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ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
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THE CHALLENGES AND CURRENT STATUS OF E-  
LEARNING IN ETHIOPIAN HIGHER EDUCATION  
INSTITUTIONS: CASE OF MEKELLE UNIVERSITY

HIRUT BERHE

JUNE 2011

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A Thesis Submitted to the School of Graduate Studies of Addis  
Ababa University in Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Information Science

By

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_____	Examiner,	_____	_____

# **DEDICATION**

**To Virgin Mary**

**For her endless help and blessings**

**In every activities of my life**

## **Acknowledgment**

First and for most I would like to thank the Almighty GOD for his unending helps and blessings.

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## **Abstract**

The aim of this research is to assess the current status of e-learning application in Mekelle University, identify its main challenges and factors that play major role to its success and provide a recommendation for a successful implementation of e-learning technology in HEIs of Ethiopia. Purposive sampling technique was employed and primary data was collected by means of structured questionnaires and interviews. The study population was academic staff, administrative officers and key informants of the Institute of Technology and College of Health Science of Mekelle University. The research identified that the current status of e-learning in the institution is in its infant stage. No ICT policy at work is found in the institution. As the finding shows availability of hardware, faster Internet connectivity, improved software, reliable electricity and open source software makes e-learning more effective. Moreover, the result of the study indicated that there are several factors that hinder the implementation of e-learning at the institutions. These include infrastructure problem, lack of awareness and motivation, lack of ICT skill, lack of training facilities, lack of administrative management and technical support and resistance of individuals to change.

The results of this research shows that effective implementation of e-learning could be possible through policy consideration that favors e-learning, creation of awareness and motivation among the university community, using open source software, skills development and trainings, management support, resource accessibility and availability.

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## List of Acronyms

ADDIE	-----	Analyze Design Develop Implementation and Evaluation
AH	-----	Adaptive Hypermedia
CBT	-----	Computer Based Training
ECBP	-----	Ethiopian Engineering Capacity Building Program
HEI	-----	Higher Education Institution
ICT	-----	Information Communication Technology
ID	-----	Instructional Design
IDM	-----	Instructional Design Models
ISD	-----	Instructional Systems Design
IT	-----	Information Technology
ITS	-----	Intelligent Tutoring Systems
LAN	-----	Local Area Network
LMS	-----	Learning Management System
ML	-----	Mailing List
MEJS	-----	Momona Ethiopian Journal of Science
MoE	-----	Ministry of Education
OER	-----	Open Educational Resources
TVET	-----	Technical and Vocational Education Training
UNESCO	-----	United Nations Education scientific and Cultural
WBI	-----	World Bank Institute
WBL	-----	Web-Based Learning

# Chapter One

## 1. Introduction

### 1.1. Background of the Study

In the era of globalization, developments in Information and Communication Technologies (ICTs) have impacted all sectors of society such as educational institutions, business institution. In higher education in particular application of ICTs in the form of e-learning is already changing teaching learning processes (Sife et al. 2007). According to Fisser (2001) and Pelliccione (2001), there are many pedagogical and socio-economic factors that have driven higher learning institutions to adopt e-learning. These include greater information access, greater communication via electronic facilities, synchronous learning, increased cooperation and collaboration, cost-effectiveness (by reaching different students in greater numbers) and pedagogical improvement through simulations, virtual experiences and graphic representations. Accordingly, both trainers and learners can choose more appropriate applications which are flexible in time, in place, personalized, reusable and adapted to specific domains and more cost-efficient. Moreover, according Herselman and Hay (2003), the revolutionary change taking place in ICTs has dramatic effects on the way universities carry out their functions of teaching, learning and research, particularly on the creation, dissemination and application of knowledge. These developments created unprecedented challenges to higher education institutions (HEIs) in developing countries.

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

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

### **1.1.1. E-learning in Mekelle University**

Mekelle University is found at Mekelle city in Tigray region of Northern Ethiopia, at a distance of 783 Kilometers from the Ethiopian capital city, Addis Ababa. It was established by merging Mekelle Business College and Mekelle University College on May 2000 by the Government of Ethiopia (Council of Ministers, Regulations No. 61/1999 of Article 3) as an autonomous higher education institution. Currently, the university has three campuses namely Arid campus (Main campus), Adihaki campus and Ayder campus and has eight colleges namely Business and Economics, Dry Land Agriculture and Natural Resources Management, Engineering, Law and Governance, Social Sciences and Languages, Veterinary Medicine, Natural and Computational Sciences and Health Sciences; and two institutes: Institute of Pedagogical Sciences and Environment and Heritage Conservation ([www.mu.edu.et](http://www.mu.edu.et)).

Mekelle University is now a government-funded higher education institution with an international reputation for teaching and research. It has developed collaborative understanding with other national and international institutions. Since its establishment, it has been proved to be one of the fastest growing universities in Ethiopia. The fundamental elements of the university's mission are teaching, conducting research and consultancy services. Thus, its ultimate goal is to pursue standards of excellence in

teaching, research and community service for the betterment of the society ([www.mu.edu.et](http://www.mu.edu.et)).

The current teaching-learning process in Mekelle University is traditional. In this mode of teaching, only face-to-face delivery system is followed. The commonly 'traditional' teaching methods are lecture or tutorial (Armitstead-Pinkney 2008). Besides, a class room of students is thought for certain duration of time. Then, the teacher would probably repeat the same task for students in other class as long as all students could not be accommodated in a class room. As far as the reading material is concerned, the students are mostly provided hard-copy materials.

The overall ICT tasks or functions are mostly performed by the ICT center of Mekelle University. This ICT center has organized its processes and staffs into four departments namely Network and infrastructure provision, Application and system development, User support services, Applications and systems development and ICT academy and innovation service. The advantage of dividing processes and staffs into departments are in order to perform tasks of the University effectively and accurately. The three campuses of Mekelle University are networked to each other in order to share files and resources. These networking and other tasks performed by ICT center of Mekelle University. Currently, the ICT shows an exponential growth in the University in various aspects. For instance, when new students arrive they can access any type of information like their dormitory, date of registration and the rule and regulations of the University through the Universities website ([www.mu.edu.et](http://www.mu.edu.et)).

Currently, there is a project for designing and implementing e-learning in different Ethiopian HEIs and Technical and Vocational Education Training (TVET) colleges. The project is performed by Ethiopian Capacity Building Program (ECBP). It performs various functions in adoption of e-learning in Mekelle University with the collaboration of Alkaline University that is found in Spain. The project that coordinates the e-learning development at Mekelle University is known as Digital Campus. The digital campus is started as a pilot study in order to implement e-learning in engineering and College of Health Science, due to availability of computers and labs. The engineering college is

under the Ethiopian Institute of Technology in Mekelle University which contains six departments: electrical engineering, industrial engineering, mechanical engineering, civil engineering, architecture & urban planning and computational science and information system. In this Institute of Technology there is a team called e-learning unit which is used to control and organize every e-learning activities of the institute. The progress of the adoption or development of e-learning in the institute technology is organized by ECBP, digital compass and e-learning unit.

The other college that is used as part of the pilot study is College of Health Science. This college encompasses five departments namely medicine, pharmacy, public health, nursing and midwifery. In this college, there is no e-learning unit. Rather, the e-learning is supervised by the ECBP and digital compass.

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

The exponential growth of Information Communication Technology (ICT) has made learning to happen very quickly in the information society. Keeping pace with this change requires new thinking about how we acquire knowledge and skills as well as how we develop learning resources. As a result, the advent of ICT and the internet has greatly influenced the teaching learning process and the way knowledge is conveyed (Mahmud and Gope 2009).

There are different factors and challenges that can influence entire life of HEIs in various aspects. For instance, factors that influence the inner life of HEIs include the use of ICT, can generally be distinguished into economic, social, cultural, and technological factors as well as the changing role of governmental policy (Middlehurst 2001). The emergence of the knowledge economy, in which economic productivity and growth is increasingly dependent on the development and application of new knowledge, creates a growing demand for a highly educated and flexible work force, leading to a further increasing of higher education and to an increasing need for lifelong learning opportunities. The process of globalization, characterized by increasing global economic interdependence and international competition, leads to the emergence of an international higher education market in which a growing number of traditional and new types of higher education

providers compete with each other. The process influences at the same time the role and responsibilities of the nation in higher education sectors. ICT is both driving and enabling the process toward a knowledge-driven global economy. It allows higher education providers to accommodate the specific needs of students in terms of mode, pace, place and time of study and to reach with different and new target groups and markets both locally and globally (CHEPS 2000).

The universities in developing countries have a number of challenges that they face when they seek to implement e-learning systems. For instance, Sife et al. (2007) state that African universities which should be in the forefront of ensuring Africa's participation in the ICT revolution, are unable and ill-prepared to play such a leadership role. This is because of the information infrastructure of African universities which is poorly developed and inequitably distributed.

The effective implementation of e-learning depends on different issues. For instance, Mahmud and Gope (2009) state that the successful implementation of e-learning is depend on successful delivery of contents, courses and training via electronic media including the internet, intranets, extranets, satellite broadcast, audio/video tape, radio, interactive television, and compact disk read only memory. On the related issue, the successful implementation of e-learning depends on the extent to which the needs and concerns of the stakeholder groups involved are addressed (Wagner et al. 2008). The stakeholder groups have an important role to play while working together towards the common goal of enhancing the overall learning experience. Students and instructors should participate as proactively as possible by provide feedback to improve future experiences and communicate the learning possibilities that e-learning creates.

According to Larocque and Latham (2003), adopting e-learning in Africa will increase education access and quality, as well as lower education cost. They also add, now there are an increasing number of success stories with e-learning throughout the African continent. While e- learning is not a cure for all the problems related to education in Africa, it is clearly a tool that now must be taken into serious consideration by policy makers and donors. Introducing e-learning technologies in primary, secondary, and

higher education in Africa will clearly present many challenges. Thus, partnerships with the private sector will be an essential part of any strategy to bring e-Learning into Africa in a systematic and cost effective way. There is now considerable potential for expanding public-private partnership activities in e-learning, including the delivery of services, private finance initiatives, demand-side initiatives and strategic partnerships.

E-learning has been known to be a fundamental thing for the improvement of teaching learning process at HEIs in Africa (Larocque and Latham 2003). In Ethiopian HEIs, the teaching learning processes are conducted in traditional method that is face-to-face teaching. However, this method is prone to lots of drawbacks. Firstly, there is scarcity of manpower that could satisfy the demands of the education system. Secondly, the students are fully expected to avail themselves in the class room at the time of teaching. This means that teaching learning is limited to designated place, at a particular time and by known tutor. Thirdly, the traditional mode of teaching is costly regarding time and financial aspects. Fourthly, there is shortage of resources. The fifth and final problem of the traditional teaching learning process is, it takes more time than electronic learning.

Being one of the HEIs in Ethiopia, Mekelle University has been affected by the problems mentioned above. For the sake of avoiding the challenges at hand e-learning project has emerged at the university. Hence, the main intent of this research is to assess and identify the challenges and current status of e-learning practices in the university. After finding out the challenges and the existing status of the university, the researcher provides a recommendation for further enhancement of e-learning implementation.

### **1.3. Significance of the Study**

This study was carried out on the challenges and current status of e-learning in Mekelle University on two colleges namely Institute of Technology and College of Health Science. Thus, knowing the current status and the challenges concerning e-learning is value-additive for establishment of effective and efficient e-learning system. It is expected that the beneficiaries of this research are the university itself, the teachers, the students, the administration and totally the community of Ethiopian HEI.

## **1.4. Research Questions**

The research answers the following questions:

- What are the challenges of implementing e-learning technologies in the university?
- What are the major factors for implementing e-learning successfully?
- What is the current status of e-learning in the university?
- What is the attitude and awareness of using e-learning in the university?

## **1.5. Objective of the Study**

### **1.5.1. General Objective**

The general objective of this research is to assess the current status of e-learning application in Mekelle University, identify its main challenges and factors that play major role to its success and finally provide recommendation for a successful implementation of e-learning technology in HEIs of Ethiopia.

### **1.5.2. Specific Objective**

The specific objectives of this study are:

- To identify the existing status of e-learning in the university;
- To identify the factors that plays a major role in successful implementation of e-learning in the university;
- To identify the attitude and awareness of the university community in e-learning;
- To identify the challenges of e-learning in the university;
- To provide recommendation.

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

The scope of the research was limited to assessing the current status of e-learning application in Mekelle University, identify its main challenges and factors that play major role to its success and finally propose a recommendation for a successful implementation of e-learning technology in HEIs of Ethiopia.

The study would be more productive if it is conducted widely by including several universities of Ethiopia. However, due to time and finance limitation, the study is limited to Mekelle University.

## **1.7. Research Methodology**

This research focuses on assessing the challenges and the current status of e-learning technology in Mekelle University. Based on the specific objective of the research, the research strategy is descriptive and the method used is a survey method. Survey method used in order to gather data at a particular point in time with the intention of describing the nature of existing conditions or identifying standards against which existing conditions can be compared, or determining the relationships that exist between specific events. In addition, this research used mixed methodology that is both qualitative and quantitative.

### **1.7.1. Target Population**

The target populations for this study are teachers, administrative officers and other key informants of the two colleges at the university. The data was collected from all departments which are found in the two colleges. The two colleges that are used as a population for this research are Institute of Technology and College of Health Science. The Institute of Technology encompasses six departments' namely electrical, industrial, civil, architecture & urban planning, and computational science and information systems. The College of Health Science contains five departments' namely medicine, pharmacy, public health, nursing and midwifery. The other colleges that are found in the university are not included in the study since they are not part of the pilot study.

### **1.7.2. Sampling Technique**

The sample technique that was used in this research is purposive sampling in order to focus on a limited number of informants. Those that have direct access to e-learning and those that are working in the Institute of Technology and College of Health Science were purposely selected.

### **1.7.3. Data collection**

The method which is used in this study was primary data collection. This method helped to collect first hand information through questionnaire from the academic staffs and in-depth interview from administrative officers' and key informants who have deep information about the subject matter of the study.

The questionnaire has an advantage that enables the respondents to express their ideas freely. Most of the questionnaire consisted of closed-ended questions and there was an open-ended question when it is necessary. This questionnaire had a numbers of questions and that are organized into five parts. The first part of the questionnaire related to the personal background information of the respondents. The second part of questionnaire consisted of the computer related skills, about ICT policy and the practice of e-learning. The third part of the questionnaire consisted of questions to find out the current status, awareness and attitude about e-learning among members of the institute. The fourth part of the questionnaire contained questions which asses the level of adoption of e-learning at the institute and factors that make e-learning more effective. The fifth and final part of the questionnaire contained the challenges of the e-learning adoption and respondents comment and suggestions.

Interviews were also held with the administrative officers and other key informants that have detail information about the subject matter. The overall theme of the interview questions were on their strategies and e-learning practices. The main aim of the interview questions were to identify the benefits, strengths, weakness, awareness and motivations of the academic staff current stand and what they plan for the future on e-learning. Ten main questions were presented for interviewees. These questions cover whether or not

they currently possess institutional ICT policy, whether this policy or draft policy specifies any e-learning usage procedure or preference if there, if e-learning is mentioned in any way, to what extent and for what purpose are they being used, what the motivation and awareness is there behind e-learning usage and what challenges are there in doing so and finally what they plan for the future.

#### 1.7.4. Quality of data

The questionnaire for this research is well designed and tested. Because it was already used for another research and gave a good result, there was no need for the researcher to make a pilot test before use.

However, the researcher was conducted a reliability test in order to measure the internal consistency of the questionnaire for part II, III, IV and V. Reliability, therefore, refers to test consistency. The method of determining the reliability of a test by internal consistency is Cronbach's alpha. This is a single correlation coefficient that is an estimate of the average of all the correlation coefficients of the items within a test. If alpha is high (0.70 or higher), then this suggests that all of the items are reliable and the entire test is internally consistent. If alpha is low, then at least one of the items is unreliable, and must be identified via item analysis procedure (Sekaran 2000). The items and their Cronbach's alpha of the questionnaire are presented as follow in the following table:

Table 1. 1: Reliability of Items in the Questionnaires

<b>Name of Related Items</b>	<b>Number of Item</b>	<b>Cronbach's Alpha</b>
ICT and E-learning policy	3	0.82
ICT Skill	11	0.75
Current Status	11	0.798
Attitude	11	0.810
Frequency of Accessing Online Modes	5	0.822
Factors for Effective E-learning	11	0.915
Challenges	17	0.815

### **1.7.5. Data analysis**

In order to reach to the final output and meet the objectives of the study, the collected data was analyzed. Once the quantitative data collected through primary source of information, the information were recorded into quantified forms and encoded into SPSS software. The analysis techniques used in this study are the frequency, percentage, mean and standard deviation. As far as qualitative data is concerned, data collected through structured interview were analyzed and interpreted by own words.

### **1.8. Organization of the report**

The report of this research is divided into five chapters. The first chapter contains an introduction which encompasses background of the study and area, statement of the problem, significance of the study, research questions, objective of the study, scope and limitation of the study, research methodology such as target population, sampling technique, data collection, quality of data and data analysis.

The second chapter deals with reviewing of the literature that provides detailed information related to history, current status of the higher education institution of Ethiopia. The third chapter deals with the evolution, definition, types, advantages and disadvantages, current status of HEI, instructional models and the challenges of e-learning.

The fourth chapter focuses on the results and discussions of the data analysis. The fifth and final chapter deals with conclusion and recommendations of the study.

## **Chapter Two**

### **2. Higher Education Institutions: An Overview**

#### **2.1. Introduction**

Education is the most and widely accepted as a crucial and leading instrument for endorsing economic growth of one country in particular and continent in general. For instance Africa, education is particularly important, where growth is very essential if the continent is to rise out of poverty (Bloom et al. 2005).

The benefit of higher education is described in many aspect of one country by many scholars. For instance, Yizengaw (2005) higher education is a vital for economic and social development. It provides the human resources required for leadership, management, business and professional positions by inculcating relevant knowledge and advanced skills. The institutions also serve as the major research establishments that generate, adopt and disseminate knowledge. It expands people's productivity, as well as national capacity and competitiveness by giving people access to knowledge and the tools for increasing and diversifying their knowledge. Today, as the world becomes increasingly interconnected, more interdependent and increasingly a globalized village, higher education is critical for the achievement of economic progress, political stability and peace, as well as for building democratic culture and society.

Moreover, according Bloom et al. (2005) stated that higher education are both a result and a determinant of income, and can produce both public and private benefits. Some of the private benefits for individuals are well established, and include better employment prospects, higher salaries, and a greater ability to save and invest. These benefits may result in better health and improved quality of life. Some of the public benefits are it create greater tax income, increase savings and investment, and lead to a more entrepreneurial and civic society. It can also improve a nation's health, contribute to reduced population growth, improve technology, and strengthen governance. However, according Friedman (1980) stated that higher education may support or promote "social unrest and political instability."

No country can ensure genuine endogenous and sustainable development without adequate higher education and research institutions providing a critical mass of skilled and educated people. In large part, the scientific and technological achievements are due to the growth of higher education and the immense contribution and endeavor of the personnel trained within it (UNESCO 1998).

In developed country like America, their higher education system is unique from the world. Borrowed its structure from both the British undergraduate college and German research university, but its character is profoundly influenced by three major philosophical beliefs. The first influence set is the limited government and freedom of expression, states, religious communities, and individuals established and maintain a range of HEIs and continue to protect these institutions from the levels of government control seen in most other countries. The second set of influences is capitalism and the belief in the rationality of markets. The final major philosophical influence on American higher education is a widespread commitment to equal opportunity and social mobility. Higher education was a best activity for much of its history, excluding individuals based on gender, religion, race/ethnicity, and social class. However, during the 20th century, economic and social changes transformed higher education into a primary gateway to the middle-class, and women and minorities made inroads against longstanding exclusion from mainstream higher education. As a result of those, the ways in which the United States continually struggles to balance market forces, government intervention, and access to high-quality education (Eckel and King 2004).

The competitive environment facing all organizations has forced many of them to choose strategies that enhance organizational effectiveness and efficiency. Higher education in developing country like Africa, Re-engineering is one of the tools used in administering productivity improvements, cost control and asset management. As a result of this, generally the HEI focused on the cost-cutting strategy especially on cost of sales and operational expenses. Consequently, there were increases in the utilization of the learning; use of the learning centers; number of home courses offered increased and a decrease in employment of part-time teaching staff. There were also marked

improvements in academic networks and partnerships that provide for knowledge exchange and transfer (Sohail 2006).

Higher education in Ethiopia was not earnestly and fully participating in the development efforts of the country. However, the contribution in the last five decade was high in many aspects. HEIs in Ethiopia have deprived our country of the opportunity of getting out of poverty and underdevelopment with their out of date orientation and worn out traditions. This mainly refers to as a result of less than ideal involvement and lack of concerted efforts towards changing the underdevelopment, poverty and undemocratic situations of our countries (Yizengaw 2003).

Furthermore, the advancement in scientific and technology in Ethiopia and Africa at large is not that much. As a result, we are stuck in a state of underdevelopment, poverty, poor health inadequate education coverage, and consequent marginality. Although with immense potential and possibilities, we are poor in competitiveness in this era of globalization and knowledge economies. Therefore building our higher education capacity is not a luxury but a necessity in order to use our potential and to bring sustainable development of our countries (Yizengaw 2003).

## **2.2. History of Higher education institutions in Ethiopia**

Ethiopian higher education is relatively very young. Higher education in Ethiopia started a little over 50 years ago. Currently there are a number of universities and colleges/institutes under the Ministry of Education. There is other HEIs run under other ministries, namely the Ministry of Defense. Moreover, there are also several junior (mainly teacher education) colleges that sponsor by regional governments (Yizengaw 2003).

Higher education expanded modestly in the period after 1975. The College of Agriculture at Alemaya, which was part of Addis Ababa University, was granted independent university status in 1985. A postgraduate studies program was established in 1978, which had an enrollment of 246 students in 1982/83, of which 15 were women. Graduate programs were offered in several fields, including engineering, natural science,

agriculture, the social sciences, and medicine. Several research institutes supported these institutions of higher education. Addis Ababa University also provided an evening extension program offering courses in many fields. Other diploma-granting independent colleges trained middle level manpower in several fields. These included the College of Teacher Education, the Junior College of Commerce, and the Municipal Technical College, all in Addis Ababa. There were also junior colleges of agriculture in Ambo and Jima, the Institute of Animal Health Assistants in Debre Zeyit, and the Institute of Health Sciences in Jima. Altogether, there were approximately twelve colleges or universities in the country in the early 1990s, with intense competition among students for admission (U.S. Library of Congress n.d.).

Enrollment in higher education grew from 4,500 in 1970 to more than 18,400 in 1985/86, of which nearly 11 percent were women. But enrollment was low, considering the size of the population and space limitations at the colleges and universities caused the government to raise admission standards. To narrow the gap somewhat, the number of students sent abroad on scholarships and fellowships grew from an annual average of 433 during 1969-73 to about 1,200 during 1978-82. The number of Ethiopians on teaching staffs also grew. The faculty of Addis Ababa University increased from 437 in 1970 to 1,296 in 1983, with a corresponding increase in Ethiopian faculty from 48 percent to 74 percent of this total during the same period.

Moreover, there was also more emphasis on the creation of technical and vocational schools, most of which were operated by the government. The Ministry of Education operated or supervised nine such schools scattered around the country. These schools had an enrollment of more than 4,200 in 1985/86, and their graduates were in great demand by industries. With Soviet assistance, Ethiopia established its first polytechnic institute, in Bahir Dar, in the 1960s. It trained personnel in agro mechanics, industrial chemistry, electricity, textile and metal-working technology. In addition, a system of general polytechnic education had been introduced into the senior secondary school curriculum so that those who did not continue their education still could venture into the skilled job market. Furthermore, the government also introduced vocational training to upgrade peasant skills. The peasant training centers, operated by the Ministry of Agriculture,

provided training in vocational trades related to agriculture for periods ranging from three weeks to six months. The country had twelve such centers, which trained more than 200,000 farmers from 1974 to 1988 (U.S. Library of Congress n.d.).

On the other hand, the Private higher education was already ranked as a major force in the higher education dominion in many countries. Expansion in Latin America had begun in the 1960s, and the private sector was dominant in several key East Asian nations. At that stage, the forces shaping higher education were relatively stable. Then, in the last quarter of the 20<sup>th</sup> century the dynamic changed dramatically and private higher education has suddenly become the fastest-growing segment of higher education worldwide-expanding rapidly in almost all parts of the world (Altabach 2005). The private provision of higher education and training in Ethiopia are growing exponentially. The first private higher education institution in Ethiopia was Unity College, it was established in 1998. Today, there are a number of public and private HEIs in the country (Negash et al. 2008).

### **2.2.1. History of Mekelle University**

Mekelle University is one of the young establishments of higher learning institutions in Ethiopia with less than two decades. It was established by merging both Mekelle Business College and Mekelle University College since May 2000. Mekelle Business College was first established as a school of Economics in 1987 by the Ethiopian People's Revolutionary Democratic Front (EPRDF). The main objective of the school was to train middle-level experts who could assume the financial and administrative responsibilities of the public in the liberated areas during the armed struggle. After the downfall of the Derg regime, the school assesses the demand in the different parts of the country and designed a new curriculum to meet the demand. In 1991, the school was upgraded to a college offering diploma level programs and was renamed Mekelle Business College ([www.mu.edu.et](http://www.mu.edu.et)).

On the other hand, Mekelle University College began in 1993 as the Arid Zone Agricultural College which had been recited in Mekelle. During the Derg regime, the College was originally intended to be located near Selekleka, in northwestern Tigray.

But, due to many reasons, it was first established at Asmara University as a faculty, due to the political instability the Derg displaced Asmara University in 1990, then it was moved to Agarfa, in southern Ethiopia. Then Asmara University returned to Asmara city in 1991 and the Arid Zone Agricultural Faculty moved temporarily to Alemaya University. In 1993, the Arid Zone Agricultural College was again returned to Mekelle. As the College of Dryland Agriculture and Natural Resources Management, and permanently settled at the Endayesus Campus, which had been a military barrack since the time of Emperor Menelik.

Although the management of the two colleges was officially independent, initiatives were taken by both institutions to work closely, with a vision of creating a full-fledged University. Having a common board of governors played a significant role for the establishment of Mekelle University and then to achieve rapid growth ([www.mu.edu.et](http://www.mu.edu.et)).

### **2.3. Current Status of Higher Education Institutions in Ethiopia**

The crucial issue for the production of vital human resources, such as teachers, healthcare professionals, lawyers, engineers, managers, businessmen, and researchers are significant for socio-economic development of a nation is higher education. Moreover, higher education is a heart for knowledge and skills creation, adaptation and dissemination. It also plays a significant role in providing relevant and quality community and public services. Therefore higher education is a critical point for economic progress, political stability and peace, as well as building democratic culture and cohesive societies (Yizengaw 2005).

The first higher education institution in Ethiopia, the University College of Addis Ababa, was established in 1950. In spite of the country's need to expand the higher education sector, little progress was made in the subsequent 50 years. Until 1995, for example, there were only two public universities and sixteen affiliated and independent junior colleges in the country. Recently, following the government's decentralization effort to expand the higher education system in regional states, four more universities were added increasing the total number of universities to six. The universities are: Addis Ababa University, Alemaya University, Bahir Dar University, Mekele University, Jimma University and

Debu University. Among these, Addis Ababa University is the largest as it accounts for about 42 percent of the regular and 39 percent of the continuing education enrollment (MoE 1998).

However, it still remains highly underdeveloped. The enrolment in both public and private HEIs is less than 200 thousand for a population of over 70 million. Actually it is only recently that the enrolment has reached such a figure with the establishment of new public and private institutions and expansion of programs (Yizengaw 2004). Access is still very low and the quality and relevance of the education and research activities of the institutions are not up to expected standards and levels.

As the system expanded, enrollments also grew. For instance, Yizengaw (2003) stated that the annual intake of students in the undergraduate programs grew from about 9,000 to over 18,000 in the period between 1996 and 2003, just sponsored by the Ministry of Education. The enrolment in graduate programs has increased from around 200 to over 2,000. However, the participation rate and the total student population in higher education are extremely low. During the same period, the total student population of the higher education system in Ethiopia including the private providers has increased from about 35,000 to over 100,000. About 18% of the total enrolment in 2003 was accounted for by private HEIs. This is a significant achievement in a relatively short period of time. However, this rapid increase may level off shortly as quality, which is usually undermined by a profit motive of the rapidly increasing institutions, becomes more demanded. The demand comes from the beneficiary students and their families as well as the private providers themselves. The number of graduates is also very low; there are only about 62 graduates of higher education per 100 thousand people, this figure indicating a lack of highly trained personnel and the poor competitive status of our country.

Moreover, there has been a steady increase in the number of students in higher education. Between 1994 and 2002 alone there was a 45% increase. On average the total number of students was growing at 15% per year (MoE 2002). The annual intake capacity of degree students has increased from around 3 thousand in 1994 to over 31 thousand in 2004. The

system in both private and public has enrolled a total student population, which includes degree and diploma, of 172,522 (77% in public and 23% in private and non-governmental institutions) in the 2003/4. The total number of graduates was over 39 thousand in 2003/04, which 29% were female a significant increase from 1999 which graduated less than 12 thousand students. The expansion of higher education will succeed only with the active involvement of the private and non-governmental sector in higher education provision (Yizengaw 2005). The number of public HEIs has also grown from only two universities eight years ago to 21 by 2009. More are planned to be established. The Government has also facilitated and encouraged the establishment of private institutions of higher education and there are now more than 60 such institutions (MoE 2007).

HEIs across the world are witnessing rapid changes associated with growth of unprecedented challenges as well as opportunities. In recent years, there has been growing awareness of the need to maintain quality in higher education across the board, while the issues and priorities for the developed world and the developing ones are different. This is basically a response to the ever-increasing competition for employment within the country as well as the aspirations and promises of cross-border employment and/or higher education institution opportunities. The need to maintain the quality of educational programs and that of the products need not be over-emphasized (Prasad n.d.).

Furthermore, HEI as well as the governments in countries like USA, UK and Australia are engaged in active promotion and marketing of their higher education offerings to student population in developing countries. This trend has some positive aspects like increased access and opportunities, which require cautious approach for policy makers in developing countries. Experiences in developing countries like South Africa and Malaysia, which have opened doors for foreign education providers, underline the importance of the role of Quality Assurance Agencies in monitoring cross border higher education (Prasad n.d.).

Until the final decade of the 20th Century, higher education in Ethiopia was not given due attention: curricula were not always relevant to the country's problems, while

graduate production capacity was not in line with the country's need for trained individuals (MoE 2002). In addition, it faces many problems associated with the quality and relevance of programs of studies and research, poor infrastructure, equity, resource constraints, high brain drain and inefficiency in the use of available resources. The overall challenges that are compounding higher education development in Ethiopia are numerous and complex. Since then, actions have been implemented to change those situations. The government has introduced several policy and strategy provisions and major re-engineering or reform initiatives by recognition of these multiple challenges. The initiatives are mainly efforts to realign the system in order to contribute more directly to the country's strategy for rapid economic growth and alleviation of poverty. Such a reform is necessary to make the system (a) democratic in all its affairs, centering on student learning experiences, (b) more responsive in producing quality graduates and citizens, (c) involve in relevant research that focuses on solving societal problems, and (d) cost effective and result-oriented in all its undertakings (Yizengaw 2005).

According to Bloom (2005), in 2002 the situation in the Ethiopian higher education system was poor infrastructure and poor management. He also includes a target area for improvement such as increase teacher training, increase vocational and educational training, increase higher education positions, strengthen research and development and strengthen and increase postgraduate programs. The expansion of numbers alone would not satisfy the needs of the country. As presented in World Bank (2003), there was some progress that has been made:

The Ethiopian Parliament's Higher Education Proclamation in June 2003 set in motion major reforms to the country's higher education system. It gave substantial autonomy to universities by allowing them to choose their own staff at all levels; encouraged the development of private universities; introduced new degree courses that better fit the country's economic needs; established a national Quality and Relevance Assurance Agency; launched a new capacity building program for information and communication technologies (ICTs); increased the share of the education budget allotted to higher education from 15 per cent to 23 per cent since 2000; and introduced a

new graduate tax, which enables students to repay the cost of university education to the government by way of a tax deducted from their income after graduation.

### **2.3.1. Current Status of Mekelle University**

Mekelle University is one of the youngest HEIs in Ethiopia with an international reputation for teaching and research. It has developed collaborative understanding with other national and international institutions in the world. Since its establishment, it has been proved to be one of the fastest growing universities in Ethiopia ([www.mu.edu.et](http://www.mu.edu.et)). In the last few years the university has grown exponentially in program diversity, depth and breadth of research, international collaborations, and overall institutional capacity in terms of human and material resources to undertake research. Those are the fundamental elements of the university's mission. The efforts to undertake research in various fields of science is increasing as the number of people with their second and terminal degrees and the diversity in fields of specialization increase.

Currently, the University has eight colleges: Business and Economics, Dry Land Agriculture and Natural Resources Management, Engineering, Law and Governance, Social Sciences and Languages, Veterinary Medicine, Natural and Computational Sciences and Health Sciences; and two institutes: Institute of Pedagogical Sciences, and Environment and Heritage Conservation. Now it host over 23,000 students in the regular, continuing education program and summer, evening, distance education and in-service programs in both undergraduate and graduate programs ([www.mu.edu.et](http://www.mu.edu.et)).

As a result of the exponential growth of both in teaching and research is enabling the university to be a center of excellence in research. Many programs have already initiated teaching at the graduate level (for example: agriculture, applied geology) and the basic sciences (biology, chemistry, mathematics and physics) will start teaching at graduate level in the near future. The initiation of post graduate education in various disciplines is expected to increase the research outputs. As a result, the establishment of a multidisciplinary journal devoted to disseminate knowledge gained in the different fields of science has many functions: encourage researchers to develop the habit of publishing,

encourage researchers to carry out further research and produce competent researchers, and create a forum for scientific contribution to the country. Thus, the establishment of the Science Journal at Mekelle University will enable the university to create a publication and communication forum among scientists within the country and the outside world (MEJS 2011).

## **Chapter Three**

### **3. E-learning Overview**

#### **3.1. Introduction**

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

Those conditions at hand, the environment of higher education is evolving because of rising costs, shrinking budgets, and increasing needs for distance education are causing educational institutions to reexamine the way that education is delivered (New Media Consortium 2007). In response to this changing environment, e-learning is being implemented more and more frequently in higher education, creating new and exciting opportunities for both educational institutions and students. E-learning has been successfully incorporate in the educational system of the developed countries; there have been studies that show the positive contribution of technology in facilitating learning. For instance, according to Scheffler and Logan (1999) conducted a study to identify technology related competencies that were important for teachers and students. He investigates on the studies the general operation of hardware and software has become less important for most teachers.

##### **3.1.1. Definition of E-learning**

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

(Romiszowski 2004). These various types or modalities of e-learning activity are represented in Table 3.1.

Table 3. 1: E-learning Modalities (source : Romiszowski 2004)

Individualized self paced e-learning online	Individualized self paced e-learning offline
Group based e-learning synchronously	Group based e-learning asynchronously

According to Romiszowski (2004), defining the different types of e-learning modalities that presented as follows:

Firstly, individualized self-paced e-learning online refers to situations where an individual learner is accessing learning resources such as a database or course content online via an Intranet or the Internet. A typical example of this is a learner studying alone or conducting some research on the Internet or a local network. Secondly, on the other hand individualized self-paced e-learning offline refers to situations where an individual learner is using learning resources such as a database or a computer-assisted learning package offline (i.e., while not connected to an Intranet or the Internet). An example of this is a learner working alone off a hard drive, a CD or DVD.

Thirdly, group-based e-learning synchronously refers to situations where groups of learners are working together in real time via an Intranet or the Internet. It may include text-based conferencing, and one or two-way audio and videoconferencing. Examples of this include learners engaged in a real-time chat or an audio-videoconference.

The fourth and the final is the group-based e-learning asynchronously which refers to situations where groups of learners are working over an Intranet or the Internet where exchanges among participants occur with a time delay (i.e., not in real time). Typical examples of this kind of activity include on-line discussions via electronic mailing lists and text-based conferencing within learning managements systems (LMS).

The term e-learning given different definitions that provide or defining by various authors and scholars some of them are as follows:

- E-learning is all process, activities and technologies that can be support learning through the information and communication technology (ICT) (Downes et. al n.d.).
- E-learning referred to the intentional use of networked information and communications technology in teaching and learning (Naidu 2006).
- E-learning referred to as a “solitary, individual activity, or a collaborative group activity (where) both synchronous (real-time) and asynchronous (flexible-time) communication modes may be employed” (Romiszowski 2004).
- E-learning can be defined as a “wide set of applications and processes, which use available electronic media (and tools) to deliver vocational education and training” (Eklund et. al 2003).
- E-learning refers to a means of education that integrates self-motivation, communication, efficiency and technology (Comerchero 2006).
- E-learning is a delivery of content via all electronic media, including the Internet, intranets, extranets, satellite broadcast, audio/video tape, interactive TV, and CD-ROM (Trace and Weggen 2000).

In addition to the above definitions, Barker and Drucker (2000) stated that e-learning concerned with providing easy access to learning resources, anytime, anywhere, through a repository of learning resources, it is also concerned with supporting such features as the personal definition of e-learning goals, and the synchronous and asynchronous communication, and collaboration, between learners and between learners and instructors.

### **3.1.2. Evolution of E-learning**

Teaching was not done in front of a computer, but in the classroom with a qualified teacher or trainer. As technology improved, educational institution and companies or organizations began to integrate training with the computer and the field of e-learning began to take shape.

In the early 1990s, many companies were using videotape-based training for their employees. At this point, the industries have a small market environment and shortage of scalability or growth. The idea of putting or preparing on video is a good idea but has some drawback. For instance, Cooke (2004) specify of putting training on video was a good idea, though it was lacking in a few areas (1) Customization based on needs of users, (2) Expensive to maintain and (3) It could not be upgraded easily. In addition these videos often had limited interactions which lead to the nearly impossible task of tracking progress and assessment because of it only one way interaction.

Later a new form of training evolved, Computer Based Training (CBT), while it was obvious that video was not the best solution. “Windows 3.1, Macintosh, CD-ROMs, PowerPoint marked the technological advancement of the Multimedia Era” (Kiffmeyer 2004). CD-ROMs could be cheaply produced so that the problem of checking in and out videos was eliminated. Employees would also be able to simply pop in a CD to their personal computer at their desk and complete the training.

CD-ROM Computer-Based Training made advances toward the better, however it still lacked the ability to track employees' performance in a central database and was also not as easy to upgrade. All these problems would avoid with the use of the Internet as a means of delivering content. The problem was, when the content was placed on the web, it was simply text to begin with and may be a few graphics (Cooke, 2004). People in the field of e-learning began to realize that you simply cannot put information on the web without a learning strategy for the users. For instance, Clark 2002 stated that “...In order for technology to improve learning, it must 'fit' into students' lives...not the other way around. As a result, e-learning was born.”

Learning Management System (LMS) was one of the first innovations in actual e-learning. “The first LMS offered off-the-shelf platforms for front-end registration and course cataloging, and they tracked skills management and reporting on the back-end.” Those improvements enabled the educational institution and companies to place courses online and be able to track students' progress, communicate with students effectively and provide a place for real-time discussions and interactions (Clark 2002).

As a result of the improvement in web-based environment, CBT and simulation leads to different ideas by integrating those and others. For instance Clark (2002) defining the eClassroom, which is developed after integrating of the web-based synchronous events with CBT and simulations. Centra are a great example of an eClassroom that is used quite often today. eClassrooms are often called Live Instructor-Lead Training (ILT). According to Kiffmeyer 2004 “Live instructor-led training (ILT) via the Web can be combined with real-time mentoring, improved learner services, and up-to-date, engaging "born on the Web" content to create a highly-effective, multi-dimensional learning environment.”

The progress of e-learning has come a very long way since its early days of being text-based via the Web or CD-ROM and others. So what does or happen in the future of e-learning? There really is no saying where the field is headed. As long as there is improvement in technology and training is continually geared towards the learners and strategies are used in the training there is no end in sight for e-learning improvement.

### **3.2. Types of E-learning**

The term e-learning have different meaning that is used is to describing a means of teaching through technology. According to Comerchero (2006) defined e-learning, it is a means of education that integrates with self-motivation, communication, efficiency, and technology. In addition to definition he tries to divide e-learning into different types based on the following ideas:

- Means of communication
- Schedule
- E-learning class structure

- Technologies used

### **Means of Communication**

E-learning can be divided into different types based on a means of communication that is the first criteria. Individuals or students use different means in order to communicate with each other and their instructors. E-learning can be conducted exclusively through on-line applications. In other cases, if distance is not a factor, some face-to-face communication can be included to create blended e-learning. Blended e-learning includes elements of web interaction and in-person interaction. Technology broadens the definition of face-to-face as there can be the use of two way video, and two way audio. E-learning incorporates with these elements of participation create a blended e-learning experience.

### **Schedule**

Based on the schedule e-learning can be divided into Synchronous or Asynchronous. Synchronous means that instructor-led or means of real-time communication is implemented, example: video conferencing, teleconferencing, and on-line chat programs. Whereas Asynchronous indicates that other means of communication are utilized that do not require real time responses or we can call it self-paced. Examples of asynchronous e-learning include; e-mail, list serves, threaded discussions, blogs, and on-line forums.

### **E-Learning Class Structure**

E-learning can be categorized into self-paced, instructor-led, or self-study with an expert based on the e-learning class structure. E-learning class structure addresses how the instruction is controlled. Self-paced instruction is administered by giving the learner the materials they needs to complete the training or instruction. Instructor-led training affords the learner a guide to implement the instruction. Self-study with an expert is a combination of self-paced and instructor-led. In self-paced the learner is responsible for staying on task and on schedule, whereas in instructor-led, there is interaction with someone like instructor that checks the learners or students progress.

## **Technology**

Technology is the final criteria that can be e-learning based on it in order to divide into different types. Technology used to implement instruction but it is not limited to web-based materials. E-learning can be achieved by utilizing any form of technology that sustains information yielding media. Video or Audio tape are such kind of technologies that can be used or a means to implement instruction. Most of the current technology supports the learning experience because there are more means to convey the information. Technology is the most variable element in e-learning. The more advanced the technology becomes, the more options there are to further e-learning. Due to the creation of the Internet subsequently created e-learning, as dial-up connections were replaced by cable modems, speed and bandwidth increased; correlatively the quality of on-line instruction improved because computers were able to support the media. The training will become more flexible and further boost the growth and popularity of e-learning as a result of speed increases and devices become smaller and more mobile or portable.

The four criteria's mentioned in the above that can be able to divide e-learning into different types are not mutually exclusive; that means they can be used in any combination to create the best instruction possible. E-learning incorporate with the versatility and advancing of technology, e-learning potential currently has increasing without limit.

### **3.3. Advantage and disadvantage of E-learning**

#### **3.3.1. Advantages of E-learning**

There are different areas that beneficial by the e-learning such as education or institution, corporations or organizations and to all types of learners. According to DelVecchio and Loughney (2006), e-learning is affordable, saves time, and produces measurable results. E-learning is more cost effective than traditional learning because less time and money is spent in traveling. Since e-learning can be done in any geographic location and there are

no travel expenses, this type of learning is much less costly than doing learning at a traditional institute.

Flexibility is a major benefit of e-learning. E-learning has the advantage of taking class anytime anywhere. Education is available when and where it is needed. E-learning can be done everywhere and anytime like at the office, at home, on the road, 24 hours a day, and seven days a week. E-learning also has measurable assessments which can be created so both the instructors and students will know what the students have learned, when they've completed courses, and how they have performed. In addition to its flexibility, it accommodates different types of learning styles because of these students like e-learning. Students have the advantage of learning at their own pace, so the students can also learn through a variety of activities that apply to many different learning styles learners have. Learners can fit e-learning into their busy schedule. If they hold a job, they can still be working with e-learning. If the learner needs to do the learning at night, then this option is available. Learners can sit in their home in their pajamas and do the learning if they desire. So the students can learn anytime, anywhere through e-learning (Kristy DelVecchio and Loughney 2006).

In relation to the above e-learning encourages students to peruse through information by using hyperlinks and sites on the World Wide Web. They are able to find information relevant to their personal situations and interests. E-learning allows students to select learning materials that meet their level of knowledge, interest and what they need to know to perform more effectively in an activity. E-learning is more focused on the learner and it is more interesting for the learner, because it provide information that they want to learn. E-learning is more flexible and can be customized to meet the individual needs of the learners.

Moreover, Kristy DelVecchio and Loughney (2006) stated that students can develop knowledge of the Internet by using e-learning. This knowledge will help learners throughout their careers. E-learning encourages students to take personal responsibility for their own learning. When learners succeed, it builds self-knowledge and self-confidence in them. Generally, educators and corporations or organizations really benefit

from e-learning. Learners enjoy having the opportunity to learn at their own pace, on their own time, and have it less costly.

In addition to the above there are various advantages of e-learning for instance, according to Alsultanny (2006), e-learning is besides to the ability to learn anytime, anywhere the corporate environment offers other benefits. First, e-learning enables companies to update materials and information across the entire enterprise, keeping content fresh and relevant. This is especially important as product development cycles continue to diminish, product modifications become more frequent, and company organizations and policies become more volatile. Second, online training also creates a personalized learning experience. Instead of daylong or weeklong programmes, the typical e-learning course can be broken into one-hour modules, offering flexibility around training. Employees can adapt training to their own lives and learning styles, accessing material whenever it is convenient to review course material.

Third, e-learning is ideal for global corporations with people in multiple time zones, there is no need to coordinate travel and delivery schedules. Global companies, however, do need to address language and localization issues. Fourth, Internet based training can reduce costs, with housing and travel costs accounting for the majority of the savings. Lost productivity and revenue from classroom training can actually be higher if one considers time spent away from the office. Finally, there is evidence that e-learning benefits corporate operation.

E-Learning on the whole, appears to offer many improvements, both in the tangible as well as the intangible world. Some of the other benefits can be summarized as shown in the Table 3.2 below.

Table 3. 2: Benefits of E-learning (source: Alsultanny 2006)

Characteristics	Benefits of e-Learning
Information is consistent or customized, depending on need	Everyone gets the same content, presented in the same way. Yet the programs can also be customized for different learning needs or different groups of people
Content is more timely and dependable	Because it is web-enabled, e-Learning can be updated instantaneously, making the information more accurate and useful for a longer period of time. The ability to upgrade e-Learning content easily and quickly, and then immediately distribute the new information to users is extremely time efficient.
Learning is 24/7	Students can access e-Learning anywhere and at any time of the day. It's "just in time – any time" approach makes the learning process ubiquitous.
Universality	E-Learning is web-enabled and takes advantage of the universal Internet protocols and browsers. Concern over differences in platforms and operating systems is rapidly fading. Everyone on the Web can receive virtually the same material in virtually the same time.
Scalability	E-Learning solutions are highly scalable. Programs can move 10 participants to 100 or even more participants with little effort or incremental cost (as long as the infrastructure is in place).
Builds communities	The Web enables students to build enduring communities of practice where they can come together to share knowledge and insight. This can be a tremendous motivator for learning.
e-Learning lowers costs	Despite outward appearances, e-Learning is often the most cost effective way to deliver instruction or information. It cuts travel expenses; it can also reduce teaching time, and significantly reduces the need for a classroom/teacher infrastructure.

### **3.3.2. Disadvantage of E-learning**

As we can see the various advantages of e-learning there are also some disadvantages of e-learning. According to DeVecchio and Loughney (2006) some of the disadvantages of the e-learning are specified as follows: First, learners need to have access to a computer as well as the Internet. They also need to have computer skills with programs such as word processing, Internet browsers, and e-mail. Without these skills and software it is not possible for the student to succeed in e-learning. E-learners need to be very comfortable using a computer. Slow Internet connections or older computers may make accessing course materials difficult. This may cause the learners to get frustrated and give up. Second, the problem occurs in managing computer files and online learning software. For learners with beginner-level computer skills it can sometimes seem complex to keep their computer files organized. Without good computer organizational skills learners may lose or misplace reports causing them to be late in submitting assignments and others. Some of the students also may have trouble installing software that is required for the class if they don't have or a limited skill of IT.

Third, e-learning also requires just as much time for attending class and completing assignments as any traditional classroom course. This means that students have to be highly motivated and responsible because all the work they do is on their own. Learners with low motivation or bad study habits may fall behind. Fourth, without the routine structures of a traditional class, students may get lost or confused about course activities and deadlines causing the student to fail or do poorly. Fifth, disadvantage of e-learning is students may feel isolated from the instructor. Instructions are not always available to help the learner so learners need to have discipline to work independently without the instructor's assistance. E-learners also need to have good writing and communication skills. When instructors and other learners aren't meeting face-to-face it is possible to misinterpret what was meant. This means when student doesn't get support from either instructor or other learners.

Table 3. 3: Some of the advantages and disadvantages of E-learning vs. traditional learning. (Source: Seyoum 2009 citing Zhang et al. 2004, p.76)

	<b>Traditional Classroom Learning</b>	<b>E-learning</b>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>• Immediate feedback</li> <li>• Being familiar to both instructors and students</li> <li>• Motivating students</li> <li>• Cultivation of a social community</li> </ul>	<ul style="list-style-type: none"> <li>• Learners-centered and self-paced</li> <li>• Time and location flexibility</li> <li>• Cost-effective for learners</li> <li>• Potentially available to global audience</li> <li>• Unlimited access to knowledge</li> <li>• Archival capability for knowledge reuse and sharing</li> </ul>
<b>Disadvantage</b>	<ul style="list-style-type: none"> <li>• Instructor-centered</li> <li>• Time and location constraints</li> <li>• More Expensive to deliver</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of immediate feedback in asynchronous e-learning</li> <li>• Increased preparation time for the instructor</li> <li>• Not comfortable to some people</li> <li>• Potentially more frustration, anxiety, and confusion</li> </ul>

### **3.4. Current status of E-learning**

Nowadays, ICT has become an important enabler to facilitate open education and distance learning at broader communities. Through the use of multimedia technologies, e-learning ensures access to information about education, training and lifelong learning. The recent growing trend of e-learning is mostly benefiting the developed countries due to some predominant facilities like infrastructure, technology, relevant content and responsive learner community. The beauty of e-learning is anyone can avail himself of the service that is learning teaching aid from anywhere, as there is no geographical barrier among the learners. So, a global participation can be ensured through the system. Internet has made the process much easier and comfortable. Furthermore, great strides have been made over the past few years in enhancing the capacity for e-learning and finding ways to broaden its exposure. The move to e-learning has been assisted on the demand side by high access levels to computers and the internet in many other countries such as Australia (Gallagher 2001).

On the other hand, the growth of e-learning is changing the way enterprises gain competitive advantage through improved human performance. Especially small and medium-sized enterprises have to face the problem that e-learning technologies, methods and strategies have mostly been developed for the needs of large enterprises and cannot be exactly transferred to their needs. For instance, Reich and Scheuermann (n.d.) presents the average annual growth of market in Austria through e-learning is very high. Currently large enterprises have by far the largest market share but small and medium sized enterprises (SME's) are more and more discovering the potentials of e-learning.

Furthermore, the issue of e-learning as an advanced system for training and educating mass people using information and communication technologies (ICTs) has been received an increasing level of interest in recent years in most of the western countries. In spite of socio-economic constraints, ICTs are rapidly expanding in the developing countries, and thus offering a new scope for the use of e-learning for the promotion of distance education. For instance, in Bangladesh by considering the rapid expansion of computer and internet, it is now appropriate time to consider inclusion of some

interactive ICTs i.e. e-learning in delivering course materials to promote distance education (ISLAM and SELIM 2006).

There are various researches that conduct on accessing the status of e-learning in developing countries like Africa. For instance, according to Unwin (2008), stated on a report that summarizes information about the status of e-learning in Africa based on 316 responses to a questionnaire circulated in 2007 to people on the e-Learning Africa database. The sample is a privileged one, but it is nevertheless abundantly clear that many different e-learning practices are currently evident across the continent. Relatively few of these are based on comprehensive LMSs, and most rely primarily on the use of the Web for gaining access to information, and on e-mail for communicating with colleagues and students. This confirms that e-learning is in its infancy in Africa, but the evidence from those the survey is that there is nevertheless considerable enthusiasm for the potential that it offers across the educational spectrum, not only for universities and schools, but also for vocational training, for lifelong learning, and for marginalized groups such as street children and those with disabilities. Ethiopia as one of the survey, as a result the Ethiopia Federal in conjunction with the State TVET Authorities and representatives of the ICT sector are currently developing an appropriate strategy for the further development of ICT and blended learning (including e-learning), addressing the issues of e-module development, development of distance education in TVET, necessary human resource development and other factors influencing the availability of ICT in the TVET sectors.

In relating to above, the respondents to this survey were from 42 different African countries, such as: Kenya (15%), South Africa (12%), Nigeria (11%), Ethiopia (9%) and Uganda (8%) and others. According those different respondents there are many various suggestions was received as things that make e-learning more effective. Among the most frequently mentioned were:

- Availability of hardware (particularly computers)
- Faster Internet connectivity/improved bandwidth
- Improved software
- Appropriate policies favoring e-learning

- Provision of technical support for e-learning at a range of scales
- Lower prices for connectivity
- Availability of reliable electricity
- Appropriate content in appropriate languages
- Awareness raising about the value of e-learning
- Improved training for teachers in e-learning at all levels

In Ethiopia, the first e-Learning project to be introduced through schools was the CivICT project of the World Bank Institute (WBI). The main idea or subject of the project was entitled "Governance in the Hands of Youth" which took place from June to July, 2003. Through the introduction of the project, the students have been able to communicate with the "world" using the e-mail, after undertook hands-on practices on Internet and website design training with financial and technical assistance received from the British Council of Ethiopia and UNESCO/IICBA office in Addis Ababa respectively. This has further encouraged the students to be able to participate in other areas of knowledge exchange and be able to exchange their cultural knowledge with other African students which include Nigeria, Zambia and Namibia using the Mailing List (ML) as organized by the WBI (Mitiku 2004).

In the case of Ethiopian higher institution there are various activities regarding e-learning technologies. For instance, eLearning Ethiopia is an online social network open to anyone interested or involved in ICT-supported education in Ethiopia. It was started and is currently being administrated by the Ethiopian Engineering Capacity Building Program (ECBP), as one of its tasks, works with introducing eLearning technology and methods to Ethiopian HEIs and TVET colleges. The implementation of e-Learning allows a number of specific advantages in the upcoming development of the Ethiopian higher education system. The planned strategic cooperation between Ethiopia and Germany in the field of higher education, which is beyond the general benefits of e-Learning in terms of flexibility in time and space (eLearning Ethiopia).

On the other hand, according Rajpal et al. (2008) stated that in India the current teaching-learning process is oriented towards class-room model. The generic approach is

transforming into the flexible on line systems capable of imparting education in the manner that can never be thought of. With the advent of internet technologies, it is bringing a turbulent change in the Indian education system. As a result, the revolution of e- learning has begun and is at an infant stage and needs to be nurtured further. Finally he mentioned they have to work hard to develop robust and flexible modules to explore the opportunities to greater heights.

### **3.5. E-learning in Higher Institution**

Higher education is crucial for the production of vital human resources, such as teachers, healthcare professionals, lawyers, engineers, managers, businessmen, and researchers critical for socio-economic development of a nation. Furthermore, higher education is a center for knowledge and skills creation, adaptation and dissemination. It also plays a significant role in providing relevant and quality community and public services. Higher education is therefore critical for economic progress, political stability and peace, as well as building democratic culture and cohesive societies (Yizengaw 2005). Related on that, according to Mutula (2003) specifies that a number of universities worldwide including some in Africa are making positive attempts to implement e-learning strategies in order to enhance equity, quality, share instruction technology resources, compete in global environment of higher education and meet the rising demand for tertiary or higher education.

Information Technology (IT) has emerged as an important component of society. Many private HEIs around the world are using e-learning in their education curriculum to compete with others and survive financially. Also many HEIs are changing to new technology in education to enhance student learning experiences and to produce better learning outcomes and competencies. Traditional universities should have a flexible organizational structure to incorporate technology such as e-learning approaches into their education curriculum to improve student learning experience (Singh et al. 2003, Laurillard 2004).

Moreover, with the various facilities of Information and Communication Technology (ICT) and the rapid growth of e-learning, computers are now used by students in many

education processes and are valuable tools in learning in higher education. Accessing online learning resources has become flexible and fast without any geographical barriers (Sivapalan and Cregan 2005, Concannon and Campbell 2005). However, there are some important factors for the success of e-learning during implementation in HEIs. Poor preparation can affect the use of e-learning facilities. Poor instructor awareness and training in using e-learning facilities will lead to poor outcomes. The availability of connections to e-learning websites combined with slow downloads discourages students from using e-learning (Al-Doub et al. n.d.).

Increasingly, various authors and scholars specify the integration of e-learning with ICT and other technologies. For instance, as presented on Commission on Technology and Adult Learning (2001) and OECD (2005) the term e-learning refers to the use of ICTs to enhance and support teaching and learning processes. It is the instructional content or learning experiences delivered or enabled by electronic technologies and it incorporates a wide variety of learning strategies and technologies. E-learning ranges from the way students use e-mail and accessing course work online while following a course on campus to programs offered entirely online. It is thus an alternative solution, which enlarges accessibility to training and becomes essential to complement the traditional way of teaching (i.e. face-to-face).

In developed countries e-learning is a popular phrase, as Anderson (2005) pointed out if we search for the phrase e-learning in one of the internet search engines, we would receive more than someone can imagine. E-learning has been defined in a variety of ways in the literature. The most common definition stated that e-learning or electronic learning in higher education is a technique to enhance learning and teaching experiences and used to educate students with or without their instructors through any type of digital media (Christie and Ferdos 2004) and/or utilizing many ICT (Laurillard 2004). In recent years the Higher Education sectors are concentrating on the online context of e-learning by using the Internet to enhance education (Arabasz and Baker 2003).

On the other hand, in developing countries like Africa the e-learning technologies are in its infancy or not that much. For instance, Sife et al. (2007) pointed out in Tanzanian

universities the implementation of e-learning platform is still very low despite of the opportunities that are provided by the open source technology and the conducive environment created by the government. Some of the conducive environment that provide by the government is like abolished all taxes related to computers and allied to equipments, and reduced license fees and royalty payable by the telecommunication operators. In the case of higher education, among ten universities, only the University of Dar salaam (UDSM) has managed to implement the e-Learning platform in Tanzania. UDSM has implemented e-learning platform by using WEBCT and Blackboard, which are e-learning proprietary software. While, other universities such as Sokoine University of Agriculture (SUA), Mzumbe University and Open University of Tanzania (OUT) possess basic ICT infrastructure such as Local Area Network (LAN), Internet, computers, CDs and DVDs facilities that form the basis for the establishment of e-learning platform.

### **3.6. Instructional Design Models for E-learning**

#### **3.6.1. What is Instructional Design?**

Different definitions were given by various scholars for instructional design. All of the definitions are an expression of underlying philosophies and viewpoints of what is involved in the learning process. For instance, Siemens (2002) given a definition for instructional design as follows, instructional design is:

- The systematic process of translating general principles of learning and instruction into plans for instructional materials and learning.
- A systematic approach to planning and producing effective instructional materials. It is similar to lesson planning, but more elaborate and more detailed.
- The systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs. It includes development of instructional materials and activities; and tryout and evaluation of all instruction and learner activities.

- The process by which instruction, computer-based or not, is created. Instructional design provides a framework for the creative process of design, and ensures the learners' needs are met.
- Also known as instructional systems design or "ISD", it is a tested and proven methodology for developing instruction.
- A systematic approach to course development that ensures that specific learning goals are accomplished. It is an iterative process that requires ongoing evaluation and feedback.
- The art and science of creating an instructional environment and materials that will bring the learner from the state of not being able to accomplish certain tasks to the state of being able to accomplish those tasks. Instructional Design is based on theoretical and practical research in the areas of cognition, educational psychology, and problem solving.

Moreover, instructional design means more than literally creating instruction. It is associated with the broader concept of analyzing human performance problems systematically, identifying the root causes of those problems, considering various solutions to address the root causes, and implementing the solutions in ways designed to minimize the unintended consequences of corrective action. Instructional design usually encompasses not just the preparation of work-related instruction but also the selection of such management solutions to human performance problems as the preparation and use of job aids, the redesign of organizational structure and reporting relationships, the redesign of jobs and tasks, the refocusing of employee selection methods, the reengineering of job-related and task-related feedback methods, and the design and implementation of employee reward programs (Richey et al. 2001).

### **3.6.2. Instructional Design Models**

Instructional design is guided by a model of human performance. In the most general sense, of course, a model is a simplified or abstract representation of a process, device, or concept. A model of any kind is designed to help understand a problem, situation, process, or device. It provides a basis for a common understanding, and common labels,

for people to discuss the issue. This applies to a model of human performance, which is a simplified representation of factors involved in producing work results. It is intended to provide labels to key factors involved in performance and clues to pinpointing underlying causes of human performance problem (Richey et al. 2001).

According Siemens (2002) Instructional design is a system or process of organizing learning resources to ensure learners achieve established learning outcomes. He define the Instructional Design Models is “it is essentially a framework for learning”. From a designer’s perspective, various models can be followed in the instructional design process. It is important to note that, a model is a representation of actual occurrences, and should be utilized only to the extent that it is manageable for the particular situation or task. The effectiveness of various models is different in different directions or perspectives. Perhaps one model is more effective for designing one course, and another model is more effective for designing other courses. Instructional design model offers excellent visuals depicting various models. Here is an overview of some different models for instructional design of e-learning:

- ADDIE stands for Analyze Design Develop Implementation and Evaluation
- Dick and Carey Model
- Kemp, Morrison, and Ross
- Three-Phase-Design (3PD) Model
- Rapid Prototyping and others

Instructional design models (IDM) provide for a systematic approach of implementing the instructional design process for a specific educational initiative. There are a wide variety of IDM, describing the ID process created for different situations and settings (Morrison et al. 2004).A model can also function as a visual and communication tool to help conceptual complex schematic or instructional design process along with how the various stages or elements relate to each other (Gustosfon & Branch 2002a). According Siemens (2002) and Ryder (2006) stated that the application and value of a model is dependent on the instructional situation, problem or task. In the following section provide a description on some models and their comparisons.

## **The ADDIE Model**

In delivering instruction, various models have been proposed. The most well-known and frequently used models in Instructional Systems Design are usually based on the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) concept. The ADDIE model is a generic and systematic approach to the instructional design process which provides instructional designers with a framework in order to make sure that their instructional products are effective and that their creative processes are as efficient as they can possibly be (Dick et al. 2001). This fundamental model consists of the five steps which are found in almost all ISD models. Each step has an outcome that feeds the subsequent step. During the phase of analysis, the designer identifies the learning problem, the goals and objectives, the learners' needs, existing knowledge and any other relevant characteristics. Analysis is also concerned with the learning environment, any constraints, the delivery options and the timeline for the project. The design phase documents specific learning objectives, assessment instruments, exercises and content. The actual production of learning materials is completed in the development phase. During implementation, a procedure for educating the learner is developed and the materials are delivered or distributed to the student group. After delivery the effectiveness of the learning materials is evaluated.

The ADDIE ISD model covers the whole process of development of learning programs from the minute the question "what must the students learn" arises to the minute the question "did the students learn what they needed?" is submitted and also provides a complete linear process which manages the development of a course's design. Its methodology consists of the five phases mentioned already and each phase is characterized by a set of activities and a project output in the form of a tangible deliverable. The deliverable for one phase is the input for the next one. Each phase of the ADDIE model is an important element of the instructional design process. In each phase the instructional designer makes decisions that are critical for ensuring the effectiveness of the instructional experience. An adaptation of the basic framework structure and, subsequently, its transformation in order to satisfy the needs and requirements posed within a Networked Learning Environment could be made in a way that follows the

principles of Information Systems (IS) development, since e-learning is an IS itself (Dick et al. 2001).

### Dick and Carey Systems Approach Model

The Dick and Carey systems approach model is one of the main ID system oriented models-similar to other models. The Dick and Carey system accepts through the conventional main elements of analysis, design, development, implementation, and evaluation, also known as the ADDIE model (see figure 3.1). The Dick and Carey model is more complex where the approach based from the five core elements is divided into additional or variety of steps with different terminology (Brandt 2001, Gustafson and Branch 2002a).

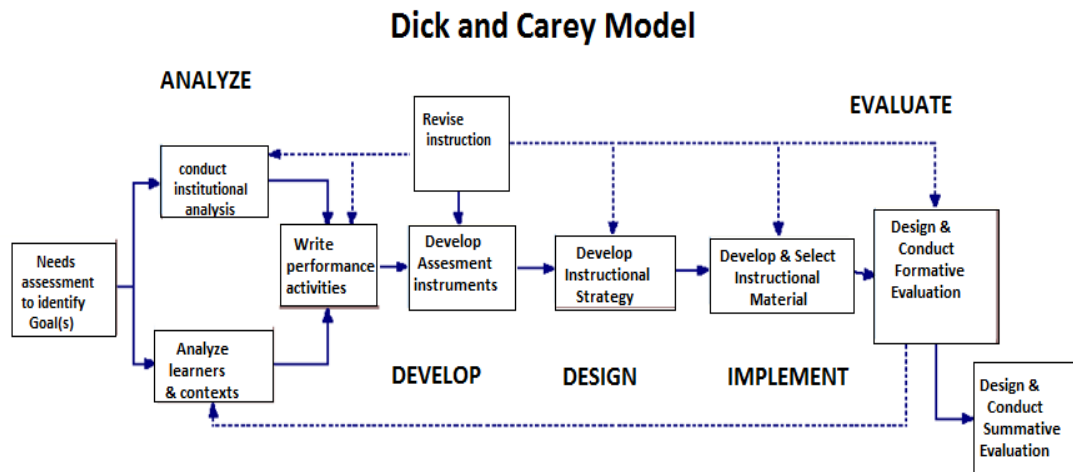


Figure 3. 1 : Dick and Carey Systems Approach Model (Source: Dick et al. 2001)

The above figure 3.1 shows that the Dick and Carey Systems Approach Model. The linear approach of the figure for design instruction with review process. ADDIE components (indicated outside the box) are added for discussion analysis. According Dick et al. (2001), the components for the models consist of nine procedural steps or linear. Those components of the model are dependent upon another indicated by the direction of the solid arrow lines. The dotted lines representing formative evaluations

points to instructional revisions that originates from re-examination of the instructional analysis' validity and entry behaviors of learners. The sequential steps for the design of the model are as follows Dick et al. 2001: Gustafson & Branch 2002a:

- a) Asses needs to help identify learning goals
- b) Conduct instructional analysis and analyze learners and contexts
- c) Write performance objectives
- d) Develop assessment instruments
- e) Develop instructional strategies
- f) Develop and select instructional materials
- g) Design and conduct formative evaluation
- h) Revise instruction based from formative evaluation (optional)

The linear form for the Dick, Carey and Carey model indicated that each process cannot function as a standalone. This means that they are dependent to each other. The systematic approach of the model is an effective and successful approach because of three main reasons (Dick et al. 2001). Firstly because of its focus on learners' objectives and final achievement prior to the planning and implementation stage. The second there is linkage between instructional strategy (targeted skills and knowledge) and desired learning outcomes (appropriate conditions must be supplied by instruction). The third and most important reason is the replicable and the pragmatic design process where the product is usable for many learners and different occasions; time and effort revising the design product during the evaluation and revision process is recommended.

### **Morrison, Ross & kemp model (kemp Model)**

According to the Morrison et al. (2004), the instructional design approach that focuses on curriculum planning stems from the learner's perspective rather than content, making different from traditional practice. The following are some of the factors which influence learning outcomes contribute to the construct of Kemp's Model.

- a) Level of readiness in dealing with lesson objective
- b) Instructional strategies related to objectives and student characteristics
- c) Media and resource selection
- d) Support for successful learning
- e) Determination of objectives achievement and
- f) Needed revisions for program improvements

The complete model of instructional design plan of Morrison, Ross & Kemp's consists of nine elements that arranged in a circular manner (clockwise) in a form of an oval shape (see Figure 3.2). The elements are as follows (Morrison et al. 2004).

- a) Instructional problem identification and goal specifications of an instructional course
- b) Examination of learner's characteristics based on instructional decision
- c) Subject content identification with task analysis related to goals and purposes
- d) Instructional objective specification
- e) Instructional units in arranged in logical and sequential order for learning
- f) Instruction strategies designed to meet the mastery of lesson objectives
- g) Plan and develop instruction
- h) Evaluation instruments for measuring course objectives and
- i) Resource selection for instruction and learning activities

## Kemp Model

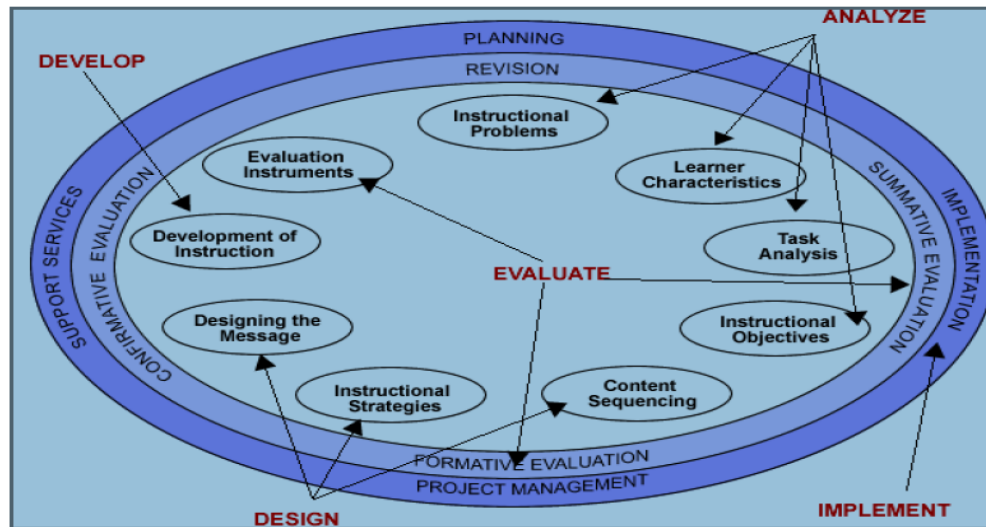


Figure 3. 2: Kemp's Model with ADDIE components (Source: Morrison et al. 2004)

As shown in figure 3.2 the non-linear elements for the design process (no connecting arrows or lines) arranged in an oval shape indicate is not predetermined; hence, it does not have targeted starting point and ending point. Instead of step or sequence the term element is used because the model is not a linear approach. The instructor can start from any point in the oval pattern and proceed in any manner or step. The flexible arrangement of the model allows the individual to select either one of the process for the course needs. Furthermore, the two outer ovals additions to the diagram represent managerial and feedback procedure conducted during the design, development and implementation stages. This circular or non-linear structure allows to designer to customize based on the organizational needs (Morrison et al. 2004).

In conclusion, the Kemp design model focuses on resource creation, implementation and delivery followed by evaluation and improvement (Sims & Jones 2002).

### Three-Phase Design (3PD) Model

According Sims & Jones (2003, p.8), the 3PD model is, "An enhancement to the traditional instructional design process focuses on the creation of functional course delivery components, with evaluation and improvement activities integrated with

scaffolding (support) for the teacher and learner to provide a dynamic teaching environment in which resources or strategies can be developed or modified during the actual delivery stage”. The dynamic process requires ongoing communication with support team for best implementation. As illustrated in Figure 3.3, the 3PD model team under each iteration phase composed of the academic person (A), designer (D) and educational designer (ED) has a focus on developing successful online maintenance, to become less dependent on the developer and educational designer over a period of time, hence becoming an independent designer and developer (Sims & Jones 2002).

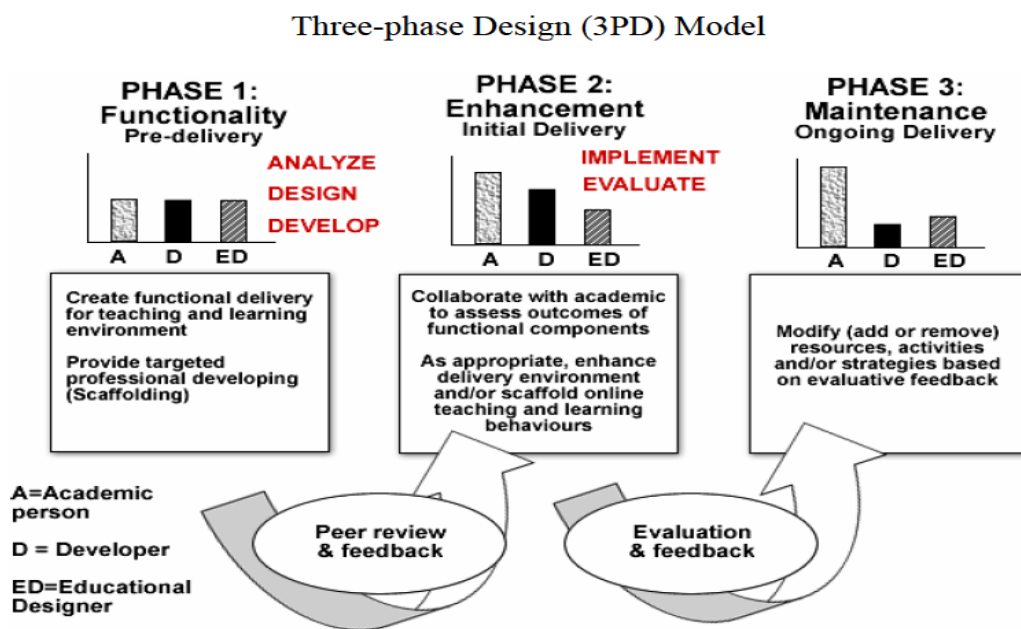


Figure 3. 3: Three-Phase Design Model with ADDIE components added for discussion analysis (Source: Sims & Jones 2002)

According Sims and Jones (2002) stated that the 3PD model proposes have four critical factors. The first factor he stated is “the instructional design development process must align with institutional expectation, contemporary pedagogical as well as available resources and skills”. The next factor relates to the academic professional development. The third factor refers to the approach of team-based work where communication and understanding among team members takes place during the development process reinforcing group collaboration. Finally, the last factor involves incorporation of

scaffolding or support units for both academic instructor and staff where skills learned can help ensure success in confronting new challenges and learning paradigms.

As shown in figure 3.3, the 3PD model composed of three phases. Phase 1 known as pre-delivery mode involves the preparation of online teaching components. This includes planning teaching and learning strategies (learner-centered, experiential or situated), learning outcomes, lesson materials and resources. Each member of the team has a specific role or task (Sims & Jones 2002). The second phase or phase 2, the enhancement mode is the delivery phase. In the delivery phase ongoing feedbacks and evaluation permits the opportunity for immediate enhancement to the learning environment, hence creating a scaffolding environment where participants can learn about the new processes. The instructor gets to improve the learning environment in a proactive way with the support through collaboration and communication from other team members including learners (Sims and Hand 2002). This is a great advantage of the proactive evaluation process because it can help take care of immediate concerns or problems while learning from the situation. Finally in phase 3, the team prescribes changes and enhancement for subsequent delivery. In this phase there is maintenance mode with ongoing support and training that takes place over a long time where quality assurance is the key focus. The educational designer is the major player in the development team while faculty and learners make up the other groups respectively. It also responsible for giving educational and curriculum design guidance, advice and may have other managerial responsibility (Sims & Jones 2002).

### **Similarities and Differences among Those Three Models**

The following section offers an account of observed similarities and differences in characteristics and qualities analyzed from the three model's process description and presentation. In particular the following are the main targeted area:

- a) The use of visuals that fits the model definition and processes
- b) The general constructs (conventional form) for each model with its goal and purpose

- c) The evaluation processes
- d) The role of team collaboration

### **Use of Visuals to Represent Model Structure and Functions**

The similarities in this section are each model process or system description is well represented and supported with diagrams by each author (see Figure 3.1, 3.2, 3.3). What makes the models different from each other is the layout for the individual element or component as it applies and relates to each other, represented through the symbolic illustrations. For example, in the Kemp model, the use of non-connecting lines indicated that the components do not relate to each other, while the Dick and Carey model the diagram shows the one-way linear application of the design stage which means they are dependent to each other. The 3PD model through the illustration of the vertical placement of all three phases represented the dynamic relationship of the model process was also able to indicate the stages of its linear activity across (phase 1- phase 2- phase 3).

### **Conventional Form Structure**

According to Brandt (2001), Gustafson and Branch (2002) as mentioned earlier that indicated in Dick and Carey model is based on the conventional core elements of the ADDIE model. The ADDIE model consisting of the components of learner analysis, design of instruction (including objectives and strategies), material development and media selection, course implementation, and evaluation is also found in Kemps and the 3PD model. ADDIE components are indicated in the diagrams of each model.

Each model utilizes at least one form of traditional (step-by step process) approach. The Dick & Carey and Kemp models are more comprehensive and detailed compared to the 3PD model. Some authors have critics on those models, for instance, the step-by step prescription is extensive and takes too long to apply, at times, the process is too costly and may not appropriate for specific instructional task (Gorden & Zemeke 2000). Dick and Carey's steps build on each other and one cannot proceed without the prior step. In addition, the design process cannot begin until instructional goals are established. Kemp's model, however, containing all Dick and Carey's steps is less prescriptive and

practical as the designer can select any applicable element. It offers a more heuristic approach where the flexibility allows adaptation for technology situation such as online environments. The 3PD model through linear in format (phase 1 to phase 3) as shown in figure 3, has iterations within each scheduled phase as well (Sims & Jones 2003). The valuable feature includes further enhancement of the traditional “development” functionality through its “evaluate, elaborate, enhance or maintain” process.

### **Evaluation Process**

All the three models offer the component of evaluation, but may vary in functionality and purposes. The two main reasons that create similarities and differences between those models are related to first technology concerns and second different emphasis at different stages of the process.

**Technology related issues:** Referring to example of traditional ISD systems like Dick and Carey as well as Kemp’s model, they stated the following, “although there are many ISD models that include systems” (Jones & Pallouci 1999). On the other hand, one of the 3PD model strategies relating to the evaluation, a proactive process infers that is able address such issues. For example, during the phase of course implementation, concerns can be immediately taken care by technology-oriented as well as academic teams (Sims & Jones 2003).

**Processes and emphasis differences:** Morrison, Ross & Kemp offers an extensive prescription on the evaluation process. Within the evaluation process itself exist models of evaluation. For example, as indicated earlier, there are three stages within the formative evaluation process. This process takes place during the development phase (Morrison et al. 2004). Summative and confirmative evaluations are conducted at the end of the course instruction by team members. The Dick and Carey model emphasizes and utilizes the same formative principles as Kemp’s model. The only difference is that the summative evaluation is a culminating process reviews instructional effectiveness conducted by someone not involved with the design process. In addition, Dick and Carey’s evaluation process does not have a confirmation (follow-up) evaluation.

On the other hand, the evaluation process works differently in the 3PD model; the process is known as the proactive evaluation. The difference in comparison to the other two models is that, the proactive evaluation in phase 2 (the implementation phase) offers valuable opportunities to enhance the quality of the learning environment. The proactive evaluation process also allows immediate trouble shooting to take place for possible problems that may arise during the progression of online activities.

### **The Role of Team Collaboration**

In the case of the role and team collaboration, each model supports the concept of individual, team collaboration and project management concerns, but varies differently at different stages of the design process. Dick and Carey's teamwork concept relies on group (manager and specialists) collaboration of skills for the production of the final product. Sometimes the instructor as a stand-alone can also be the "team" on condition that the instructor has all the skills needed for the project (Dick et al. 2001). The Kemp model assumes that the designer has strong meta-cognitive and leadership skills to be able to manage and revise changes during the development process (Morrison et al. 2004). Morrison, Ross and Kemp stated that the four essential roles are the instructional designer, instructor, SME and evaluator each having specific skills and responsibilities. In the 3PD the team members consist of administrators, technicians, designers, instructors and as well as learners (Sims & Jones 2003). The inclusion of learners as well as focus on team (academic and technical staff) care and concerns contrast the 3PD model from the other models.

### **3.7. Challenges of E-learning Adoption**

The exponential growth of Information Technology (IT) has made learning very quickly to happen. Keeping pace with this change requires new thinking about how we acquire knowledge and skills as well as how we develop learning resources. The advent of Information and Communication Technology (ICT) and the Internet has greatly influenced the way knowledge is conveyed. This has resulted in the development of e-learning (Mahmud and Gope 2009).

The successful implementation of e-learning is dependent on successful delivery of contents, courses and training via electronic media including the Internet, intranets, extranets, satellite broadcast, audio/video tape, radio, interactive television, and compact disk read only memory. Weaker economy and absence of adequate infrastructure facilities are main obstacles of effective e-learning practices in least developed countries. As a member of least developed countries, Bangladesh has lots of challenges regarding e-learning (Mahmud and Gope 2009). Those challenges are affect successful implementation of e-learning for higher education in Bangladesh regarding to technological, psychological, socio-cultural and economic factors. The most difficult challenges are scarcity of ICT resources and infrastructure, internet connectivity and bandwidth issue, difficulty in engaging learners online, lack of confidence in using computers, Poor competencies in English, lack of awareness, unwillingness to change learning environment, ethically harmful internet contents, load shedding of electricity, lack of training facilities and software piracy problem. Similarly another research that conducting on assessing the challenges in deploying of successful e-learning in Bangladesh are cost for developing ICT infrastructure, lack of awareness, Weak in English language skill, concerning the copy right, problem on constant supplies of electricity and others (Patra et al. 2010). Those challenges are almost similar to the former one that describes the status of e-learning in Bangladesh.

Moreover, there are various challenges in adopting e-learning that affect in developing countries like Africa. For instance, Unwin (2008) stated that the most common challenges is the infrastructure of the availability of access to electricity, availability of computers and the Internet connectivity and others. According to Rhema and Miliszewska (2010) stated that Libyan higher institutions still face many challenges in terms of the implementation of ICT and e-learning in teaching and learning. These challenges are associated with the cultural and linguistic background of students and instructors, their awareness and attitudes towards e-learning, the underdeveloped technological infrastructure and the often prohibitive cost of educational technologies, the lack of local expertise in curriculum development for e-learning and the lack of educational management mechanisms to support e-learning initiatives. In addition to those, the other

most serious challenges facing many African countries are the departure of their best scholars and scientists away from the Universities (Teferra and Altbach 2004)

Developed countries like developing countries there are challenges that affect in adoption of e-learning. For instance, in Austria according to Reich and Scheuermann (n.d.) the challenges in introducing or implementing e-learning are management problems, understanding of e-learning potentials i.e lack of awareness, inadequate infrastructures (Lack of organizational and spatial prerequisites, Learning materials, Equipment), Missing organizational perspective (Cooperation of different actors, Learner, Training provider (intern / extern)).

On the other hand, not only challenges occur for HEIs when adopting of e-learning but there are also challenges for students and instructors in using e-learning systems that mean after implementation of e-learning in higher institution. Firstly, the challenges regarding of e-learning to the instructors are time management in giving online class and preparing online material, student's technical limitations, and bandwidth and computer hardware's problem. Secondly, in the case of students the challenges are lack of confidence and experience with computers; lack of skills in commonly used applications like Microsoft word, Excel, or PowerPoint and others. In addition, the access level of laptop or desktop computers, time management skills and motivations those are the main that can influence student performance in e-learning classes (Judith 2004).

## **Chapter Four**

### **4. Results and Discussions**

#### **4.1. Results**

This chapter deals with the results and discussions of the data analysis. The data was gathered from eleven departments which are found in the two colleges of Mekelle University namely Institute of Technology and College of Health Science. It was obtained through questionnaires and interviews. Most of the questionnaire was self administered; this is done to increase the quality of data collected and the response rate. Meeting respondents in person helped to better clarify and explain the objectives and importance of the research, so that they would give the actual information. The total numbers of distributed questionnaires were 260 out of which 223 were filled and returned. These number shows that above 85 % were filled and returned. Those entire 223 questionnaires were filled properly and found appropriate for analysis.

##### **4.1.1. Quantitative Study**

###### **4.1.1.1. Demographic analysis**

The academic staffs who filled the questionnaires of the two colleges were about 60 % from the Institute of Technology and 40 % from the College of Health Science. From the total respondents who filled the questionnaires 89 % were males and 11% were females. As far as classification of respondents based on age is concerned 61 % of the respondents were between 22 and 28, 30 % of the respondents were between 29 and 35, 4% were between 36 and 42 and 2 % were 43 and above. The classification of the data collected based on department, educational qualification, work experience, computer skill are presented in the next tables (from table 4.1 to 4.5) respectively.

Table 4. 1: The number of questionnaire distributed and returned in every departments

No	Departments of the Respondents	Distributed Questionnaires	Returned Questionnaires in %
1	Electrical Engineering	25	80 %
2	Industrial Engineering	24	83.3 %
3	Mechanical Engineering	30	93.3%
4	Civil Engineering	18	83.3%
5	Architecture and Urban Planning	24	83.3%
6	Computational Science & Information System	27	92 %
7	Medicine	34	85 %
8	Pharmacy	25	88 %
9	Public Health	22	86 %
10	Midwifery	16	81 %
11	Nursing	15	80 %

The above table 4.1 indicates that the maximum percentage of the returned questionnaires were in mechanical engineering from the Institute of Technology and pharmacy from College of Health Science. On the other hand, the minimum percentage of the returned questionnaires was in electrical engineering from Institute of Technology and nursing from College of Health Science.

Table 4. 2: Educational qualification of the Respondents

No	Educational Qualification of the Respondents	Number of Respondents	Percent (%)
1	Bachelor Degree	108	48
2	Masters Degree	87	39
3	PHD (Doctorate Degree )	6	3
4	Others	22	10
<b>Total</b>		223	100

Table 4.2 indicates that, most of the respondents' educational qualifications were bachelor's degree and master's degree holders. The remaining were PhD holders and

others. As table 4.3 indicates, the highest working experiences of the respondents were 1 - 3 years.

Table 4. 3: The Respondents Work Experience in Teaching

<b>No</b>	<b>Work Experience of Respondents</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
1	1-3 years	122	54.5
2	4-6 years	67	30.1
3	7 years and above	25	11.4
4	Others	9	4.1
<b>Total</b>		223	100

Table 4. 4: Computer Related Qualification of the Respondents

<b>No</b>	<b>Computer Related Qualification</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
1	Certificate	79	35
2	Diploma	11	5
3	Degree	29	13
4	Others	104	47
<b>Total</b>		223	100

As we can see from the table 4.4, the highest numbers of respondents have no computer related qualification which accounts 47 % of the respondents. Fifty three percent of the respondents have a computer related qualification. As table 4.5 below indicates, out of certificate holder respondent, the highest numbers were in mechanical engineering and the lowest were in computational science and information system and pharmacy. The highest numbers of computer related qualifications that have degrees were in the department of computational science and information system. Except electrical engineering, there were no other departments that have degree holder staffs in computer related qualification.

Table 4. 5: The Departments and their Computer Related Qualification

		Computer Related Qualification				Total
		Certificate	Diploma	Degree	Other	
<b>Departments</b>	Electrical Engineering	10	2	5	3	20
	Industrial Engineering	8	2	0	10	20
	Mechanical Engineering	12	1	0	15	28
	Civil Engineering	5	2	0	8	15
	Architecture & Urban Planning	10	0	0	10	20
	Computational Science & Information System	0	1	24	0	25
	Medicine	10	2	0	17	29
	Pharmacy	0	0	0	22	22
	Public Health	11	1	0	7	19
	Midwifery	5	0	0	8	13
	Nursing	8	0	0	4	12
<b>Total</b>		79	11	29	104	223

#### 4.1.1.2. Institutional ICT and E-learning Policy

It was evident from the table 4.6 below that concerning the institutional policy the highest percentage that is more than 50 % of the respondents have lack of awareness about the presence of ICT policy. On the other hand, about 42% of the respondents claimed that ICT policy is practiced in the university.

Table 4. 6: ICT Policy in the University

Items	Number of Respondents	Percent (%)
Yes	94	42
No	9	4
I don't know	120	54
<b>Total</b>	223	100

Table 4. 7: Existence of E-learning in the ICT Policy

<b>Items</b>	<b>Frequency</b>	<b>Percent (%)</b>
Yes	80	36
No	5	2
I don't know	138	62
<b>Total</b>	<b>223</b>	<b>100</b>

Table 4.7 illustrates that from the total number of respondents 62 % have no awareness about the specification of e-learning in the ICT policy of the university. Thirty six percent of the respondents assert that e-learning is mentioned in the policy. This would infer that there is an awareness problem on the university staff that has a profound role in the success or even failure of the institutions objective.

Table 4. 8: Level of E-learning mentioned in the ICT policy

<b>Level of E-learning that Mentioned</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
E-learning is considering in the university as very essential	36	16.3
E-learning is the preferred option	25	11.4
I don't know	160	71.5
<b>Total</b>	<b>223</b>	<b>100</b>

Table 4.8 indicates that, 71.5 % of the respondents have no awareness about how e-learning is mentioned in the ICT policy. More than 16 % of the respondents selected e-learning is considering in the university as very essential and 11.4 % of the respondents asserted e-learning is the preferred option. This figure shows that there is no awareness about the presence and level of e-learning in the ICT policy.

#### **4.1.1.3. Computer Skill**

The computer skills of the respondents are presented in table 4.9 below. The highest percentage of the respondents that have high skills are occupied in e-mail, search engine and word-processing applications which account 83.7 %, 82.9 % and 74.81 %, respectively. The deviations of values of the response of these two former items are less than from their mean. This indicates that the respondents have relatively better experience on word processing and e-mail. The respondents who have lowest percentage have high skill on LMS like Moodle, webpage development and publishing a webpage, these accounts to 19.5 %, 17.9 % and 8.9 %, respectively. The highest percentage that have medium skill in use Microsoft Access, CD-ROMs like Encarta encyclopedia, Microsoft excel and LMS like Moodle which accounts to 31.7 %, 28.5 %, 26.8 % and 26.8 %, respectively. The respondents who have the lowest percentage in the medium skill in using e-mail and search engine which accounts to 9.8 % and 8.9 %. The highest percentage of the respondents who have low skill in Microsoft Access, publishing a webpage, webpage development, LMS like Moodle and uploading of different materials which accounts to 26.8 %, 26.8 %, 25.2 %, 22 % and 18.7 respectively. Whereas the lowest percentage in the low skill are in using e-mail, search engine and word-processing application which accounts to 2.4 %, 4.9 % and 4.9 %, respectively.

Moreover, the highest percentage of the respondents who don't have skill in publishing a webpage, webpage development and LMS like Moodle which accounts to 48 %, 39 % and 31.7 %, respectively.

Table 4. 9: Computer Skill

No	Computer Skill of the Respondents	High	Medium	Low	None	Mean	SD
1	Microsoft Word	74.8%	17.1%	4.9%	3.2%	1.34	0.69
2	Microsoft Excel	52%	26.8%	15.4%	5.8%	1.73	0.90
3	Microsoft Access	22.8%	31.7%	26.8%	18.7%	2.4	1.034
4	Using E-mail	83.7%	9.8%	2.4%	4.1%	1.27	0.702
5	Searching engine	82.9%	8.9%	4.9%	3.3%	1.26	0.666
6	Using online learning materials	54.5%	23.6%	13.8%	8.1%	1.74	0.96
7	Uploading different materials	51.2%	23.6%	18.7%	6.5%	1.75	0.91
8	Using CD-ROMs like Encarta encyclopedia	46.3%	28.5%	17.1%	8.1%	1.85	0.959
9	Using Learning Management System like Moodle	19.5%	26.8%	22%	31.7%	2.65	1.12
10	Webpage development	17.9%	17.9%	25.2%	39%	2.81	1.127
11	Publishing a webpage	8.9%	16.3%	26.8%	48%	3.1	0.999

#### 4.1.1.4. Current Status, Awareness and Attitude of E-learning

As depicts in table 4.10, the majority of the respondents i.e. 48 % agreed on the encouragement of incorporating e-learning by the Institute. While 26.8 % strongly agreed, 13.8 % neutral, 6.5 disagreed and the remaining 4.8 % strongly disagreed.

Table 4. 10: Encouragement of Instructors to Incorporate Technology

<b>Item</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
Strongly Agree	60	26.8
Agree	107	48
Neutral	31	13.8
Disagree	14	6.5
Strongly Disagree	11	4.9
<b>Total</b>	223	100

Table 4. 11: Awareness of E-learning

<b>Item</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
There are no staff	5	2.4
A few staff have a basic awareness & the majority have no awareness	149	66.6
All staff have basic awareness	31	13.8
A few staff have an extensive awareness & the majority have basic or no awareness	37	16.4
All staff have an extensive awareness	1	0.8
<b>Total</b>	223	100

The awareness of e-learning among the staffs is listed in table 4.11. The highest percentages of the respondents which account 66.6 % chooses a few staffs have a basic awareness and the majorities have no awareness. From the respondents 2.4 % chooses there are no staff who have e-learning awareness, 13.8 % of the respondents chooses all staff have a basic awareness and 16.4 % chose a few staff have a highest awareness & the most of the staff have basic or no awareness. However, 0.8 % of the respondents said that all staffs of the university have an extensive e-learning awareness.

Table 4. 12: Current Status of E-learning Activities

<b>Current Status of E-learning</b>	<b>Already in place</b>	<b>Planned</b>	<b>Not envisaged</b>	<b>I don't know</b>	<b>Mean</b>	<b>SD</b>
Already plays a major role	21.1%	38.2%	10.6%	30.1%	2.42	1.108
There is delivery of online courses	27.6%	30.9%	17.1%	24.4%	2.31	1.107
There is development of curriculum for online course	13.8%	25.2%	12.2%	48.8%	2.91	1.145
There is development of e-learning content	21.1%	29.3%	8.9%	40.7%	2.64	1.203
E-learning is at its infant stage	44.7%	18.7%	10.6%	26%	2.00	1.17
There is blended learning courses	17.9%	22.8%	15.4%	43.9%	2.75	1.169
There is OER	8.1%	26.8%	13.1%	52%	2.98	1.066
There is staff training in some department	49.6%	17.9%	5.7%	26.8%	1.98	1.223
There is staff training in all department	13.8%	22.1%	13.7%	50.4	2.96	1.172

The majority of e-learning activities in the institutes are planned for implementation in the future. As table 4.12 indicates, 49.6 % of the respondents said that there are e-learning activities like staff training in some departments and 44.6 % of the respondents claimed that e-learning is at its infant stage. The mean value of these two activities in the above are 1.98 and 2.00 and the deviation values of responses are less than their mean value. This indicates that those two activities are highly practiced and existed in the institution. About 38.2 % of the respondents assert that e-learning will be play a major role in the university, 30.9 % of the respondents claim that e-learning activities like online courses will be delivered, 29.3 % of the respondents said that e-learning activities like online contents will be develop, 26.8 % of the respondents states that there will be e-

learning activities like OER and 25.2 % of the respondents said that there will be development of curriculum for online courses in the university. Furthermore, from 5.7 % to 17.1 % of the respondents said that there is no e-learning activities currently visualize in the university. On the other hand, from 24.4 % to 52 % of the respondents don't know about the current activities of e-learning in the university.

There is an extensive attitude on understanding the definition of e-learning in most of the respondents. Table 4.13 indicates that, 50.4 % of the respondents who give the exact definition of e-learning. However, 24.4 % of the respondents gave limited definition of e-learning as, all process, activities and technologies that support learning through the ICT. About 13 % of the respondents who define e-learning as it is concerned with providing easy access to learning resources, anytime and anywhere and about 3.2 % of the respondents who don't know the definition of e-learning.

Table 4. 13: Meaning of E-learning Given by the Respondents

<b>Meaning of E-learning</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
E-learning is all process, activities and technologies that support learning through the ICT	54	24.4
E-learning is a means of education that integrates self-motivation, communication, efficiency and technology	7	3.3
E-learning concerned with providing easy access to learning resources anytime and anywhere	31	13.8
E-learning is an electronic learning, digital learning and others	1	0.8
All of those can define e-learning	123	54.5
I don't know	7	3.2
<b>Total</b>	<b>223</b>	<b>100</b>

Table 4.14 illustrates about the attitudes of the majority of the academic staff on which activities can support by e-learning are on the extensive level. The result shows that from the total number of respondents, 69.1 % to 78.9 % (i.e. the highest percentage) strongly agree on e-learning can support various capacity development such as sharing policies and standards, providing internal capacity building, improved flexibility of delivery of training courses, quality enhancement of teaching and learning, giving opportunity to design joint degrees or programs and widening access to training materials. Furthermore, between 12.2 % and 19.5 % of the respondents agree on the idea that e-learning can be supported in different capacity development. However, less than 3.3 % of the respondents strongly disagree on the activities that can be supported by e-learning. On the other hand, from 4.8 % to 11.4 % of the respondents have no awareness about which activities are supported by e-learning.

Table 4. 14: Attitude or View of Respondents about E-learning

<b>Attitudes or Views of the Respondents</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>	<b>Mean</b>	<b>Std.Dev</b>
Do you think e-learning can support capacity development like sharing policies and standards?	71.5%	17.1%	9.8%	3.3%	1.6%	1.41	.828
Do you think e-learning can support capacity development like providing internal capacity building?	71.5%	19.5%	6.6%	2.4%	2.4%	1.38	.734
Do you think e-learning can support capacity development like improved flexibility of delivery of training courses?	78.9%	12.2%	7.3%	3.3%	1.6%	1.29	.703
Do you think e-learning can support capacity development like quality enhancement of teaching & learning?	69.1%	22.8%	4.8%	2.4%	3.3%	1.38	.674
Do you think e-learning can support capacity development like giving opportunity to design joint degrees or programs?	71.5%	13.8%	11.4%	3.3%	3.3%	1.46	.909
Do you think e-learning can support capacity development like widening access to training materials?	74%	16.3%	8.1%	3.3%	1.6%	1.35	.755

#### 4.1.1.5. Level of Adoption of E-learning and Factors for Effective E-learning

Table 4.15 indicates that, about 26 % i.e. the majority of the respondent's, on the coverage of e-learning in teaching learning process chose there is e-learning in one or more sub-section of the institute. About 15.4 % of the respondents chose to be implemented institution-wide for the future. However, 16.3 % chose e-learning currently is not available and about 10.6 % remained unfilled the questions. This shows that there are a number of respondents who don't have awareness about the presence of e-learning in the institution. On a related issue concerning the awareness of the respondents on the usage of LMS as shown in table 4.16 represented that the highest percentage which accounts 42.3 % said that the institution does not use LMS while 30.9 % of the respondents claimed that LMS is used in the institution and 26.8 % remained unanswered. This figure also shows that the respondents don't have awareness about the LMS.

Table 4. 15: Coverage of E-learning in Teaching Learning Process

<b>What is the coverage of E-learning activities/teaching</b>	<b>Frequency</b>	<b>Percent (%)</b>
In place institution wide	45	20.3
In place in one or more sub-section of the institute	58	26
To be implemented institution-wide in the next 12 months	13	5.7
To be implemented institution-wide in the next 1-2 years	13	5.7
To be implemented institution-wide for the future	34	15.4
currently not available	36	16.3
Missing Value	24	10.6
<b>Total</b>	<b>223</b>	<b>100</b>

Table 4. 16: Usage of LMS in the Institution

<b>Item</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
Yes	69	30.9
No	94	42.3
Missing Value	60	26.8
<b>Total</b>	<b>223</b>	<b>100</b>

Table 4. 17: Kind of LMS

<b>Type of LMS</b>	<b>Number of Respondents</b>	<b>Percent (%)</b>
Moodle	43	19.5
Blackboard	4	1.6
Currently not available	11	4.9
I don't know	22	9.8
Missing Value	143	64.2
<b>Total</b>	<b>223</b>	<b>100</b>

In case of the kind of LMS, the majority of respondents don't have awareness about the kind of LMS for e-learning. As shown in table 4.17, about 64.2 % of the respondents did not filled, 19.5 % chose Moodle. Table 4.18 shows that, the time usage for online mode is not that much enough. A few, which accounts 2.4 % (the minimum) and 9.80 % (the maximum) of the respondents chose usage of online mode is very often. On the other hand, about 47.2 % of the respondents never used on line mode on the current program and 44.7 % of the respondents choose never use web dependent on the current program offered. From the respondents about 30.10 % use online mode occasionally and 30.30 % used face to face with modest online presence and significant online presence. Generally, the result shows that most of the respondents don't use online mode.

Table 4. 18: Frequency of Accessing Online Modes

<b>Item</b>	<b>Very Often</b>	<b>Often</b>	<b>Occasionally</b>	<b>Never</b>	<b>Missing Value</b>
How often do current program offered by your institution like face to face with modest online presence?	9.80%	16.30%	30.10%	30.90%	13.00%
How often do current program offered by your institution like significant online presence?	4.10%	15.40%	33.30%	35.00%	12.20%
How often do current program offered by your institution like web dependent?	2.40%	17.10%	22.00%	44.70%	13.80%
How often do current program offered by your institution wholly or largely conducted online?	3.30%	13.80%	23.60%	47.20%	12.20%
How often do current program offered by your institution like none or trivial online presence?	16.30%	9.80%	26.80%	27.60%	19.50%

As shown in table 4.19, the highest percentage above 60 % of the respondents who strongly agrees on the specified conditions for making e-learning more effective. As the opinion of the respondents, the institution’s e-learning service could be more effective if the following preconditions are fulfilled: availability of hardware, faster Internet connectivity, improved software, creating awareness about the value of e-learning, availability of reliable electricity, using open source software, using appropriate policies favoring e-learning, provision of technical support for e-learning, using appropriate content in appropriate languages and training for teachers on e-learning in all levels. The deviations of the responses are less than their mean values which indicates that there is no gap on the respondents’ opinion.

Table 4. 19: Factors that Makes E-learning More Effective

<b>Make E-learning More Effective by:</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Mean</b>	<b>Std.Dev</b>
Availability of hardware	84.60%	11.40%	0.80 %	3.3%	3.30%	1.14	0.418
Using faster Internet connectivity	87.80%	5.70%	1.60 %	2.4%	2.40%	1.16	0.534
Using improved software	78.00%	13.00%	4.10 %	4.1%	0.80%	1.28	0.690
Raising awareness about the value of e-learning	74.80%	18.70%	1.60%	3.3%	1.60%	1.28	0.581
Availability of reliable electricity	73.20%	17.10%	1.60 %	3.3%	4.90%	1.33	0.652
Using open source software	74.00%	16.30%	3.30 %	4.1%	2.40%	1.32	0.690
Using appropriate policies favoring e-learning	80.50%	13.80%	2.40 %	2.4%	0.80%	1.23	0.590
Provision of technical support for e-learning	76.40%	17.10%	1.60%	3.3%	1.60%	1.26	0.590
Lowering the price for connectivity	61.00%	26.00%	4.10%	4.9%	4.10%	1.49	0.773
Using appropriate content in appropriate languages	69.90%	20.30%	1.60 %	4.1%	4.10%	1.35	0.646
Improving training for teachers in e-learning in all levels	82.10%	9.80%	1.60 %	3.30%	3.3%	1.22	0.585

#### **4.1.1.6. Challenges for Adopting E-learning**

As table 4.20 shows, the respondents identified major problems and major challenges which hinder the adopting of e-learning. About 62.60 % and 26.00 % of the respondents choose strongly agree and agree, respectively, on the scarcity of ICT resources and infrastructures and 68.30 % and 23.60 % of the respondents choose strongly agree and agree on the problems in Internet connectivity. In relation to, 47.20 % and 39.80 % of the respondents choose strongly agree and agree, respectively, on the lack of systemic approach to ICT implementation and 47.20 % and 35.00 % of the respondents choose strongly agree and agree on the technical challenges. Moreover, 46.30 % and 38.20 % of the respondents choose strongly agree and agree, respectively, on the lack of administrative and technical support and 41.50 % and 34.10 % of the respondents choose strongly agree and agree on the lack of staff development and training. However, 38.20 % and 34.10 % of the respondents choose strongly disagree on culture & poor competencies in English language and unwillingness to change learning environment and about 32.50 % choose strongly disagree on lack of confidence in using computers. In addition, 24.4 % and 20.30 % of the respondents choose strongly disagree on load shedding of electricity and students technical limitation. The deviations values of the responses are less than their mean values which indicate that there is no gap on the respondents' opinion on the challenges.

Table 4. 20: Challenges for Adopting of E-learning

<b>Challenges</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Mean</b>	<b>Std.Dev</b>
Scarcity of ICT resources and infrastructure	62.60%	26.00%	3.00%	4.00%	4.10%	1.46	0.735
Problems in Internet connectivity	68.30%	23.60%	1.60%	2.40%	4.10%	1.38	0.649
Difficulty in engaging learners online	39.00%	35.80%	7.30%	4.90%	13.00%	1.88	0.921
Lack of confidence in using computers	16.30%	34.10%	13.00%	4.10%	32.50%	2.44	0.930
Culture & poor competencies in English language	13.80%	30.10%	13.80%	4.10%	38.20%	2.54	0.912
Lack of awareness	30.10%	43.10%	2.40%	4.90%	19.50%	1.94	0.791
Unwillingness to change learning environment	20.30%	39.00%	4.10%	2.40%	34.10%	2.22	0.825
Load shedding of electricity	22.80%	39.00%	8.90%	4.90%	24.40%	2.21	0.915
Lack of systemic approach to ICT implementation	47.20%	39.80%	1.60%	3.30%	8.10%	1.63	0.711
Lack of attitude & motivation towards ICT & e-learning	38.20%	41.50%	2.40%	5.70%	12.20%	1.78	0.770
Lack of administrative or management & technical support	46.30%	38.20%	1.60%	4.10%	9.80%	1.65	0.732
There is no staff development & lack of training facilities	41.50%	34.10%	5.70%	3.30%	15.40%	1.85	0.899
Lack of ownership	32.50%	33.30%	9.80%	7.30%	17.10%	2.04	0.981
Inadequate funds	43.10%	35.00%	9.80%	4.10%	8.10%	1.84	0.961
Students technical limitation	35.00%	34.10%	5.70%	4.90%	20.30%	1.97	0.909
Problems in curriculum development	37.40%	32.50%	10.60%	5.70%	13.80%	1.97	1.00
Technological challenges	47.20%	35.00%	4.10%	5.70%	8.10%	1.67	0.11

## **4.1.2. Qualitative Study**

### **4.1.2.1. Response Rate**

All members of the e-learning team, some of the key informants and one member of the e-learning project were selected for interview on this research. Almost all were available and interviewed as per a schedule.

Generally, the response rate of the interview was successful. Three of the interviewees were chosen from the e-learning team of the Institute of Technology. From the total interviewees one from College of Health Science and one from computational science and information system were chose as a key informants. One interviewee was chosen from the e-learning project as a very key informant to be interviewed. The last two interviewees were supposed to be interviewed from the ICT center that has detail information about the ICT of the university. From the total interviewees that should be contacted for interview only one was not available. So the interview was 86 % successful.

### **4.1.2.2. Institutional ICT and E-learning Policy**

According to the interviewees, there is no stated ICT policy in use by now in the institution. However, there is a draft policy that was produced about 3 years ago. One of the interviewee said that he has no awareness about the presence of ICT policy in the institution.

When we come to the e-learning policy, the majority of the interviewees said that e-learning policy is not stated in the institution. However, one of the interviewees answered that the institution has had e-learning policy/strategy signed off since Dec 2009. Some other interviewees said that e-learning is mentioned in the draft of the ICT policy of the university.

#### **4.1.2.3. The Extent and Purpose of E-learning Usage**

The responses on the extent and purpose of e-learning usage were almost similar across the interviews. Some of the purpose of e-learning are to make more interactive, enhancing or make easier and improve teaching learning process; access anytime anywhere, to avoid shortage of resources, to decrease face-to-face session, to get enough time to cover all the needed lecture by the instructor and to participate in other tasks like conducting a research to give community services. Some of the other interviewees said e-learning has two main purposes. Firstly, It helps teachers to think carefully about what they are actually teaching and how their courses are delivered to students (interactive content, activities etc), trying to move away from “chalk and talk” lectures. Secondly, it helps students to be more interested in the courses given by having more appealing activities.

When we come to the extent of e-learning, it is being used mainly in Institute of Technology and College of Health Sciences. Regarding the extent of usage of e-learning, around 50 courses are available online from these two colleges and about more than seven hundred students used the system. However, the laboratory and ICT resources of the institution are in low level.

#### **4.1.2.4. Initiatives and Type of E-learning in the Institution**

Some of the interviewees said that there are two main initiatives for implementing of e-learning in the institution. Firstly, the ECBP on.e program is developing the e-learning team within the Institute of Technology. Secondly, the Digital Campus program which were working in both Institute of Technology and College of Health Sciences, providing e-learning training and certification as well as developing technologies for providing cost effective and well maintained computer labs. There is collaboration/cooperation between these two initiatives, to avoid duplication of effort.

The type of e-learning that implemented in the institution was a blended type which is composed of face-to-face and online. The online part covers tasks like quizzes, uploading assignments, materials and results, forum post, message board, events like workshops and

grading system whereas the face-to-face covers introduction and highlight lectures given by teachers.

#### **4.1.2.5. Benefits of E-learning**

There are various benefits of e-learning technology in the institution. E-learning has various benefits in the institution. First, it can reduce the amount of face to face lecture time, thereby producing good researchers and allowing the institute to cope better with the large number of new students each year. Second, it can avoid the shortage of human and material resources. Third, it can minimize lecture time then the teachers get time to participate in different activities like conducting research and providing community services. Fourth, they improve and acquire technological knowledge (developing their technological skill). Fifth, it could give more practical, interactive and collaborative activities to the students than just learning by rote. By creating good quality activities (whether in the classroom or through e-learning), they would hope that students think more critically about their course content and make use of the vast amount of resources available by the teacher and search other materials on the internet. Moreover, the system makes students to have active participation in the teaching-learning process and is used as an initial stage for further technological improvement.

E-learning can bridge theory and practices in some courses by simulation or demonstration using multimedia and video. However, most of the practices cannot be supported by e-learning and it is simply performed in physical practices. Hence, it is better to give e-learning in blended way. There are strengths and weakness when bridging the practice and theory using e-learning. Some of the strengths are: it saves time because of visualize some demonstration or simulation, it initiates the students to make more practices and feel as if they are with their instructor and it reduces shortage of materials (eg. corpus in health science) they can access by visual demonstration using uploading videos and images. Some of the weaknesses are size limitation of the technologies like moodle, difficulty of accessing directly from the platform.

#### **4.1.2.6. Awareness and Motivation**

The awareness and motivation of the academic staffs and students are weak. Some of the interviewees said that most of the teachers and students in Institute of Technology and College of Health Science seem to be aware of the e-learning program. For those who do and participate in putting their course online, attended the training on e-learning their students are aware about the e-learning. The majority of the interviewees answered that out of the total academic staff of the Institute of Technology and College of Health Science almost only half of them aware about the e-learning. Some of the academic staffs do not prepare their courses in softcopies; even hide the materials, by freighting about the ownership of their materials. Thus, shortage of awareness on the academic staff creates big problems on the students' awareness. Some of the staffs need incentives because of lack of awareness.

There are differences on the motivations among the staff members. Those who attended the training have a motivation to know the technologies. On the other hand, those who have not taken the training have no motivation. Moreover, because of the negligence of the technology by the academic staff, the students spend their time on social networks like face book and twitter.

#### **4.1.2.7. Challenges in Adopting E-learning**

There are many challenges that were provided by the interviewees of the survey. The majority of the respondents said that the main challenges in adoption of e-learning are lack of awareness and motivation, infrastructure problem, shortage of ICT resources and lack of ICT skill. Besides, the e-learning can be accessed only locally, there is technical problems on the system; it is not user friendly the user can not accessing external devices like flash, CD-ROM and resistance of the individuals on the e-learning are provide as a challenges.

#### **4.1.2.8. Future Plan on the Adoption of E-learning**

The major tasks that should be done towards the adoption of e-learning at the HEIs of Ethiopia are enormous. As the interviewees claimed, some of the future plan on the adoption of e-learning are networking the e-learning labs (for extending lab), preparing workshops for creating awareness, discussion on how to create motivation in the staff and preparing continuous training to run their courses.

### **4.2. Discussion of Findings**

#### **4.2.1. Current Status**

As the study shows, the majority of current status of e-learning activities in the institute are planned to implement or perform in the future. Some of the activities that are currently performed in the Institute of Technology and College of Health Science are staff training in the departments and uploading of some courses. Concerning the extent of usage of e-learning, around 50 courses are now online or uploaded from these colleges and about more than seven hundred students used the system. However, the laboratory and ICT resources of the institute and the college were not that much enough. Generally, the current status of the e-learning is at its infant stage.

In addition, the e-learning status that currently exists is dependant of external supporting. If these support stopped in the university as a whole, then e-learning would also stop. The only exception is the Institute of Technology in which dedicated e-learning team is set. Only outsider projects could support the system if there isn't the dedication and motivation from local staff and management present in the institution.

#### **4.2.2. Awareness and Attitude**

The main means used to find out the attitude and awareness of e-learning in the institutions was to assess their explicit policy considerations towards e-learning. The findings of this study indicates that even though there is no specific institutional ICT policy at work, there is a draft policy on its way to be ratified. These draft policies have considered e-learning according to the highest ICT officials of these institution. This is one of the findings of this research.

As the findings point out that there is a big variation or gap in the awareness of the community of the institute and the colleges. The majority of the academic staffs have no awareness, but a few members have basic awareness about the technology. More than 50 % of them don't have awareness on the presence of ICT policy and about 62 % of them don't have awareness about the inclusion of e-learning in the ICT policy. On the other hand, there is an extensive attitude (level of understanding) on defining e-learning in most of the respondents. In addition to this, the majority of the academic staffs, which is more than 70 %, have high attitude on identifying which activities can be supported by using e-learning are high.

The motivation of the academic staff on e-learning is another indicator of the level of awareness. As the finding of this research indicates, there are big differences on the motivations among the staff members. Those who attended the training have a motivation to know the technologies. On the other hand, those who did not attend the training have no motivation. In general, the awareness and motivation among the academic staffs towards e-learning were not that much appreciable, however their attitudes were better.

#### **4.2.3. Main factors for making E-learning More Effective**

The results identified several factors that could make e-learning implementation more effective in the institution. These include availability of hardware, faster Internet connectivity, improved software, creating awareness about the benefits of e-learning, availability of reliable electricity, using open source software, using appropriate policies favoring e-learning, provision of technical support for e-learning, using appropriate content in appropriate languages and improving training for teachers on e-learning in all levels.

#### **4.2.4. Main Challenges for Adopting E-learning**

The results of this study indicated that the major challenges for adopting e-learning in the institution were mainly six namely the infrastructure problem, lack of awareness and motivation, lack of ICT skill, lack of training facilities, lack of administrative management and technical support and resistance of individuals to change.

The infrastructure problems were one of the main challenges in adoption of e-learning in the Institute of Technology and College of Health Science. The problem of infrastructure can be described in different ways. Firstly, the infrastructure problem was faced in the location of the e-learning labs and servers. The e-learning labs are a few far from the server so they are not directly connected with server. Instead, there is another building with a switch that is positioned between the lab and the server which is used as a connector. This creates delay on accessing materials from the server. The other is the scarcity of the ICT resources like computers and labs. As a result, the e-learning lab cannot handle a large number of students at the same time and place. Thirdly, the thin clients that found in the e-learning labs cannot handle removable devices like flash, CD-ROM, external hard disk.

The second main challenges in adopting e-learning were lack of awareness and motivation. From the total academic staffs of the Institute of Technology and College of Health Science almost only half of them were aware about e-learning. According to the results of the survey, from those who have the awareness, most of them attended training that was given in both Institute of Technology and College of Health Science. Those who have awareness on e-learning also have motivation. As a result of the lack of the awareness of the academic staff, students spent their time on accessing social networks like face book and twitter. Due to the lack of awareness most of the staffs only want to use what they were familiar with before.

Lack of ICT skill was the third challenge in adoption of e-learning. There is a high variation in the ICT skill like uploading of the materials and other related tasks. This limitation create work load to the e-learning team that operates the technology in the institute.

The fourth challenge was the lack of training facility. One of the shortages of facility which existed in the institution was the laboratory with enough computers and good trainee. As described before, training was one way of creating awareness, if there is no training, there is no awareness. The training which was given in creating awareness and

adopting the technology was not continuous. As of the survey conducted, most of the staff needs continuous follow-ups.

The fifth challenge was the lack of administrative management and technical support. This includes lack of management or negligence on controlling the progress on the usage of e-learning and there were inadequate funds on technical supports like fulfilling the labs with enough computers and preparing maintenance. Those conditions creates problem on the staffs like negligence of the e-learning.

The final challenge and most probably the direct result of the above five challenges was the resistance of individuals to change. Users are not usually willing to change the existing status.

# Chapter Five

## 5. Conclusion and Recommendation

This chapter deals about the conclusion and recommendation part of the study according the conducted survey.

### 5.1. Conclusion

- There is an e-learning practice in one or more sub-section of the institution in teaching learning process. Most of the academic staffs don't use online mode in their teaching-learning process. However, few of them are using online mode in composing with face-to-face delivery. Generally, the current status of e-learning is at its infant stage. As the study shows, the major activities of e-learning in the institute were planned to implement or perform in the future. Some of the activities that are being currently performed in the institute are staff training and uploading of some course materials.
- There is a gap in computer skills among the academic staffs except in basic applications of Microsoft Word, Using E-mail, and using Searching engines.
- As the finding of this research indicated, almost 50 % of the academic staffs have awareness about the e-learning. More than 50 % of the academic staffs don't have awareness about the presence of ICT policy and about 62 % of them don't have awareness about the inclusion of e-learning in the ICT policy. On the other hand, the majority of the academic staffs have a positive attitude and understanding in defining e-learning and in identifying which activities can be supported by e-learning.
- The result of this study shows that there are big differences on motivations of using e-learning among the staff members. Those who have attended the training of e-learning usage have a motivation to know the technology. On the other hand, those who have not attended the training have no motivation. In general, awareness and motivations among the academic staffs towards e-learning are not those much satisfactory.

- Some of the future plan regarding e-learning are networking the e-learning labs (for extending of the lab), preparing workshops for creating awareness, preparing discussion on how to create motivation in the staff and preparing continuous training to run their courses.
- Availability of hardware, faster Internet connectivity, improved software, by raising awareness on the value of e-learning, availability of reliable electricity, using open source software like moodle, using appropriate policies favoring e-learning, by provision of technical support for e-learning, using appropriate content in appropriate languages and improving training for teachers in e-learning in all levels in the long run are supposed to make e-learning more effective in the institution.
- The results of this study indicated that the major challenges for adopting e-learning in the institution are the infrastructure problem, lack of awareness and motivation, lack of ICT skill, lack of training facilities, inefficient administrative management and technical support and resistance of individuals to technological change.

## 5.2. Recommendation

Based on the findings of this research, the researcher strongly agrees on the need of the following measures in order to improve the current Ethiopian higher education e-learning system and alleviate the problems they are facing right now.

- The majority of the academic staffs are young who are eager to know a technology. Thus, in order to bring the desired success, mass training on e-learning needs to be delivered for all academic staffs.
- To achieve the intended benefits there must be proper e-learning with enough resource accessibility and availability, continuous follow up and management support.
- In order to narrow the gap between what is intended and what is achieved through e-learning the responsible body had better allocate ICT resources adequately.
- The devotion of the higher management and assigning responsible body for the overall activities including training and staff development are supposed to enhance e-learning implementation at the institution.
- E-learning shouldn't be a second choice, it should be mandatory for all high level universities. The number of students increases every year, hence to provide students with enough materials and quality assured education, e-learning plays a great role. Therefore, it should be taken as a primary task in every higher level educational institution.
- The management of the university (college deans, and department heads) should begin to practice e-learning, making this part of lecturers' normal job requirements. The university needs to decide how it should encourage/enforce this and to take responsibility for e-learning implementation.
- The responsible body needs to work in the way of delivering computer access for all of their students. The current ICT infrastructure cannot cope with a number of students, labs are very poorly maintained and many are almost permanently closed. The university needs to invest in well supported and maintained computer labs which are open 24 hours a day and seven days in a week, not just for e-

learning, but also to ensure effectiveness and productive of students in their chosen careers.

- There should be a strong dedication and motivation among local academic staff and the management of the institution.
- E-learning service could be more effective if the following preconditions are fulfilled such as policy consideration that favors e-learning, creation of awareness and motivation among the university community, using open source software, skills development and trainings, management support and resource accessibility and availability.
- Finally, the researcher recommends that further research can be held to extend and enhance this research especially in terms of scope for better generalization. This research has discovered the current status of e-learning adoption in Mekelle University, the factors that make e-learning more effective and the barriers that hinder its adoption. The same research topic with the same methodology can also be repeated to assess the situation in several HEIs of Ethiopia.

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## **Appendices**

### **Appendix A: Research Questionnaires**

**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**  
**SCHOOL OF INFORMATION SCIENCE**

Dear respondents:

My name is Hirut Berhe, a post-graduate student at the school of Information Science at Addis Ababa University. Currently I am doing a Masters thesis entitled as “The Challenges and Current Status of E-learning in Ethiopian Higher Education Institutions: Case of Mekelle University”.

The objective of this self administered questionnaire is to collect data from teachers and administrative officers and key informants in order to investigate the challenges and current status of e-learning in Mekelle University, suggest possible recommendation to enhance the usage of e-learning in the university in particular and Ethiopian HEI in general. Finally, come up with an appropriate recommendation for effective implementation of e-learning.

Therefore, the researcher kindly requests you to fill this questionnaire carefully. All the information you will provide will be kept strictly confidential. Moreover, the information that you will provide is quite useful to achieve the objective of the study.

The researcher would like to thank you in advance for spending some time in answering the questions related to the issues.

## **PART I: Personal information**

1) Specify your gender

Male  Female

2) Your age

22-28  29-35  36-42  43 and above

3) What is the name of your college? \_\_\_\_\_

4) What is the name of your department? \_\_\_\_\_

5) What is your educational qualification?

A. Bachelors Degree B. Masters Degree C. PHD (Doctorate Degree)

6) What year are you currently teaching?

A. 1<sup>st</sup> year B. 2<sup>nd</sup> year C. 3<sup>rd</sup> year D. 4<sup>th</sup> year and above

7) How long is your working experience?

A. 1-3 years B. 4-6 years C. 7 years and above

8) What is your computer-related qualification?

A. Certificate B. Diploma C. Degree D. Others

## **PART II: Computer related skills and policy (please choose by putting ✓ mark)**

1) Does your institution have an ICT policy?

Yes  No  I don't know

2) If your answer for Q1 is yes, does this policy or any other policy at your institution specify anything regarding e-learning?

Yes  No  I don't know

3) If your answer for Q2 is yes, how e-learning mentioned in the policy?

E-learning is considering in the university as very essential

E-learning is the preferred option

I don't know

4) What is your computer related skills (please choose by putting ✓ mark)?

**Description:**

1=High, I have good experience on it.

2= Medium, I have some experience on it.

3=Low, I have seen how people use it.

4=None, I have no experience on it or I don't know the item

	1	2	3	4
1. Using word-processing applications like Microsoft Word				
2. Using spreadsheet applications like Microsoft Excel				
3. Using databases systems like Microsoft Access				
4. Using email				
5. Using search engine (like Google, yahoo)				
6. Using online learning materials				
7. Uploading different materials				
7. Using educational CD-ROMs like Encarta encyclopedia				
8. Using Learning Management Systems like Moodle				
9. Web page development				
10. Publishing a web page				

**PART III: the current status, awareness and attitude consideration of the institute regarding e-learning. (Please choose by putting ✓ mark)**

5) To what extent do you agree with this statement; my institution encourages instructors to incorporate technology into instruction?

- Strongly agree
- Somewhat agree
- Neither agrees nor disagrees
- Somewhat disagree
- Strongly disagree

- 6) What best describes the awareness of e-learning by staff of your institution?
- There are no staffs of the institution with any awareness of e-learning
  - A few staffs have basic awareness and the majorities have no awareness about e-learning
  - All staffs have basic awareness
  - A few staffs have extensive awareness and the majorities have basic or no awareness
  - All staffs have extensive e-learning awareness

If none please explain

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- 7) Please indicate the status of e-learning activities at your institute. (**Please choose by putting ✓ mark**)

Description: 1= Already in place 2= Planned, 3= Not envisaged 4= I don't know	1	2	3	4
1. E-learning already plays a major role at my institution				
2. There is delivery of online courses				
3. There is development of a curriculum for online course				
4. There is development of e-learning content				
5. E-learning at its infant stage at my institution				
6. There is development of blended learning courses (association of face to face courses and online courses) in some departments				
7. There is development of open educational resources (OER)				
8. There is staff training in some departments				

8) What do you think about e-learning?

- E-learning is all process, activities and technologies that support learning through the information and communication technology (ICT)
- E-learning refers to a means of education that integrates self-motivation, communication, efficiency and technology
- E-learning concerned with providing easy access to learning resources, anytime and anywhere
- E-learning is an electronic learning, digital learning and others
- All of those can define e-learning
- I don't know

9) Do you think that e-learning can support capacity development activities at your institution in the following ways?

<b>Description:</b> 1= Strongly Agree 2=Agree to some extent 3=Strongly Disagree 4= Undecided	1	2	3	4
1. Sharing policies and standards within different Training Programs and Institution				
2. Providing internal capacity building				
3. Improved flexibility of delivery of training courses				
4. Quality enhancement of teaching and learning				
5. Giving opportunities to design joint degrees or programs with other institutions and universities				
5. Widening access to training materials and capacity development to a larger audience				

**PART IV: Level of adoption of e-learning and factors that make e-learning more effective at the institute. (Please choose by putting ✓ mark)**

10) What is the coverage of e-learning activities/teaching and learning processes staff expertise for development of e-learning courses?

- In place institution-wide
- In place in one or more sub-section of the institution
- To be implemented institution-wide in the next 12 months

- To be implemented institution-wide in the next 1-2 years
- To be implemented institution-wide for the future
- Currently not available

11) Does your institution use a Learning Management System (i.e a software for delivering and managing teaching or training) for delivery online course:

- Yes
- No

12) If your answer for question number 14 is yes, what kind of learning management system use?

- Moodle
- Blackboard
- Currently not available
- I don't know

13) According to your best estimate, how often do current programs/courses offered by your institution have the following online modes?

<b>Description:</b> 1 = Very often, 2= Often, 3= Occasionally, 4= Never	1	2	3	4
1. Face to Face with modest online presence(e.g. simple online courses with documents to download, lecture notes, links to external				
2. Significant online presence (e.g. the online course integrates interactive components, such as online discussions, assessment tools)				
3. Web dependent(e.g. key interactive elements of the program are online, such as online discussions, assessment tools and collaborative)				
4. Wholly or very largely conducted online				
5. None or trivial online presence				

14) How to make e-learning more effective in your institution?

<b>Description:</b> 1= Strongly Agree 2=Agree to some extent 3=Strongly Disagree 4= Undecided	1	2	3	4
1. Availability of hardware (particularly computers)				
2. Faster Internet connectivity or improved bandwidth				
3. Improved software				
4. Use open source software				
5. Appropriate policies favoring e-learning (e-learning policy and guidelines)				
6. Provision of technical support for e-learning at a range of scales				
7. Lower prices for connectivity				
8. Availability of reliable electricity				
9. Appropriate content in appropriate languages				
10. Awareness raising about the value of e-learning				
11. Improved training for teachers in e-learning at all levels				

**PART V: The challenges of the e-learning adoption in the institute and respondents comment or suggestions (choose by putting ✓ mark)**

15) What are the Challenges for implementing e-learning in your institution?

Description: 1= Strongly Agree 2=Agree to some extent 3=Strongly Disagree 4= Undecided	1	2	3	4
1. Scarcity of ICT resources and infrastructure				
2. Problems in internet connectivity and bandwidth issue				
3. Difficulty in engaging learners online				
4. Lack of confidence in using computers				
5. Culture and Poor competencies in English language				
6. Lack of awareness				
7. Unwillingness to change learning environment				
8. Load shedding of electricity				
9. Lack of systemic approach to ICT				

implementation				
10. Attitude and Motivation towards ICTs and e-learning				
11. Lack of Administrative or Management support and Technical support				
12. There is no staff development and Lack of training facilities				
13. Lack of ownership				
14. Inadequate funds				
15. Student's technical limitations				
16. Problem in curriculum development				
17. Technological Challenges				

16) Please feel free to give any other comments and suggestions

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**Note:** The questions of the questionnaires are adopted from Ghosh et al. (2002), Seyoum (2009) and UNITED NATIONS UNIVERSITY (2008).

## **Appendix B: Research Interview Questions**

### **Interview Questions:**

- 1) Is there a stated ICT policy in your institution?
- 2) Does this policy or your draft policy specify anything regarding e-learning?
- 3) To what extent and for what purpose is e-learning being used in your institution?
- 4) What e-learning initiatives are there in your institution?
- 5) In what way you are implementing the e-learning in the teaching learning process?
- 6) What are the benefits of e-learning in this college/institution?
- 7) How does e-learning help to bridge theory and practice in your college/institution? What are the strengths, weakness observed?
- 8) How is the awareness and motivations of the teachers and students in the college/institution?
- 9) What are the challenges are there in adopting e-learning?
- 10) What the plan for the future regarding e-learning?
- 11) Any comments and suggestions?

## **Appendix C: Declaration**

I declare that the thesis is my original work and has not been presented for a degree in any other before.

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Date

The thesis has been submitted for examination with my approval as university advisor:

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Advisor