa university. This study confined on sample students, instructors, University leadership, AAU ICT experts.

The researcher encountered scarcity of similar research work and literature on the issue in Ethiopia in general. As a result, the researcher was obliged to rely to related foreign materials. The researcher faces scarcity of well documented project materials and conducted research report on the issue domestically.

1.7 Operational Definition of Terms

Information and communication technology: - refers to all forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. (UNESCO, 2002).

ICT policy: - is defined as the country or jurisdiction's guide in ICT use and securing the information economy benefits. It deals with issues related to information dissemination, information utilization and technology spread and use (Labelle, 2005).

1.8 Organization of the study

The research is organized in to five chapters. The first chapter deals with the introductory part of the research in which background of the research, statement of the problem, objectives of the study, significance, scope of the study, organization of the paper and Operational definition are incorporated. The second chapter deals with the literature review. Chapter three incorporates research design and methodology, which describes the methodology undertaken in relation to justification of the research design, observation and interview and observation design, sampling process and data collection, and the intended analysis strategy. Chapter four discusses survey results presentation, analysis and interpretation. Finally, conclusion and recommendation presented in the fifth chapter.

CHAPTER TWO:

LITERATURE REVIEW

2.1 Theoretical Literature

Information and communication technology (ICT) have the potential to increase access to information; make learning available anytime, anywhere; and make learning more enjoyable for learners, thereby improving participation rates and learning outcomes. Use of ICT can also improve the quality of teaching, enable the creation of more relevant and stimulating learning materials, improve education management, enhance the provision of educational services and make such services more cost-effective.

The term information and communication technology refer to all forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. Examples of forms of ICT that can be used in education include such things as educational radio programmers, DVDs, mobile phone (m-learning) applications and interactive computer programs.

ICT in education is a cross-cutting theme across all education types and levels. Policies relating to the use of ICT in education can be found embedded in a wide range of educational areas that include education policy, teacher education, teaching and learning, non-formal education, monitoring and measuring change, research and knowledge sharing, and cross sectoral ICT programmers.

2.1.1 Benefits of ICT for education

1) ICT can increase access to education:

Acts such as distance education system, e-learning and access to personal computers provides education to people in remote areas where teacher recruitment is often difficult. It is also evident that educational satellite plasma television in Ethiopia has been accessed to rural and urban areas. Moreover, the internet enables these educational contents and other educational information to access in the world without actual transportation.

2) ICT can improve the quality of education:

The quality of education is improved by Information Communication Technology through use of multimedia digital teaching and learning materials, broadcasting qualified lecturers and providing distance learning for students as well as instructors.

3) ICT can motivate students:

ICT motivates not only students to study but also their parents to send their children to schools, because computers are something new which seem attractive and nowadays people recognizes that Information Communication Technology skill is necessary for the information age.

To realize the above-mentioned benefits, many ICT4E projects have been implemented by international organizations, non-governmental organizations (NGOs) and developing countries' governments. Amongst these stakeholders, government may have the strongest influence since the educational sector is managed within a framework of national educational policies and most schools are governmental ones. Actually, in the case of Ethiopia, the Ethiopian government has implemented ICT4E project as a key component of the broad e-government strategy (Getahun, 2006).

Furthermore, when it is considered that 'government has been the single largest collectors, users, holder and producer of information' (Heeks 1999: 16) and that the national development policy is created by the government, it is obvious that the government is the most important stakeholder and top-down approach in implementing not only for ICT4E but also ICT4D initiatives in general.

2.1.2 Challenges of ICTs

Truly, there are many kinds of constraints or pitfalls for Information Communication technology for Education /ICT4E/ projects, such as, poor infrastructure (Duncombe 2006; Ndou 2004), organization or community acceptance (Whyte 1999 cited in Harris et al. 2003), relevance of information (Etta and Parvyn, 2003), financial sustainability (Oestmann and Dymond 2001), lack

of training and skilled personnel (Ndou 2004), literacy (Roman and Colle 2002; Warschauer 2003), gender (Farrell and Isaacs 2007; Törenli 2006).

The principal factors that prevent schools from using Information Communication Technology including Educational Satellite plasma Television, School Net and computers as tools for teaching and learning are insufficient funds, insufficient numbers of computers, lack of computer literate instructors, lack of teacher competence in integrating computers into different learning areas, and the absence of properly developed curricula for teaching computer skills (Howell and Lundall 2000). This area discusses that school-networking projects should address and provides examples of how countries in Africa are coping with the challenges facing them.

As mentioned above, since the advantage/benefits and rationale of ICT use for development is understandable, an optimistic expectation may be generated that ICT is used as a powerful tool for development in many projects under the adequate government initiative. However, the reality is different from such an optimistic expectation.

2.1.3 Concept and Evolution of ICT

Abdulsalam et al. (2008) postulate that information can be defined as knowledge communicated by others or obtained from investigation of study or instruction. It could be the process by which the form of an object of knowledge is impressed upon by the apprehending mind so as to bring about a state of knowing. Technology, on the other hand, is the science of application of knowledge to practical purposes. Technology determines the quality of life of a people and the overall status of their nation (Momah, 1999). Information has been the driving force of so many human activities in search of developing one's self, which has created a basis for the need to know.

ICT stands for Information and Communication Technology and is defined as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." The term ICT refers to forms of technologies that are used to create, store, share or transmit, and exchange information. This broad definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software; as well as the equipment and

services associated with these technologies, such as videoconferencing and electronic mail (UNESCO, 2002).

ICT has been defined by different commentators; many of such definitions focusing particularly on the 'newer' computer-assisted, digital or electronic technologies, such as the internet of mobile telephony. Some, however, do include 'older' technologies, such as radio or television. Others even do include the whole range of technologies that can be used for communication, including print, theatre, folk media and dialogue processes. Some focus only on the idea of information handling or transmission of data. Others encompass the broader concept of tools to enhance communication processes and the exchange of knowledge (Greenberg, 2005; Weigel and Waldburger, 2004).

Academics and students who use ICT gain deeper understanding of complex topics and concepts and are more likely to recall information and use it to solve problems outside the classroom (Apple Computer, 2002). In addition, through ICT, Academics and students extend and deepen their knowledge, investigation, and inquiry according to their needs and interest when access to information is available on multiple levels (CEO Forum on Education and Technology, 2001).

Babalobi (2010) acknowledges that ICT is the processing and maintenance of information, and the use of all forms of computer, communication, network and mobile technologies to mediate information. Communication technologies include all media employed in transmitting audio, video, data or multimedia such as cable, satellite, fibre optics, wireless (radio, infra-red, bluetooth, and Wifi). Network technologies include personal area networks (PAN), campus area network (CAN), intranets, extranets, local area networks (LANs), wide area networks (WANs), metropolitan area network (MANs) and the internet. Computer technologies include all removable media such as optical discs, disks, flash memories, video books, multimedia projectors, interactive electronic boards, and continuously emerging state-of-the-art PCs. According to him, mobile technologies comprise mobile phones, personal digital assistants (PDAs), palmtops, etc. These technologies have information as their material object. Information is not reserved for use in isolation, but rather communicated among users.

ICT consists of hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as their related services. It can be divided into two components; Information and Communication Infrastructure (ICI) which refers to physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that utilize information (internet, voice, mail, radio, and television). In the words of Amenyo (2003), the characterization of ICT is robust. He purported that it encompasses automation of the information and meta-information aspects and representations of people, items, goods, systems, tools, equipment, instrument and machinery. It necessarily embraces data capture (gathering, collection, entry, acquisition and measurement), data storage (recording, archiving and logging), data retrieval, data processing (manipulation, calculation, computation, analysis, modelling, representation, presentation and simulation) and data communication (transfer, flow, interchange and exchange).

2.1.4 Categories of ICT facilities

Asiamah (2011) divides ICT into the following groups: Capturing technologies with input devices that collect and convert information into digital form. Such devices include keyboards, mice, trackballs, touch screens, voice recognition systems, bar code readers, image scanners and palm-size camcorders.

Storage technologies which produce a variety of devices to store and retrieve information in digital form. Among these are magnetic tapes, floppy disks, hard disks, RAM disks, optical disks (such as CD-ROMs), erasable disks and smart cards (credit-card sized cards with memory and processing capacity for financial transactions or medical data). Also, the processing technologies create the systems and applications software that are required for the performance of digital ICT.
Communications technologies which produce the devices, methods and networks to transmit information in digital form. They include digital broadcasting, integrated services digital networks, digital cellular networks, LANs, WANs, such as the Internet, electronic bulletin boards, modems, transmission media such as fibre optics, cellular phones and fax machines, and digital transmission technologies for mobile space communications (the new Low Earth Orbit satellite voice and data services).

Display technologies which create a variety of output devices for the display of digitized information. Such devices include display screens for computers, digital television sets with automatic picture adjustment, set-top boxes for video-on-demand, printers, digital video discs (which might replace CD-ROM drives and audio CD players), voice synthesizers and virtual reality helmets.

ICT has been applied to several facets of our world. These include education (schools), health (hospital), business (trade) and many others. Therefore, it is the purpose of this review to discuss the accessibility, availability and use of ICT by academics in higher education. This enables policy makers, school administrators, and academics to pay the required attention to integrate this technology into the educational system. In so doing, it highlights the levels of accessibility, availability and use of ICT in education, existing promises, the limitations and challenges of ICT integration into the educational system.

2.1.5 ICT accessibility, availability and use by academics

Educational systems around the world are under increasing pressure to use the 'new' ICT (UNESCO, 2002 as cited by Yuen, Lee, Law and Chan, (2008) based on the premise that it is important for bringing changes to classroom teaching and learning. These skills include the ability to become lifelong learners within a context of collaborative inquiry and the ability to work and learn from experts and peers in a connected global community (Law et al., 2008).

The information society demands a workforce that can use technology as a tool to increase productivity and creativity. This involves identifying reliable sources of information, effectively accessing these sources of information, synthesizing and communicating that information to colleagues and associates (Alibi, 2004). Hence, Hawkins (1998) affirmed that information is a key resource for undergraduate teaching, learning, research and publishing. This brings the need for effective methods of information processing and transmission.

Laurillard (2002) highlighted that instructional technology and research initiatives surrounding educational innovation have evolved very quickly over the past hundred years, beginning with the development of the phonograph, radio, film and television and their implementation as

teaching and learning tools in tertiary schools. As computer-based innovations were developed, they also became tools in the classroom in many forms (e.g., drill and practice software, simulations, educational games, tutorials, video disks, internet access, email, digital media, personal computers, laptops, etc). Therefore, Lucus and Murray (2002) concurred that the educational system is being challenged to change as innovative technology changes the interaction with information and knowledge and as new generations of students pass through with new expectations and new needs.

According to Debra (1999), today's education world is information and communication intensive, and IT professionals and the entire faculty in the context of this study need to be empowered with the knowledge, skills and abilities that technology offers. Even with the enormous potential and academic advantages that innovation and improvement of communications afford, without the direct participation and support of an institution's leadership, this power cannot be pushed to its full potential. Leadership in IT requires many of the characteristics common to all leaders, but also requires special abilities and insights into technology's impact. Jesse Jackson said “You can't teach what you don't know, and you can't lead where you won't go". This means that the Academics of higher education cannot impact ICT driven education without them acquiring the knowledge.

With the evolution of ICT, the delivery of education and training by faculties/Academics is changing. Rapidly, ICT is affecting the way university education, research are conducted respectively, is delivered. They are currently being used effectively in higher education for information access and delivery in libraries, for research and development, for communication and for teaching and learning (Jacobsen, 1998). The drive for engendering the ICT environment dates back to the Beijing Declaration and Platform for Action (PfA), adopted by the Fourth World Conference on Women in 1995 (UNGASS, 2000).

Much literature described faculties in higher education as comfortable using technologies such as word processing, email, and web searching (Vannatta, 2000), but not comfortable integrating technology into their classroom practices for meaningful learning (Glaser and Hardin, 1999; Ropp and Brown, 2000). The issues of best practices in the innovative use of technology and

integration among higher education faculty are not clearly focused and results of research in this area vary widely indicating the need for additional research (Kozma, 2003).

As technological innovation continues in universities, levels of ICT availability, accessibility and use for faculty, schools, students and educational technologists become increasingly important; it is clear that "different technologies are deployed at different rates in different ways at different settings" (Molenda and Sullivan, 2002). Some major questions asked include the elements that would constitute effective professional development programs for faculties. Researchers need to investigate effective ways to help each population successfully work with new instructional technologies.

Thus, effective professional development may require an understanding of the kinds of motivations and psychological resistances that determine how faculties will decide to use new technologies. To what degree, for example, is the adoption of instructional technology related to a faculty's disciplinary affiliation or commitment to high quality instruction? As information technologies become increasingly woven into social expectations, Molenda and Sullivan (2002) opine that the pressure to adopt them in education can only increase. Informing educational leaders and decision makers on the full range of issues concerning development and deployment of technology and innovation is increasingly a critical priority.

The demands on higher education faculties no longer focus on content expertise but also on creating active learning environments that integrate technology within content. Faculties can adapt to this role by reflecting, analyzing, observing, implementing, and evaluating successful examples of best practices in technology integration (Ertmer, 1999). Use of an Innovation Component Configuration Map (ICCM) which measures technology integration practices, would also help faculties reflect on their pedagogical practices related to technology integration within their curriculum and allow them to document contemporary exemplary practices in technology integration.

Ertmer (1999) elaborates further between external (first order) and internal (second order) barriers. First order barriers would include lack of access to ICT facilities, support, time constraints, and tenure and promotion guidelines which do not promote innovation. Second order barriers would include beliefs about instructional technology, teaching methodologies, and attitudinal change. Similarly, Rockwell, Schauer, Fritz and Marx (1999) reveal specific factors such as time requirements, cost, instructional design, instructor-student relationships, reward structure, degree programs, policy and training. In addition, their study (a survey of 207 faculty and 30 administrators) revealed faculties do indeed have pedagogical concerns, such as "providing innovative instruction and applying new teaching techniques". However, a scrutiny of their work falls short on how to address these intrinsic concerns of Academics motives regarding availability, accessibility and use of ICT.

Taking a cue from the above, the unavailability and inaccessibility of ICT facilities affects the use of ICT by the academics of higher education. This means that Academics inability to access internet, computers, scanners, video conferencing, emails among others in higher educational institutions, consequently translates to Academics not using these facilities for collaboration, research, teaching, learning, distance learning and improved student-faculty relationship as purported in the objectives of the study. With exponential growth in e-learning or distance education practices in higher education, there is the increasing interest in faculty members' use of and perceptions of ICT. While the innovators and early adopters of e-learning have embraced it enthusiastically, the majority of faculty members seem still disengaged and uninterested in elearning (Newton, 2003). Access to ICT, point to the heart of faculty members' disposition to change, innovation adoption, and general unwillingness to move out of their comfort zones to develop new skills and competencies in order to be able to cope with new phenomena. It has been suggested that engagement in innovative educational practices has tended to render faculty members vulnerable. Besides, it has the potential to detract them from the pursuit of their research and other reward-related activities (Bower, 2001; McKenzieet al., 2000).

Innovation in teaching and research, especially in view of the changing context of higher education, is inevitable (Clarke, 2003). The political, social, economic and educational imperatives for the engagement in e-learning now seem to be clear. However, without

institutional sponsorship, support and appropriate rewards for engagement in ICT (e-learning) and the pursuit of excellence, faculty members are likely to remain disengaged and unenthusiastic about engagement in e-learning or innovative educational practices.

2.1.6 Ease of Access to ICT resources

Pickersgil (2003) found out that the ease of access and ICT facilities allow Academics to become experts in searching for information rather receiving facts. He claimed that ease of accessibility increases that awareness of the world around them. Lack of access to much needed infrastructure is the result of insufficient funds (Ololube et al., 2007). While ICT continues to advance in western and Asian countries, African countries still experience a lag in its implementation, and that continues to widen the digital and knowledge divides. Kiptalam et al. (2011) observed that access to ICT facilities in higher learning institutions is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries.

2.1.7 Use of ICT by academics

In higher learning institutions, ICT facilities can be put into several uses and for various purposes. It was the objective of this study to compare the level of use of ICT between male and females' academics.

2.1.8 Different uses of ICT

Much literature described faculty in higher education as comfortable using technologies such as word processing, email, and web searching (Vannatta, 2000), but not comfortable integrating technology into their classroom practices for meaningful learning (Ropp and Brown, 2000). The issues of best practices in innovative use of technology and integration among higher education faculty are not clearly focused and the results of research in this area vary widely indicating the need for additional research (Kozma, 2003).

Interestingly, a study by Agbatogun (2006) discovered that with global technological wave that is affecting every sector and every aspect of Academics' life whether male or female, experienced or inexperienced, humanities, science or vocationally oriented need to struggle

zealously to be computer literate in order to face the present educational challenges. Not only that, Onasanya, et al. (2010) confirmed the findings in this study that, attitude of male academics towards integration of ICT in tertiary institution is higher than female academics. Male academics were rather found to be more interested in the use of ICT facilities/equipment for teaching and research work than their counterparts in the Humanities and Arts.

Chong et al. (2005) found out that most academics in higher learning institutions use ICT on regular basis for common computer packages such as word processing, spread sheet, databases and for internet services such as search engine. This is supported by Amanortsu et al. (2013) that found Academics used computer slides presentation and reading materials from web sites. Surprisingly, Chong et al. only discovered fewer academics using higher level skills activities such as evaluative (e.g. assignments, portfolio, testing), instructional (e.g. drill practice, tutorials, remediation), organizational (e.g. database, spread sheets, record keeping, lesson plans) and creative (e.g. Desktop publishing, digital video, digital camera, scanners, and graphics) as these activities required specialized knowledge and training in order to used it. Chong et al. (2005) claimed that eight aspects of computing purposes were: informative, communicative and expressive, integrating computer technology, evaluative instructional, organizational and creative purpose.

ICT offers several opportunities in higher education. First, they can be used as a means of preparing the current generation of students for future workplace that is, providing tools for tomorrow's practices. This is underscored in the foreword written by Lemke (2005) in the Milken Exchange on Education Technology commissioned report. Lemke noted inter alia "Today's students live in a global knowledge-based age, and they deserve instructors whose practice embraces the best that technology can bring to learning". Through instructors' use of technology (ICT) students can be given the opportunities of becoming a part of the knowledge age and skills imparted to the young people in an increasingly complex world. Academics will need to use ICT in order to equip tomorrow's employees and customers with the requisite competence and knowledge to use ICT within their work (Davis and Tearle, 1999). Secondly,

ICT can make the university more efficient or more productive, engendering variety of tools to support and facilitate teacher's professional activities. Finally, ICT is seen as means to reform and innovate teaching, that is, to stimulate learners to learn actively and independently in a self-directed way and/or in collaboration with others (Kirschner and Woperies, 2003). It can be deduced that ICTs can be used to enhance learning and teaching within a university system.
However, some scholars (McFarlane, 2002; Bransford, Brown, and Cocking, 2000) have raised doubts about the effectiveness of ICTs in education. Others have claimed that the effectiveness of ICT depends on those who use them. Academics are key to the successful implementation of ICT in higher education. "What we do know, whether from personal experience as teacher or learner, or as the result of 20 years of research is that ICT has an impact on learning, for some learners, under some conditions, and that it cannot replace a teacher" (McFarlane, 2002). McFarlane has placed great emphasis on the key role of the Academic's skill in integrating ICT.

Abimbade (1998) expressed that one needs to be literate in the use of computers to effectively use them in teaching, learning and research. In this study, the researcher found that computer was attained outside the UG. As observed by Amanortsu et al. (2013), a new society requires skills, thus computer skill can be promoted and put at the service of higher education, provided that policy makers, instructors, and students show and develop the necessary understanding, willingness and preparation to use ICT. Nowadays, most students in developed countries come to university with expectations that in universities ICT will be accessible, available, and effectively used. In Ghana, some students may be less aware of current developments in ICT or may be digitally less literate to have the same level of expectations.

Yusuf and Onasanya (2004) confirmed the findings in the present study by identifying three specific areas of relevance of ICT to Academics in the area of research:

I. It provides opportunities for scholars to communicate with one another through email, mailing lists and new groups and chat rooms. These ICT resources enable communication between scholars as they can post research, assignments, books or journal lists references to on-line materials. Problems and solutions can be discussed between researchers and scholars can react to the work of others in an electronic manuscript. The use of ICT

further provides greater opportunities for research collaboration and networking among scholars spread throughout the world, thus, national and international dimensions of research issues can be studied as they can allow for communication with peers and experts around the world. Through collaborative knowledge building, studies can spotlight trans-national trend analysis through human and instrumentation collaboration.

II. The use of ICT can facilitate research in any discipline as they provide quicker and easier access to more extensive and current information through digital libraries that provide digitized full-text resources to learners and researchers. Others are the electronic list- a directory of scholarly and professional e-conferences containing relevant topics and articles relevant to researchers and electronic reference desks or virtual libraries. Others include electronic journals and catalogues and image database. Others are Internet resources; gopher and CD-ROM can provide a researcher with current, in depth, first-hand information.

III. ICT can be used to do complex mathematical and statistical calculations which are important in research. They can be used for data manipulation and analysis. The ICT will facilitate the compilation of data on time, performance of statistical analysis. In fact, complex statistical analysis is not only performed instantaneously but also more accurately than possible manually

To fully tap into the outcomes from the availability, accessibility and use of ICT facilities in UG, Legon, scholars such as Bower (2001) and McKenzie et al. (2000) suggested that faculty members' dispositions to change, innovation adoption and general unwillingness to move out of Academics' comfort zones and develop new skills and competencies in order to be able to cope with new phenomena is most critical. Therefore, they advocated the engagement in innovative educational practices that have tended to render faculty members vulnerable and more importantly, it has the potential to detract them from the pursuit of their research and other academic related activities.

2.2 Empirical literature

Information Communication Technology for education has evolved and become more central to teaching and learning. The rapid development of information and communication technologies (ICTs), internet technologies and web-based applications have initiated unparalleled transformation in the education sector all over the world (Cheng, 2010). Every aspect of human relationships and interactions within the educational environment has been affected by the World Wide Web in many ways. This technological breakthrough in the fields of education has further benefits with the use of electronic learning.

In the report "The National ICT for Development (ICT4D) Five Years Action Plan for Ethiopia", as Dzidonu (2006) mentioned that Ethiopia recognized the developmental potentials and opportunities of the information and technological revolution to embarking on a process of economic transformation through the modernization of the key sectors of the economy including those of agriculture, services and industrial sectors through the deployment and the exploitation of ICTs.

According to Dzidonu, (2006) not only does the Government of Ethiopia consider ICT as an indispensable tool and means to alleviate poverty but it also considers ICTs as a major tool for facilitating the on-going state transformation which is aimed at effective and efficient service delivery in every sector. The Government therefore views ICTs within a wider context of its socioeconomic development goals. The goal is to make Ethiopia an ICT-driven country able to function effectively in a networked global economy.

Regardless of the potential benefits of ICT for the developing countries, there are ongoing barriers to implementation of these technologies within many developing countries. Developing countries can often be reprioritize in policymaking and resource allocation due to attitudes regarding the usefulness of ICT in the development process, as well as lack of knowledge regarding the potential benefits of ICT implementation (Imran, 2009).

The introduction and use of ICTs within the Developing Country has a substantial potential benefit for the economy and social service. ICTs are even seen by some commentators as a key link to globalization and development, as a means of overcoming the so-called 'Digital Divide,' or gap in knowledge and access between ICT users and non-users (Akpan, 2003).

According to Heeks (2003), 35% of e-government projects in developing and transitional countries are total failures and 50% are partial failures. Similarly, Gauld and Goldfinch (2006) mention the high failure rate of e-government projects, especially large projects. Likewise, in the case of Ethiopia, particularly, the report from Addis Ababa University states that Addis Ababa city administration spent huge amount of money for ICT investment but the outcome is not as much as expected (Bekele et al., 2005).

Moreover, in the case of ICT4E projects, negative statements are found on the documents from InfoDev/World Bank. For example, 'the positive impact of ICT use in education has not been proven' (Trucano 2005: 6) and 'the use of ICTs in education in many developing countries, especially the "poorest of the poor" is associated with high cost and potential failure' (infoDev, 2007: 2).

Ethiopia like other developing countries, ICT usage is still at an infancy stage, in spite of Government's effort to promote it. According to the Ethiopian Ministry of Education (MoE) the role that ICTs can play in widening access to education to a wider section of the population cannot be underestimated. ICT therefore praised for assisting and augmenting literacy education and also for facilitating educational delivery and training at all levels and this has been acknowledged in the Ethiopian ICT For Development (ICT4D) policy document. The above policy document also states that the Ethiopian government recognized the key role that ICTs can play in transforming the educational system and making education accessible to the greater proportion of citizens. Furthermore in its five years action plan (i.e. for the year 2006 – 2010) the Ethiopian Ministry of Capacity Building stated that the government is committed to addressing the nation's human resource requirements in the area of ICTs through the promotion of mass ICT literacy education and training and the increase in the use of ICTs in educational institutes

(schools, universities and colleges) as well as implementing initiatives aimed at connecting schools and higher educational institutions to the online resources including the Internet.

Light (2009) further argued that ICT alone cannot create this kind of teaching and learning environment. Educators must know how to structure lessons, select resources, guide activities, and support this learning process; many traditionally trained instructors are not prepared to take on these tasks. Light (2009) referred to the work of Bransford, Brown, and Cocking (2000) and stated that to use technology effectively, the pedagogical paradigm needs to shift toward more student-centered learning. This shift is not trivial or easily accomplished, particularly in countries with teacher-centered educational traditions.

2.3 Empirical review

2.3.1 ICT and its application

Information and communication technology (ICT) is often used as an extended synonym for information technology (IT), but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers, middleware as well as necessary software, storage and audio- visual system, which enable users to create, access, store, transmit, and manipulate information. Basically, ICT consists of IT as well as telecommunication, broadcast media and all the other types of audio and video processing and transmission and network-based control and monitoring functions (Howe, 2010). Thus, it supports all the activities involving information. ICT is based on the notation that using ICT involves matching it to one`s purposes of which it requires a rationale for using it.

ICT basically depends on the local culture and the particular technology available and how it is configured and managed. The understanding, management and configuration of the available technology might vary the concept of ICT. This variation may be different from a collection of tools and devices used for particular tasks. An organized set of equipment (like a “workshop”) for working on information and communication, components of integrated arrangements of devices, tools, services and practices that enable information to be collected, processed, stored and shared with others and to the components in a comprehensive systems of people, information

and devices that enables learning, problem solving and higher order collaborative thinking, that is, ICT as key elements underpinning a (sharable) workspace (University of Tasmania, 2011).

ICT application in institute covers a wider scope. This includes the comprehensive approach to innovate training systems, methods, and management through information and communication technology, restructuring training giving system, diversifying teaching- learning methods & practices, engaging all stakeholders and adapting rapid to changes in society and the environment and enhancing education efficiency, effectiveness, and productivity (Gwango-jo, 2009). In the administration of institute, ICT can also be applicable in the administering of human, physical and financial resources.

2.3.2 ICT use in instruction

The use of computers in education dates back to 1924 when Sidney Presley tried out the so called 'teaching machine' for revision and testing at Ohio University in the United States of America. However, use of technology in education was generally slow until the coming of computers (Kavagi, 2010). In the current world situation 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 (trainee) achievement. Angrist and Lavy (2002) asserts that education systems need to prepare citizen for lifelong learning in an information society. This can be characterized by, societal changes as a result of ICT many societies will change in to information societies, competent citizens and new skills due to educational innovations aimed at attaining new skills with the help of ICT and at finding a new balance between old and new educational targets. This will lead to education being more focused on creating opportunities for students to acquire new skill related to autonomous learning, communication skills, authentic problem solving, collaborating in teams via various communication technology.

Technology integration covers a wide area ranging from instruction on programming skill, self-directing drill, testing, instructional delivery, and internet-based accessibility to information and communication.

It has been argued by certain scholars that the use of new technology in the classroom is essential for providing opportunities for students to acquire knowledge and skills that will enable them to function in an information age (Bingimlas, 2009). It is therefore evident, as Yelland (2001) argued, that traditional educational environments do not seem to equip the learner with adequate skill to be productive in their place of work in today`s society.

There are several roles that ICT can play in the teaching and learning process. First, ICT has a great potential to enhance learning achievement (Bransford et al., 2000). A number of theorists and scholars assert that the use of computers can make the learners to become knowledgeable, reduce the amount of direct instruction given to them and provide a learning environment where instructors can assist learners with special needs. In addition, use of new technology will motivate the learners and hence develop favorable attitude towards short time management training.

ICT brings about effectiveness in instruction. Kulik (1994) observes that, students learn more in classes in which they receive in which they receive computer based instruction, lessons take less time, student like classes more when they receive computer help in them and they also develop more positive attitudes towards computers when they receive help from them in class.

Forman and Puffal (2003) explain that, ICT has the potential to be used in support of new educational methods, as tools enabling student learning by doing. Modern learning theories emphasize on critical thinking, problem solving, authentic learning experiences, social negotiation of knowledge and collaboration and pedagogical methods that challenge the role of the instructor from disseminator of information to learning facilitator, helping students as they actively engage with information and materials to construct their own understandings. That is, trainee learn how to learn, not just what to learn.

ICTs allow instructors and students to access books easily, promotes student interaction, access to wide range of reference materials, helps in saving time while doing research, encourage learner centered learning, exposes students to technology, facilitates revision and conceptualizes complex concepts making them easier for students to understand (Njiru 2012).

Fulton (1998) further asserts that, ICT is important in developing skills for the workplace. After leaving school, to embark on a career, young people can expect the day to day practice of every discipline to be affected by the use of ICT. In the future, economic competitiveness, employment and personal fulfillment may no longer be based on the production of physical goods. Personal and national wealth creation may be linked to the production and dissemination of knowledge and depend on research, education and training and on the capacity to innovate. Having advanced ICT skills and knowing how to use discipline- specific applications may help students` secure suitable employment and enhance their productivity once employed. Furthermore, the ability to engage in lifelong learning opportunities offered by educational institutions around the world is increasingly dependent upon access to and use of ICT (Bates, 2004).

Information and communication technology (ICT) provide the institute support services such as course outline, digitally recorded class room materials, discussion group, laboratory manuals and lab assignment, lecture notes, live lectures for later viewing and re- viewing, links a course with specific websites, online tutorials, and virtual libraries (Jefpeeraer,2005). According to Brown and Duguid (2000) to improve the usage of information and communication technology evaluating the current usage is important.

2.3.3 Purpose of using ICT

According to the Swedish National Agency for School Improvement (2008), information and communication technology (ICT) provide a positive impact on learning and student performance when it becomes an integrated element in the class room and teaching. Usually, performance is a measure of how well a process achieves its purpose. Moulin (2003) define institute`s performance as "how well the institute is managed "and "the value the institute delivers for customers and other stakeholders." Though ICT have the capacity to facilitate easy access to information and provide more efficient information services to users and consequently improve overall performance of users (Adetimirin, 2009).

ICTs are revolutionizing education by removing distance from education and making knowledge more accessible to all (Industry Canada, 1997). Technology enhances learning performances by

empowering learners. It is not surprising therefore to see a growing interest in technology-based learning across the world. Technology based learning may be defined as the array of hardware and software used in the teaching and learning system that include computer- based training system, as well as the internet with World Wide Web system (WWW). Technology also provides greater flexibility to adapt teaching and learning to meet a goal.

Although ICTs are by far the most significant element undergirding the foundation of management training, there is paucity of literature and research regarding its implementation and use in this field of education and training.

Limited information on the current use of ICTs in management training institute constrain the researcher to go further Information and communication technology make it possible to engage people in widely dispersed locations through computer network, learners can be drawn together from almost anywhere, and they can construct their own learning groups.

A computer network or data network is a telecommunications network which allows nodes to share resources in computer networks; networked computing devices exchange data with each other using a data link. The connections between nodes are established using either cable media or wireless media.

Computer networks support an enormous number of applications and services such as access to the World Wide Web, digital video, digital audio, shared use of application and storage servers, printers and fax machines, and use of e-mail and instant messaging applications as well as many others. A computer network facilitates interpersonal communications allowing users to communicate efficiently and easily via various means providing access to information on shared storage devices is an important feature of many networks.

Information and communication technology (ICT) have increasingly become important in almost all sectors of modern life. According to UNESCO (2007), ICT has the capability of widening education access and subsequently improve learning outcomes.

2.3.4 Availability of ICT resources

Resistance to change and negative attitudes by instructors affect ICT implementation. This study therefore, sought to find out where assessing ICT resources that were found in EMI then assessing the usage of ICT. Further, a study by Kiptalam and Rodrigues (2010) observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students per school against the ratio of 1:15 students per school in the developed countries. This ratio in the developed world has now improved with time to 1:5 per school. An ideal student computer ratio would be 1:1, but due to the advantage of collaboration, 1:2 would be best whereby learners can share a computer and assist each other in the learning process. ICT use also encourages disable students to learn according to Davis (2000) assert that increased availability of ICT is especially useful for students who suffer from learning disabilities science ICT use allows instructors to prepare suitable tasks for individual needs and each individual more effectively.

2.3.5 Accessibility of ICT resources

Successful integration of ICT in any institute would help to access any information and resources via Internet and Intranet. The computer labs and classroom computers need to be sufficient in number to allow ready access by student and staff in most subjects across the institute. A wide range of peripheral and remote working devices, including video- conferencing, is provided and integrated into the curriculum. Large and small group presentation facilities are readily available (School net Africa, 2004). Despite the above desired situation, most institutions in Africa face barriers to effective integration of ICT in the teaching and learning process; limited infrastructure in terms of satisfactory physical condition of laboratories and the subsequent accessibility of the resources (ICT)to the learners (Singh, 1993).

Accessibility and use of ICT allows students to investigate more thoroughly the real world (Bracewell and Laferrie're, 1996). They can more readily access information sources outside the classroom and can use tools to analyze and interpret such information. Information may be accessed through online system or through data logging systems (Riel, 1998). The technologies allow them to receive feedback, refine their understanding, build new knowledge and transfer from school to non- school setting (Committee on developments in the science of learning,

2000). In the past this has been difficult to provide in schools due to logistical constraints and the amount of material to be covered all of which can now be addressed with ICT. What can be learned is broadened and deepened (Re'ginald, 1996).

Now a day in many government and training institutions seem to recognize the importance of introducing ICT in education and training. Much as students and staff need training on a continuous basis with modern requisite skills to fully exploit the ICT environment in their different functions. Awareness skills only may not be sufficient enough but rather continuous accessibility to ICT resources would do much better. Continuous access to computers helps instructors/instructors feel more secure in their ICT use during lessons and gives them the courage to experiment more and thus helps them integrate ICT into lessons effectively. Many studies also indicate that the impact on learning will increase over time as instructors and students become more experienced in continued practice on using computers (Swedish National Association for School Improvement, 2008).

Dewey (1989) argues that information that is accessed but never put to use during that process, may be difficult to retrieve and use when need arises in the real world. Equal attention must be paid to ensuring that the technology is actually being used by the target learners and in ways that truly serve their needs (Salomon, 1994).whereas the above studies looked at the accessibility of information and communication technology resources in institutions of learning, key information in regards to access points like library, laboratory, the frequency of access by the trainee/student and staff was never looked at.

2.3.6 ICT in Ethiopia

The Ethiopian government has made the development of information and communication technology one of its strategic plan priorities (GTP, 2017). ICT in Ethiopia is early stage of development. The major indicators pointing to the low level of ICT development are: -

- The absence of appropriate legal and regulatory frameworks
- Limitations in telecommunication infrastructure and low level of internet service penetration
- Lack of organized data & information resources and poor accessibility to those that exists
- Lack of skilled human resources coupled with low ICT literacy

These constraints present the government with real challenge, but also opportunities, for all accelerated development of ICT in Ethiopia (Government of Ethiopia, 2009).

The strategic directions of Ethiopian government are expanding digital infrastructures, accelerating information and communication development and use ICT for government administration. The other strategic direction are to reduce the share of the second generation mobile technology from 93% in 2014/15 to 47% by 2019/20, create conditions to enable all government offices and the public benefit from broadband internet (GTP II, 2016).

ICT facilitates the development of education and enables both individuals and countries to meet the challenges presented by the knowledge and information age.

As the vast majority of Ethiopian population lives in remote areas and gets low quality of education, ICT is crucial in addressing access and quality of education. According to Grimus (2000), ICT brings about educational innovations which are important in basic educations as they have a strong pedagogical focus on student- centered and increasingly student- directed didactical approaches facilitated by ICT. Therefore, the government of Ethiopian to ensure integrating ICT with education

CHAPTER THREE:

RESEARCH DESIGN AND METHODOLOGY

3.1 Research Approach and Design

In any research the type of methodology used depends on the research problem, research question, type and source of data to be collected and the analysis processes required (Koranteng, 2012). Research design is a comprehensive plan for data collection in a research project. It is a "blueprint" for research aimed at answering specific research questions or testing specific hypotheses, and must specify at least three processes: (1) the data collection process, (2) the instrument development process, and (3) the sampling process (Bhattacherjee A.,2012).

In order to achieve the objectives of this research, descriptive survey research design is applied. This study will use this design for two main reasons: firstly, descriptive survey research design helps to obtain current information concerning the ICT in Addis Ababa University. Secondly, it allows using quantitative methods, which provide rich data that lead to important recommendations (Kothari, 2005). a. Sproul (1995) states that; a survey research design collects background information. He recommends the technique for research where attitudes, ideas, comments and public opinion on a problem under investigation. It helps to gain insight in generalizing a situation without utilizing the whole population. To this end, a descriptive survey design will be employed with the assumption that it could help to get a description of the current state of the implementation of the program by examining its practical achievement, challenges and prospects. According to (Kother, 2004) the major purpose of descriptive research method is description of the state of affairs as it exists at present.

3.2 Population, Sample size and Sampling procedure

Target population is defined as the entire group a researcher is interested in. According to (Zikmund, 2003) the definition of population was identifiable total set of elements of interest being investigated by a researcher.

The sample size was determined using the following formula as it stated in (Israel, 1992).

Sample size obtained as;

$$n = \frac{N}{1 + N(e)} = \frac{51{,}981}{1 + 51{,}981\,(0.05)^2} = 397$$

Where, n – designates the sample size the research uses.

N - Designates the total number of the target population.

e – Designates maximum variability or margin of error 5% (0.05).

1 – Designates the probability of the event occurring

Table 3. 1 The Sampling method, population and sample size

No	Sample Participant	Sampling Method	Population Size	Sampling Size
1	Campuses	Convenience Sampling	14	1

No	Sample participant	Sampling method	Population Size	Sampling size
1	Students	Convenience Sampling	48,673	372
2	Instructors	Convenience Sampling	2,408	18
3	Staff members /Leaderships/	Convenience Sampling	900	7
Total			51,981	397

The study used proportionate sample allocation formula so as to make each stratum sampled identical with proportion of the population. The researcher used proportionate sampling method as it determines appropriate sample size for gathering participants for the study, Because the population is composed of several subgroups that are vastly different in type and number. The number of participants from each subgroup is determined by their number relative to the entire population.

Proportional sampling is a method of sampling in which the investigator divides a finite population into subpopulations and then applies random sampling techniques to each subpopulation. Proportional sampling is similar to proportional allocation in finite population sampling, but in a different context, it also refers to other survey sampling situations. For a finite population with population size N, the population is divided into H strata (subpopulations) according to certain attributes. The size of the hth stratum is denoted as N_h. Proportional sampling refers to a design with total sample size n is such that of $n_h = n\frac{N_h}{N}$

As instance we can take a look at how this method was applied for finding sample size of students.

The researcher selected 397 from the population of 51,981 and employed this formula to determine the required sample size; here an arithmetic calculation is performed to find sample size of students 48,673/51,981*397=372. These 372 were then selected with the help of the nominal roll in the institution.

Therefore, 397 respondents were selected from population to be used as sample for this study and pursue the data gathering through questionnaires. The researcher deemed it's necessary to take independent sample for each subgroups of the institution to ensure equal representation, because they have different type and number of populations. Therefore, the researcher strongly believes that proportionate method is a likely suitable tool to create more accurate and reliable output from each subgroup.

3.3 Data Source and Data Collection Method

The study was gathered from two sources, primary and secondary.

As primary sources, data were collected from students, instructors and university leaders (principals). Three sets of survey questionnaire for students, instructors and university leaders is developed to gather data based on basic research questions to secure issues on the subject area under study.

This study uses two data collection instruments those are questionnaires and document analysis. These methods enable to obtain adequate information for the study.

Questionnaires

The questionnaires were designed closed-ended items. And they were distributed to students, instructors and Leaders in educational institutions. In this study, three sets of questionnaires were utilized for the data gathering process. The first two set of the questionnaire is for students and instructors to rate their perception, practice and challenges. And the second set was for the leaders to rate rule and regulations in the institution.

Document analysis

As previously described in the research design more descriptive survey research method used for the discussion of practices, challenges and prospects of ICT in Addis Ababa University. This type of research method helps to describe the issues under investigation. document analysis on the ICT policy of AAU part of the study.

3.4 Data Analysis Method

The data were collected from the respondents and cleaned, coded and then entered into SPSS computer software. The data were then analyzed, organized, tabulated and described quantitatively, using frequency and percentage.

The data gathered through questionnaire instruments were analyzed by using quantitative data analysis techniques. through descriptive statistics.

3.5 Validity

Bryman & Bell (2007) defined validity as how much any measuring instrument measures what it is intended to measure. They also suggest that the important issue of measurement validity relates to whether measures of concepts really measure the concept or not. There are several ways of establishing validity such as content validity, convergent validity concurrent predictive validity, construct validity, and convergent validity. This study addressed content validity through the review of literature and adapting instruments used in previous studies.

3.6 Reliability

Nunnaly (1978) stated that reliability is the consistency of a test, survey, observation, or another measuring device. The level of reliability of the instrument indicates the consistency of the variables. Cronbach ‘s alpha is an index of reliability associated with the variation accounted for the true score of the underlying construct and it can only be measured for variables which have more than one measurement question. 0.5 is a sufficient value, while 0.7 is a more reasonable value. Therefore, the reliability of the questionnaire was analyzed by using Cronbach’s alpha statistics.

Table 3. 2 Reliability Test Statistics

No	Variables	Number of Items	Cronbach’s alpha
1	Infrastructure	6	0.783
2	Importance of ICT	7	0.791
3	Use of ICT	8	0.761
4	Challenges of ICT	6	0.798
5	Policy issues	5	0.777

Source: Survey Result 2020

As shown above in table test Results of the Instruments scoured acceptable Cronbach’s alpha and the scales are found reliable.

3.6 Ethical Consideration

Every person involved in the study is entitled to the right of privacy and dignity of treatment, and no personal harm caused to subjects in the research. Information obtained will be held in strict confidentiality by the researcher. All assistance, collaboration of others and sources from which information will be drawn is going to be acknowledged.

CHAPTER FOUR:

RESULT AND DISCUSSION

This chapter deals with the presentation and analysis of the data collected from sample groups of respondents: AAU students, Instructors, Institution leaderships. The data from these groups were collected through questionnaires and document review. All the data gathered and through close ended questionnaires were organized and analyzed in tabular form and interpreted using percentage and frequency.

The findings from the questionnaires were analyzed by using SPSS (version 24), Among the 397 questionnaires that were distributed and representative of the total population 335 questionnaires were properly filled and returned which is 84.3% response rate.

The first part of this chapter focuses on the characteristics of respondents from sample population while the second part deals with the analysis of the data corresponding to the basic research questions.

Analysis and interpretation of the data were made based on the responses obtained from responses and the data obtained from document analysis.

4.1 Demographic Characteristics of Respondents

Description of the characteristics of respondents gives some highlights about the sample population. The following sections deals with demographic characteristics of sample students, instructors and Leaders in AAU

4.1.1 Characteristics of respondents, Students, Addis Ababa University

The major characteristics of sample students include gender, chronological age, and level of study and year of study.

Table 4. 1 Characteristics of respondent (Students)

Characteristics	Category	Frequency	Percent
Gender	Male	240	77.4
	Female	70	22.5
	Total	310	100.0
Age Group	Below 20	-	0.0
	20-30	173	55.8
	30-40	137	44.1
	41 and Above	-	0.0
	Total	310	100.0
Level of Study	Undergraduate	76	24.5
	Postgraduate	176	56.7
	Research	58	18.7
	Total	310	100.0
Year of study	Year 1	52	16.7
	Year 2	28	9.03
	Year 3	48	15.4
	Year 4	54	17.6
	Year 5	128	41.2
	Total	310	100.0

Source: Own Survey 2020

Table 4.1. above shows the demographic characteristics of the respondents. As we can see from the table 4.1., 240 (77.4%) of the respondents were male and the remaining 70(22.5%) of them were females. This shows that females are less in number in the study area.

Regarding the age of the respondents, most of the age groups 173(55.8%) were found between 20- 30 years of the total respondents while 137 (44.1%), of the respondents found above the age range of 30-40 years respectively. From this we can observe that the majority respondents are in the age category of 20- 30. Referring the data, the majority of the respondents are young.

The total sample population was 310 students. Distribution of students in level of study comprised of 176(56.7%) students from postgraduate, 76(24.5%) students from undergraduate and 58 (18.7%) students from Research.

Concerning year of study observed in the table above, 52(16.7%), 28(9.03%), 48(15.4), 54 (17.6) and 128(41.2%) were year 1-5 respectively. Generally, the finding regarding the characteristics of the sample respondents confirms that the respondents are learning ICT and have some experience on it. So, the response obtained from them is reliable and trust full that enables the researcher to move towards intended research finding.

4.1.2 Characteristics of respondents, Instructors, Addis Ababa University

Table 4. 2 Characteristics of respondents (Instructors)

Characteristics	Category	Frequency	Percent
Gender	Male	15	83.3
	Female	3	16.6
	Total	18	100.0
Age	Below 20	-	0.0
	20-30	3	16.6
	30-40	7	38.8
	41 and Above	8	44.4
	Total	18	100.0
Educational Qualification	Diploma	-	0.0
	BA/BS Degree	3	16.6
	MA/MS or above	15	83.3
	Total	18	100.0
Level of teaching	Undergraduate	4	22.2
	Graduate /Postgraduate	6	33.3
	Doctoral research	8	44.4
	Total	18	100.0

Department of teaching	Linguistics	6	33.3
	Research method, academic writing, comparative education	5	27.7
	Common courses in English department	3	16.6
	Management Control Systems	4	22.2
	Total	18	100.0

Source: Own Survey 2020

The above table shows that the instructors response frequency. Accordingly, the instructor's respondents show 15(83.3%) male and 3(16.6%) female. Majority of the respondents were male compared to the female.

Regarding the age of the respondents the age groups 3(16.6%) were found between 20- 30 years.7(38.8%) of the respondents found the age range of 30-40 years. 8 (44.4) were found above 41 and above. From this we can observe that the majority respondents are in the age category above 40.

Concerning educational qualification of instructors are important to support and create favorable condition for ICT. According to table 4.2 above, the instructor's respondent qualification consisted of 15(83.3%) have MA/MS or above and 3(16.6%) have BA/BS Degree. The data indicate that majority of instructors were MA/MS and above holders.

With regard to level of teaching, the following results were collected. 4(22.2%) of instructors taught doctoral research, 6(33.3%) of instructors taught Graduate/postgraduate and 4 (22.2%) of instructors taught undergraduate.

As can be seen in department of teaching above, the frequency of Linguistics, Research method, & academic writing, Common courses in English department, Management Control Systems

consist of 6(33.3%), 5(27.7%), 3(16.6) and 4(22.2%) respectively. This shows that there were representations of different department.

Generally, the finding regarding the characteristics of the sample respondents confirms that the respondents are experienced, and qualified in the area. So, the response obtained from them is reliable and trust full that enables the researcher to move towards intended research finding.

4.1.3 Characteristics of respondents, Leaderships, Addis Ababa University

Table 4. 3 Characteristics of respondents, (Leaderships)

Characteristics	Category	Frequency	Percent
Gender	Male	7	100.0
	Female	-	0.0
	Total	7	100.0
Age Group	Below 20	-	0.0
	20-30	-	0.0
	30-40	6	85.7
	41 and Above	1	14.2
	Total	7	100.0
Educational Qualification	Diploma	-	0.0
	BA/BS Degree	2	28.5
	MA/MS or above	5	71.4
	Total	7	100.0
Position	ICT team leader	1	14.2
	ICT Director	1	14.2

	ICT Infrastructure development and services team leader	1	14.2
	ICT Infrastructure Administration Team Leader	1	14.2
	Network Administrator	2	28.5
	Learning-Teaching Technologies Team Leader	1	14.2
	Total	7	100.0

Source: Own Survey 2020

The leadership's respondents show 7(100%) male and 0(0%) female. All of the respondents were male compared to the female. This implies that the leadership position was dominated by males in which females were under represented in leadership position in the area under investigation.

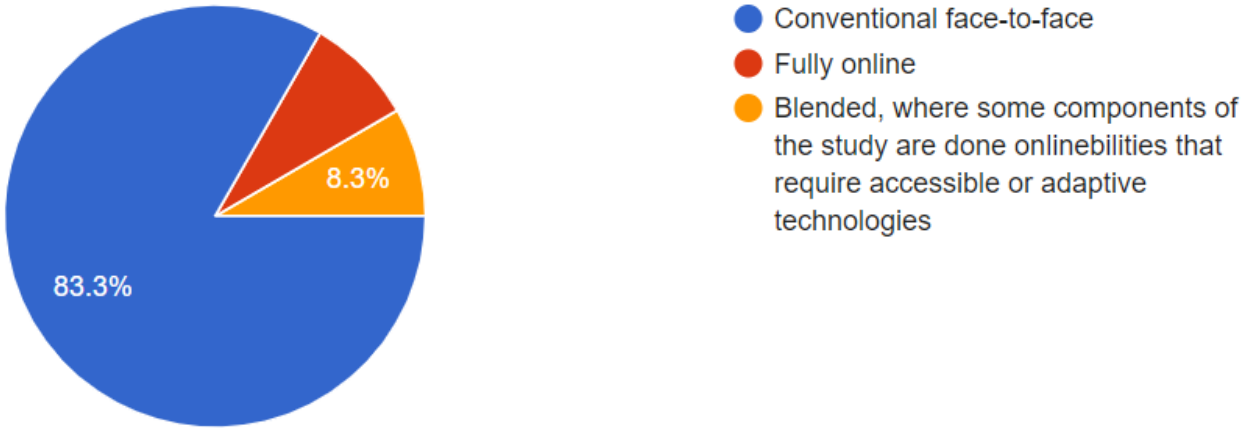
In age grouping nearly 6(85.7%) of the principals have 30-40 year while the rest 1(14.2%) of participant is above 41. The table clearly show that sample respondents leaderships 5(71.4%) have MA/MS or above while 2(28.5%) have first degree. The data revealed that the participant position was ICT team leader, ICT Director, ICT Infrastructure development and services team leader, ICT Infrastructure Administration Team Leader, Network Administrator and Learning-Teaching Technologies Team Leader respectively.

4.2 Descriptive Statistics Analysis

As indicated in the preceding chapter, the study utilized descriptive statistics as brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire or a sample of a population. The following subsections provide summary of the descriptive statistics of quantitative data gathered through administering the questionnaire.

4.2.1 Access to and Use of Information and Communication Technologies (ICTs)

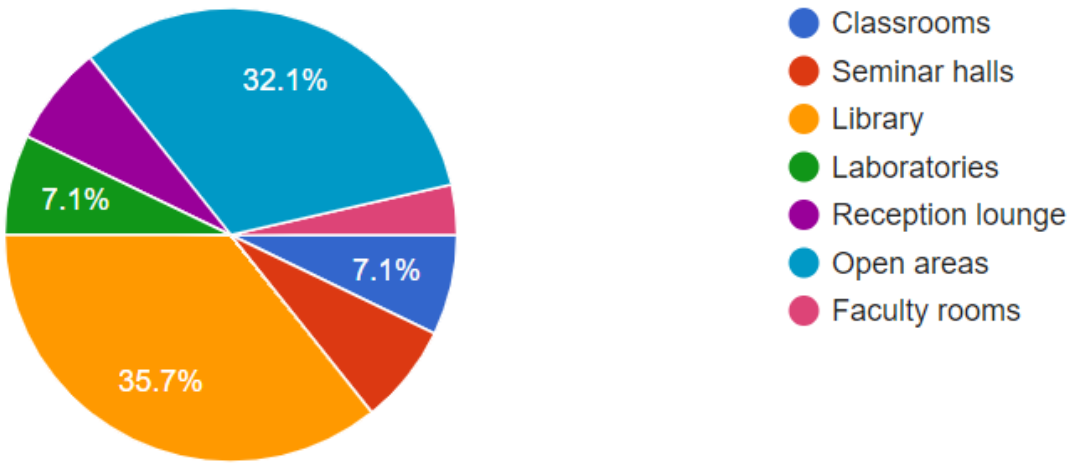
Figure 4. 1 Use of ICT in learning system (Students)



Source: Own Survey result (2020)

Figure 4.1 show 258(83.3%) of students learn on conventional face to face and only 26(8.3) use fully online learning system the rest 27(8.4%) were some components of study found to be mixed as online and face to face learning. This Implies, despite their limitedness in size equal number of students have access to both face to face and online learning systems and pure online learning platforms while majority of students do not have the access which benefit them from e-learning systems, rather they employed the conventional face to face learning strategy on a higher side.

Figure 4. 2 Internet service across the institution (Students)



Source: Own Survey result (2020)

It was tried to collect data on the availability of Internet connectivity services in the institution, figure 4.2 shows 110(35.7%) students get Internet connectivity in library and 100(32.1%) access it at open areas and the other 22(7.1%) of students with similar size in each place category get internet connection in classrooms and faculty rooms, lounge , laboratories and seminar halls. This show students in the institution have access to internet connectivity in different palaces. Most students which are on a higher side responded having access to internet in libraries while comparable number of students have their access in open areas, among the respondents few numbers of students said to have access in other facilities like classrooms, lounge, laboratories and seminar halls.

4.2.2 Resources/Services/Spaces Provided by Institution

Table 4. 4 Resources/services/spaces provided by institution (Students)

Statements	Poor	Fair	Good	Excellent	Not available
eClassroom facilities (e.g. computers, projection systems, lecture capture systems, SMART boards, etc.)	4	94	97	115	-
	1.29%	30.3%	31.2%	37.0%	-
Computer labs (for practical and Internet access)	9	100	124	77	-
	2.9%	32.2%	40.0%	24.8%	-
Email services institutional	30	46	48	162	24
	9.67%	14.8%	15.4%	52.2%	7.7%
Network bandwidth/speed of Internet	82	70	76	82	-
	26.4%	22.5%	24.5%	26.4%	-
Wi-Fi Access	46	70	103	91	-
	14.8%	22.5%	33.2%	29.3%	-

Source: Own Survey result (2020) SPSS Output

It is notable from table 4.4, students practice on eClassroom facilities (e.g. computers, projection systems, lecture capture systems, SMART boards, etc.) in the learning activities show 115(37.0%) respond excellent on the request delivered to them. And 97(31.2%) students' response good. This represents that more than half of students are satisfied on eClassroom facilities by rating these facilities above average ranging from Excellent to Fair and few students have negative response since the facilities do not satisfy their needs.

When it comes to access nearly 124(40.0%) students respond good practice of lecture works and access to the internet in Computer labs while the other major respondents which accounts 100(32.2%) of the population think that the access provided by the institution is fair. This derives that most of the students are satisfied on the given access for Computer labs while few students implicated that more emphasis need to be given in the area.

With regard to table 4.4, students were requested to express their perception on availability of Email services in the institution the data show that 162(52.2%) of the students respond excellent while some other students which account 24(7.7%) of the population indicated they completely do not have access to it and a comparable number of students 30(9.67%) indicated that the service provision is poor. From this we can deduct that higher number of the students have access for institutional email services while a few of them are not satisfied on the provided service and the other few said doesn't even have access to it.

In table 4.4 students were requested to respond on the Network bandwidth/speed of Internet provided by institution show that only 80(26.4%) responded excellent while equivalent proportion of the samples said the Network speed is poor and comparable number of respondents rated the same as fair and good. This portrays equal number of students were fully satisfied with Speed of internet connection speed while the others were fully unsatisfied and less than the average of users rated mediocre for the same service

Nearly 70(22.5%) students respond fair practice on wi-fi access while 103(33.2%) of students think the access is good and on the lower side 46(14.8%) of the respondents considered this access to be poor. This shows that majority of the students are not satisfied on wi-fi access while some or few considering this service satisfactory for their needs.

4.2.3 Benefit of ICT in Learning & Education

Table 4. 5 Benefit of ICT in learning & education (Students)

Statements I want to use technology in my studies because:	Agree	Neutral	Disagree	Total
It will help me get better results in my subjects.	267	43	-	310
	86.1%	13.8%	0.0	100.0%
It will help me understand the subject material more deeply.	276	34	-	310
	89.0%	10.7%	0.0	100.0%
It makes completing work in my subjects more convenient.	246	64	-	310
	79.3%	20.6%	0.0	100.0%
It allows me to collaborate with others easily, both on and outside of the campus.	270	40	-	310
	87.0%	12.9%	0.0	100.0%
It will improve my IT/information management skills in general.	259	41	-	310
	83.5%	13.2%	0.0	100.0%
It will improve my career or employment Prospects in the long term.	243	65	2	310
	78.3%	20.9%	0.65%	100.0%
It motivates me to explore many topics I may not have seen before	279	31	-	310
	87.0%	10.0%	0.0	100.0%

Source: Own Survey result (2020) SPSS Output

It is notable from table 4.5 nearly 267(86.1%) of the student's respond that ICT will help to get better results in their subjects while the remainder refrain from forwarding any suggestion. Thus, it can be considered that students have similar perceptions with technology usefulness and have accepted that this as an asset to get better results.

Even though, students agree on usefulness of technology help to understand their subject material more deeply on the higher side which is 276(89.0%) students show their agreement to the statement while the remaining did not want to express themselves as neutral to solicited. From this we can deduct that majority of the respondents firmly believe technology is a gateway to widen the materials and resources which contribute to their successfulness on the given courses and their assigned field of study in general.

In table 4.5, student's response on their perception on completing work in their subject more convenient by use technology point out 270(79.3%) of the students agree on the issue while the remainder stays neutral. This shows that students agree on technological utilities enhance and aid their learning activities significantly.

It is notable from table 4.5, 270(87.0%) of students show their positive perception on usage of technology allows to collaborate with others easily, both in and outside of the campus. Educational subject contents easily accessed only during school time. This represents that students agree on the matter that ICT can allow multiple people to collaborate on the same or different topic of interests with others.

With regard to the table 4.5, student's response on improving IT management skills in general show that 259(83.5%) of students agree to the idea while the remaining few have not said none. From this we can deduct that students highly believe IT Skills are very crucial for the success in their endeavors

As students' response on use of technology dictates it will improve career or employment Prospects in the long term, in the survey the researcher found out 243(78.3 %) agree to this matter. This shows that students agree to ICT use has higher impact and will enable long-term career success.

With regard to table, 4.5 279(87.0%) of students show their agreement on technology can be used to motivates them to explore many topics which they may not have seen before or have the

access to use in such a form while the remaining do not have any opinion towards it. Students comprehend different learning abilities through technology. One can derive that higher number of students agree that ICT can be utilize in a manner to increase motivation towards exploring study of interest as it is directly proportionate in improving the learning, association as well as recall abilities of students

In general, students agreed that the usage of ICT is important for various educational activities, it's something they want to master. Learning to use it enhances their self-esteem and makes them excited about coming to school or even about the entire teaching learning process. According to the above survey in the research, most students believe that using classroom technology motivates students to learn. Technology in the classroom allows students to take greater control of their education because tools and utilities like access to the internet, use tablets and laptops encourage interactive, hands-on learning.

4.2.4 Perceptions of Use of ICT

Table 4. 6 Perceptions on the use of ICT (Instructors)

S.N0	Item	Agree	Neutral	Disagree	Total
1	ICT can solve many of our educational problems	16	2	-	18
		88.8%	11.1%	0.0	100.0%
2	ICT will bring new opportunities for organizing teaching and learning.	15	3	-	18
		83.3%	16.6%	0.0	100.0%
3	ICT increases access to education and training.	17	1	-	18
		94.4%	5.55%	0.0	100.0%
4	ICT will increase my efficiency in teaching.	17	1	-	18
		94.4%	5.55%	0.0	100.0%
5	ICT enables collaborative learning.	13	4	1	18
		72.2%	22.2%	2.7%	100.0%
6	ICT can engage learners more than other forms of learning.	15	3	-	18
		83.3%	16.6%	0.0	100.0%
7	ICT increases the quality of teaching and learning because it integrates all forms of media: print, audio and video.	17	1	-	18
		94.4%	5.55%	0.0	100.0%
8	ICT increases the flexibility of teaching and learning.	17	1	-	18
		94.4%	5.55%	0.0	100.0%

Source: Own Survey result (2020) SPSS Output

It is notable from table 4.6, instructors were requested to express their perception concerning the clarity and educationally usefulness of ICT contents in their teaching and learning. And from the responses one can grab 16(88.8%) of the instructors agree that ICT can solve many of our educational problems useful while the rest do not provide answer to the solicited. From this we can perceive ICT allows the instructor to monitor and manage students learning, show way forward to think critically and creatively, solve simulated real-world problems through collaborative work, engage in ethical decision-making, and adopt a global perspective towards issues and ideas. As it provides students from remote areas access to expert instructors and learning resources, and gives administrators and policy makers the data and expertise they need to work more efficiently.

Nearly 15(83.3%) of instructor's express their attitude towards the idea that ICT will bring new opportunities for organizing teaching and learning with positivism. This implicates that instructors have a positive attitude that ICT will bring new opportunities for organizing teaching and learning resources which the institution needs to work towards fulfilling this crucial requirement.

In table 4.6 above, instructors responded to their perception and practice as ICT increases access to education and training were 17(94.4%) while the remaining were neutral on the subject. This significantly implies that instructors agree on using ICT can make access of education and training much easier as it promotes freedom of stakeholders to align a flexible timeline, location and presence to present needed educational resources.

In table nearly 17(94.4%) of instructors confirm their agreement on ICT will increase their efficiency in teaching processes, it also helps them to increase the flexibility to teaching and learning. This shows that instructors agree on ICT can help them to develop their teaching system and presented an equal opportunity to those who are lacking success in the area.

From table 4.6, It is easy to conceive that instructors agree on the idea as ICT enables collaborative learning by 13(72.2%) while most of the remainders show neutrality to the subject

and some few respondents deviate from it. This shows that ICT enables collaborative learning as it represents helping others to learn has to do with offering better channels for communication.

With regard the table 4.6, instructors were requested to give their perception on that ICT can engage learners more than other forms of learning, 15(83.3%) of instructors provided their agreement on the issue while the remaining are still neutral to the matter. These indicates that instructors strongly believe that ICT has a power to engage learners more than other forms of conventional learning mechanisms which seems to be outdated less attractive.

One can note from table 4.6 that, 17(94.4%) of responses are positive towards the perception on integration of media use on ICT as it increases the quality of teaching and learning because of the fact when one integrates all forms of media: print, audio and video while the remaining gave response in neutrality. This indicates that instructors are in agreement on their preference to integrate and use graphically rich contents in their teaching learning activities as ICT promotes and made easy of such preparation as well as uses.

4.2.5 Challenges to Use of ICT

Table 4. 7 Challenges to use ICT in education (Instructor)

S.No	Item	Agree	Neutral	Disagree	Total
1	Lack of training on ICT	13	2	3	18
		72.2%	11.1%	16.6%	100.0%
2	Lack of technical support in the University	9	7	2	18
		50.0%	38.8%	1.11%	100.0%
3	Lack of professional prestige Concern about the quality of e-courses	14	2	2	18
		77.7%	11.1%	11.1%	100.0%
4	Lack of motivations to use ICT	2	6	10	18
		11.1%	33.3%	55.5%	100.0%
5	Inadequate availability of hardware and software	9	6	3	18
		50.0%	33.3%	16.6%	100.0%
6	Poor Internet access and	13	3	2	18

	networking in the university	72.2%	16.6%	11.1%	100.0%

Source: Own Survey result (2020) SPSS output

It is notable from table 4.7, nearly 13(72.2%) of instructors responded on the lack of appropriate ICT training as hey disclose their agreement on the issue even if few respondents disclosed it negatively. This data presented that instructors face lack of appropriate ICT training to enhance their teaching methodology further which is an alarming issue in the teaching learning process as it's true that without proper and adequate training it will be difficult for delivering subjects with the level of quality expected from them.

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In table 4.7, instructors given their input on lack of technical support in the University, 9 (50%) of the instructors agree to the fact that there was lack in this area while the remaining majority stayed with neutrality and a few of them disagreeing as support given to them was sufficient. Based on this data one can get into a notion that the technical support given instructors needed to be streamlined to enable them purse their daily activities.

In table 4.7, we can also see that the responses for lack of professional prestige concern about the quality of e-courses has been rated high as 77.7% of them agreed to it. From this we can deduct more emphasis need to be given for the area. Nearly 14(77.7%) of respondents from survey presented expressed their concern on their attitude on Lack of professional prestige concern about the quality of e-courses goes to agreement as it strengthen that instructors have negative attitude towards it.

In above table 4.7, instructors were also requested to express their concern on lack of motivations towards use of ICT as 10(55.5%) of the instructors showed that they were not interested in additions to the use of technology. Based on this data one can conclude that the instructors are equal number of instructed are interested and not interested to make use of technological aids.

On the same survey from table 4.7 adequacy on availability of hardware and software was questioned and 9(50.0%) of instructors out of the sample agree to this point of matter negatively while the remaining majorities are indifferent to the query. This shows that instructors pointed out the lack of availability of hardware and software which suits their nature of work and interest.

It is notable from table 4.7, they response acquired on poor Internet access and networking in the university shows that 13(72.2%) of instructors agree to this issue which shows that, instructors were having poor Internet access, connectivity and unappealing networking environment.

In general we can grasp the idea that lack of different training for instructors on how to use ICT tools, and supply of poor internet connection with poorly managed network infrastructure and services contributed a major role in hampering the teaching learning environment from upward and healthy growth as lack of attention towards the needs of ICT by institution administrators are the main challenges to get the benefits beyond their presence.

4.2.6 Policy Issues for ICT

Table 4. 8 ICT Policy in teaching and learning (Leadership)

S.No	Item	Yes	No	On Development
1	policy for ICT use in teaching and learning in your university/institution	4	-	3
		57.1	0.0	42.8
2	strategy for ICT in your university/institution	5	-	2
		71.4	0.0	28.5
3	ICT policy in your university/institution covering what technologies to use and not use for teaching and learning	-	3	4
		0.0	42.8	57.1
4	privacy and data protection policy in your university/institution	2	1	4
		28.5	14.2	57.1
5	workflow escalation procedure for repair and maintenance of ICTs in your university/institution	3	2	2
		42.8	28.5	28.5

Source: Own Survey result (2020) SPSS Output

As it can be exhibited from table 4.8, response on presence of policy for ICT use on teaching and learning in the institution, 4(57.1%) were positive yes while 3(42.8%) were on the status of "On development". Hence, from collected data one can understand that there is ICT Policy for teaching and learning system in the studied institution but much needs to be done in preparation of well-rounded and full fleshed policy to this area to address overhanging matters and as we are noticing new trends are coming up on a daily basis.

On the other hand, responses given on presence of strategy for ICT in the institution 5(71.4%) found to be "Yes" and 2(28.5%) responded "On development". Here it's noticeable there is a strategy for ICT in institution covering applied technologies on use for teaching and learning, 3 (42.8%) respondents give negative replies and 4 (57.1%) answered "On development" it's required to the institution to create to awareness program and protocols as well as regularly update existing one.

On a different side, privacy and data protection policy on the use of currently available resources in the institution is indicated to be weak as 2(28.5%) responses were positive while 4 (57.1%) said "On development". This implicates the emphasis given to policy and directive development to address and regulate the entire ICT eco-system.

From the table 4.8 above, respondents satisfied on workflow escalation procedure for repair and maintenance of ICTs in the university as their proportion counts to 3 (42.8%) and the other 2(28.5%) responded "No" as they do not consider the escalation methods and procedures for service requests to be acceptable and 2(28.5%) showed the mechanism used to resolve this is under development or to be inadequate on the higher side. Generally, from respondents we can easily understand much work is required by concerned stakeholders in the institution to make less flawless above-mentioned practices in reality.

CHAPTER FIVE:

CONCLUSION AND RECOMMENDATION

This chapter presents the summary of the findings, conclusions and recommendations of the research. The title of the research is: "Assessment of ICT implementation practice in higher education institutions: the case of Addis Ababa university". The main objective of the study is to assess the implementation of ICT practice in Addis Ababa university. It has also four basic research questions.

To answer these research questions the researcher derived four sub-questions, all of which were addressed through the questionnaire and document analysis

This section summarizes major findings, draws conclusions and forwards possible recommendations to overcome the problems mentioned in the previous sections.

5.1 Summary of Findings

The findings revealed that the practices, challenges and prospects of ICT in Addis Ababa University. This summary is in agreement with the basic research question. These include the extent ICT implementation on higher education, the perceptions of students', instructors and institutional leaderships on ICT.

1) Inadequate infrastructure: Concerning the available services, internet connectivity and availability for teaching and learning instructors responded 27(75.0%) agree. This shows that there are availability and connection problems of Internet for teaching learning activity.

2) Instructors' lack of ICT skills: Instructors have poor training in ICT because only very few have taken training in ICT, Instructors responded 28(77.1%) of them agreement receiving computer training.

3) ICT Integration Challenges at AAU

- Lack of adequate teacher skills in ICT

- Lack of adequate pre-service and in-service teacher training
- Lack of technical and pedagogical support available for instructors
- Lack of accessible ICT resources for instructors and students
- Absence of institutional ICT policy for education
- Absence of skilled staff in the ICT support office that can provide technical and pedagogical training to instructors

Concerning prospect of integrating ICT in the teaching/learning process, are summarized in Table 4.6, the study did not find negative attitude and lack of motivation among the challenges. However, lack of institutional ICT policy stands out as another challenge to ICT integration at AAU. The study indicates that the majority of AAU instructors do not employ ICT in the teaching/learning process. As a result, students are largely unexposed to ICT mediated learning process. This study analyzes instructors positively appreciate and realize the importance of ICT, share a positive attitude towards ICT utilization in teaching and learning. This is a good foundation for a successful future integration of ICT in the teaching/learning process at AAU.

5.2 Conclusion

The ICTs has great advantage in improving all sphere of life including education and vital role as a strong agent for change among many educational practices. Thus, ICT in Higher education improves teaching learning process, provides the facility of online learning to thousands to thousands of learners who cannot avail the benefits of higher education due to several checks, such a time, cost, geographical location etc. Once again ICT serve to provide the means for much of this activity to realize the potential it holds.

The above data suggest the unavailability and inappropriate ICT infrastructure, instructors training, limited ICT knowledge and skills for both the instructors and the students characterized by inadequate time for in-service courses for instructors, limited technical support during teaching and learning process, and lack of proper ICT policies in the institution. Therefore, there has been limited use of ICTs in class presentation in the institution. The researcher therefore

concludes that the inadequate practice, poor perception and the mentioned challenges hindered ICT implementation in the institutions.

A related challenge is that most have limited or low access to the Internet, which makes it difficult to assume that educators can integrate ICT into their teaching, and only a small number of students use computers and the Internet as a learning resource.

5.3 Recommendations

Based on the findings of the study, it is recommended that:

1. Avail resources to instructors. Network infrastructure and computational facilities need be augmented, and equitably allocated to instructor. Basic access to personal computer and Internet must be available to every instructor.

The institution has invested to his capacity to provide adequate number of computers in the institution and also enhance internet connection in the institution to ensure easy access to teaching learning.

Help instructor with the available computer hardware or the software. Moreover, ICT competency framework has to be developed to make instructors capable to integrate ICT in their teaching and learning activities at the classroom setting.

2. To effectively integrate ICT into the teaching and learning process:

I. Acquire ICT staff capable of providing/coordinating technical and pedagogical trainings to instructors. The institution should enhance instructors ‘in-service staff training programs that are tailored to the institution programs to keep instructors up to date with the technological changes which will promote proper integration of ICTs in teaching and learning.

II. Elevate instructor awareness, skill, and confidence towards ICT through differentiated training. Continuous monitoring and evaluation of the ICT infrastructure after setting the goals for the project and make things ready for

implementation, and then continuous monitoring and evaluation should be part of the process.

III. Motivate instructors to participate in training sessions and encourage them to integrate ICT enabled teaching. Some incentives to motivate instructors include: reduction in workload, peer-recognition, and certification.

IV. Access student ICT abilities. Consider offering introductory ICT courses as part of the general requirement for all students. Putting the Student at the Heart of Learning Instructors should build symbiosis relation with technology. This will help them communicate well with available educational resources through technology and then to their students. Because it is not the technology, what matters is the pedagogy.

V. Encourage independent longitudinal studies to assess the state of affairs of ICT integration on a continued basis.

3. Institute a clear ICT policy. ICT may find it useful to identify peer/comparable higher education institutions that have already integrated ICT, and bring experiential insights from them.

The institution leadership should inform themselves with the national ICTs policies and especially in education in order for them to develop ICT policy that would enable them integrate use of ICTs in teaching and learning.

Furthermore, adequate funds must be provided to initiate, develop, promote, review and implement ICT policies in the educational sector to bring about an improvement on ICT utilization, through computer apprentices courses taught in the institutions.

5.4 Suggestions for Further Studies

1. A study could be carried out to find out Instructors and students' level of satisfaction using ICT.

2. A comparative study can be carried out on the implementation of ICT in development of academic performance

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APPENDEX I

St. MARY'S UNIVERSTY

SCHOOL OF GRADATE STUDYIESY

QUESTIONNAIRE ON ASSESSMENT OF ICT IMPLEMENTATION PRACTICE IN HIGHER EDUCATION INSTITUTIONS: THE CASE OF ADDIS ABABA UNIVERSITY

Dear respondents,

I'm a postgraduate student at St. Mary's University. Currently, I am conducting a research entitled "assessment of ICT implementation practice in higher education institutions: the case of Addis Ababa university" as partial fulfillment of the requirements for the award of Masters of Business Administration in General Management.

The purpose of this questionnaire is to gather data for the proposed study, and hence you are kindly requested to assist the successful completion of the study by providing the necessary information. Your participation is entirely voluntary and the questionnaire is completely anonymous. I confirm you that the information you share will stay confidential and only used for the aforementioned academic purpose. So, your genuine, frank and timely response is vital for the success of the study. I want to thank you in advance for your kind cooperation and dedication of your time to fill this questionnaire.

Sincerely yours,

Please Note:

1. No need of writing your name.
2. Indicate your answer with a check mark (√) on the appropriate block/cell for all questions.

Please respond to all the questions by following the instructions.

A. Personal Information

1.1 Gender: □ Female □ Male

1.2 Your age group: □ Below 20 □ 21-25 □ 26-30 □ 31-35 □ 36-40 □ 41 and above

1.3 Your level of study: □ Undergraduate □ Graduate or postgraduate □ Research

1.4 Year of study: □ Year 1 □ Year 2 □Year 3 □Year 4 □Year 5

B. Access to and Use of Information and Communication Technologies (ICTs)

1. Most of the courses you are currently studying are:

□ Conventional face-to-face

□ Fully online

□ Blended, where some components of the study are done online

2. Where do you get access to Internet in your university/institution? (Tick (□) all that apply.)

□Classrooms □Library □ lounges

□Faculty rooms □Laboratories □Other, _____

□Seminar halls □Open areas

4. ICT Environment

4.1 Please rate your experiences with the following resources/services/spaces provided by your institution.

Resources/Services/Spaces	Poor	Fair	Good	Excellent	Not available
eClassroom facilities (e.g. computers, projection systems, lecture capture systems, SMART boards, etc.)					
Computer labs (for practical and Internet access)					
Email services institutional					
Network bandwidth/speed of Internet					
Wi-Fi Access					

5. Please rate the following statements about technology use in your studies.

Statements I want to use technology in my studies because:	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Do not know
It will help me get better results in my subjects.					
It will help me understand the subject material more deeply.					
It makes completing work in my subjects more convenient.					
It allows me to collaborate with others easily, both on and outside of the campus.					
It will improve my IT/information management skills in general.					
It will improve my career or employment Prospects in the long term.					
It motivates me to explore many topics I may not have seen before					

APPENDIX 2

The Questionnaire should be completed by instructors in an institution.

1. Personal Information

1.1 Gender: □ Female □ Male

1.2 Your age group: □ Below 20 □ 21-25 □ 26-30 □ 31-35 □ 36-40 □ 41 and above

1.3 Educational Qualification: □ Diploma □ BA/BS Degree □ MA/MS or above

1.4 Level of teaching (√) all the apply

□ Undergraduate □ Graduate /Postgraduate □Doctoral research

1.5 Department of teaching_____

2. Perceptions of Use of ICT

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
ICT can solve many of our educational problems					
ICT will bring new opportunities for organizing teaching and learning.					
ICT increases access to education and training.					
ICT will increase my efficiency in teaching.					
ICT enables collaborative learning.					
ICT can engage learners more than other forms of learning.					
ICT increases the quality of teaching and learning because it integrates all forms of media: print, audio and video.					
ICT increases the flexibility of					

teaching and learning.					

3. Please rate the following challenges to your use of ICT.

Challenges	Strongly agree	Agree	Average	Disagree	Strongly Disagree
Lack of training on ICT					
Lack of technical support in the University					
Professional prestige Concern about the quality of e-courses					
Lack of Motivations to use ICT					
inadequate availability of hardware and software					
Poor Internet access and networking in the university					

APPENDIX 3

The questionnaire shall be completed by a responsible officer in a university/institution to provide relevant data.

1. Personal Information

1.1 Gender: □ Female □ Male

1.2 Your age group: □ Below 20 □ 21-25 □ 26-30 □ 31-35 □ 36-40 □ 41 and above

1.3 Educational Qualification: □ Diploma □ BA/BS Degree □ MA/MS or above

1.4 Your Position: _____

2. Policy issues for ICT

2.1 Is there a policy for ICT use in teaching and learning in your university/institution?

□Yes □ No □ In development

2.2 Is there a strategy for ICT in your university/institution?

□ Yes □ No □ In development

2.3 Is there an ICT policy in your university/institution covering what technologies to use and not use for teaching and learning?

□ Yes □ No □ In development

2.4 Is there a privacy and data protection policy in your university/institution?

□Yes □ No □ In development

2.5 Is there a workflow escalation procedure for repair and maintenance of ICTs in your university/institution?

□ Yes □ No □ In development

DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of research advisor Tiruneh Legesse (Asst. Prof.). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

_____ _____

Name **Signature**

St. Mary's University, Addis Ababa **June, 2020**

ENDORSEMENT

This thesis has been submitted to St. Mary's University for examination with my approval as a university advisor.

_____ _____

Advisor **Signature**

St. Mary's University, Addis Ababa **June, 2020**