

**E-LEARNING PRACTICES IN TEACHING, LEARNING
AND RESEARCH AT MAKERERE UNIVERSITY,
UNIVERSITY OF DAR ES SALAAM, AND
UNIVERSITY OF NAIROBI**

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DECLARATION

I, Walimbwa Michael hereby declare that the work contained in this dissertation is my original work. Compliments were made to people whose work I have consulted. I have not submitted this same work in its entirety or in part at any other university for a degree award.

Signature_____

Date: August 2007.

APPROVAL

This is to certify that this work entitled “*E-learning practices in teaching, Learning and Research in the University of Dar es Salaam, Makerere University and the University of Nairobi*” was done under our supervision:

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DEDICATION

This book is dedicated to my parents, brothers, sisters, friends and relatives, who supported, encouraged, tolerated, and gave me a chance to make my dream come true. To those who were always by my side during the odd and rough times, I dedicate this piece of work to them.

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TABLE OF CONTENTS

Declaration	i
Approval	ii
Dedication	iii
Acknowledgement	iv
Table of contents	v
List of tables	x
List of illustrations	xi
Abstract	xiii
CHAPTER ONE: INTRODUCTION	1
1.1.0 Introduction	1
1.2.0 Background	1
1.2.1 Historical perspective: Evolution of the e-learning concept.....	2
1.2.2 Theoretical perspective	5
1.2.3 Conceptual Perspective: ICT in learning.....	7
1.2.4 Contextual perspective	10
1.3.0 Statement of the problem	14
1.4.0 Purpose.....	15
1.5.0 Objectives	15
1.6.0 Research questions	15
1.7.0 Scope	16
1.8.0 Significance.....	16

CHAPTER TWO: LITERATURE REVIEW	17
2.1.0 Introduction.....	17
2.2.0 Theoretical framework.....	17
2.2.1 Constructivist theory	17
2.3.0 Conceptual framework	20
2.4.0 Review of related literature	24
2.4.1 Components of an e-learning environment in a university	24
2.4.2 Multimedia in e-learning.....	25
2.4.3 Hypertext in e-learning	27
2.4.4 Hypermedia in e-learning.....	30
2.5.0 Utilization of the components of e-learning in Universities.....	31
2.5.1 Intranets, e-mails and communication in e-learning.....	38
2.5.2 Internet in e-learning	42
2.5.3 Getting started in the use of e-learning	47
2.6.0 Attitudes towards the use of e-learning in teaching and learning	48
2.6.1 Technology and the transformation of learning situations	49
2.6.2 New role of lecturers: instructors	51
2.6.3 An aspect in the management of e-learning.....	53
CHAPTER THREE: METHODOLOGY	56
3.1.0 Introduction.....	56
3.1.2 Research design	56
3.1.3 Population.....	56
3.1.4 Sampling strategy	57

3.1.5 Research instruments	58
3.1.6 Data collection techniques.....	58
3.1.7 Reliability of research instruments	59
3.1.8 Validity of the research instruments.....	59
3.1.9 Research procedure.....	60
3.1.10 Data analysis techniques.....	60

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS & INTERPRETATION ..62

4.1.0 Introduction.....	62
4.2.0 Research Question 1: What are the components of e-learning environment in Makerere, Nairobi and Dar es salaam universities?	63
4.2.1 Computers and computer history of students and lecturers.....	63
4.2.2 Use of computer as multimedia tool applications in e-learning.....	66
4.2.3 Learning to participate in e-learning and policies.....	68
4.2.4 E-learning and online platforms and the learning management system ..	72
4.2.5 Internet and Intranet in e learning	73
4.3.0 Research Question 2: How are the components of e-learning utilized in instruction and learning in Dar es salaam, Makerere and Nairobi universities? 75	
4.3.1 Design of e-content modules in e-learning	75
4.3.2 E-content in e-learning and interactive content	79
4.3.3 Multimedia design in e-learning	80
4.3.4 Support and administration in e-learning.....	81
4.3.5 Communication in e-learning	84

4.4.0 Research Question 3: What is the attitude towards e-learning as a teaching and learning resource in Nairobi, Dar es salaam and Makerere universities?	88
4.4.1 Attitude towards general use of e-learning	88
4.4.2 Motivational factors in the use of e-learning	91
4.4.3 Benefits and advantages of the use of e-learning	93
4.4.4 The challenge of participation in e-learning	94
4.5.0 General comments about the practice of e-learning by respondents	97
CHAPTER FIVE: DISCUSSION, CONCLUSION & RECOMMENDATIONS.....	99
5.1.0 Introduction.....	99
5.1.2 Use of computer multimedia applications in e-learning.....	101
5.1.3 Learning to participate in e-learning and policies.....	103
5.2.0 Learning management system, internet and intranets in e-learning.....	105
5.2.1 Patterns of e-learning usage in Makerere, Nairobi and Dar es Salaam universities	107
5.2.2 Content availability in e-learning environments	108
5.2.3 Design and development of interactive e-content	109
5.3.0 Communication level in e-learning	110
5.3.1 Role of an instructor in an e-learning environment	110
5.3.2 Administration and management of e-learning environment	111
5.4.0 Attitude towards the use of e-learning in instruction and research	112
5.5.0 Summary and Conclusions	113
5.6.0 Recommendations	115

5.7.0 Further research	116
REFERENCES.....	117
APPENDICES	125
APPENDIX A: CHECK LIST.....	125
APPENDIX B: STRUCTURED INTREVIEW GUIDE- INSTRUCTORS	126
APPENDIX C: STRUCTURED DISCUSSION GUIDE-STUDENTS.....	131
APPENDIX D: LETTER FROM UDSM.....	135
APPENDIX E: LETTER FROM UONBI	136
APPENDIX F: LETTER FROM DICTS	137
APPENDIX G: LETTER FROM THE DEAN	138
APPENDIX H: LETTER FROM HOD	139
SOME PHOTOS DURING THE RESEARCH PROCESS.....	140

LIST OF TABLES

Table 1: Conditions for successful initiating e-learning.....	11
Table 2: Computer application in various educational fields	37
Table 3: E-learning tools	53
Table 4: Showing the selected sample.....	57
Table 5: How instructors and students rated computer literacy	65
Table 6: Numbers of courses found on university e-learning platforms	79
Table 7: Reaction to potential to include multimedia content	90
Table 8: Motivational factors in the use of e-learning by instructors	92
Table 9: Advantages of e-learning as rated by instructors	93

LIST OF ILLUSTRATIONS

Figure 1: Constructivist requirements of learning situations.....	7
Figure 2: E-learning environment illustrated	9
Figure 3: Conceptual framework for an e-learning environment.....	21
Figure 4: An illustration of a multimedia computer system.....	26
Figure 5: Normal text versus hypertext structure.....	28
Figure 6: University of Dar es Salaam intranet graphical user interface	39
Figure 7: Main internet services used in learning	42
Figure 8: Makerere university network plan.....	52
Figure 9: Computer literacy ratings by instructors and students	63
Figure 10: What users commonly use if they have access to computers	66
Figure 11: Frequency of use of specified computer applications	68
Figure 12: Rating how the users learnt how to participate in e-learning.....	69
Figure 13: Places of accessibility to computers rated	71
Figure 14: Various Learning platforms in East African Universities.....	72
Figure 15: Internet connection in the selected Universities	74
Figure 16: Number of courses students had on learning platforms	76
Figure 17: Instructors' reaction to their ability to design e-content	77
Figure 18: A patent header for a University of Nairobi e-learning module.....	78
Figure 19: Quality of e-content rated in e-learning.....	80
Figure 20: Ability to include multimedia in e-content	81
Figure 21: Reaction to preferred support in e-learning by students.....	83
Figure 22: Frequency of communication by instructors in e-learning.....	84
Figure 23: Understanding e-learning by students	86
Figure 24: Rating the challenges of e-learning by students	95

LIST OF ACRONYMS

BB	Blackboard
CD- ROM	Compact Disk Read Only Memory
DICTS	Directorate for Information and Communication Technology Support
DLE	Digital Learning Environment
E-CONTENT	Electronic Content
E-LEARNING	Electronic Learning
E-MAIL	Electronic Mail
GUI	Graphical User Interface
HTML	Hyper Text Mark up Language
ICT	Information and Communication Technology
ISP	Internet Service Provider
KEWL	Knowledge Environment for Web Based Learning
LAN	Local Area Network
LMS	Learning Management Systems
MM	Multimedia
MAK	Makerere University
PhD	Philosophy Degree
RAM	Random Access Memory
SPSS	Statistical Package for Social Sciences
UDSM	University of Dar es Salaam
UONBI	University of Nairobi
WAN	Wide Area Network
WWW	World Wide Web

ABSTRACT

The practice of e-learning in universities is here to stay. This study is a structured description of e-learning practices in Makerere University, the University of Nairobi and the University of Dar es Salaam. The practice of e-learning is taking root in these universities however, the practical indicators and utilization of the same e-learning is anecdotal. Even more, the attitude towards the use of e-learning has not enhanced its full utilization in instruction, learning and research.

The study takes a qualitative design with an exploratory and descriptive focus in which instructors and students participating in e-learning in the three universities are targeted and sampled. Interviews guides, checklists, observations schedules and focus discussion group guides were designed to reach out and collect views from instructors and students concerning e-learning practice with the objective of identifying the indicators and practice of e-learning, the utilization and attitudes towards the practice of e-learning in the three universities. There is a trace of the origin of e-learning in these universities.

The research discovered that the selected universities have e-learning infrastructure with instructors and students having various perceptions about e-learning. There was a basic procedure of participation in e-learning. The aim of e-learning in these universities was discovered to have a basis on improving teaching and learning. The practice of e-learning is apparent, though scanty. In addition, the attitude towards e-learning is mixed because the general context in

which e-learning is practiced is largely based on narrow perceptions. This has led to the under-utilization of the potential of e-learning in instruction and research.

For enhanced use of e-learning in instruction and research, the indicators and practices of e-learning must be clear to all the participants. To be clearly defined is participation through harmonization of policies, which will eventually change attitude towards the practice. Enhanced practice of e-learning has a basis in teamwork by all the stakeholders. It takes patience and resilience to attain full realization of the benefit of e-learning that should be a guiding principle for the practice. Generally, more studies in e-learning are vital and will go a long way in enhancing the implementation of the e-learning projects in universities.

CHAPTER ONE

INTRODUCTION

1.1.0 Introduction

This chapter gives the background to the study, with four perspectives: historical, theoretical, conceptual and contextual. In addition, the chapter presents a statement of the problem, the purpose and objectives, research questions, significance and scope of this study.

1.2.0 Background

There are enormous and varied challenges in higher education in Africa today. Universities are investing in the integration of Information and Communication Technology (ICT) into teaching, learning and research (e-learning) to offset some of the challenges. The digital revolution is helping the educational environment specifically teaching, learning and research to change (Eisendrath, 2006). Faculties are exploiting the investment by adopting e-learning. Resnick (2002) asserts that new digital technology can make possible a “*learning revolution*” in education. This is an ambitious claim to make and tempts one to find answers as to how the revolution will take place and what the impact will be.

The basic question in this study is how faculties can basically understand the practice and components, technological operation and change attitude towards e-learning in instruction and learning, making participation in e-learning an exciting and beneficial experience. This study is not about the comparative

advantage of e-learning or the cost of technology over classroom learning; it is about how e-learning is used in instruction to enhance and promote exciting teaching and learning experience and improve research.

1.2.1 Historical perspective: Evolution of the e-learning concept

Information and Communication Technology has come to solve some of the problems of accessibility in higher education in Africa. The World Bank (2000) holds that in many nations, higher educational institutions initiate sweeping transformations to align themselves with current educational demand and competitiveness. The Report adds that the transformations are all encompassing: touching on programs offered academic structure organization, pedagogical process and modes of delivery. These changes are ushered in by application of new technologies: Information and Communication Technology (ICT). Yates (2001) recommends media literacy programs by the participants in cases where institutions are adopting new technologies like e-learning. In the application of new technologies however, media literacy is low or non-existent, thus a gap in the capacity of the users to proficiently understand and exploit the potential of the technology.

The history of e-learning starts with the use of radios and television sets in the earlier days of educational technology (a one-way communication system). Then followed the instructor led system where radio cassettes and television sets were still used but this time for distance education. Here there was reliance on printed text, where one could be able to access printed text of the content. Cassettes are audio equipment, which again offered no interactivity in

communication. In the 1980s, there was the multimedia era where the available mainframe computers and CD-ROMS were used in teaching and learning. The 1990s saw the emergence of the World Wide Web (www) where electronic mail came into. E-mails offered a *modus operendi*, which was educationally interactive, thus an effective delivery mode. The year 2000 saw the new generation with universities using computers in teaching, learning and research, (Omwenga, 2003) using networked computers.

The use of computers in instruction and training has been done for some time elsewhere (Charp, 1997). Historically, in East African universities, e-learning is a recent technological initiative, which has origins in the 1980's with few computers and basic networks. Makerere University, University of Nairobi and the University of Dar es Salaam, connected to an internet service provider (ISP) that could periodically download e-mails. These Universities, with little knowledge of the potential of e-mail in instruction and limited networks left internet service to the wits of a few individuals, who later abandoned it (Tusubira, 2002).

Over the recent years, computers have evolved from machines that depended on typing and text printouts and were difficult to program, to machines that allow interaction via text, graphics, voice and pointing (Alessi and Trollip, 2001). Interaction with computers, done through a Graphical User Interface (GUI) is an aspect that accords computers a vital role in e-learning, besides advancement in visual and audio attributes of computer technology.

Interaction brought about the increase in use of computers in instruction. Subramanian (1986) as cited in Kothari (2004) holds that in the recent world, computers are used by just about anyone, professional or not and most recently housewives! Computers are not only about numeric applications but have many other applications, learning being one of those applications thus the emergence of e-learning.

Jonassen (2001), in agreement with Resnick's (2000) predicted learning revolution says that, required in education at all levels is a revolution, not just a change in methodology but also a fundamental revolution in spirit. In calling for this revolution, Jonassen is calling for an overhaul that paves way for e-learning, which promises a fertile environment for pedagogic reforms. The e-learning *revolution* promises to bring about learners energized by personal growth that comes from learning new things, rather than being taught something new. Though computers are not the cause of this revolution, they provide the tools for this reform.

More coordinated efforts to implement e-learning in Makerere University, the University of Nairobi and the University of Dar es Salaam were in the year 2000. There was establishment and expansion of networks, with universities taking on e-learning as a pedagogic strategy to address over-crowding and increase access to information (Makerere University, 2005). Makerere University, which had less than 5,000 students in 1990, had increased her enrolment to 32,000 students in 2005. There were equivalent increments in

student enrolment at universities of Nairobi going up to approximately 20,000 and Dar es Salaam 16,000 students respectively. The increase in enrolment brought in many challenges in service provision, negatively affecting instruction and learning, assessment and research services. The beginning years of e-learning in universities were about awareness and workshops in information systems and changes in education strategies for staff and students as major participants in e-learning.

1.2.2 Theoretical perspective

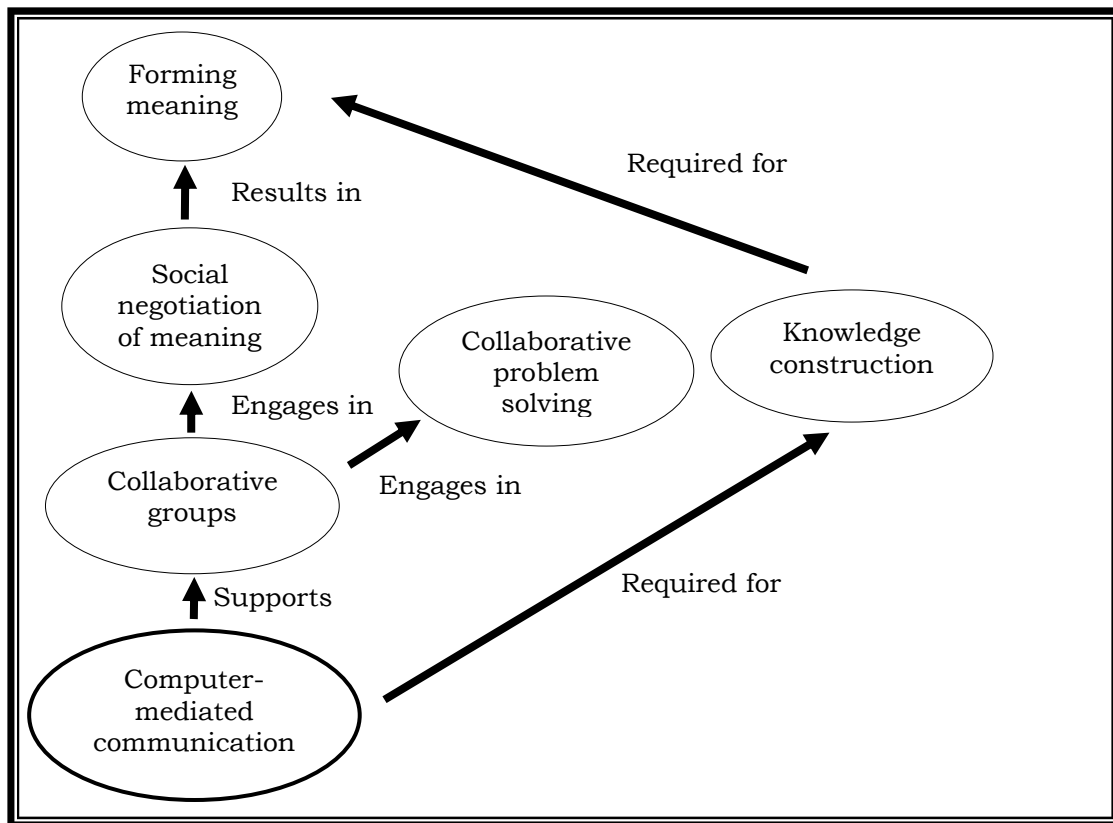
Coupled with the increasing enrolment, educational theory has changed over the past decades from the dominion by behaviorism to constructivism (Alessi and Trollip, 2001). The entrant to universities change in terms of learning needs and behavior. The instuctivist teaching and learning systems become outmoded. People have to learn, what they want as opposed to being taught what is on the syllabus (Omwenga, 2005). With constructivism, comes increased emphasis on collaborative learning situations, instruction anchored in realistic contexts, communication theory applied to e-learning situations, multimedia, hypermedia and open-ended learning environments. Computers and networks have brought about the ability to engage in instruction and learning at any time. Changes like the availability of learning content twenty four hours and seven days a week, availability of courses across geographical boundaries, access to lifelong education and education across age, are just but some of the advantages of e-learning ushered in through constructivism.

The move to e-learning is not to replace the traditional face-to-face teaching and learning systems, but to align learning situations, regarded as appropriate to needs of present learners, to constructivist principles. Unfortunately, those involved in e-learning are not up to date with constructivism. Therefore, there is lack of understanding of the practice of e-learning and wrong perceptions about operating in a constructivist environment. Howard (2003), upon this background, infers that as students and faculties move from traditional on-site e-learning and teaching to e-learning, there is need to make the necessary adjustments to understand e-learning.

Computers, multimedia (MM), interactive databanks and communication platforms in e-learning stirs expectation of the potential of ICT in education. Institutions of learning embarked on connection to the internet, formulation of ICT policy master plans and acquisition of Learning Management Systems (LMS) sometimes called learning platforms. Meanwhile, there was demarcation of e-learning centers and intensive set up of other appropriate facilities for e-learning. It is felt that ICT in education has the potential to increase not only the effectiveness of the educational process but also its overall efficiency whether in terms of classroom activities or administration (Omwenga, 2003).

To make meaningful adjustments and align themselves to the modes of using ICT in learning, faculties need to understand operational requirements of constructivist learning situation (Chien, 1999) in Figure 1.

Figure 1: Constructivist requirements of learning situations



Source: Jonassen (1996:148) cited in Chien (1999) Educational Technology and Society, Palmerton North: International Forum of Educational Technology and Society, p. 139.

1.2.3 Conceptual Perspective: ICT in learning

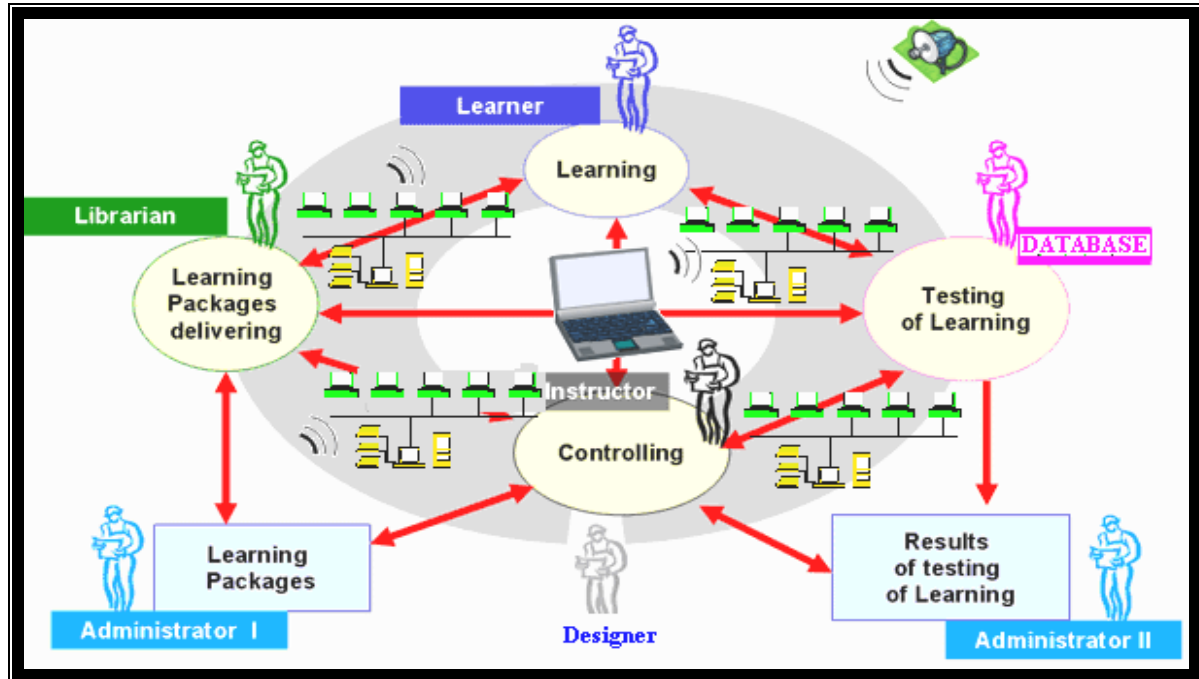
E-learning is the use of Information and Communication Technology (ICT) for teaching and learning. Mutula (2002) defines e-learning as an interaction in teaching and learning towards student oriented, active, open and lifelong learning. E-learning is a technologically enhanced learning environment, system of managing and accessing information and knowledge (University of Dar es Salaam, 2005). Makerere University (2006) defines e-learning as the delivery of a learning, training or education program by electronic means. E-learning involves the use of computers and other electronic devices to

provide training, educational or learning material. Given the progression of definitions, e-learning, computer-based learning, online e-learning and web based learning all speak of each other, (Plaisent, Maguiraga, Prosper, and Larhrib, 2004). This project adopts the definition of e-learning as a digital learning environment (DLE), or computer assisted education in which there is instruction, learning and research through electronic sources via the internet, intranet, and computer based learning including other electronic devices.

E-learning is “*electronic learning*” which started taking shape in the 1990s as institutions struggled to make money by adding an “e” on their businesses. In some institutions, the addition of “e” was irrespective of the quality of educational teaching and learning activities (Van Der Merwe, 2004).

E-learning takes place using a computer and network environment. Computers located near each other (as in one building) can communicate and share resources through a network link called local area network (LAN) while wide area network (WAN) enables LANs as well as other remote (far from each other) computers to be linked to enable them communicate and share resources. Communication and sharing between computers is a potential resource in instruction, learning and research. Learning situations are enhanced by enormous additional content via the internet as an educational resource. There has been a paradigm shift in teaching, learning and research situations because of e-learning, which requires change of attitude to enhance its utilization.

Figure 2: E-learning environment illustrated



Source: Adopted and modified: [www.stel.ru/en/ E-learning/E-learning.gif](http://www.stel.ru/en/E-learning/E-learning.gif)

Omwenga (2003) presents five modes of using ICT in e-learning as:

- Support mode: The aim is increased accuracy and enhancing presentation of work. Tools for use here include word processing, PowerPoint, computer aided design and desktop publishing among them.
- Exploration and control: Students are able to explore, examine, experiment with and build situations. Simulations, expert systems and statistical packages are mostly used for this purpose in e-learning.
- Tutorial mode: Information is presented at an appropriate level and pace giving learners an opportunity for feedback on progress.

- Resource mode: Technology, used to access information and other resources online through internet and offline through CDs and other software.
- Link mode: is where there is communication between individual students and instructors, examples of e-mails, net meetings and video conferencing.

Notably however, these modes are not exclusive of each other as one can be entrenched in another.

1.2.4 Contextual perspective

Learning platforms in their operation take a constructivist approach to instruction and learning, where teaching and learning is self-paced, interesting and interactive. There exist empirical tools like chat rooms, discussion boards, e-mail, assignments, self-assessment, and course materials among them on a learning platform. The tools give students control over e-learning process while enabling the instructor to attend to other aspects of the e-learning process. The tools on a learning platform are universally accessible; all the user needs is, to do the rightful clicking and get responses. The tools are meant to support self-study of materials, unfortunately, in the universities of Makerere, Dar es Salaam and Nairobi this practice is an ideal far from the reality.

E-content materials are chosen, designed by instructors in any format (simulation, tutorial, or drill) and made in any program including PowerPoint, Microsoft Word, Macromedia, Visual basic or otherwise, posted by instructors

on platforms for accessibility of students as online courses and modules. The platform serves as a media of communication and exchange between students and instructors ideal far from the real operation in East African universities.

In the universities of Makerere, Dar es Salaam and Nairobi, implementation of e-learning requires careful planning and consideration of various factors that affect the process (Omwenga, Waema, Wagacha, 2004), originating in Rogers' work in understanding factors that facilitate or impede the diffusion of innovations in an organization (Rogers,1983). Van Der Merwe (2004) summarizes these factors in table 1.

With the infrastructure for e-learning in place on a campus, it is common for instructors and students searching for information on the internet to use in instruction and learning activities. Besides, universities of Nairobi, Dar es Salaam and Makerere have acquired learning platforms like Blackboard (BB), Knowledge Environment for Web-based Learning (Kewl) and Wedusoft to enable a more organized digital learning environment (DLE).

Table 1: Conditions for successful initiating e-learning

Condition	Description
Choices	Identification of a strategic direction and selection of a path to follow based on a clear sense of institutional mission.
Commitment	Allocation of resources to enable the institution adjusts its course and follow the path selected.
Courage	Energetic and clear leadership from the very highest level of administration.

Communication	Building an atmosphere of trust by including the entire institution community in the transformation process through a thoughtfully conceived and well-executed strategy for dissemination of information about existing and emerging e-learning services, plans, decisions etc.
Co-operation	Collaboration across functions and throughout levels and stakeholders to achieve a consistent and integrated set of support services for teaching and learning.
Community	Complementing the community of support nurtured through cross-functional collaboration with an equally unified community of faculty across disciplines.
Curriculum	Re-conceptualization of the curriculum to reflect distributed interdisciplinary and out-come oriented nature.
Consistency	Reflection on institutional commitment to transformation through consistent action and recognizing the importance of standards within both the technology industry and the institution.
Capacity	Development of the teaching and learning capacity of the institution (e.g. curriculum and faculty) to serve student achievement and outcomes.
Culture / Context	Understanding the culture, values and sensitivities of a given campus environment.
Complexity / Confusion	Overcoming the confusion associated with coping with transformation by adapting to the inherent complexity of the decision-making process by adopting more agile and responsive governance processes.
Creativity	Developing strategies and tactics that harmonize with the campus culture and context and recognizing this is a creative, not just a political process.

Adopted and modified, from Van Der Merwe (2004) Evaluating the integration of ICT into teaching and learning activities at a South African higher education institution, p. 118.

Learning platforms and other computer software enable faculties to design, upload digital materials and allow accessibility to students. Besides the material on a learning platform, students and instructors acquire extra materials from other Internet sources and multimedia (MM) tools (text, graphics and video). E-learning utilizes technology in the improvement of the quality of teaching and learning as it provides many possible materials needed for instruction. The previously described DLE allow for the implementation and combination of up to date technology and research to produce effective e-learning practices (Omwenga, 2003). However, this practice is not widespread in the universities of Nairobi, Makerere and Dar es Salaam.

Universities are putting resources in the development of an ample e-learning environment with a view to enjoying benefits like, enhancing learning, relieving the instructor of the enormous workload and easing access to research literature among others. Alessi and Trollip (2001) holds that, early days of educational computing were filled by excitement and prophecies for the potential of great educational improvement, just as it is in Nairobi, Makerere and Dar es Salaam universities. Though technology and its availability in these institutions are improving, actual components, use are anecdotal; and attitude towards the same technology in instruction is mostly misconceived. Notwithstanding the contradictions, e-learning is growing in East African universities.

The use of ICT in African context however, brings about challenges. With the growth and potential of e-learning to transform instruction, the question remains why there is anecdotal evidence of massive change in research, teaching and learning in universities. Possible barriers include the focus on aspects of e-learning, which limits understanding and promotes misunderstanding of the operational basics of e-learning technology.

1.3.0 Statement of the problem

Despite the investment and expectations, ignorance about the basic operation of e-learning technology still prevails in the Universities of Makerere, Nairobi and Dar es Salaam. Such challenges as understanding, change of attitude and training are still prevalent (Omwenga, Waema and Wagacha, 2004). The persistence of these challenges and unawareness about the potential of ICT in education hinders any real utilization of e-learning as a resource that facilitates educational environments (Fonseca, 2001). Though Fonseca presents this from a global perspective, the problem also exists particularly in the use of Information and Communication Technology (ICT) in Nairobi, Makerere and Dar es Salaam universities. This prompts an investigation into the components, use and attitude towards e-learning thus the question: Do the instructors and students in Makerere, Nairobi and Dar es Salaam universities understand the basic practice of e-learning technology to make better use of it as a resource in pedagogy and research?

1.4.0 Purpose

This study describes the basic features, utilization, practice, and attitudes towards the use of e-learning by instructors and students in teaching, learning and research in Dar es Salaam, Makerere and Nairobi universities. The purpose of this project is to identify the indicators of and attitude towards e-learning, focusing on the value added by e-learning and its technologies in enhancing teaching and learning in the selected institutions.

1.5.0 Objectives

The study:

- (i) Identifies the components of e-learning in Makerere, Dar es Salaam and Nairobi universities.
- (ii) Describes the level of utilization of features of e-learning in Dar es Salaam, Nairobi and Makerere universities.
- (iii) Outlines the attitude towards the use of e-learning in teaching and learning in Nairobi, Dar es Salaam and Makerere universities.

1.6.0 Research questions

On the assumption that the indicators, practice and use of e-learning technology are not vividly depicted, the following questions were tested:

- a. What are the components of e-learning in Makerere, Dar es Salaam and Nairobi Universities?
- b. How are the componets of e-learning utilized in instruction and learning in Dar es Salaam, Nairobi and Makerere?
- c. What is the attitude to e-learning as a teaching and learning resource in Nairobi, Dar es Salaam and Makerere universities?

1.7.0 Scope

Geographical scope was East African nations, three universities chosen, one from each nation: Makerere University, Uganda (MAK), University of Nairobi, Kenya (UONBI) and University of Dar es Salaam, Tanzania (UDSM). Makerere University was the main focus of this study, as it required base lining e-learning activities. The universities of Nairobi and Dar es Salaam were chosen because the study needed a broader outlook to establish indicators, practice and attitude towards the use of e-learning. The sample scope included 65 students and 15 instructors from Makerere University, 40 students and 10 instructors from Dar es Salaam and Nairobi universities respectively. Content scope covered the practical engagement in and utilization of e-learning by instructors and students in instruction and research, and attitudes towards e-learning use.

1.8.0 Significance

Focus on e-learning is mostly on the advantages: information transmission and archiving aspects of e-learning. Focus on basic operational practices in e-learning is to enhance practice and use of e-learning, which enables more positive change in attitude. In addition, the significance of this project is to add theory to the practice of e-learning particularly in Makerere, Nairobi and Dar es Salaam universities. University e-learning: users, implementers, administrators, and other researchers will find this project useful in their various activities relating to e-learning and digital learning environments.

CHAPTER TWO

LITERATURE REVIEW

2.1.0 Introduction

This chapter presents theoretical framework spelling out the role of constructivist theory, conceptual framework defining the working concepts and related literature to this study.

2.2.0 Theoretical framework

The Constructivist Theory applies very nicely to e-learning in the view of this researcher. This theory assumes that practical knowledge is constructed through constant and high interaction with a learning situation and it is what one needs to learn that he/she will learn. The theory is applicable to e-learning because of its emphasis on interaction and practical knowledge construction.

2.2.1 Constructivist theory

Constructivism is a teaching and learning paradigm in which people are assumed to act interactively and socially to create knowledge. Teaching methods are being recast to leverage new learning media and honor multiple e-learning styles to fit learning situations. Ravenscroft (2001), remarks that most e-learning initiatives have been technology-led rather than theory-led. Leading thinkers from both within and outside academia are exploring radically different approaches to teaching and learning (Delvin, 2002) based on theory; e-learning is among them.

Jonassen (2001) suggests that computers serve as mind tools in a learning environment, that is, computers should help learners engage in critical thinking rather than present information for them to use. Thus in teaching and learning situations, computers are tools for accessing, interpreting and organizing information into personal knowledge as stated in the modes of using ICT in education. Based on this theory, the researcher views computers as mind tools that foster constructivist-learning situations in which learners construct knowledge meaningful and satisfying to them personally. Jonassen further, describes a constructivist-learning situation as:

- **Active:** where students meaningfully process their own information into valuable personal and social knowledge.
- **Cumulative:** where new learning bases and builds on prior learning; why personal experiences are a good basis for instruction and instructional design.
- **Integrative:** where learners elaborate on new knowledge and inter-relate it with their current knowledge, just to suit the knowledge into prior knowledge.
- **Reflective:** where learners consciously reflect on what they know and need to learn. This is a basis for transfer of learning and situational or practical learning.
- **Goal directed and intentional:** where learners subscribe to goals of learning; enabling focus on ideas that fascinate them most.

It is my argument that the above attributes make an ideal constructivist situation and greatly govern the operation of e-learning environment in the selected universities.

Constructivism specifies the roles of learners, instructors and structuring of learning content in a learning situation. The learner, reflects and communicates with others, and transforms data into information and meaningful concepts using non-linear and creative linkages (Resnick, 2002). These are reasons why learning platforms have features like the hypertexts, hypermedia and multimedia to enhance e-learning and cater for creativity. Presentation of learning content and methodology are non-linear because a learner has to be given chance to explore, be flexible in learning, and interact freely and take their own direction. Roy (2004) concludes that the key value that the “e” adds to learning in e-learning situations is networked, interactive, collaborative and creative e-learning.

Learning situations in constructivism begin with understanding common experiences (Jonassen, 2001). Learning events in e-learning then present learning materials beginning with common experiences, which in turn may require a situational analysis on the part of the designer of learning material. There are however incidences where materials meant for a different situation are used in instruction and learning in another situation. This is possible, but done with consideration of the capabilities and attitude of learners.

Instruction in an e-learning situation is viewed as guiding a learner into finding meaning. Collison, Elbaum, Haavind, and Tinker, (2000) cited in Howard (2003) argue that online teaching requires “moderators” not “teachers” in the classical sense to enable *guidance* not *teaching*. This compares well with Alessi and Trollip (2001) that hold instruction as presenting a challenge to learners aiming at learners’ active construction of knowledge and assigning it with meaning. Simulated learning materials are more placed to achieve this objective. This eventually changes the position of a teacher in instruction.

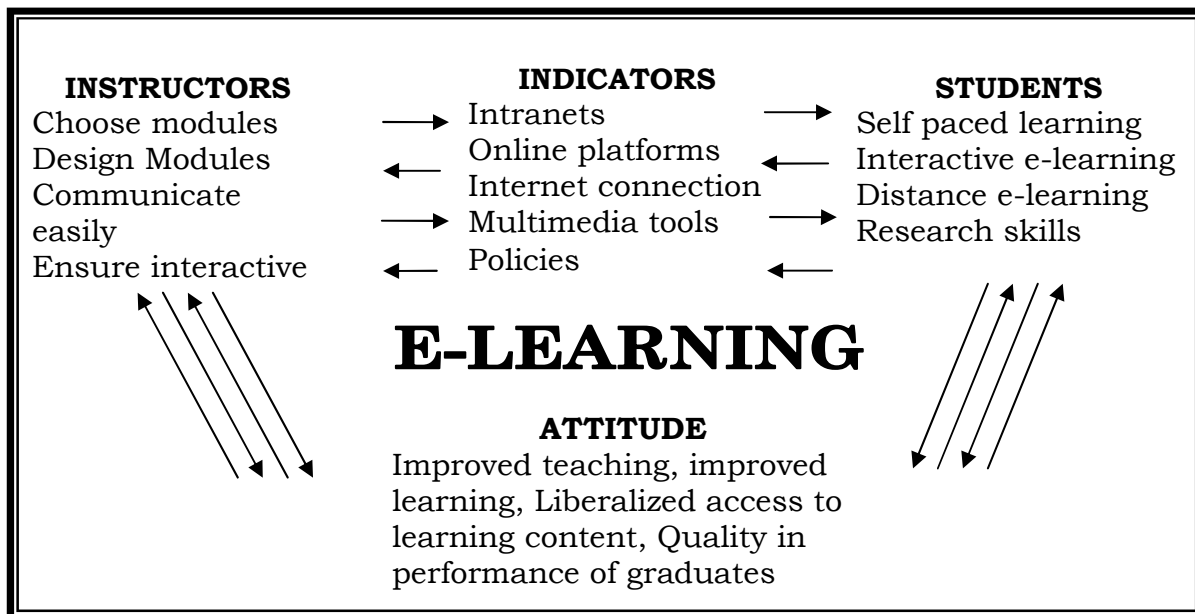
2.3.0 Conceptual framework

Commenting about the general role of computers, Kothari (2004) says that computers have added energy to the traditional problem solving skills. The use of computers has made complicated research designs practical which means that computers are essential in physical, behavioral and humanities researches. This has a basis in the basic understanding of the manner in which computers help people to appreciate the utility of this powerful tool in research and e-learning in general.

Introduction of e-learning in universities aims at improving teaching and enhancing practical learning situations. Learning activities can be anchored to practical tasks or problems yet dangerous, expensive or unique learning content can be simulated to enable a constructivist approach to instruction and learning. The design of learning tasks, learning environment and situation reflects the complexity of the real environment, in which learners are afterwards able to function (Alessi and Trollip, 2001). E-learning environment

encourages testing ideas against alternative views and contexts (Duffy and Savery 1995), giving learners an opportunity for support and reflection on both the content being learned and the e-learning process.

Figure 3: Conceptual framework for an e-learning environment



(Adopted and modified from Laurillard (2002) as cited in Van Der Merwe 2004. Evaluating the integration of ICT into teaching and learning activities at a South African higher educational institution, p. 96).

Laurillard (2002) a Professor of educational technology, designed a “*conversational framework*” of a learning environment (figure 3). I adopt it to conceptualize an e-learning environment. According to the framework, Internet connection in a university provides for online platforms, courses and MM tools as indicators of e-learning in an institution. Instructors use the platforms to choose and design e-content (interactive materials: modules). Students use the modules to engage in self-paced, interactive, distance e-learning and sometimes research (thus constructing knowledge). The framework operating in the described state improves teaching, learning and

research situations making them faster, efficient and more personally relevant and meaningful to those engaged in them.

There is evidence in her study that in well-executed e-learning environment, there is no significant difference in terms of performance between face-to-face and e-learning in general. Learning materials allow exploration and therefore improve on the research skills of students in e-learning. Laurillard says that all activities in her framework take place in an interactive “situation” or an environment (which refer to e-learning) purposely designed to improve teaching and enhance e-learning situations that ultimately changes attitude. In support of Laurillard’s framework, Pask (1975) cited in Ravenscroft (2001) advocates for “conversational” teaching and learning systems. Howard (2003) concludes that an effective e-learning environment is interactive among students, peers, instructors, technology and content, a basis on which e-learning and DLE are designed.

Resnick (2002) in support of Laurillard (2002), argues about how technology can transform knowledge through the “*conversational framework*”, emphasizing the interconnectedness between a knowledge society and digital technology in describing the transition from an “information society” to a “knowledge society”. Resnick holds that in this transition, the key to change is not information but how people transform information into knowledge using technology. It is my argument that the design, appropriate use and attitude to

operational technology of a learning platform have a strong basis on Resnick's observation.

Makerere University (2005), supplements that e-learning starts with online courses and learning platforms. Learning platforms or learning management systems (LMS) started out as systems that were used to organize course material and communicate with students (Van Der Merwe, 2004). A learning platform is a launching pad for e-learning tools that are used in instruction, discussion, coursework assessment and communication materials between the instructor and the student. Universities select appropriate infrastructure and software responsive to the academic needs for use as a learning platform. One basic need in a university for better teaching and learning is interactivity. As Howard (2003) observes, effective e-learning is not passive. It is through interaction among variables as described in the conceptual framework that there is liberalized accessibility to university education, self-paced engagement in and improved teaching, learning and research strategies.

Adendorff (2004) holds that in e-learning, instructors, students are located in different places, and most of the interaction takes place via the *networks*. E-learning is used because it blends the best of classroom learning with the best of e-learning (Omwenga, 2003) as it allows communication even at far distances. The development of e-learning therefore requires faculties to adopt new ways of teaching and *communicating* with students through networks. It is my argument that it is the lack of understanding of this phenomenon has

curtailed the clear manifestation of the indicators of an improved attitude towards the practice of e-learning thus its underutilization in instruction, research and learning.

2.4.0 REVIEW OF RELATED LITERATURE

2.4.1 Components of an e-learning environment in a university

Introducing e-learning in an East African context is on the basis model of the level of availability of infrastructure, technical support, clear policies on implementation, evaluation and curriculum re-orientation, (Omwenga, Waema and Wagacha, 2004). The presence of the above aspects of e-learning make e-learning a clear feature in an institution though at times it is not definite. Makerere, Dar es Salaam and Nairobi universities have established such policies and infrastructure that enable effective and smooth implementation of the e-learning initiatives.

Bardzell (2002) describes features of an e-learning environment that are reflected through: social learning, interface standard of usability and accessibility, diverse and well defined outcomes, content quality modules, interactivity, facilitation of addition of content, and assessment and evaluation integration. The features are a virtual face-to-face situation and utilized to improve on a teaching and learning environment. The features, supported by digital learning platforms, are available in Makerere, Nairobi and Dar es Salaam.

Andersen and Cunningham (1999) affirm that established computer Local Area Networks (LANs) support learning from anywhere within an institution. Indeed, where there is an intranet, the place for learning is not dictated unlike a face-to-face lecture room scenario. In addition, the internet in a digital environment is a great feature. Universities have e-learning centers connected to the internet and learning platforms that provide tools like chatrooms, discussion boards, e-mails, assignments, grades among them. Basic e-learning features discussed here are multimedia tools, the internet, intranet, and some other features on a learning platform like search engines. Of course, these features come from the broad one of policy.

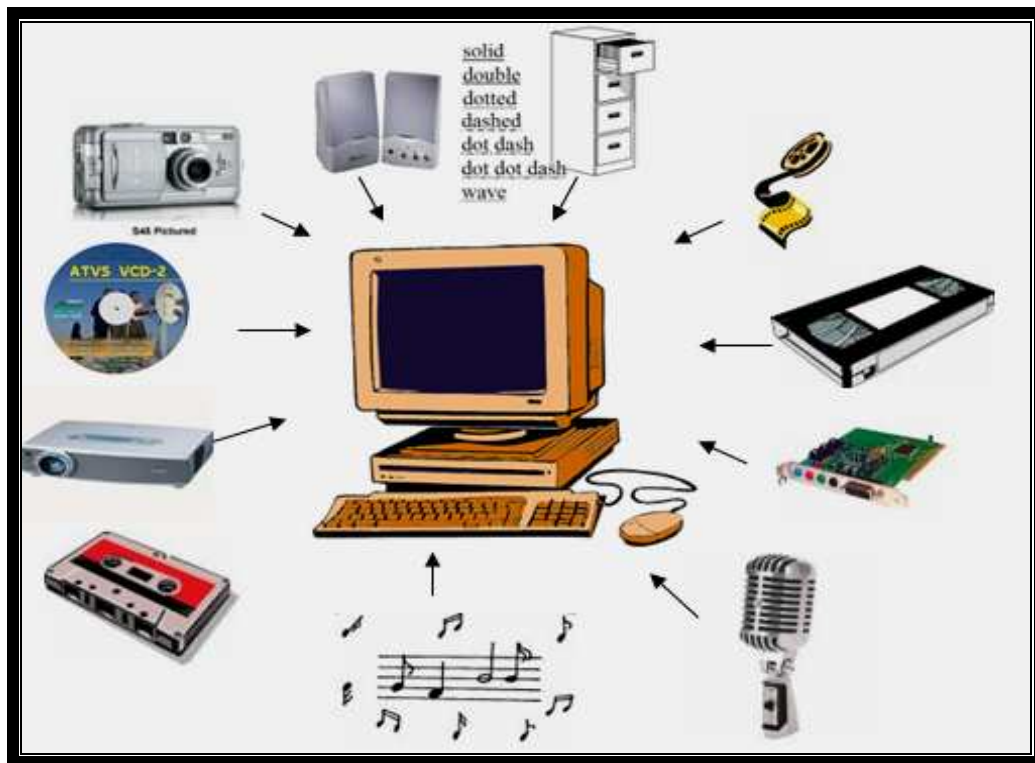
2.4.2 Multimedia in e-learning

Farrant (1997) suggests that modern curriculum development tends to adopt multimedia approaches to learning, so the competence in the use of educational technology is essential for teaching and learning of the new curricula. Although Farrant suggested this, at the time education technology focused on audio-visual and projected media the suggestion is still vital when it comes to present e-learning situations.

Multimedia refers to text, sound, graphics, animations, imaging, and spatial modeling into computer systems. Multimedia involves the integration of more than one medium into a form of communication. As seen in chapter one, e-learning and communication theory combines for effectiveness. With the emergence of computers into education, multimedia has been strengthened and is popular in e-learning. Multimedia holds a special place in e-learning

because as Jonassen (2001) argues, it is more attention getting and attention holding. A multimedia computer (Figure 4) is able to capture sound and video. High-resolution monitors, sound cards and increase in random access memory (RAM) and processing speed of personal computers, can be exploited to transform teaching and learning environments.

Figure 4: An illustration of a multimedia computer system



(Adopted and modified from Jonassen, 2001 Computers in the classroom: mind tools for critical thinking, p. 187).

Qualities of modern computers enable them to give special effects, synthesize and produce sound and video, manipulate those sounds and images to produce special effects on graphics, including animations and integrate all of them into a single multimedia presentation that may be very relevant in enhancement of instruction and learning (compare with Bardzell's indicators).

However, it is not easy to produce quality MM presentation and little current research is available regarding learning effects from MM on learning. Nevertheless, Ager (2004) affirms that the use of multimedia in learning is significant for departments with limited resources as many multimedia simulations are freely available and accessible on the internet as freeware.

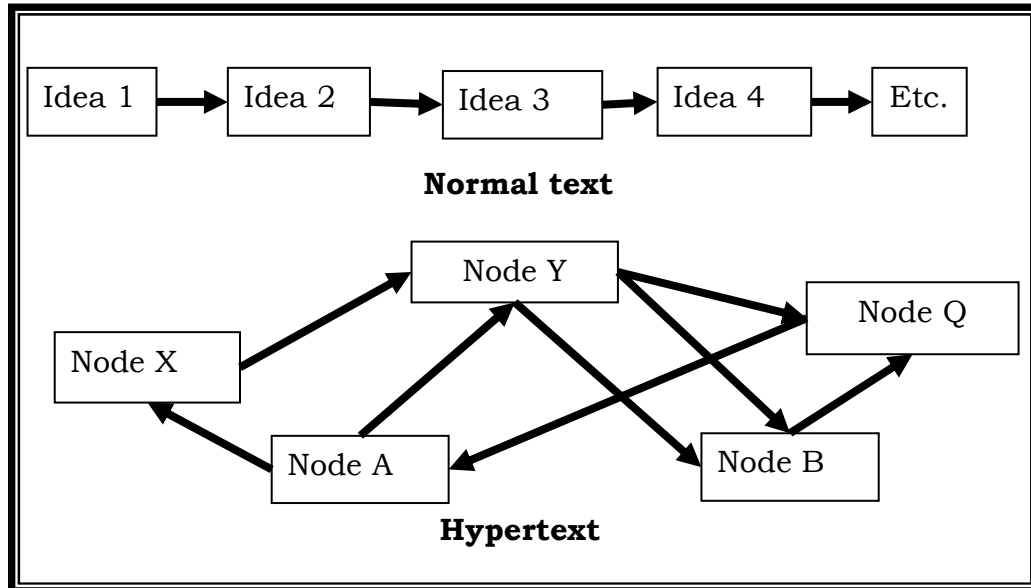
Jonassen (2001) argues that past research has proved that multiple-channel and complimentary channels improve e-learning situations while information from different channels which are inconsistent worsens a learning situation. This compares with the position of Mayer (2001), Clarke and Mayer (2003) as cited in Merrill (2002) who contends that when a presentation contains three elements: graphics audio and visual, there is a decrease in learning. Nevertheless, the integration of multimedia as a tool in e-learning is very vital to enhance instruction and learning situations provided it is carefully used, given the fact that it goes far beyond what could be possible in a normal face-to-face lecture room situation.

2.4.3 Hypertext in e-learning

Hypertext has its basis on the word *hyper* meaning more than normal. Frequently used in digital learning environment (DLE) are written text materials. Howard and Martins (2002) carried out a study on questioning about concepts using hypertext and discovered that it improves and enhances learning. The design of e-content text materials can be done in such a way that they make e-learning and instruction exciting in many ways. In e-learning, the text is more than normal (Jonassen, 2001) (figure 5). Hypertext

applies in e-learning as a non-sequential, non-linear method of text as well as content presentation (constructivist approach).

Figure 5: Normal text versus hypertext structure



(Adopted from Jonassen 2001 Computers in the classroom: mind tools for critical thinking, p. 189).

Hypertext used in the design of e-content enables a reader to get information in a style that is most meaningful to them. Hypertext is super text because the reader has control over the text read and the sequence of reading, therefore appealing to the constructivist approach to a learning environment. Hypertext assumes that the organization the reader imposes on the information they are reading is more personally meaningful than the one imposed by the author (Jonassen, 2001). This is true because learners have the freedom to determine the criteria and order of involvement in a learning situation. In this way, learning is enhanced and more personally meaningful.

Hypertexts, made up of nodes or text on buttons are basic units of information storage. While using hypertext, one can access any node depending on their interests. While researching a particular topic, one can access whatever document believed to be relevant in that topic. What is most vital in a hypertext-learning situation is that users can customize the nodes by adding or changing the information on the node or creating their own nodes on a document thus making a learning situation active. Hypertext can be a dynamic growing knowledge base as Jonassen (2001) concludes, representing new, different and contrasting points of view depending on how the learner has organized them.

The organization of hypertext or the relationship between nodes defined by links that connect them, called hyperlinks produces a lively and interactive instruction and learning environment. Schrum and Hong (2002) did a research about hyperlinks in learning and remark that hypertext, as a strategy of instruction should adhere to active participation, topical flexibility, and minimal technological requirement.

Hypertext mark up language (HTML), a computer programming language makes hypertext possible. HTML enables programmers to give learners capacity to determine a sequence of access to information (browsing), to add to the information: making it more personally meaningful for students to build their own knowledge base. Schreibman (2002) did a research on the effect of hypertext on learners' acquisition of information and in her finding; she

explains that hypertexts have an effect on learners' acquisition of information though she does not present details. Jonassen (2001) concludes that in a hypertext situation, interaction is a vital attribute.

There are some problems with the use of hypertext in an e-learning environment, the most common one being navigation (Scherly, Roux and Dillenbourg 2000), due to the many nodes with multiple links learners are easily lost in the cyberspace. More still, problems of how and when learners should access information; comes from the constructivist approach to learning situation, as there are fewer hints to where to begin from or continue to yet there is an array of options.

Jonassen (2001) suggests that considering hypertext as a mind tool to construct and learn with, not a source of knowledge to learn from solves the above problems. Besides, it is important to realize that beginners using multimedia, hypertext and hypermedia tools will not use them perfectly at the strike of magic. It is therefore advisable for one to be patient, keep trying and make appropriate adjustments for improvements.

2.4.4 Hypermedia in e-learning

Hypermedia is integrating multimedia and hypertext. Hypermedia nodes are not only text as they are in hypertext; they may be text, graphics, images, sound bite, animation sequence or video clips (Alessi and Trollip, 2001). Instead of pointing to a hot spot to retrieve text material about Napoleon Bonaparte for example, the learner may retrieve a video clip, an animation, a

real picture or all these. In this way, hypermedia enhances instruction and learning situations by making content more interesting and richer; Jonassen (2001) observes that in hypermedia, content can *anchor* to rich and sensory data.

In hypermedia, users take different directions and approaches but still get to the desired outcome (Doyle, 2001). Chian-Ru (2002) in his study on hypermedia remarks that hypermedia promises to accommodate individual differences. Chian-Ru, hastens to caution however that, hypermedia requires complex skills for effective use, a subject that needs careful consideration by instructional designers. Miguel and Fowell (1996) remark about the use of hypermedia basing on the “Everest syndrome”- just because it is there arguing that one has to critically question the appropriateness of hypermedia before.

2.5.0 Utilization of the components of e-learning in Makerere University, Nairobi University and Dar es Salaam University.

New technology is seen as having the potential to improve working conditions and overall quality of life for human kind. While technology can facilitate access to information, it also has the capacity to create isolated and artificial existence for individuals becoming more dependent on technology rather than direct human-to-human contact as in communication (Omwenga, 2003). These are aspects taken advantage of by students and instructors in teaching, learning and research situations.

Learning begins with good instructional design, computers usher in a platform for multimedia and design. It is through design activities that computers offer greatest new learning opportunities (Resnick, 2002). Instructional designers use computers to design learning modules by placing emphasis on sensing, and imagination; combined with traditional skills of analysis, reason, and sequential problem solving, to produce appropriate instructional materials (Alessi and Trollip, 2001). Design evaluation is widely accepted in the development of computer based training systems (Mills, 2001).

Delvin, (2002) says unlike textbooks, computer learning modules (e-content) could undergo literally hundreds of updates or editions and still play a vital role in instruction. Success in making technology and new media to support learning, needs moving far beyond the traditional view of teaching as delivery of information, but requires a well thought process. Roy (2004) in his study argues, modules as learning materials are very useful, but have to be re-versioned, or re-designed even for similar courses.

Even if computers offer an ideal design environment, there are a number of poorly designed digital learning materials. In the use of computers in e-learning, computers do not think, they only execute instructions of a thinking person, (Kothari, 2004). Poor design of e-content is associated to the designer not the computer. Jonassen (2001) associates poor design of material to teachers' low expectations of students' ability to learn. The low expectation from students reduces performance of students, which further erodes

teachers' designs. In designing digital materials therefore, an instructor should have a high expectation from students.

Seely (2002) emphasizes the social context of learning. Knowledge implies the understanding of information rather than merely holding it. Fonseca (2001) cautions that there is a difference between information and knowledge. The resources for learning using computers lie not simply in information, but in the practice that allows making sense of it and in the practitioners who know how to use it in social contexts. Teaching in e-learning is therefore not only the delivery of information by computers, but also one has to look at the social context, resources, background and history within which information resides. This is fostered in online e-learning environments (Van Der Merwe, 2004). Nkata (2005) supplements that education and training is holistic, promoting reasoning, use of intuition and understanding changing realities.

There is collaboration and support for cooperative e-learning. Learners are encouraged to involve in dialogue (collaborate) (Jonassen 1996 & Chien, 1999) with each other and instructors, a feature utilized on most e-learning platforms, through features like discussions boards, white boards and chat rooms (conforms to the constructivist principle of social construction of knowledge). To enhance comprehension of e-content, instructors encourage dialogue as inquiry (Howard 2003), a strategy to accomplish group projects. Advocating for this style of learning environment (collaboration), Mehdi (2004), carried out a study and holds that most traditional approaches to instruction

are no longer adequate in responding to the new challenges concerning the need for increased efficiency in developing, acquiring or disseminating knowledge.

Utilization of e-learning tools in learning and instruction requires internet connection. Forsyth (1988) asserts that the Internet, as a means of accessing information, is a valuable tool to use as a teaching resource; however, there are many factors to be taken into account in actual practice of internet delivery. In e-learning it is not just how to use the technology (e.g. internet and intranet) most effectively, but also how to assess the results, monitor students' progress and ensure that designed materials promote e-learning (compare with Bardzell, 2002 and Van Der Merwe 2004).

The internet has the capacity of delivering multimedia rich content giving users full benefits of animated graphics, video clips and sound, enhancing learning situations and encouraging participation and interaction, (Gama and Church, 2005). Online learning platforms using internet technology range from simple and inexpensive online lectures to costly multimedia, interactive modules (Delvin, 2002). The principle use of the internet technology in pedagogy is simplicity and user friendliness of the designed programs (compare with Bardzell 2002). The program should be easy to control, to work as slowly or quickly as possible depending on the user requirements (Doyle, 2001).

Design of learning materials focuses on primary concepts (Alessi and Trollip 2001) by manipulation of which concepts e-learning enriches the variety of learning materials. Instructors therefore tailor material design strategies to student's primary responses and encourage students to analyze, interpret, and predict information (using any of the modes in Omwenga 2003). Instructional designers rely on open-ended questions to promote extensive dialogue among students calling for the elimination of standardized testing. A valuable way to measure learning in a DLE is to make assessment part of the learning process, ensuring learners are provided with information on the quality of their learning explaining why learning platforms have self-assessment tools.

Learning platforms make it easy to present and manage course content calling for both the instructor and the learner to get the required skills to operate proficiently in a digital environment (induction courses). Features of a learning platform enable accessibility to users at convenience (Alessi and Trollip, 2001). All access uploaded assignments or course materials, than would have been in a physical face-to-face delivery session. Electronically handled assignments are very possible.

Real-time communication via chats, discussions and teleconferencing systems make genuine cooperation between students be they in the same institution or not. Howard (2000) holds that time and space do not confine online teaching and learning because of the communication facility. This kind of communication does not have to be centrally organized; a student has an

opportunity to choose whom to communicate. In this way e-learning has the capacity to involve students who are introverted and unconfident.

Paloff and Pratt (1999) in their experiment are convinced that e-learning can draw out students who might seem unmotivated in face-to-face classroom situations because it presents to them a possibility to communicate. Effective facilitation in this case can enhance a sense of inclusion for students who may be socially or geographically isolated as communication to other students is by email.

Provisions on a learning platform in e-learning address tutorial issues. Tutorials are meant for in-depth understanding of content. Working on a theme together (Howard 2003, calls them common “*threads*”) by learners creates a conversation, that is deep enough to enable in-depth analysis and understanding.

Because of the overwhelming number of students in most universities currently, it is hard to organize meaningful physical face-to-face tutorials. An e-learning platform however, can comfortably address such a situation using tools like chat rooms and discussion boards. Chat rooms and discussion boards enable learners to engage in discussions from wherever they are irrespective of distance and location. Schrum and Hong (2002) in their study, suggested small groups of three to five students in e-learning. Howard (2003) argues that in tutorials instructors’ postings should be limited to “interventions” and not “contributions”.

Van Der Merwe (2004) has a very strong opinion, saying that the integration of ICT into teaching and learning brings about “borderless education” adding that the integration adds value to existing educational activities leading to new and improved educational models. Indeed basing on a conceptual level borderless education could mean breaking traditional barriers separating teaching, learning, research and communication in education because of the new technology of e-learning. World Bank report (2002) concludes that e-learning has the capacity to expand access and improve the quality of instruction and learning at all levels.

Table 2: Computer application in various educational fields

Application in	Some of the various uses
1. Education	<ul style="list-style-type: none"> • Provides a large databank of information • Aid to timetabling • Carry out lengthy and complicated calculations • Assist teaching and learning process • Provide students profile • Assist in career guidance
2. Management	<ul style="list-style-type: none"> • Planning new enterprises • Finding the best solution from several options • Inventory management, forecasting and planning • Scheduling projects
3. Communication	<ul style="list-style-type: none"> • Sending e-mail • Receiving e-mails
4. Research	<ul style="list-style-type: none"> • Model processing • Performing computations • Finding data • Data analysis and presentation

5. Homes	<ul style="list-style-type: none"> • Games • Educational aid • Home management facilitation. • Receiving and sending e-mails
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Source: Kothari (2004) Research methodology, methods and techniques, p. 370-371.

All aspects in the table are activities in e-learning. Researchers have been specifically concerned with data storage, processing, retrieval and manipulation which roles computers can do well thus Kothari's conclusion that using computers has reduced human drudgery and benefit to the quality of research activities (Kothari, 2004).

2.5.1 Intranets, e-mails and communication in e-learning

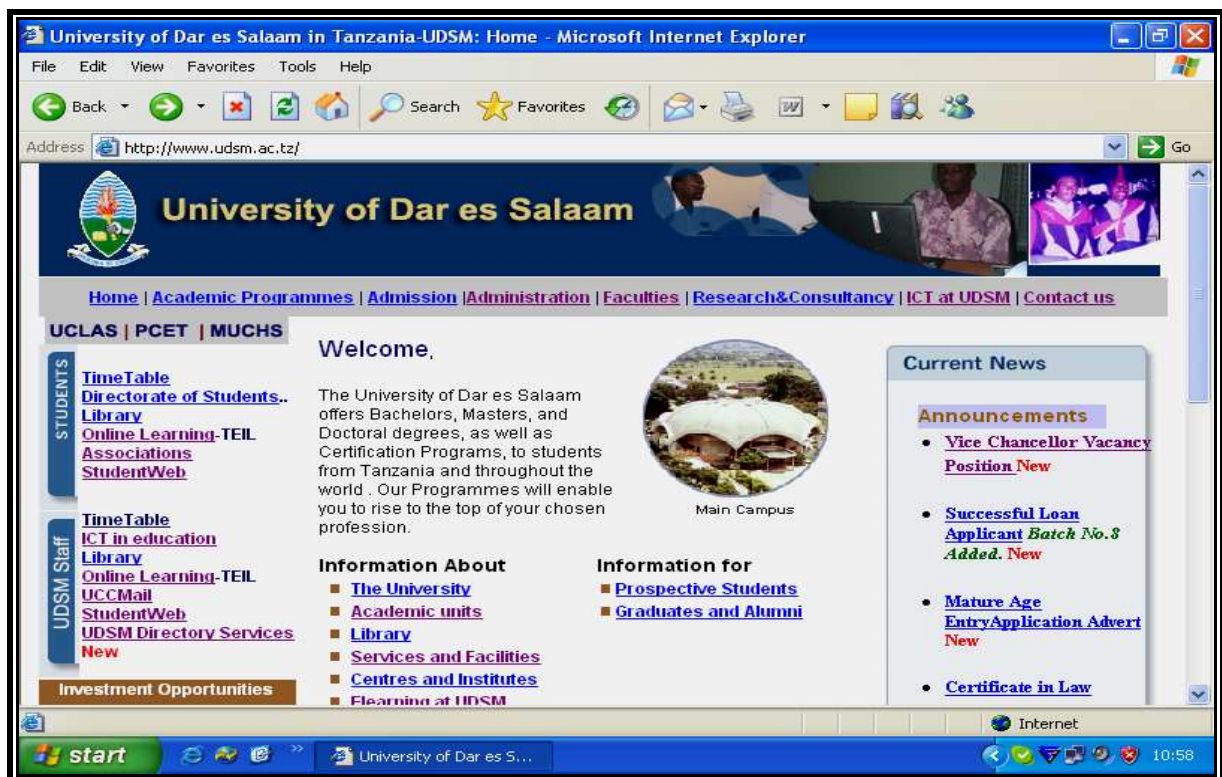
An intranet is a practical way for institutions to make the best use of computer networks in e-learning. The intranet uses internet technologies to enable computers communicate to each other within an institution. The intranet is a basis structure in the establishment of e-learning infrastructure in a university. Lilforde (2005) argues that intranets in an organization are for access privilege to information based on permission. This is true because on a university intranet, individual students can view contents of an intranet; a module can be posted on the intranet and reviewed by instructors according to the permission granted to them by systems administrators.

Internal e-mail as provided for on the intranet and learning platform is not only a useful way for instructors and students to communicate, but it is also a safe way for learning about the internet. Anyone familiar with the intranet can

ably work on the internet (Kippenberger, 2000). Students can access resources and e-content materials through an icon based intranet (Beal, 2005).

The intranet has emerged today as the tool for knowledge management. For better utilization of basic operational technology of the intranet, there is need for induction courses or better still, basic computing skills. A study carried out on three South African libraries by Mphidi and Snyman, (2004) reveals the awareness about the intranet as a knowledge management tool in institutions but found little utilization of its potential as a knowledge management tool.

Figure 6: University of Dar es Salaam intranet graphical user interface



Source: University of Dar es Salaam website (2006)

Andersen and Cunningham (1999), hold that intranets have the value of information presentation, sharing and contact. An intranet allows instructors to save and retrieve information in one sharable file for publishing or distribution over a LAN (Cuthell 2005, El Emary and Sindi, 2006). Indeed as more learners get online in an institution by acquisition of e-mail accounts, the intranet is used to send information from an instructor to students or vice versa. Intranets ensures direct and personal contact which increases on the communication level between instructors and students, besides enabling sharing knowledge (Mphidi and Snyman, 2004) with other users outside the geographical location of the university. Lilfords (2005) concludes that an intranet is a very effective way of storing and controlling documents.

The potentially most revolutionary aspect of the intranet in e-learning is not the overflow of information in modules, which is available to students and instructors, although this is a major breakthrough; it is the intranet's communication capacity, which is spectacular. Omwenga, Waema and Wagacha (2004) hold that asynchronous, synchronous communication is possible within an intranet and internet availability is therefore not mandatory.

In e-learning, e-mails are at the heart of communication. E-mails are useful for communication between instructors and students. E-mail is easy and inexpensive communication to students and instructors outside the classroom (Andersen and Cunningham 1999). Howard (2003) affirms that in addition to

e-mails, with electronic bulletin boards, discussion boards, discussion groups or chat rooms in universities, e-learning is interactive. Students engage in chatting with peers and instructors thus increase in communication.

E-learning helps learners to relate and know each other. Schrum and Hong (2002) advocate for students self-posted biographies to enable effective knowledge of each other. Learning platforms provides the names and addresses of all users. Students decide to send messages to any of the users whether they are physically known to each other or not. However, much as there is interaction, it is mostly virtual, limiting physical interaction, which may be at times more fruitful to learning and instruction.

Picciano (2002) reviewed the research literature on web-based learning and contends that it supports the position that success and understanding in e-learning depends upon the nature of interactions and contributions on a discussion board. It is therefore common for online instructors to encourage or even require an amount of participation from students in various forms of interactivity including e-mails, just to implement constructivism in learning situations to support practical learning.

One can use e-mail to participate in a discussion, or passively follow the discussion going on or just to exchange mails. When there is need to reply mail, clicking on a reply button located on the graphic user interface (GUI) brings a mail form ready with the recipients address. Students and instructors have time to think about what they want to say and without disturbing

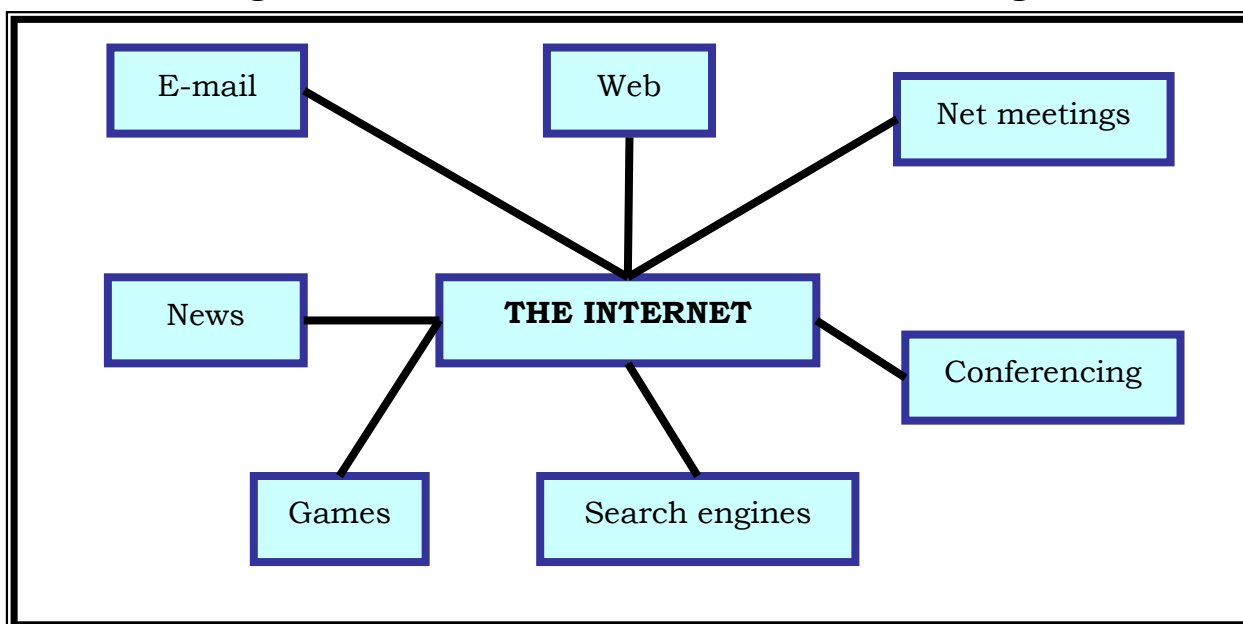
recipients by demanding immediate attention as it is in the lecture room face-to-face situation would (Andersen and Cunningham, 1999). There is informality of expression unlike the written language. While a formal letter would require traditional addresses, formal salutations, and closing phrases, an e-mail of one or two lines in e-learning is in order. It is possible to send attachments of course works, assignments and tests.

2.5.2 Internet in e-learning

Many instructors in universities have operated successfully for many years without any connection to the internet, as have been the students. Therefore, they wonder what has been done with the recent innovation of the internet in instruction. Van Der Merwe (2004) in support of the internet in learning argues that the use of internet technologies to deliver courses means that learning and instructions are no longer bound by geographical boundaries.

Alessi and Trollip, (2001) assert that the internet has and will continue to transform many activities in teaching and learning. Presently, millions of people all over the world use the internet for various activities, including instruction and learning. It has been said that ICT will bring a revolutionary change to the face of instruction and learning (Andersen and Cunningham 1999; Resnick, 2002) as may be seen from the illustration in figure 7.

Figure 7: Main internet services used in learning



Source: Andersen and Cunningham (1999): Teachers, pupils and the internet p. 5

Due to the internet, instructors are given an *advisory role* as students gather their own data, transform it into information and construct their own knowledge.

The internet has the potential of enabling instructors and students to contact individuals or organizations, which they would not do without the internet connection. With proper planning and preparation, these contacts can be rewarding educationally. The internet can in this way become a vital aspect of every university's curriculum (Andersen and Cunningham, 1999). Farrant (1997) supplements, that technology has found a place in most curricula because it is increasingly recognized as essential. There is material on the internet relevant to every subject or course done at university, besides the possibility of designing and posting more.

Taking course modules posted on the learning platforms as an example, the university population can see what is in the module, can comment and make recommendations. In sports for example, university inter-hall football team's lineups, scores, match fixtures, changes in fixtures can be availed, just by uploading. There is therefore a smooth and timely information flow thus minimal communication mishap. Alessi and Trollip, (2001) remarks that it is easier to use internet technology to ensure that everybody has the most recent version of materials and communication.

The task force on higher education and society (2000) affirms that the internet means more knowledge than ever is in circulation. Those who have access to internet have access to an extraordinarily valuable and sustainable resource. Even if the internet is to some extent an unreliable source of information, there is a lot of worthwhile information that is simply not available elsewhere. Research capabilities of the internet combined with basic word processing software and the abundant information increase researchers' abilities to contribute to scientific publication- (the task force on higher education and society 2002). Many authorities and official bodies have websites with information relating to them with information that may be relevant for academic and research purposes. Libraries use the internet service to make catalogues available thus increasing and easing access to data for research.

The internet in e-learning is a vent through which the classroom is presented to the world. Lecture rooms traditionally are isolated from the rest of the

world. Instructors and students have seemed to be self sufficient in face-to-face learning situations. The task force on higher education and society (2000) describes a learning situation in a higher education institution without the internet and inadequate facilities for learning in Democratic Republic of Congo saying: instructors must dictate notes or copy them onto a blackboard for students. Students take instructors notes as the only truth because there is no internet to get extra data. Instructors teach and assess students, with the help of textbooks. Students study what the instructor gave them and at the assessment, the same instructor evaluates them. There is no opportunity for somebody outside the class to engage in the learning and instruction process, but the instructor and the student. It is difficult, to judge the evaluation externally or globally with internet technology.

In addition, with the internet instead of writing assignments for only instructors who teach to assess, students are availed an opportunity to write portfolios (Howard 2003), post them on the internet and be assessed by people outside the lecture rooms. Students therefore write for a wider public than for instructors. Writing for a wider audience forces students to be more analytical and careful, as they are aware of the critical public.

With the entry of the internet into a lecture room, lecturers and textbooks are no longer the only sources of information. In addition to reference books in electronic libraries, the web also provides more information. Students therefore find own knowledge about their studies. This is a constructivist

approach to learning. However, finding own information is not necessarily good, as some students often copy chunks (plagiarism), (Andersen and Cunningham, 1999) of undigested material into their work. If the information is on the computer, unlike if they have to copy out what the textbook says. There are also established sites on the internet with databases where students can locate ready coursework assignments, essays which some lazy e-learners access, and use which is detrimental to the purpose of e-learning.

Merrill (2002) remarks that all the information that may be ready online, but the way it is passed on to the participant is sometimes less ideal. Some information is presented by amateurs so having little pedagogic value. Besides the information is boring as it is a lot and mixed up. Andersen and Cunningham (1999) hold reservations about the use of internet technology, the information from internet needs strict scrutiny. Questions like where does the information come from, who wrote it, for whom, when, is it correct; are required in use of internet. On the internet, there is no central organization to see that everything is done professionally. Worth noting however that is the internet will enrich the curriculum rather than change what is being done traditionally. The function of the internet in e-learning is therefore as well as rather than instead of other resources the same authors conclude.

Arsham (2002) wraps up on web-based learning as a more effective learning experience, since the learner is an active participant in the learning process and receives individual attention. Web-based learning atmosphere allows more

effective interaction between the student and instructor. Internet can be more effective than traditional classroom learning environment where the space could be inadequate.

2.5.3 Getting started in the use of e-learning

Universities provide training through workshops and awareness-seminars, to kick start e-learning. Many potential e-learning users are stuck at the start in a digital learning environment to the extent that some do not take any initiative, because of lack of necessary initial help. E-learning modules themselves do not offer sufficient help.

Discussing e-learning in relation to an appropriate learning environment, the assumption most often made is that e-learning is a stand-alone environment as a source of information because of the various media that can be used: color and variety of topics for e-learning environments. Instructors and students have access to up-to-date facts that can be compared with contrasting points of view. Indeed looking for information in e-learning, could not be easier; just by typing a key word or phrase in the search engine's window, there emerges many details. There is supposed to be necessary help and training in an e-learning environment.

Paloff and Pratt (1999) carried out a research on online community in e-learning in which they concluded that participation of the instructor as facilitator and equal member of an e-learning community is a significant factor in effective instruction and learning. In as much as this is so, Howard's

argument is that instructors and students in e-learning need to be trained to accept the fact that they will face challenges (technical or pedagogical), will have questions and need clarifications from time to time thus calling for teamwork between systems administrators, instructors and students.

2.6.0 Attitudes towards the use of e-learning in teaching and learning

Introduction of new technologies in education has occurred within a framework of extremely traditional educational attitudes of both learners and instructors. Fonseca (2001) compares this to the application of the nineteenth century educational methods to the potential offered by technological resources of the twenty first century. What affects the use of a digital learning environment is the attitude that computers are a “media of putting across information”. This leads to instructors uploading electronic *book notes*, in Microsoft word or PowerPoint slides with static photos, but adding no value to teaching and learning environments. Cotton and Gresty (2006) confirm that many web-based resources replicate didactic teaching methods without adding any value to them.

Howard (2003), comments about the attitude of teachers in e-learning, specifying teacher’s roles as “facilitating”. However facilitating is a challenge to many teachers thus instructors often find special difficulty adjusting from traditional unidirectional teachers to the role of facilitation. However, educators must make efforts to adjust as online education is more about discovery than memorizing and repeating content. Effective online facilitation

of learning is more informal than the face-to-face classes. It takes effort to move from formal to informal instruction.

The common attitude towards e-learning, is viewing learning and instruction as better-done using e-learning than lecture room learning. Much as this has truth in it, it is wrong to compare e-learning with traditional lecture room learning as no technology can in itself improve instruction and learning (Van Der Merwe, 2004). The appropriate consideration is the distinct advantage instructional technology offers that instructors can exploit to enhance learning situations. This consideration is appropriate because it does not create an opposing contact of e-learning and lecture room learning and there are many other factors that may affect learning situations.

2.6.1 Technology and the transformation of learning situations

Education and learning have always been considered as information transmission or delivery of content. Due to the ability of ICT to enable the transmission of content across geographical boundaries, the marriage of ICT and learning is therefore considered a perfect one (Van Der Merwe, 2004). The focus on information transmission however is limiting both education and the use of information communication technologies. Jonassen (2001) argues for a move beyond the information centric view of computing and learning. Learning situations should be seen as interactive processes in which students construct new knowledge and understand the world through explanation, experimentation, discussion and reflection. Instead of viewing computers as information machines and e-learning as simply information transmission

media (Resnick, 2002), e-learning can be used for active explanation and experimentation as well as facilitation of discussion and reflection. Fonseca (2001) observes, the potential and role of ICT in education have made educational stakeholders consider e-learning a cure it all.

E-learning ushers in interactive teaching and learning, (Arsham, 2002). Instructors need time and skill to produce effective learning materials and learners need the skill to use interactive materials. Jonassen (2001) holds that computer aided instruction works best where learners are perceived constructors of ideas and defenders of those ideas they have constructed. This, (my conclusion) is the reason why faculties which hold their students with high esteem in knowledge construction are more successful in e-learning because they produce interactive materials. Attitude towards such instruction and learning is mixed, as some instructors are uncomfortable that computers networks take over their jobs (Van Der Merwe, 2004) and little time.

With the emergence of technology and increase in online courses, traditional lecture room teachers and trainers are nervous, reluctant and skeptical to teach in online environments because they do not know what is expected of them. Adendorff (2004) claims this attitude is brought about by assuming that online teaching is the same as teaching in the traditional lecture room. In e-learning, instruction though similar, is different from face-to-face instruction. A good instructor in a lecture room will not necessarily be a good online instructor and a good online instructor will not be a good instructor in a

face-to-face instruction. Adendorff adds that universities should promote e-learning, by recognizing the difference between online instruction and face-to-face instruction and prepare both instructors and students to make adjustments to suit the same.

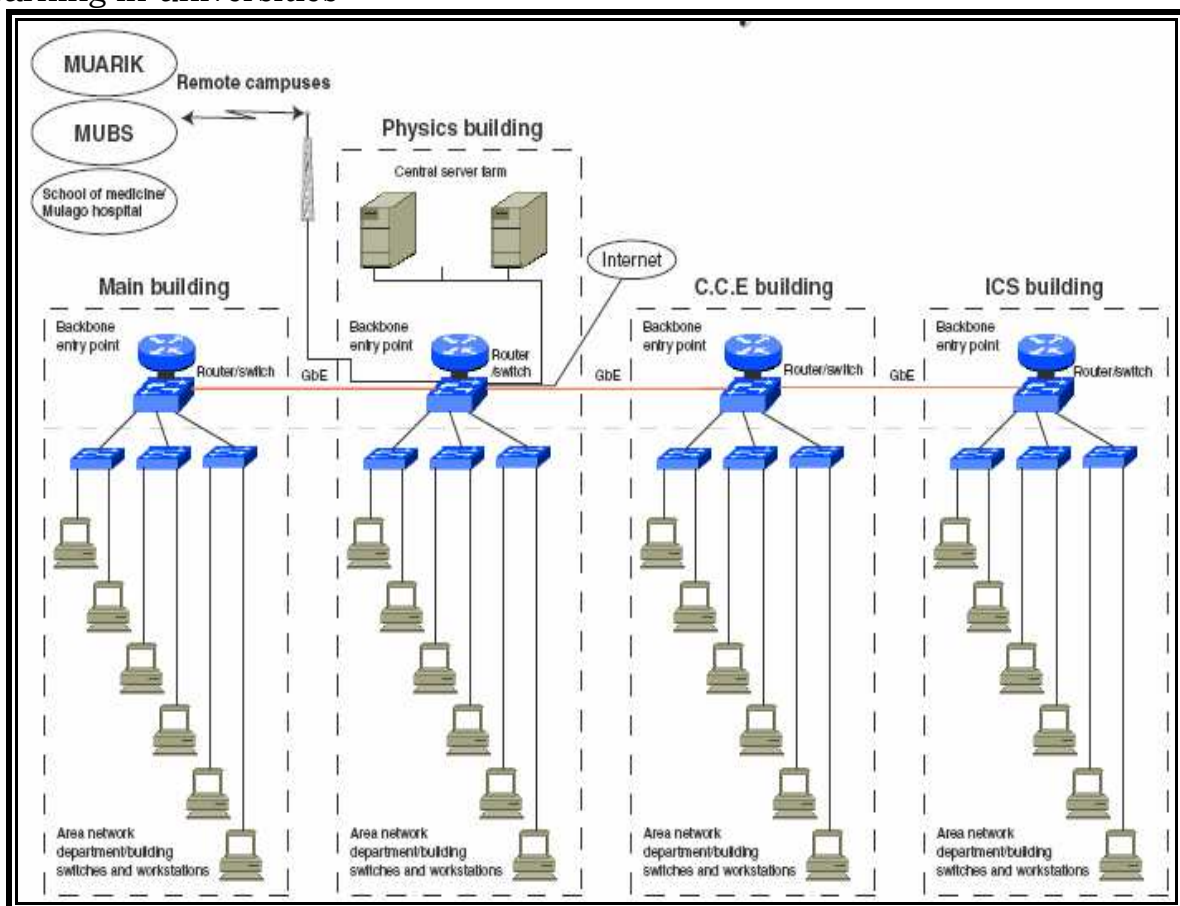
Content drives e-learning activities. Production e-content has a basis on attitude. Andersen and Cunningham (1991), contends that, the great many programs, which claim some kind of pedagogic value, are of course unfounded. Educational software has often been very grey and boring and quite unattractive because of lack of design and pedagogy principles. Much of the e-learning offered today lacks a distinct pedagogical approach. Merrill, (2005) is critical of faculties that have turned e-learning into *empty* learning saying, faculties uncritically transfer course materials, to open-source sites, wondering whether such repositories of notes, syllabi, power-point presentations, and videos are really instruction.

2.6.2 New role of lecturers: instructors

Jonassen (2001) holds that the role of instructors in e-learning must change from purveyor of knowledge to instigator, promoter, coach, helper, model, and guider of knowledge construction. Howard (2003) adds that online instructors need to act like “*a guide on the side*” instead of a “*sage on the stage*”. This is quite difficult because instructors are used to showing students how to do things and providing them with answers. Instructors carry this attitude to e-learning. This is why students’ course works and portfolios appear virtually identical because teachers teach the content and its organization.

Attitude to e-learning is from learning outcome. Omwenga (2003) asserts that it has been argued that retention in learning varies basing on content type and delivery vehicle. The better the matching of content and delivery vehicle to a learning style, the greater the retention and the results. Instructors are collaborators to learning, which role is not the same as teaching. There is a debate on this view- Kozma and Clark's media debate, Swan (2004), the best conclusion in e-learning is to use the medium of e-learning because no other medium can achieve the learning outcome you desire.

Figure 8: Makerere university network plan: networks like this implement e-learning in universities



Source: Makerere University ICT policy. Available on MAK website.

2.6.3 An aspect in the management of e-learning

E-learning happens within a context of a sophisticated environment so management and training is pertinent to successful operation of such an environment (Omwenga, 2005) e-learning can be successful if it is carefully planned, managed and supported. Howard (2003) argues that ongoing management of technology and online learning must be addressed. Students and instructors critically need initial training and ongoing technical support and management in terms of human assistance and appropriate software. Werner and Botha (2005) suggest a management system that enables users a degree of freedom in the computer use areas while ensuring that actions are monitored for appropriate action if things go wrong. Van Der Merwe (2004) adds that e-learning can be useful and renew learning only if it is managed properly. In today's fast growing culture, organizations implementing e-learning provide their workforce with the ability to turn change into advantage (Gunasekaran, McNeil, and Shaul, 2002).

Table 3: E-learning tools, uses and advantages, and principles of good teaching

DLE "tool"	Uses and advantaged	Principle for good teaching
COMMUNICATION		
Homepage	Good way of introducing instructors to students, last minute changes can be made, other resources.	Student-instructor contact
Bulletin board or discussion tool (asynchronous)	One-to-many communication moderated discussions, anonymous interaction, debate, peer assessment, group work, searches, introvert students get involved, more writing by students, attachments can be posted	Student-instructor contact, cooperation among students.

Chat rooms (synchronous)	One-to-many communication, brainstorm, virtual office hours, immediate feed back	Cooperative learning, gives prompt feed back
Calendar	Posting of target dates, reminders, last minute changes, full calendar available with dates of activities	Emphasizes time on task, communicates high expectations.
E-mail	One-to-one and one-to-many communication, private communication, reminders of specific dates, personal motivation, group work, searchable medium, documents can be sent as attachments	Student-Lecturer contact, cooperation among students
TOOLS FOR AVAILABILITY AND ENRICHMENT OF CONTENT		
Content module: linked pages	Gives the feeling of flow, easier navigation, can add video, audio, graphics	Encourage active meaning
Digital drop box	Presentation of moving images and sound to make the module more interesting	Respects diverse talents and ways of learning. Encourages active learning
Self assessments	Students asses their own knowledge of the subject, lecturers can include detailed feedback, tests can be repeated until students are sure that they mastered it, drilling is good for memory.	Encourages active learning, gives prompt feedback
Hyperlinks and references	Gives links to other pages which can be interactive and credit to referred to material	Encourages active learning, respects diverse ways of learning
Syllabus (course content folders)	Gives a description of the module content, lecturer information, outcomes, textbooks and expectations	Emphasizes time on task, student-lecturer contact
STUDENT ACTIVITY AND STUDY TOOLS		
Search facility	Students can find material electronically	Encourages active learning, respects diverse talents.
Grade tool	Students get their marks rapidly and can determine if they have to put in more effort for a module	Gives prompt feedback (depends on what and how much is made available), high expectations

Site map	Alternative way of navigating through the module at own time and pace and access the activities according to preferences	Respects diverse talents and ways of learning, emphasizes time on task
Help files	Explains to students what is necessary to be successful	Encourages active learning, gives prompt feedback
ASSESSMENT TOOLS		
Quizzes: Timed, Randomized and multiple	Formative / summative assessment, immediate feedback. Students must have mastered the work to complete it in the set time. Students get different sets of questions, generated randomly from the question database	Encourages active learning, Expectations, emphasizes time on task, gives prompt feedback, Diverse learning.
Assignment tools	Students can submit assignments electronically, grade assignments and the grades and feedback are immediate	Emphasizes time on task, gives prompt feedback
Group projects	Gives students the opportunity to help each other as they become aware of each other's strengths and weakness, prepares students for future jobs, in which group work is becoming vital.	Cooperative learning

Adapted from Van Der Merwe (2004) Evaluating the integration of ICT into teaching and learning activities at a South African higher education institution, p. 124-126

Van Der Merwe (2004) presents features of an e-learning platform and their appropriate use, adopted here to explain the advantage and the principle of good practice (Chickering and Gamson, 2002). Generally, many studies have been done on e-learning in institutions and some have been reviewed. The studies reveal the practice of e-learning as in the beginning studies with participants having little understanding of the practice.

CHAPTER THREE METHODOLOGY

3.1.0 Introduction

This chapter presents the research design, study population, sampling strategy, and instruments. Data collection techniques and procedure of determining the reliability and validity of instruments and the data collection and analysis techniques are presented.

3.1.2 Research design

The study was conceived to evaluate the implications of implementing e-learning in universities. The design followed was a cross sectional survey with a focus on exploration and description aiming at base lining e-learning. This research design was seen to be the most desirable because the study sought to describe e-learning in universities at the time of the study. The study used both paradigms, qualitative (Greenhalgh and Taylor, 1997) and quantitative for triangulation. Data was collected from a number of groups of subjects; through structured questionnaires, interviews, focus group discussions and direct observations. The required data mainly concerned actions and feelings about the practice, usage and attitude to a digital learning environment (DLE). The data required was for evaluating practice (Jansen and Vithal, 2005) that made triangulation of the designs suitable.

3.1.3 Population

Data relating to e-learning was collected from students and instructors (parent population) at Makerere University, University of Nairobi and the University of Dar es Salaam. The universities, students and instructors are chosen

purposively. The universities of Dar es salaam and Nairobi were chosen to enable a baseline for Makerere University's e-learning project and make the study a comparative one. Additionally, all the three universities engaged in piloting e-learning at different levels, introduction, implementation and evaluation. The target population was faculty students and instructors.

3.1.4 Sampling strategy

Purposive sampling was considered because e-learning is a piloted project thus few students and instructors are evocatively involved. The characteristics of e-learning practice and indicators needed to be studied intensively too. Through discussion groups, observation, and interviews respondents data was attained, that required a small sample size as the purposive research required only those respondents with relevant data.

The student sample was reached by focus group discussions and instructors were mostly interviewed. The universities have defined e-learning resource centers, which ensured easy sampling of students, and instructors. The study expected relevant information from the instructors and students because they are regularly involved in e-learning.

Table 4: Showing the selected sample

University	Makerere		Nairobi		Dar es Salaam	
Respondents	Students	Instructors	Students	Instructors	Students	Instructors
Numbers	65	15	40	10	40	10
TOTAL						180

3.1.5 Research instruments

The collection of data was done using instruments: observation checklists (Appendix A), structured interviews and focus group discussion guides (Appendices B and C). Observations enabled the researcher to get first hand information through personal experience. Focused group discussions enabled the researcher to participate in live discussions while noting reactions and opinions of the respondents. While interviews enabled in-depth examination the practice of e-learning in Makerere, Dar es Salaam and Nairobi universities.

3.1.6 Data collection techniques

Focus group discussions were held because it was vital to facilitate informants' interaction and therefore generate a wider response, while directly observing group reactions and feelings to e-learning issues. Focused group discussions consisted of 20 students each, 5 focus group discussions from Makerere, and two for each of the other universities of Dar es Salaam and Nairobi respectively. This technique helped in getting data faster by way of brainstorming.

Structured interviews and focus group discussions (Appendices: B and C) involved intensive probing questions using a structured guide to reinforce group discussions and get information from instructors. Participant observation and checklists helped the researcher get and record rightful data from the practical ground. The researcher made a fourteen days observation tour of Nairobi and Dar es Salaam universities and e-learning centers during

data collection. Observation checked inter-rater agreement and inter-rater reliability because of poor observation sometimes.

Secondary data was used as universities had extensive e-learning and policy documents, some of them posted on the university internets. Many other publications from textbooks, journals, magazines and compact disc read only memory (CD-ROM) and libraries were studied and analysis of the same done (Jansen and Vithal, 2005).

3.1.7 Reliability of research instruments

To ensure instruments collected the rightful data, questionnaires were scrutinized by experts, only experts with relevant data were interviewed and relevant documents were selectively studied. Items from existing surveys about e-learning were used. A pretest was carried out among respondents in Makerere University items were adjusted (Appendices B and C). Most items on the instruments were however chosen from those instruments used in earlier related studies by other researchers and were not subjected to any test.

3.1.8 Validity of the research instruments

Most items were from instruments used in the earlier (but related studies: Omwenga, 2004, Van Der Merwe 2004) but some items in the instrument (Appendices B and C) were subjected to content validity by the supervisors. The supervisors validated the item appropriateness and generalization to the study. The content validity index (CVI) of the items was computed.

$$\text{CVI} = \frac{\text{Number of items rated as relevant}}{\text{Total number of items on the instrument}}$$

Using the above formula, the index was calculated and was found to be 0.6; and according to Amin (2005), the instruments (Appendices B and C) were rated as relevant. To ensure content validity, the objectives of the study (chapter one) were examined by the supervisors and judged as suitable, correct and appropriate. Adjustments were made to those that needed improvement on clarity and comprehensiveness to cover relevant information.

3.1.9 Research procedure

The researcher obtained an introduction letters from the Dean of School of Education (Appendix I), the Head of Department of Higher Education (Appendix H), and the Director of Directorate for Information and Communication Technology Support (DICTS) of Makerere University (Appendix F). Permission and appointment from the appropriate administrators of Dar es Salaam and Nairobi Universities (Appendices D and E) was sought to observe, interview and hold group discussions with respondents in the data collection process.

3.1.10 Data analysis techniques

After collecting data, it was organized into a meaningful and logical order to make it easy to interpret and analyze. All group discussions, interviews, checklists and some of the observed characteristics were edited to eliminate ambiguity and errors like none response, completeness, eligibility and to confirm that answers were accurate and consistent. Some of the responses

that were incomplete were completed, those with no responses at all separated, and only entirely complete responses used. Some of the answers from checklists and focus group discussions were classified and reduced into statistical form for interpretation using a computer application package called statistical package for social scientists (SPSS). Data, entered into this application, produced frequencies counts, tables, pictorial graphs, presented.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1.0 Introduction

In order to determine the components, utilization and attitude towards e-learning in the selected universities, this chapter reports on the following three research questions as outlined in chapter one. Some subsidiary questions and themes come directly from the main questions. For easy presentation, some of the subsidiary questions themes are used in presentation. The main questions are:

- a. What are the components of e-learning in Makerere, Dar es Salaam and Nairobi Universities?
- b. How are the components of e-learning utilized in instruction and learning in Dar es Salaam University, Nairobi University and Makerere University?
- c. What is the attitude to e-learning as a teaching and learning resource in Nairobi University, Dar es Salaam University and Makerere University?

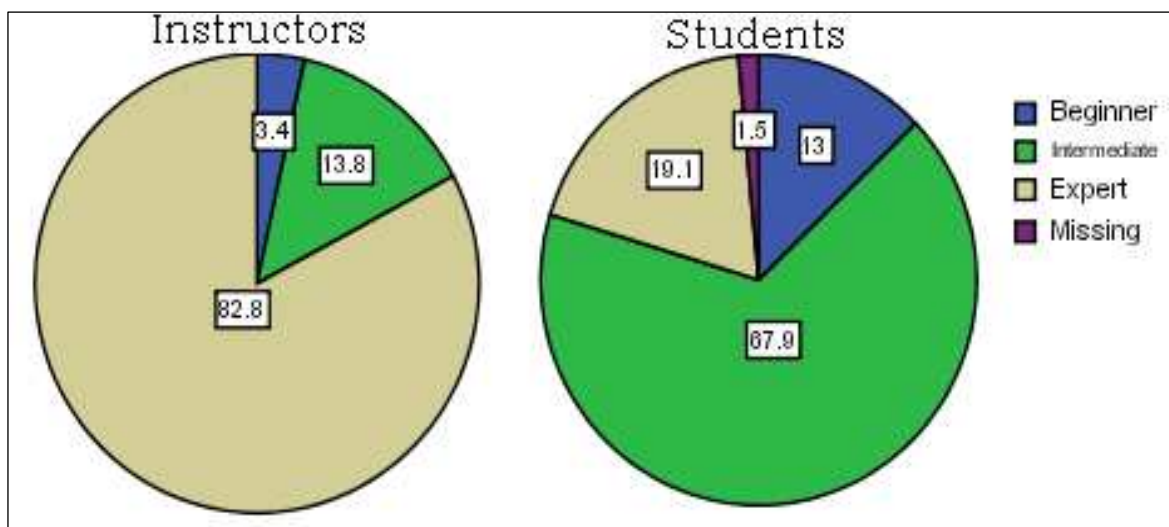
Of the expected sample of 180 respondents, 162 (90%) were attained which was a representative and good attainment of the target.

4.2.0 Research Question 1: What are the components of e-learning environment in Makerere, Nairobi and Dar es salaam universities?

4.2.1 Computers and computer history of students and lecturers

How long one has used a computer is what I call computing history, which has an effect on the engagement in, and practice of e-learning. The history of ones' computing skill was determined by how long they claimed to have used computers and how they rated their computer skills. Most instructors and students in all the three universities had a strong history of computer use. Instructors (83%) who had taught at university for over five years had used computers in instruction for more than three years. The use of computers was mostly for personal work not necessarily pedagogic, as a policy, governing their use in instruction is not fully implemented.

Figure 9: Computer literacy ratings by instructors and students



The use of computers for pedagogic issues was mostly unconsciously done. Students rated their computer history high with 68% claiming, they had used computers for more than an average of three years. One can base on the

numbers to assert that there was generally a strong basis history of computing in the universities of Makerere, Dar es Salaam and Nairobi. The number of years that respondents claimed in computer usage is considerable. About computing history, an instructor from Makerere University observed:

“... I have been using computers for the last 10 years. By the way, every day I use a computer, I never remain the same as I learn something new.”

A Student expressed this opinion about computing history with this statement:

“I have used computers before. I used computers in my high school and so I do not find a big problem using them in e-learning. Had I not used computers in secondary school, I could not have known where to start but am aware of my colleagues who have not used them before but use them now...”

As regards to computer history, respondents from the University of Nairobi rated themselves with the longest history. This is not surprise because Kenya has a well-developed national curriculum in computer studies at secondary school so those who come through the Kenyan secondary schools are expected to be conversant with computers. In Makerere nonetheless, instructors has a long history but the history only dates from when they started lecturing at university.

Some courses in the University of Dar es Salaam are delivered purely through e-learning mode like a certificate in computer science and postgraduate

diploma in education. Interaction with students pursuing such courses led to the observation that without computing history, engaging in e-learning would be hard for them, nevertheless, they would have started the hard way.

Asked to rate their computer skills, 72% of the instructors rated their skill as experts while 19% of the students rated themselves as experts too. The student expert numbers are low but encouraging because they indicate a good start. Additionally, 70% of the students rated themselves as having intermediate skills. Computing is taught in schools so students rating themselves these high is not very surprising. At the University of Nairobi, instructors and students rated themselves highest compared to Makerere respondents in computer literacy. It should be noted however, that rating computer literacy was a way respondents perceived their own personal skills. Also notable is that the Dar es Salaam, Nairobi and Makerere universities do not teach students and instructor basic computing skills as a course unit or if it is done, it is on a very informal basis without standard curriculum to be followed, measure or test of literacy.

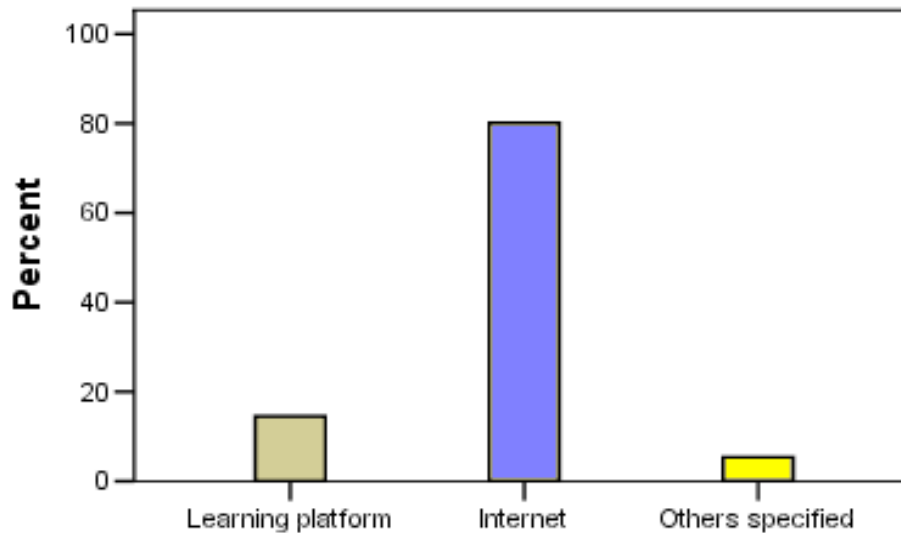
Table 5: How instructors and students rated computer literacy

Category	Instructors		Students	
	Frequency	Percent (%)	Frequency	Percent (%)
Beginners	3	9	17	12
Intermediate	5	14	89	61
Expert	21	60	25	12
Missing	6	17	14	10
Total	35	100	145	100.0

4.2.2 Use of computer as multimedia tool applications in e-learning

Computer literacy involves the use and manipulation of computer applications. The longer the period of engagement in e-learning, the more perfect one becomes in its use. Users were required to rank what they mostly use when they get access to a computer. The options were internet, a learning platform, or any other. The following graph represents their choice.

Figure 10: What students commonly use if they have access to computers

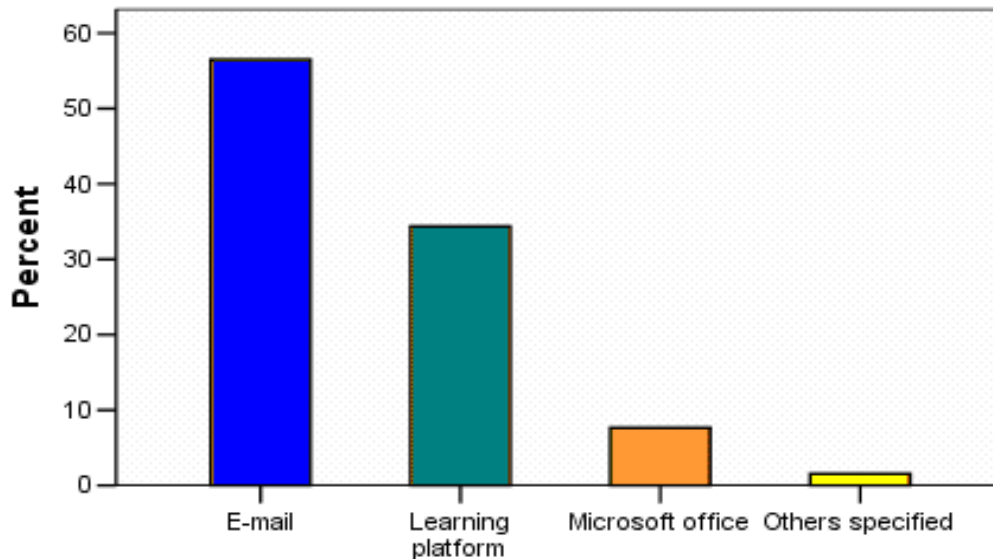


Universities have computer application software that instructors and students use. Every university had Microsoft Office™ applications. Other applications that were available in all the universities included Macromedia packages like Flash™, and Dream Weaver™. Other applications are specialized based on the needs of a particular university and learning group. Users were not comfortable with applications like Visual Basic because they said it requires high programming. Though users with a purely computer science background were very comfortable with such applications. Both University of Dar es

Salaam and Makerere University run a Windows operating system, whereas at the University of Nairobi, most computers had a Linux system running.

Application software in itself offers many learning opportunities by the way they are manipulated to produce desired outcomes. The software application provides an opportunity for design and development of instructional materials. In the same way, students use the software to learn interactively using the designed application software and research using search engines and all users had used one or more of the applications. The use of application software by students ranges from production of project work, to answering quizzes electronically among others. Instructors and students were required to rate the use of these application software. Most of the users (67%) rated themselves high on the use of e-mail and Microsoft Office™ applications whenever they have access to a computer and the use of Macromedia packages, Flash™, and Dream Weaver™ in design of e-content. While Dream Weaver™ was popular at the University of Nairobi, Flash was popular at the University of Dar es Salaam. At Makerere, most of the e-content was designed in Microsoft Office™ application.

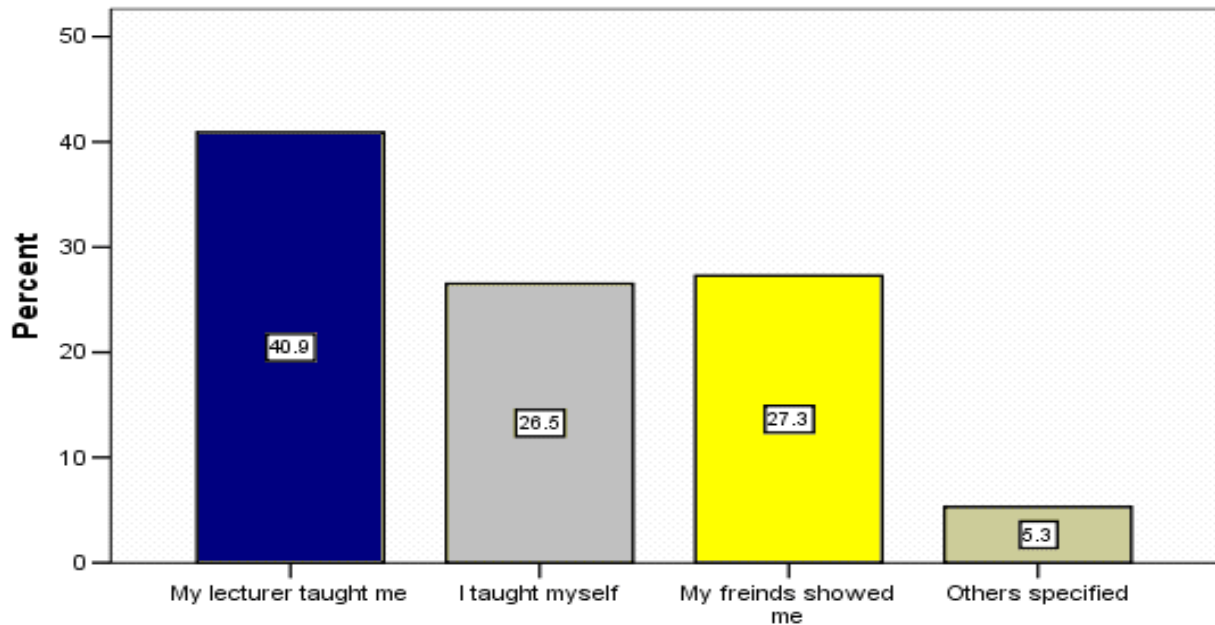
Figure 11: Frequency of use of specified computer applications in universities by students



4.2.3 Learning to participate in e-learning and policies

As already mentioned, universities do not teach basic computing skills to students as formal courses. There are however, generally induction courses in e-learning in some of the faculties in the selected universities. Training courses available are for specific aspects in e-learning like design of content for instructors and access to content and learning for students and not general operation of e-learning. These courses are limited. Some instructors and students make their way into e-learning by self-training in the universities of Dar es Salaam and Makerere. In the University of Nairobi however, there is an intensive campaign for awareness about e-learning and a training curricula in e-content design and development.

Figure 12: Rating how the users learnt how to participate in e-learning



Instructors (69%) affirmed that they started using e-learning by way of an induction course. Though as already stated, the induction courses and workshops have different and particular aspects to address other than getting started. It is also possible for one to get started in e learning without any particular training as 27% of the students admitted and as seen from the comments below from a respondent:

“Anything to do with computers apart from “programming” can be told to me and I find my own detail, I did not therefore think I needed any major training in e-learning.”

In relation to the above another comment runs:

“Do we need to be taught how to start? I heard my colleagues talking about this... the following day; I was trying it out myself, before long I personally did it all.”

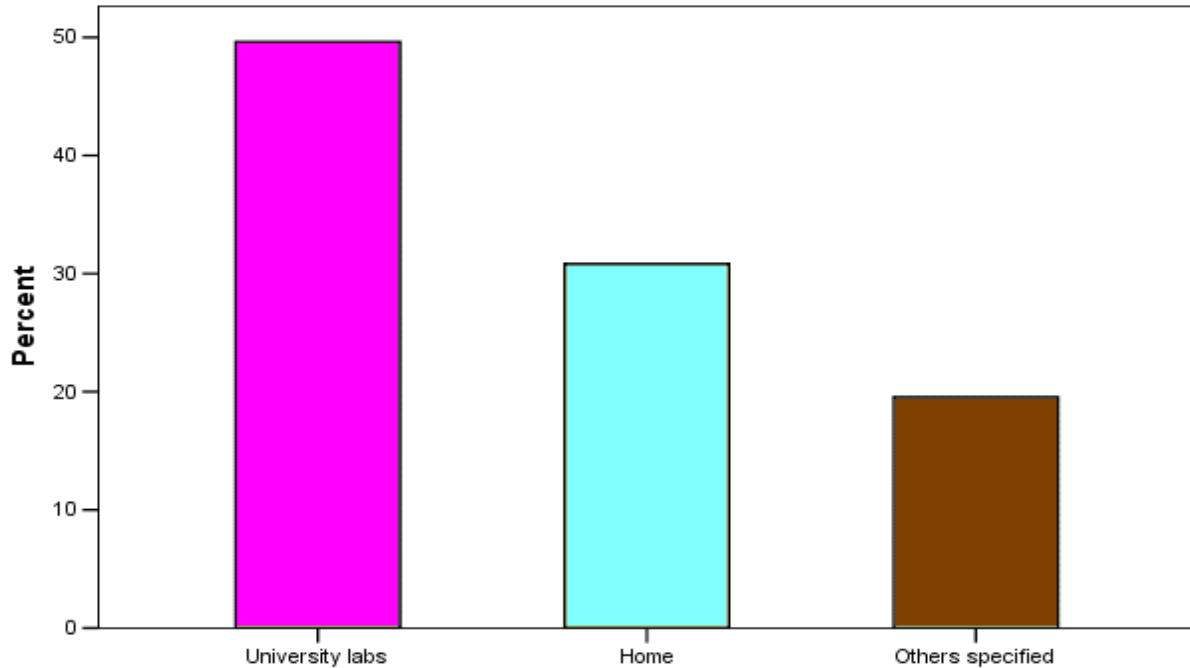
Some induction is given to the students by an instructor and this usually takes the first lecture or few lecture hours. Some students (41%) in all universities affirmed that their instructors give them an induction course in e-learning and the same percentage claimed they had attended formal training and workshops. At the University of Dar es Salaam, some students completed a two-week induction course.

Respondents from Makerere University ranked highest in self-training and induction into getting started in e-learning. The ability to train oneself and others in e-learning implies that e-learning may be quite easy to engage in as a respondent from the University of Dar es Salaam comments:

“I used to find my colleagues in the computer laboratory, I looked at them trying out webCT, I sat down and started out myself, I was not perfect at the beginning but eventually, I became perfect with my friends help.”

Learning to participate in e-learning is easy due to accessibility of the e-learning facilities. Respondents from the selected universities accepted they could access e-learning facilities. The places of accessibility were either university laboratories, homes or others specified. Places of accessibility as rated by respondents is as shown on the graph below.

Figure 13: Places of accessibility to computers rated by both instructors and students



Accessibility at Makerere University was more than other universities because of the various access points. Notably at Makerere University, in addition to established e-learning centers, there are also demarcated internet café points in various faculties and university buildings for accessibility. These give instructors and students ease of accessibility to practice with the resources thus bringing about proficiency in use of e-learning. Nonetheless, the available points are still fewer than the users who demand them. Notably also, 65% of the students rated the internet cafes as the most popular in accessibility to e-learning facilities. The fewer number of access points and computers limits accessibility.

4.2.4 E-learning and online platforms and the learning management system

The need to ease accessibility to learning content and research data is possible through the learning management system (LMS). University of Nairobi, Makerere University and the University of Dar es Salaam have e-learning platforms, with Makerere having Blackboard™ (BB) and Knowledge environment for web based learning (Kewl), Nairobi with Wedusoft and Dar es Salaam with Blackboard™ and WebCT™, Makerere with Blackboard™ and Kewl™ and Nairobi with Wedusoft™. Students who take courses from the University of Western Cape but are based at Dar es Salaam use WebCT™ in the University of Dar es Salaam. Learning platforms are part of university intranets. Among all e-learning platforms, Blackboard™ is the most popularly used learning management system with 52% of the students from the University of Dar es Salaam and Makerere University using it when engaging in e-learning. This is because blackboard is used in both Makerere and Dar es Salaam universities.

Figure 14: Various Learning platforms in East African Universities

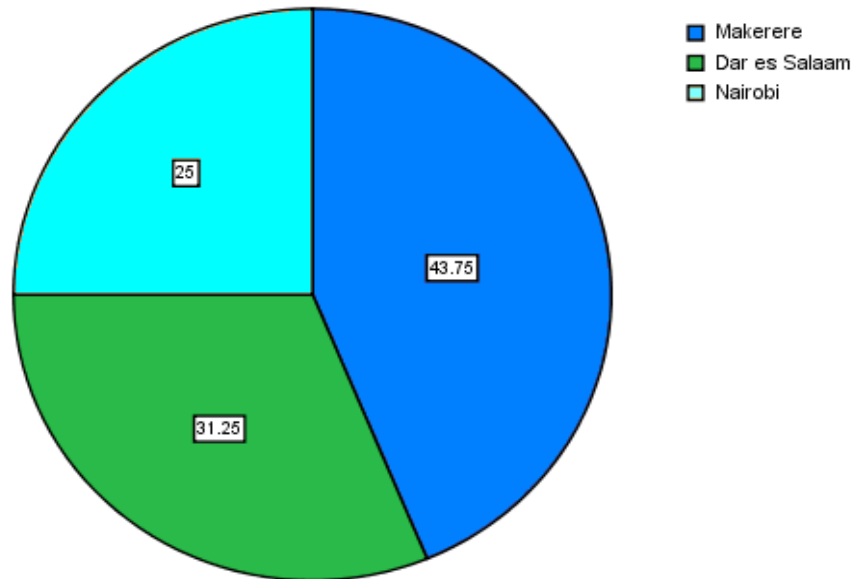


There are various available tools on all the learning platforms in all the selected Universities. These tools included among others, those for instructors to design and upload e-content and those for students to access and manipulate the content to their own understanding. Learning platforms make an all in on e-learning situation as observed by instructors from the three universities. The platforms are interactive that makes a stand alone electronic teaching and learning environment possible in some situations. Though the users appreciate the value of learning management systems in pedagogic situations, there are some challenges as will be presented later. Wedusoft™ as used by the University of Nairobi looked more user friendly as far as accessibility is concerned than the platforms as used at the university of Dar es Salaam and Makerere. To connect to the LMS at the University of Dar es Salaam, one had to go through a number of connections of “*portal addresses*” making it a slow and tedious process.

4.2.5 Internet and Intranet in e learning

In all universities, there is connection to the internet so the students and instructors can access information with ease. Universities have internet connection in offices, computer laboratories and in some halls of residence. Makerere was apparently more connected than the two the universities. In all universities, Internet technology is used to create the intranet, from where information relating to particular and general audiences of a university is posted. Comments about the internet rotated around information variety and communication. It is upon the one looking for information to get that they require otherwise all information is available.

Figure 15: Internet connection in the selected Universities



Makerere university website, had hyperlinks to several faculties and information which when followed leads one to the information required from public announcements, internal communication to assignments. All websites of the selected universities have links to the library for research information. The research links have electronic databases of research information. Respondents were enthusiastic about the operation of such services. Makerere has among them an Electronic Library Information Navigator (ELIN), Dar es Salaam and Nairobi have e-resources on their intranets specifically for research journals. Instructors and students use these services to access information from numerous electronic and non-electronic journals as seen from this comment:

“More than 20,000 electronic scientific journals can be consulted on each connected computer in this university; I have millions of literature piece related to my research, moreover in full text and details.”

In **summary** of the presentation of finding on this objective, the following issues are salient

- Computer usage and computing history of students and instructors in all the three institutions is average.
- Computer literacy is high, with the highest literacy noted at the university of Nairobi
- There is use of various computer applications in the design of e-content with macromedia™ and Microsoft Office™ often used in all the institutions.
- There are few courses as induction into e-learning for students in all the universities. For instructors, there are several induction and refresher courses in e-learning. Sometimes, it is easy for both students and instructors to find their own way into e-learning.
- E-learning platforms exist in all the universities with the Kewl and BB for Makerere, BB™ and WebCT™ for Dar es Salaam and Wedusoft™ for Nairobi with the internet as an open source in the institutions.
- Internet connection exists with the intranets though the access points and facilities are still inadequate.

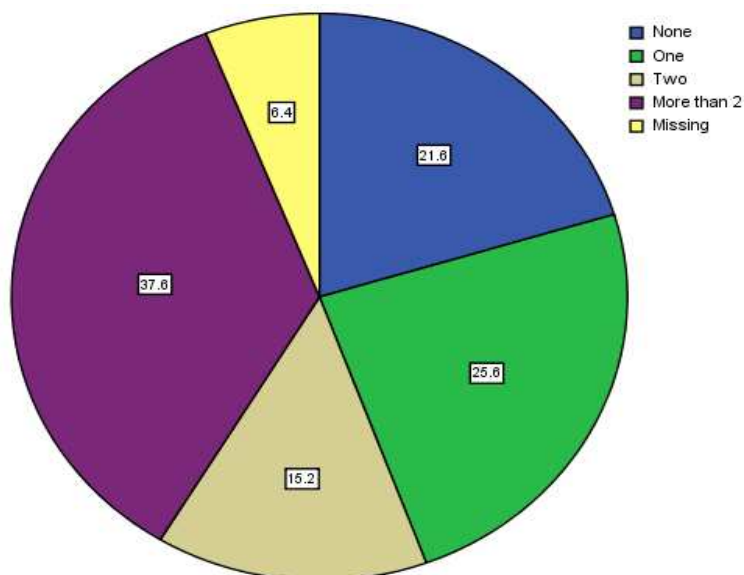
4.3.0 Research Question 2: How are the components of e-learning utilized in instruction and learning in Dar es salaam, Makerere and Nairobi universities?

4.3.1 Design of e-content modules in e-learning

The first issue considered here was to ask the students the number of courses they had on the learning platform in their university.

The number of courses more than two is the majority according to the above pie chart. Users were required to say if they would like more courses than the number, they had stated to be included on the platform. Most said yes with some who were unsure and some saying no. It should be stated that some users did not have courses on the platforms.

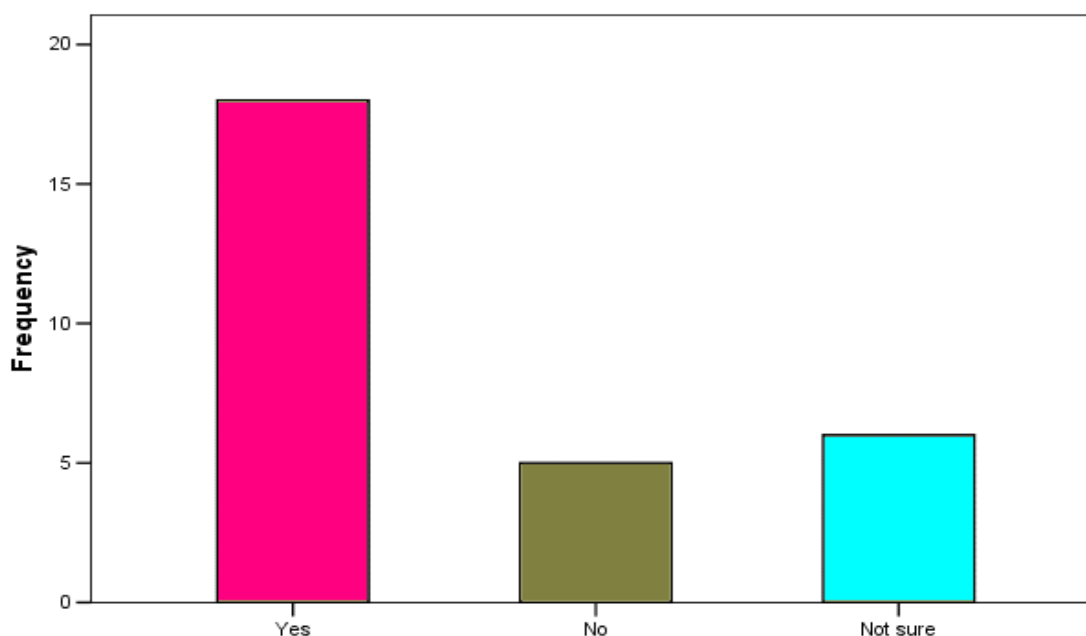
Figure 16: Number of courses students had on learning platforms



E-learning begins and has a focus on appropriate design of e-content materials. The ability to design e-content or modules is a skill that one acquires and improves on gradually. Universities have held workshops in e-learning. About 69% of the instructors had attended workshops in e-learning. Relating to the potential of the workshops in e-learning, respondents observed that without workshops, it would be difficult for them to produce any substantial work in e-learning. Design of e-content is easier depending on the software being used to design and the team working relationship of the designer and other members. Most of the instructional material seen that were

locally designed for local consumption had hyperlinks to cater for interactivity in their use.

Figure 17: Instructors' reaction to their ability to design e-content



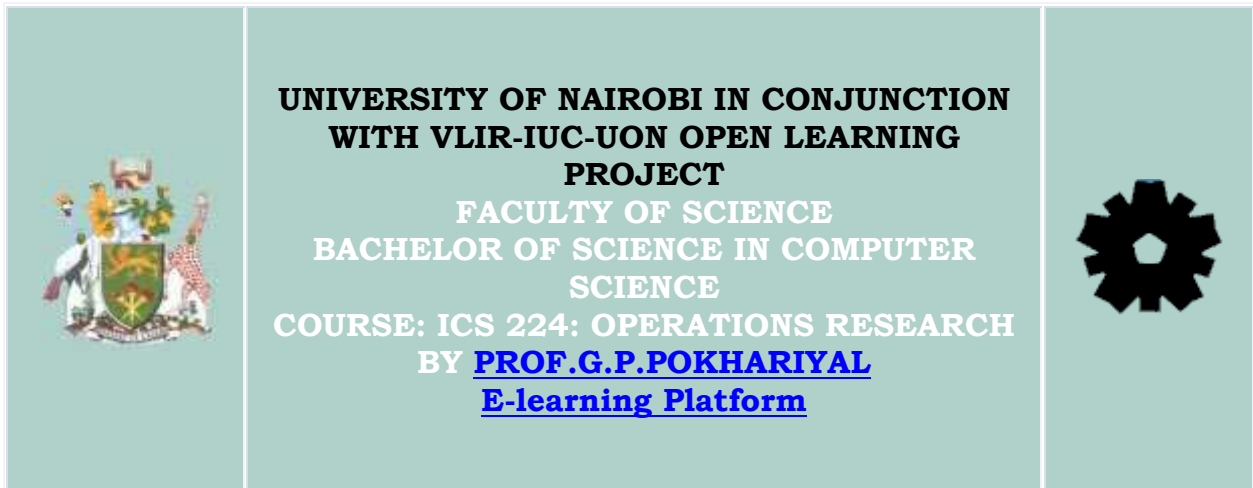
To design a module requires one to have understanding of basic principles of instructional design as commented by one instructor:

“E-content development is not an easy process and one can not take it for granted- each day is a day of learning whether it is self learning or someone else teaching me, I am now able to aptly design my e-content.”

Most instructors are not teachers by profession so the component of instructional design instill in them basic pedagogic skills. At Nairobi, Dar es Salaam and Makerere Universities, instructors have pedagogic skills workshops. The basis of instructional design is simple, clear and comprehensive module. Instructors admitted having acquired the ability to design e-content through training, such content produced at the University of

Nairobi has a patent header as in figure 18. About 59% of the instructors admitted that there were locally designed modules (some running on CDs) besides the internet materials. Once an instructor at the University of Nairobi designs a course, it becomes university material and is patented as such.

Figure 18: A patent header for a University of Nairobi e-learning module



Source: Paul Wando: University of Nairobi e-learning technologist 2006

Design of e-content is an aspect that requires more time on the instructor's part. To produce a module, an instructor compiles the required materials, tests them for consistency, pilots them uploads them to full use with constant adjustment depending on the situation. The following comments illustrate the above phenomenon:

“...need enough time to get this module together. It takes about three weeks of preparation for an e- class that I take ten minutes if preparations in a face-to-face lecture.... I have not adjusted my module since I made them, mostly because I do not have the time to do this.”

At the University of Nairobi, comparing well with the universities of Dar es Salaam and Makerere, a strategy to support instructors in instructional (e-content) design and development, is taking instructors to retreat centers for weeks and giving them enough time to concentrate on the design with the support of e-learning technologists and the instructors are paid money for any e-content designed.

Makerere University took a lion's share of the e-content courses listed on learning platforms. A survey on the university intranets showed that 130 courses were listed under various faculties at Makerere; University of Nairobi had 46 (this number excluded those courses available on CDs but not uploaded on an e-learning platform. and University of Dar es Salaam with 33 courses. Courses at Nairobi were generally more detailed compared to courses in other universities. Makerere and Dar es Salaam had parts of courses in electronic formats.

Table 6: Numbers of courses found on university e-learning platforms

University	MAK	UONBI	UDSM
Number of courses on the platform	130	46	33

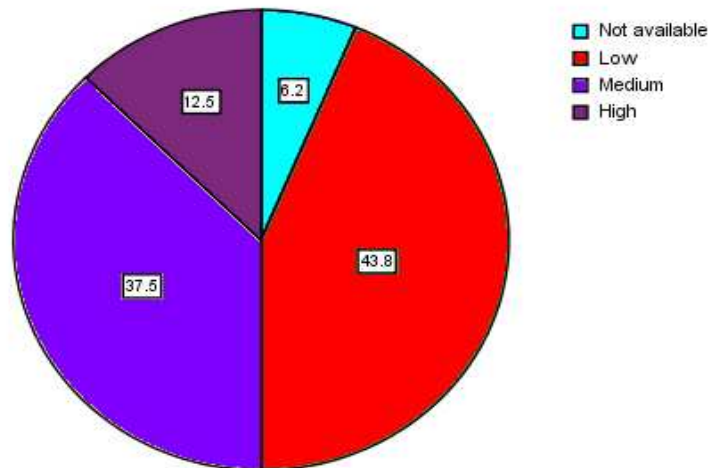
Source: Dar es Salaam, Makerere and Nairobi Universities websites (2006)

4.3.2 E-content in e-learning / interactive content

There is the design of static files in Microsoft Word™, PowerPoint™ or PDF files as in hand out and lecture notes giving as 66% of the respondents said they do. The design of e-content in the beginning stage takes this format. There is however a move by instructors (14%) to design more interactive e-

content in form of simulations. This was evidenced at Makerere medical school (Medical illustrations department). Other simulations were at the departments of Geology at University of Dar es Salaam. Though the quality of simulation was low, it is commendable since this is the beginning stage of e-learning. An opinion held about the type of content on the e-learning platform was that simulations are complicated and required experts to produce them. Simulations are imitations of some real thing, state of affair or process.

Figure 19: Quality of e-content rated in e-learning

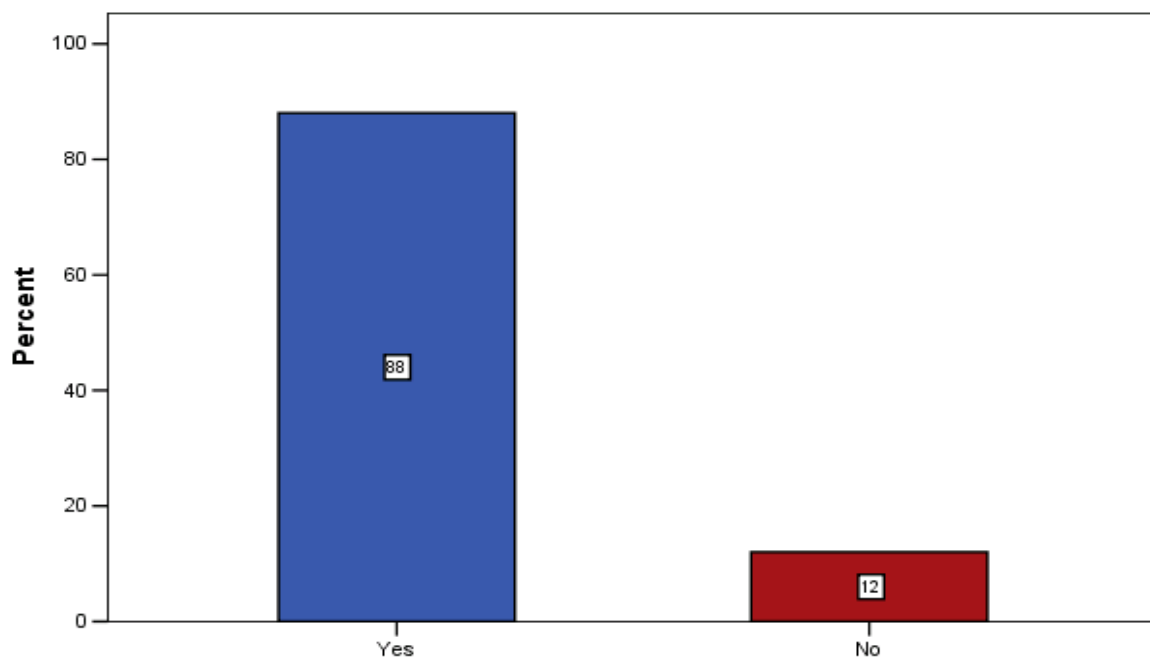


4.3.3 Multimedia design in e-learning

Designing multimedia content is made easy by the ability of modern computers to produce quality multimedia content according to respondents. All universities had modern computer systems that can ably produce multimedia instructional material (Audio and video learning materials development). At the University of Nairobi, some courses were multimedia where some instructors had integrated video and hypermedia in a single module. Other multimedia teaching materials were at the Faculty of Agriculture in Makerere University. It was noted that multimedia production

involved the integration of audio, video and text into one module thus multimedia makes e-content more interactive. About 88% of the instructors accepted that e-learning has the capacity to include interactive activities like multimedia. There was little evidence of multimedia e-content materials at the University of Dar es salaam, though users were aware that multimedia could be easily presented in e-learning.

Figure 20: Ability to include multimedia in e-content



4.3.4 Support and administration in e-learning

In all the selected universities, there are management structures for e-learning however, they are not clearly structured. There was a department or faculty that was in charge of e-learning that is faculty of informatics and virtual education at the University of Dar es Salaam, ICT center at the University of Nairobi and Directorate for Information and Communication Technology Support (DICTS) at Makerere University though e-learning is as a separate

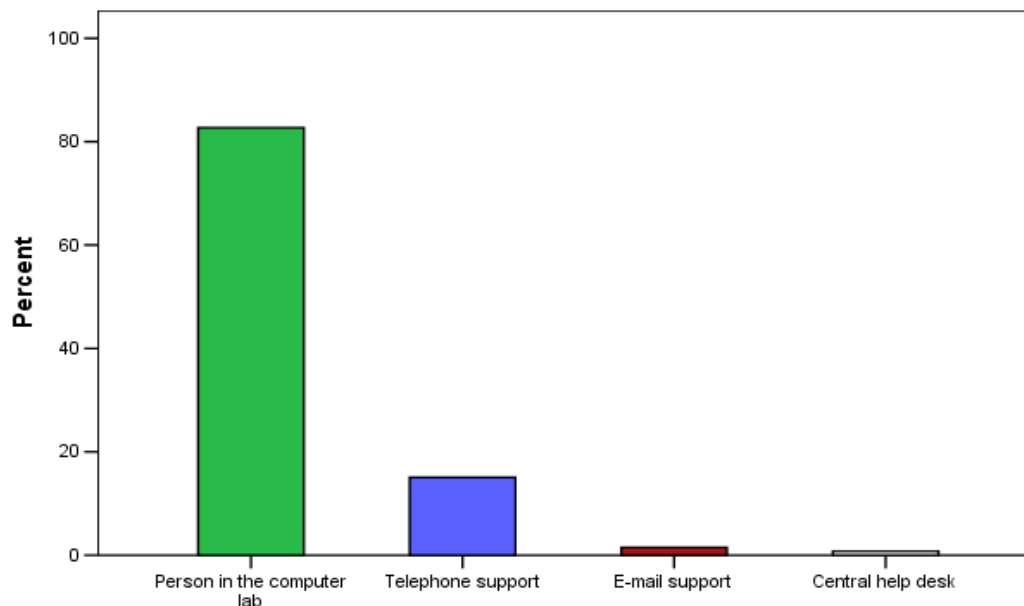
structure is evolving. The e-learning management structures in all universities were all seemingly at the evolving stages.

The University of Nairobi has e-learning technologist team headed by an administrator, who helps in the design, uploading and trouble shooting of e-learning processes. The strategy that Nairobi has taken is using e-learning technologists who work in collaboration with the instructors to design, produce and develop e-content materials. The instructor may not be conversant with design issues so e-learning technologists are on ground to lend a hand put the content in an electronic format and upload it. At the University of Dar es Salaam computing centre, e-learning also has a technology team. The technology team like at Nairobi University is responsible for production and support in e-learning activities. This strategy contrasts with the strategy in Makerere University where an independent e-learning department was being formulated by the time of this research.

Being an innovation, with many huddles to come over, support is necessary for the smooth practice of e-learning. In the cases where the whole course unit has been developed in an electronic form, there is remote or minimal face-to-face interaction with the instructors, what therefore happens when there is a problem in case of machine failure and one needs trouble shoot? Notably at the University of Nairobi, there is a close link between the open learning project, open and distance e-learning center, school of computing and

informatics and the faculty of external studies in the support and management of e-learning.

Figure 21: Reaction to preferred support in e-learning by students



Various support systems discussed included face-to-face support, e-mail support, telephone support and a central help desk. Among those suggested support systems, the one mostly preferred is face-to-face support system (83% of the students approved this). The preference was expressed in such statements as:

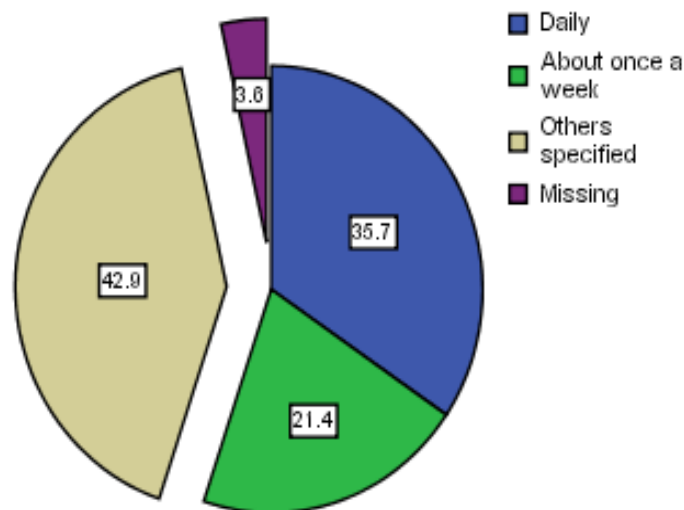
“I need support from a human being, I can’t use a computer that has hanged to send an e-mail, and how do you use it to send an e-mail to ask for support anyway? This is electronic learning, but I would not like electronic help, I need physical people to help me in a computer environment. I wish you were here to help us always.”

Though all the institutions have a central help desk, students preferred other support.

4.3.5 Communication in e-learning

Effective communication is a very vital aspect of research, learning and instruction. Communication should also be timely and on these issues, debates rotated. There is a low level of communication in all the selected universities as only 35% of the instructors communicated daily and 21% communicate once a week.

Figure 22: Frequency of communication by instructors in e-learning



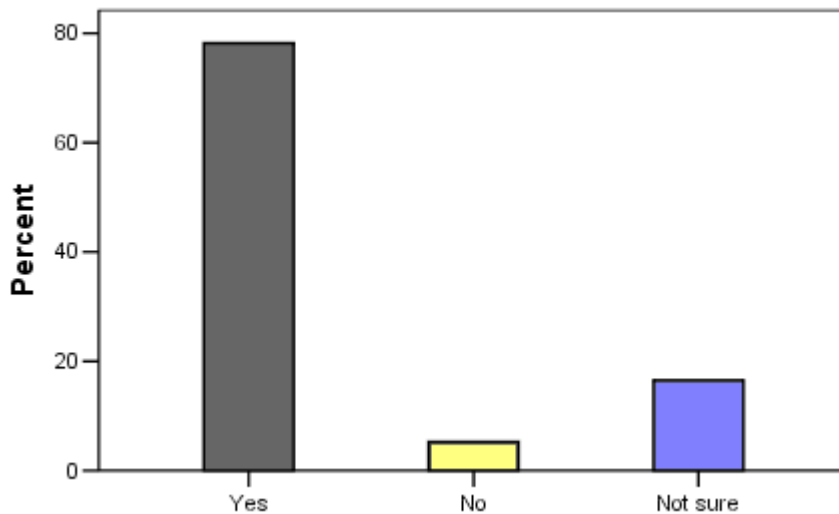
Many tools including e-mail, discussion boards and chat rooms among them give the provision for the use of communication tools on e-learning platforms and internet. About 56% of the students nonetheless used e-mail on a daily basis. There is not much skill required to operate the communication tools though one needs to be cautious of time and the response of the recipient and sticking to the topic being communicated. A general comment made about communication in e-learning from the universities of Nairobi and Dar es Salaam runs thus:

“Communication is a vital instrument in e-learning but some of us abuse it by not communicating relevant issues whether on the platform or the internet.”

Instructors however, said they communicate with their learners only on special occasions. This is an inconsistency. Learners complained about communication mishaps, saying instructors do not provide timely replies to their queries thus saying:

“Whenever, I send a query to the instructor, I do not get my answer on time, sometimes the answers come when they are already expired. I cannot continue with the module until I get a clarification whether am doing well or not.”

An instructor however, was overwhelmed with students' rate of participation in e-learning, observing that e-learning has just started yet every day he finds over a dozen questions in the mailbox each requiring a personal response yet time is not in my favor. This is evidence that learners are actively involved in e-learning as shown by the eagerness to participate in e-learning. Over 78% of the student said they understood the practice of e-learning so the high frequency in communication is not surprising.

Figure 23: Understanding e-learning by students

Communication changes the role of an instructor to that of a guider of learning situations and not a teacher. Instructors were required to explain their role in e-learning as compared to the time when e-learning was not in the universities. They mostly agreed that their role had changed because instead of having most time in the lecture room, they concentrate on the design of e-content materials and answering learners questions from remote access areas with little face-to-face interaction with such opinion as:

“E-learning is a transformational; I do not teach as I do verbally, I am instead an inspirer into ideas that are worked on by the students from remote.”

Learners had the opinion that the position of their instructor has changed, claiming that their instructors were mostly placed aside in the instructional environment; they can only be consulted in the-learning process.

In **summary** of the finding about objective two, the following issues are distinct:

- Instructors to design e-content materials utilize the components of e-learning existent in the universities in e-learning. The design skills are provided in the several e-learning workshops. At the university of Nairobi, all courses on the learning platform are a property of the University
- Instructors need enough time to concentrate on the design of e-content though this time is hard to be availed to them by the institutions.
- Makerere University learning platforms had more e-content courses than other institutions though the quality of these courses was low with less or no interactivity in most of them being lecture notes and PowerPoint slide shows.
- Though the institutions evidently had e-learning equipment that could produce quality multimedia e-content, multimedia content was not common, because they require more time to make.
- Effective administration and support makes smooth e-learning utilization.
- E-learning takes places through effective communication and its structures though instructors did not report effective communication and its use in e-learning. Students on the other hand were more enthusiastic in communication.

4.4.0 Research Question 3: What is the attitude towards e-learning as a teaching and learning resource in Nairobi, Dar es salaam and Makerere universities?

4.4.1 Attitude towards general use of e-learning

E-learning, though a new innovation is increasingly gaining the number of users day by day. Users of e-learning have perceptions and beliefs about e-learning, some are legitimate yet others are sometimes baseless. Because of varying perception, users have formulated varying attitude towards the practice of e-learning.

Instructors and students seemed to present the attitude that e-learning *versus* face-to-face instruction. It was found out that out that the instructors saw e-learning replacing face-to-face instruction as illustrated by the statement below:

“I do not do face-to-face instruction anymore, and gradually I would wish to do away with chalk if it is possible can be able to engage in e-learning.”

Students had a mild attitude towards e-learning, though they showed the need for less face-to-face lectures in amidst e-learning. Sessions of e-learning and face-to-face combine to bring about blended learning which learners said benefit. Reports showed that some situations, students prefer e-learning to face-to-face modes of delivery due to such factors as flexibility and uncommitted instructors.

Some attitude formulated towards e-learning is because some learners use it as an excuse to dodge face-to-face sessions. What is presented in face-to-face

session can be accessed through the e-learning platform at another time said a student. Instructors complained about e-learning “*robbing*” them of students and rendering them jobless. The availability of content all the time was seen as beneficial but causes “*cutting*” lectures. An instructor made the following observation:

“My students no longer attend face-to-face sessions on the pretext that they can access the same content on a learning platform yet there are certain things I explain in face-to-face that I cannot do in the e-content.”

This was mostly the case at Makerere University but was never the case in the University of Dar es Salaam and University of Nairobi.

Most instructors and students believe in e-learning as a mode of instruction and delivery of content to an audience. The demand on the part of the instructor to pass on content in the most appropriate way is an enormous task calling for commitment and time. The demand by the student to get *ready-made* information or at least processed data preoccupies the mind of the instructor. However, learners also have the perception that they need more time to use e-learning materials. This result into the attitude that e-learning is demanding, as noted from the report in an interview at the University of Dar es Salaam: I have very little time for e-learning and its demands. Had I been with enough time, I would be trying out a few things here and there, but it is too late now. This was a similar situation at the University of Nairobi and Dar es Salaam.

The potential to include multimedia and hypermedia or plainly stated, more interactive teaching and learning materials also bring many other attitudes to e-learning. Instructors have assumed an approach that e-learning can be a do it all approach and left the administration and management of teaching and learning process to e-learning. Learners have the attitude that e-learning is one of the best modes of instruction because of multimedia approach yet instructors see the challenge in collection and compilation of e-learning materials.

Table 7: Reaction to potential to include multimedia content in e-learning by instructors

Response	Frequency	Percent(%)
Yes	25	72
No	6	17
Missing	4	11
Total	35	100

Attitude to e-learning is also determined by the kind of support in an e-learning environment. Most Computer user area attendants in Makerere are not cooperative with students though this was not the case in other universities. This led to such comments as this from the School of Education Makerere University:

“Sometimes I want to look for information on the internet, am not allowed in the lab, other times I want to type my assignments, am not allowed, they should do away with this computers in this place if that is the case.”

4.4.2 Motivational factors in the use of e-learning

The use of e-learning bases on motivation, both intrinsic and extrinsic. Motivation comes from the institution and the individual. Institutional motivation to use e-learning includes provision of up-to-date environments, time off to concentrate on the design of e-content and monetary motivators. Motivation is also a basis for attitude towards e-learning. Instructors and students engage in e-learning because of motivation by individual factors one is perceived benefit and advantage in comparison with face-to-face instruction and learning.

In all the three universities (as seen from the table 8) motivation ranks high as a major factor of engagement in e-learning. Other factors are: a belief and conviction that e-learning delivers learning equally as good as face-to-face instruction, availability of content twenty four hours, seven days a week and the ability to enable a learner to get through content at their own pace, including diversity and variety of content available to a learner. This comment is about motivation to use e-learning:

“I upload content on the learning platform, student are able to work through it all by themselves in a very constructive way, they get tested and at the end of all they present their work with confidence, am just motivated to do exactly that...”

Responses from all the three universities harmonized very well from both students and instructors.

The above opinion from an instructor compares well with that from a student below:

“I learn well, I set my own standards, my own timetable, I get to the detailed learning materials just at the click away, all my learning requirements are satisfied in a single session, I would not know any other reason why I engage in e-learning.”

Extrinsic motivational factors are in place to promote e-learning usage. This a motivator that is unique at the university of Nairobi, where instructors are paid money to transform e-content into electronic formats and at times taken for retreats to review and update their e-content. This motivator contrasts with the Makerere and Dar es Salaam, which do not pay their instructors. Overall, however, extrinsic motivators seemed limited in their motivation capabilities; nevertheless, it works on a limited scale at the University of Nairobi as compared to the universities of Dar es Salaam and Makerere.

Table 8: Motivational factors in the use of e-learning by instructors

Factor	Increase contact with my students	Increase student-student contact	Encourage active e-learning	Prompt feedback to students	Others specified
Applicable	65	83	89	92	50
Not Applicable	35	17	11	8	50

Other equally strong motivational factors included increased contact active e-learning and prompt feedback in several cases. Learners observed that they feel motivated by the prompt feedback in self-assessment tests and grades.

The ability for e-learning to present multimedia content in one module at the University of Nairobi was seen with text, audio and video. A student made this comment about multimedia content modules:

“The blind will hear the audio, the deaf can follow the pictures and text, of course, those with all the senses are more advantaged but everybody is included in a teaching and learning situation, this is the power of e-learning.”

4.4.3 Benefits and advantages of the use of e-learning

Discussions involved details regarding the advantages of e-learning. The advantages of e-learning bases on the kind of module one had on a learning platform. Some of the perceived advantages rated high are access to more advanced content, access to content all the time, increased communication, more interactivity support for communication tools and studying at convenience. The opinion held in the advantages and benefits was positive. The following observation by a respondent illustrates the picture:

“We are talking about the potential of e-learning to improve the teaching and learning situations, we have seen some graduates of e-learning, who prove that they can also be equally as good as other graduates, but we cannot forget the fact that there are some loopholes in e-learning.”

Table 9: Advantages of e-learning as rated by instructors

	Framework for organizing coursework materials	Module security	Communication tools	Others specified
Frequency	22	21	23	1
Missing	3	4	2	24

Benefits of e-learning were that e-learning provides a framework for one to organize teaching and learning. A respondent noted that, in e-learning, the skeleton is provided by templates that they only need to *dress* with the content of the discipline one is dealing with. This is an advantage on the designer of e-content instructors' side.

4.4.4 The challenge of participation in e-learning

It is not always a smooth run in e-learning as there are many challenges. A given perception towards e-learning is determined by challenges, which users have to overcome in the process including insufficient infrastructure, training, inaccessibility to computers, learning platform being difficult to use, little time to design, slow networks, and insufficient support. A student said:

“The internet is very slow, I do not sometimes know what exactly I must do and there is unfriendly staff here, they do not want me here or sometimes they do not want to be asked any question about the use of these machines.”

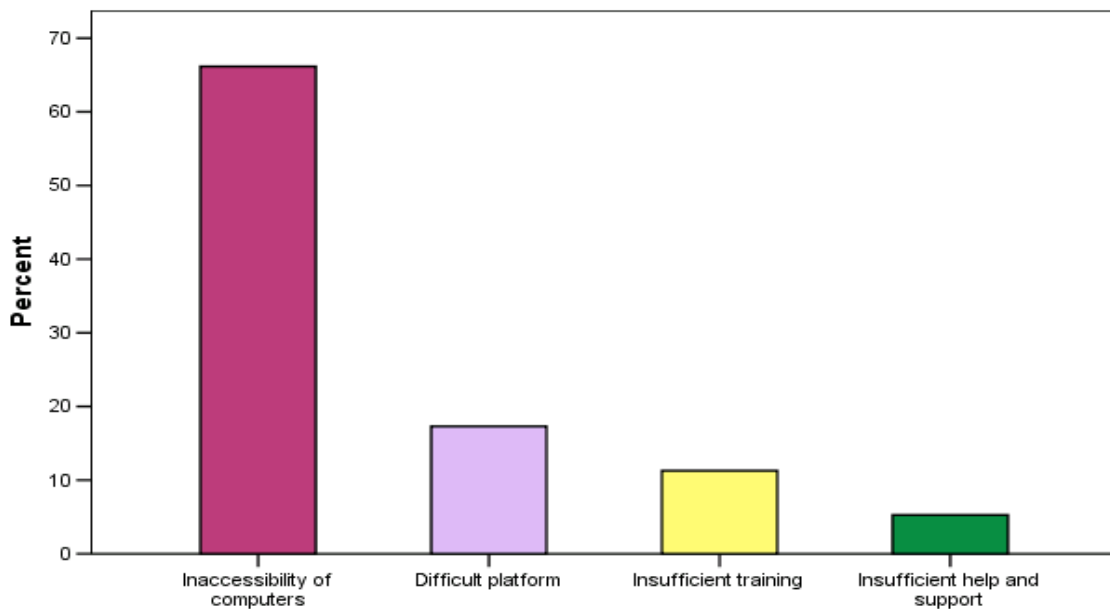
This combined most of the challenges in all the three institutions.

Though many instructors from Makerere University did not agree that e-learning is inflexible, equally many from university of Dar es Salaam agreed that it is inflexible. Interestingly, most instructors from the University of Nairobi did not agree with the claim that e-learning is unsuitable for their course outcomes though some agreed. Inflexibility comes from such incidences as this example. To improve a macromedia flash-designed content one needs the same version of flash used in design yet the versions keep changing. This

is inconveniencing because the institution are forced to have all or keep updating the versions, which is costly.

Two instructors from the University of Nairobi presented the challenge of policy in the university. They argued that the university policy has it that a learner is allowed to sit university examinations after attending lectures for a specified number of hours, how can these hours be determined in e-learning ? This dilemma compares well with the one at Makerere and Dar es Salaam universities. There is no monitoring of attendance in e-learning, as there is no registration of attendance like in normal face-to-face. The policies governing e-learning should be clear on this, they suggested.

Figure 24: Rating the challenges of e-learning by students



E-learning requires some of the course modules redesign to include more interactive content to cater for the diverse learning styles. Less than half of the instructors had redesigned their course modules because they claimed they

were inadequately trained to do so. An experience from the University of Nairobi, one instructor, required to respond to the question of redesigning, revealed that it was only then that the question had been presented that he realized that it was important otherwise he honestly said

“I have not done any redesigning of content in my course; I do not remember training in this since I designed my e-content, to be honest. I see the importance now that you say it.”

Regarding challenges, I observed a scenario in a student’s residential place at the University of Dar es Salaam: there was a computer in the common room where a postgraduate was trying to work. In a short while, he complained that he had lost the document he was working on, other students came to try to rescue his document, unfortunately and they were unable. This time he came with a CD-ROM to save his work. He tried but the computer had no CD-R drive, but he took it for granted that all computers must be able to write on a CD. He cursed the computer and himself for having wasted his time. Such are the challenges are daunting to the user.

One student made a comment:

“This computer does not give me what I want, I go to Google, type in what I want then it brings too many things without the one I specifically need. Besides, I get lost sometimes because of the inconsistent directions on some of my courses.”

These and others in the comments give an insight into the difficulty in the use and operation of e-learning facilities.

4.5.0 General comments about the practice of e-learning by respondents

Instructors and students made several additional comments and recommendations from all the universities. One instructor from Makerere University said:

“E-learning is not about anything else but learning. Important to note is that it is not about machines and networks but about the e-learning potential.”

Another comment from the University of Dar es Salaam

“We are going digital in our teaching and learning, equipments are in place, policies are being formulated and we are working as a team, two courses- certificate in computer science and post graduate diploma in education (PGDE) are already delivered purely by e-learning, I am sure things will be better in e-learning.”

A comment from University of Nairobi was:

“E-learning is not exclusive, it should be used as blended and it is not cheap, it is very expensive in the short run with the struggle to change attitudes in individuals.”

A general comment from a student worth noting is:

“E-learning is quite good to slow learners, faculties should use it to help those students who can't keep pace in lecture room situations, besides giving, those who are very fast learners to also enjoy themselves.”

Other comments included e-learning making instruction enjoyable and reducing on the time of instruction, fewer computers. E-learning they added should be promoted strongly even in rural areas and that it increases technological knowledge of using computers.

In **summary** of the presentation of this objective, the following is noted:

- It is difficult to get a general attitude towards the operation of e-learning in all the three institutions, as it required more time than the researcher had.
- E-learning is viewed as demanding considerable amount of time for one to make an effective contribution or use of it.
- The presence multimedia and interactive content in e-learning sets users to formulate different perception about e-learning. The kind of support and administration in an e-learning environment also gives users a platform for different attitudes.
- There are different motivational factors for engagement in e-learning both intrinsic and extrinsic in all the institutions.
- Users saw many benefits in e-learning including the ability to access advanced content, availability of content all the time and more effective communication.
- Challenges of participation in e-learning exist in all the universities.
- General comments indicated that in e-learning, users go for learning aspects including interactivity in e-content and the potential to improve teaching not technological issues.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1.0 Introduction

The opinions from Makerere University, University of Dar es Salaam and University of Nairobi, presented in chapter four have various implications on the practice and integration of e-learning. The discussion presents a picture of the meaning and implication of the respondents' views and observed situations in all the three universities of Makerere, Dar es Salaam and Nairobi.

5.1.1 Computers and computing history of instructors and students in e-learning

Users have varying history and skill in computer use. The various histories and skills are not surprising because users have diverse backgrounds in the use of e-learning. Opinions of people who have a longer history of computing and a better skill is related to participation in e-learning, it is shown that the longer the history, the better the e-learning practice. Computing history and computer skills affect e-learning practice. This is an ideal, but it should be noted that over 10% of the respondents did not have a long history and high skills in computing but used e-learning. It was not surprising that the University of Nairobi had the best computing history as they have a well-established computer curriculum at secondary school level.

Although the respondents score high on computer literacy, this does not mean that they practice e-learning effectively. Only what can be inferred is that the respondents rate their skill higher. As already mentioned, rating the computer

literacy skills is not based on any standard measure. It is just a way one perceives him or herself. However, perceiving oneself in a positive way is a very important basis on which to judge the ability to participate effectively in an activity.

Much as it is true that history and skill affects practice, it cannot be taken for granted. The history of computing of an individual is simply related to, not an indicator of e-learning practice. It is only true that a good history in computing in all the universities brings about an indicator of e-learning practice; nonetheless, users without a long history also participate in e-learning. Consider the University of Dar es Salaam experience where some courses are delivered entirely by e-learning, yet recruitment to such courses is not based on computer literacy competence and skill. Students recruited in such programs participate effectively in e-learning yet they have little or scanty computing history and skills. It should not be taken for granted that all students and instructors have a good computing history though many confessed this.

Computer skills influence e-learning, students and instructors with such skills were seen to be more comfortable in their participation in e-learning, meaning, those who rated their computer skill high also have high e-learning skills. This was also observed in practice where those learners with a good history of computing were more proficient than their colleagues who had rated themselves low.

5.1.2 Use of computer multimedia applications in e-learning

There were computers and networks, connections to the internet, e-learning platforms and basic software and hardware application for use in all the three institutions. It is indicated that facilities for the practice of e-learning are in place. For anything to be used, it must be in place first. The year 2000 in the universities of Nairobi, Makerere and Dar es Salaam saw the swift extension of networks to places where they were not and instructors and students make good use of it. Instructors use the facilities to search for, compile and design learning software, learners use the same soft and hard ware to engage in learning and search for literature to use in their research projects; as Jonassen (2001) emphasized the use of computers in this way as mind tools. To be able to use the soft and hardware appropriately, there should be the required skill, which most universities are trying to avail to e-learning participants. The existence of such software is a sign that e-learning is taking shape. The existence of networks and computers should not be based on to conclude that there is e-learning effectiveness in the institutions as many other factors like skills and the appropriate software are important.

It should however, be noted that some software and hardware considered basic lacked in several faculties of the selected institutions, apart from Microsoft Office™ application, which was universally available. Though the variation of the distribution of software and hardware depends on the needs of a faculty, department or university there is software that cuts across. Nevertheless, e-learning is not uniform in practice at every university and is

never meant to be uniform; the diverse requirements make the practice vary thus the variation in both soft and hardware needs. It is worth noting that connections to the internet, which is one of the major indicators of e-learning in an institution, is not fully implemented in every sector especially, the halls of residence. Alessi and Trollip (2002) precisely hint that the internet will transform many activities including teaching and learning. This makes e-learning to manifest and be limited to computer laboratories and offices in the university. Learning on the internet conforms to the constructivist approach to instruction (Jonassen, 2001) so the limit to places is not an ideal practice.

E-learning started in these universities in the year 2000 and it is therefore expected that most respondents only started using computers in an educational sense two years after that in 2002 as the beginning two years were for training and awareness about the integration of technology in teaching and learning. Interestingly however, respondents rated themselves as having used computers for more than three years (on average) indicating that the users were very eager to use the facility thus they immediately begun using the service as soon as it came in place yet others had access to computers at home before. The use of computers in e-learning, though, should be governed by policy, which was only being drafted at the University of Dar es Salaam. A confession made by some instructors at Makerere shows how eager they were to use e-learning facilities. Rolling out the internet to every office was in 2002, before they brought a computer for in this office: I had already bought one and

gone a long way in using it to do some research since I was connected. It is not surprising therefore, that since the beginning of e-learning, there has been a sharp rise in the number of users year by year. The number will increase provided the facilities are also increased. The existing facilities indicate a good start into e-learning but they can not be said as enough.

5.1.3 Learning to participate in e-learning and policies

Workshops, training policy guidelines and self-training are the some of the entry points into e-learning. E-learning existed before but had no policies to govern its practice. The issue of policy as noted in the previous chapter is a great challenge as the policies in universities needs to be amended to accommodate e-learning, anyhow universities have drafted and formulated the policies to govern e-learning. Drafts of policies are an indicator into progress in e-learning. Based on policies e-learning participants get to know their role, responsibility and procedure in the practice. This is because the issue of harmonization of policies ranged high on the users views about e-learning.

The indicators of e-learning clearly manifest in the selected institutions. The existence of the e-learning environment is designed in way that it is appropriately exploited in daily teaching and learning business including preparation of the stakeholders to use the environment. Workshops and training are some aspects that enable the e-learning stakeholders effectively participate in e-learning. Of strange notice is that students have mostly trained themselves or been taught by colleagues to participate (peer to peer education) in e-learning. The implication is that e-learning is simple that

enables self-indulgence. Environments that require self-training, as is the case in Makerere may be ideal to kick start e-learning. There is however, a great relationship between workshops or training and the practice of e-learning. This can be seen by way the users who attended workshops were involved in e-learning thus, workshops and training influence the practice, though they involve more costs than self training.

Learning to participate in e-learning is however hindered by accessibility to e-learning resources. Bardzell (2002) emphasized the issue of accessibility as a feature of e-learning. Because of the limit in the numbers of functional computers, e-learning centers are timetabled and time for accessibility is limited. Instructors and students are supposed to adhere to time schedules. This is contradictory to the practice of e-learning (accessibility at convenience). Nonetheless, timetabling is aimed at better organization and management of an e-learning environment and most respondents agreed that there is access, though it is insufficient in all universities. There is a concern that computer access points operate only sometimes that limits accessibility for some users.

It is important to note that most students had at least one course on a learning platform. This is a manifestation of the presence of e-content; interestingly most e-content is locally designed though given a patent by some institutions. Giving a patent to a course may be demoralizing to the one who designed that course unless the designer consents to it. However, a '*course*' is defined according to a specific instructors' need. A course could consist of modules, one module or even part of a module. Having many courses on a

platform does not therefore mean that there has been full digital transformation to e-content in an institution, but is a proof that there is a move to digitalization of a teaching and learning environment. What was observed nonetheless was that a good number of students have more than two courses on a learning platform in all the universities; implying e-learning exists though e-learning is not just a question of numbers but entails even the detailed content. Instructors however, need the skill to be more apt in production of course modules and e-content.

5.2.0 Learning management system, internet and intranets in e-learning

The most dynamically interesting aspect in e-learning is the e-learning management system (LMS) or learning platform. The existence of a LMS is an opportunity for users to put it to practice in Makerere University, University of Nairobi and the University of Dar es Salaam. There are various tools on an LMS. Tools on a LMS are not useful unless put to use, and the skill to use them is also required. The tools are to be manipulated but they call for creativity to make e-learning, instruction and research enjoyable. This calls for the application of the constructivist approach to all these activities. Many courses are listed on the e-learning platforms at Makerere but, venturing into their content folders, they are virtually empty. This is because instructors have failed to abide by the demand of time to compile, design and upload e-content thus the underutilization of e-learning resource.

Worth noting on the LMS is the fact that apart from Wedusoft™ at the UONBI, which was designed by an insider, other platforms like Kewl™ and BB™ are

designed externally. Makerere University and the University of Dare es Salaam have to get experts from the parent designers to help them out which involves cost implications.

The internet that works in combination of the intranet is an open source e-learning platform. The complexities of working on the internet are many but can be contained. There is a lot of information on the internet whether for pedagogic or other purposes that is accessed. The design of the material on the internet takes a general design format, and this may not be suitable for pedagogic value at times. It is upon the discretion of the user to pick only information relevant to them. Most users of the e-learning resource in all the universities find the internet a vital aspect for extra content, which conforms to constructivism.

However, universities have created intranets to help in facilitating e-learning and other management issues. Intranets serve specific university environments, and are used for local information as instructors and students confessed using the intranet facility. Intranets may be the strongest aspect of e-learning attained so far in all the three institutions. The shortfall of getting lost in the “cyberspace” while looking for information on the internet is avoided by the intranet. Scherly, Roux and Dillenbourg (2000) discussed issues about proper navigation in e-content. Internal and external communication issues are managed by the intranet, which may be more emphasized on the part of the instructors. What is limiting in both the internet and intranet is the speed

at times; it is quite slow due to bandwidth and other technical problems. Nevertheless, technical issues as earlier noted should be left to technicians.

5.2.1 Patterns of e-learning usage in Makerere, Nairobi and Dar es Salaam universities

There is a tendency to use e-learning more and more because it is interesting. The increasing use of e-learning shows an attempt to use e-learning facilities in instruction. E-learning trends for most instructors have increased since they started using it, meaning with more appropriate policies, the use will increase even more.

The observation as presented in chapter four shows that e-learning platforms are mostly used for static content files. Only few instructors use the platform for communication with students. There is a tendency to use the platform to make notes available to the students. This even if it is a bad practice, should not be dismissed as completely ineffective. It is the first and on many occasions vital step in e-learning as it indicates the beginning of the practice. Use of e-learning platform, discussed by many authors in chapter two including Alessi and Trollip (2001) and Van Der Merwe (2004) conforms to these practices. In fact, there are already indicators that some instructors are moving towards the design use of interactive content or files. Those using static files will definitely move to interactive content with time. This is judged from the high confidence of the instructors and students about the potential of e-learning to include more multimedia and interactive content.

5.2.2 Content availability in e-learning environments

The value of content being available all the time should not be underestimated. In the discussions, students and instructors noted that they enjoy content when available at a time they are ready to access it. Howard (2000) emphasized that time and space should not dictate e-learning situations. Save for the power and network failures as interruptions, users are interested in making online access to content at their convenience possibly anytime. This goes a long way into ensuring equal access to learning material by all students at their convenience thus making learning more personally meaningful across learning styles. Though the situations in the universities may not guarantee this access, the attempts are in the right direction.

Some instructors however believed that learning content availability at any time in e-learning encourages students not to attend classes. This comes from the students' attitude of a stand-alone e-learning environment. Another reason for students dodging face-to-face sessions is the duplication of online material to be uploaded on a learning platform by designers in face-to-face sessions. Students discover that they can access the same material on the internet and claim that they can do without attending face-to-face as instructors just transform what is acquired on the internet.

Content availability twenty-four hours a day and seven days a week is nevertheless, a problem as noted by instructors. Design of content is done without proper reflection sometimes (Merrill, 2002). Because e-learning

platforms enable upload of Microsoft word TM, PowerPointTM or PDF files it does not force instructors to change their sometimes old-fashioned ways of pedagogy. The use of e-learning this way indicates some problems:

- Technology is used this way as a delivery tool to transport the classroom to the internet, meaning outmoded approach to teaching and learning (instructor centered information transfer, instructivist transmission model) are enforced thus the potential of technology is not well utilized.
- Just converting a course for online delivery without reflection is worse than face-to-face teaching and learning and could be more of a liability than an asset.

5.2.3 Design and development of interactive e-content

Alessi and Trollip (2001) discussed many aspects of instructional design and development. There are e-content materials; most are still raw with many pedagogic aspects missing. It should be pointed out that most instructors are people who acquire good first degrees and become instructors after adding on masters and PhDs not teachers by training. These people are prone to transferring their otherwise face-to-face techniques to e-learning; (Adendorff, 2004). The design of digitized materials is still quite low with little interactivity in the e-content. Some pedagogic courses are recommended for instructors involved in design of e-content. The design and development of e-content may be taking a snail speed but is certainly a welcome move.

5.3.0 Communication level in e-learning

Two of the seven principles of good practice outlined in Chickering and Gamson (1987), cited in Van Der Merwe (2004), refers to the importance of regular communication between instructors and students and between students. Basing on the finding that e-mail communication by instructors is not regular among the respondents with some communicating only on special occasions, this principle has been ignored by most instructors. Pallot and Pratt (1999) argued that students can be able to communicate in e-learning as they consider e-mail a vital way of communication with instructors. Students' opinion was that instructors should answer their e-mails very fast as most of them relate to content on an electronic platform. E-mail is a vital aspect in e-learning and instructors had better adjust to it. Basic emphasis on clear and effective communication should be sought and accorded to the instructors and students.

5.3.1 Role of an instructor in an e-learning environment

Students made suggestions regarding the role of an instructor in e-learning. Instructors guide the interaction. Instructors should not leave students to discuss alone in an electronic environment as it was noted they do, if there is any aspect on a discussion board or chatrooms. Students are fond of irrelevant issues and need constant guidance, so the role of an instructor in e-learning is still very vital (Howard, 2003). E-learning however needs restructuring modules and instructors effectively giving feedback about tutorial. The instructor's role is still vital and not taken away though certainly it is transformed to a team player and collaborator in teaching and learning.

These are procedural issues in e-learning that a number of instructors will gradually adjust to.

Another concern was that e-learning made instructors jobless. Considering that students need guidance in tutorials and drills in e-learning and the constant role of design and updating e-content materials by instructors such fears are rendered baseless and disproved. An instructor will still be important in the teaching and learning matters, all it takes is a little investment of time and resources to get to proficiency into how the position if an instructor is adjusted to suit an e-learning environment.

5.3.2 Administration and management of e-learning environment

In administration, students and instructors are aware of the role of university management in e-learning. Though the management of e-learning in all the universities is existent, it is not clearly structured. This is not an urgent issue at this moment because e-learning is just taking root in institutions. Users were satisfied with the role of the management and existent structure, but are disgusted with the computer laboratory attendants who apparently do not offer them enough help. The user area attendants are not trained to manage these areas thus their behavior. Gunasekaran, McNeil, and Shaul (2002) and Werner and Botha (2005), in chapter two argue for care in selection of people to support instructors and students in e-learning environment. All that is necessary for effective e-learning is teamwork by all involved.

5.4.0 Attitude towards the use of e-learning in instruction and research

Howard (2003) and Van Der Merwe (2004), presented many aspects about attitude towards e-learning. What was clear was a positive attitude towards e-learning in the universities of Makerere, Dar es Salaam and Nairobi. This attitude was determined by the positive statements towards e-learning presented in the various discussions and interviews held. The statements though may not portray a very clear picture of the practice of e-learning, presents a hint into its use. Otherwise, why would somebody state affirmatively about e-learning, which they are ignorant about.

Internet cafes and homes are increasingly becoming popular places of access points to computers and other e-learning infrastructure, which change attitudes towards e-learning as users look at potential learning situations as in a variety of places. Though the accessibility of e-learning infrastructure at homes and internet cafes has a number of limitations that militate against the practice of e-learning. Universities can take advantage of most especially internet cafes to increase accessibility to learning materials. E-learning will be for everybody through this strategy of using cafes as access terminals. This will transform the teaching learning situations.

Nevertheless, users still have misguided attitude about the practice of e-learning. Such attitudes at this level are expected as users still have a lot to learn about the operation of e-learning and the expectations imposed on the performance of an e-learning environment. What should be the rightful attitude towards e-learning is an environment full of constant learning and

adjustments, which calls for a lot of dynamism on the practitioner's side. A rightful attitude is created and does not exist devoid of an ample environment.

5.5.0 Summary and Conclusions

The practice of e-learning in the universities of Dar es Salaam, Makerere and Nairobi is there to stay. It is an evolving and gradual process. It has just and has not yet reached the climax and users have expectations from e-learning. It should be noted that e-learning will not replace face-to-face teaching and learning but will be a complementary and blended aspect of learning in which learners have a diversity of media in learning. Users need patience with e-learning because it has just started.

This study was carried out to establish the indicators, practice and attitude towards e-learning. The findings reveal the indicators and attitude towards e-learning in the three institutions as the objectives are stated thus:

1. There are clear components of e-learning in the University of Nairobi, University of Dar es Salaam and Makerere University as seen from the infrastructure available. There is internet connection, learning platforms, multimedia and policies. There is also a potential skill in users in the operation of e-learning.
2. There is utilization of e-learning infrastructure in instruction, learning and research in the University of Dar salaam, Makerere University and the University of Nairobi. Utilization of e-learning has been the design of e-content, provision and search for content in a given course unit

with little emphasis on the pedagogic issues. The potential of e-learning in instruction learning and research is therefore yet to be fully tapped.

3. There is a generally positive attitude towards e-learning in all the three institutions. Students, instructors and other administrators concur that e-learning presents a choice for them to operate in an environment they like best. Knowledge about effectiveness of some aspects of e-learning is still limited for misconceived reasons. This hinders the real utilization of e-learning in teaching learning and research.

In the Universities of Makerere, Nairobi and Dar es Salaam, basing on the discussions in this chapter, the following specific conclusions can be obtained relating to the practice of e-learning:

- E-learning is clearly taking shape in institutions. E-learning in its first steps is being used for distribution of content though there is an apparent move towards more interactive materials
- E-learning is not yet used in its full potential, though e-learning has a very bright future. The potential benefits of e-learning in teaching and learning manifest but does not reflect in most instructors due to lack of course redesign.
- Motivators into participation in e-learning are intrinsic: teaching and learning issues (such as increased benefit to students). Effective team management and administration of e-learning infrastructure is not yet in place.

5.6.0 Recommendations

Basing on the findings of this project, in order to improve on the practice and enable change of attitudes towards the practice of e-learning, the following recommendations may be considered:

- There is a need to connect more computers to the internet and liberalize accessibility in the institutions. In some e-learning center there was evidence of numerous computers but with very few connected to the internet. This limits the number of access terminals to e-learning. More infrastructures: computers, printers, e-learning centers, networks for more practice and utilization in e-learning.
- More sensitization about the practice of e-learning is called for to make it more popular among all participants in the selected institutions. Emphasis on drawing a curriculum in e-content development to be used in the same purpose as in the case with the University of Nairobi.
- More training and workshops as popular practices to users should be encouraged to popularize e-learning in Nairobi, Makerere and Dar es Salaam Universities. In these workshops however, aspects of learning and effective communication and not technology should be emphasized.
- Need for more training about the design of instructional materials. Many of the instructors are not teachers by training thus needing pedagogic training to make more appropriate instructional material in all the three universities. The capacity to exploit e-learning depends on users' skills.
- Increase on the bandwidth most particularly in Dar es Salaam and Nairobi universities. Makerere may maintain the bandwidth it has now.

- The kind of support given in e-learning centers be improved, particularly in Makerere University though it may be applicable in all the three institutions. Harmonization of policies to enable e-learning operate alongside face to face delivery without conflict.

5.7.0 Further research

Basing on the study the following are aspects that require further research to enable better practice of e-learning in the universities of Makerere Dar es Salaam and Nairobi:

- Further research is therefore necessary into ways through which e-learning can be integrated with the traditional methods of instruction.
- Strategies and the success of e-learning
- Comparing performance of face-to-face and e-learning technologies
- Accessibility and the patterns of e-learning usage in universities
- Design of e-content and its effectiveness in e-learning
- Workshops or training: relationship with the practice of e-learning
- ICT proficiency skills and the level of practice of e-learning

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APPENDICES

APPENDIX A

CHECK LIST FOR E-LEARNING PRACTICE IN THE UNIVERSITIES OF NAIROBI, DAR ES SALAAM AND MAKERERE

You are to objectively rate the e-learning environment in your faculty according to the given scale in your own observation.

1 = Not availed 2 = Low 3= Medium 4= High

FACULTY.....University.....

- | | | | | | | | | | |
|-----|---|--------------------------|---|--------------------------|---|--------------------------|---|--------------------------|---|
| 1. | Computers | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 2. | E-learning centers | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 3. | Local area networks | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 4. | Internet | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 5. | Accessibility | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 6. | Learning platforms | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 7. | Digitized learning materials | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 8. | Quality of digitized learning materials | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 9. | Interactivity in learning materials | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 10. | Software for designing materials | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 11. | Learners and instructors in comp. labs | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 12. | Printing services | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 13. | Use of digital learning environment | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 14. | Pedagogic strength of DLEs | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 15. | Posting designed materials | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 16. | Redesigning digital materials | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 17. | Workshops in e-learning | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 18. | Communication by e-mail | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 19. | Skill in use of e-learning | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 20. | Attitude towards e-learning | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 21. | Frequency in use of Computers | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 22. | Support for e-learning | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |
| 23. | Management of e-learning | <input type="checkbox"/> | 1 | <input type="checkbox"/> | 2 | <input type="checkbox"/> | 3 | <input type="checkbox"/> | 4 |

APPENDIX B

STRUCTURED INTERVIEW GUIDE: INSTRUCTORS

Dear respondent,

This questionnaire solicits response regarding “**E-learning practice in teaching learning and research selected East African universities.**”

E-learning enhances the quality of instruction, learning and research. You have been purposely selected to participate in the study because you have relevant data. Please objectively answer the questions here. The information you give is strictly confidential and is only going to be used for academic purposes.

1).Faculty.....University.....

2).How long have you been **using computers** (e.g. Word, Excel, Internet searches)? (Choose one)

1 Less than 1 year 2 1-2 years 3 More than 2 years

3).How would you **rate** your **computer skills**? (Choose one)

1 Beginner 2 Intermediate 3 Expert

4). Do you use any of the e-learning **platforms** below? (Check all that apply)

1 Blackboard 2 Kewl 3 Others (Specify)

5).How often do you use the **computer applications** listed below? (Choose one in each case).

	Daily	About once a week	A few times a month	Once a semester	Never
a) Intranet	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
b) Learning platform	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
c) Microsoft office	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
d) Other(specify)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

6) Do you have any knowledge of **e-learning** in your university? (Choose one)

1 Yes 2 No 3 Not sure

7) How would you **rate** your **e-learning skills**? (Choose one)

1 Beginner 2 Intermediate 3 Expert

8) Have you attended any **e-learning** workshop or training?

1 Yes 2 No 3 Unsure

9) How did you **get started** with **e-learning**? (Check all that apply)

1 I taught myself

2 One of my colleagues helped me to get started

3 Other (Specify):

10). Are you able to design **course modules** for e-learning yourself? (Choose one)

1 Yes 2 No 3 Unsure

11). Does this university have any **course module designed from here**? (Choose one) 1 Yes 2 No 3 Unsure

12) What do you often use a **learning platform** for? (Check all that apply)

1 Static module content files (Word, PowerPoint, Excel, PDF etc. files)

2 Interactive content / Simulations

3 Communication (e.g. Chat rooms, e-mail)

4 Other (Specify)

13) How often do you **communicate by e-mail** with the students? (Choose one)

1 Daily 2 About once a week 3 Other (Specify)

14) Do your students complain that they cannot get **access to a computer**? (Choose one) 1 Yes 2 No

15) How frequent are the following types of **electronic communication** according to the number of postings on the Bulletin Board in e-learning from students.

	Daily	About once a week	A few times a month	Once a semester	Never
a) Questions about content	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
b) Social Interactions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
c) Other(specify)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

16) Compared to when you **started using e-learning**, would you say your current usage of e-learning is: (Choose one)

1 More 2 The same 3 Less

17) With regard to **barriers / challenges you perceive to the use of e-learning** in general, how much do you agree with the following statements?

	Agree	Neutral	Disagree	Not applicable
a)The e-learning training is not adequate	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
b)The technological infrastructure (e.g. computers and access) for lecturers is not adequate	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
c) Many of my students are not computer literate	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
d)Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

18) Which teaching and learning activities **motivate you to use e-learning** in your teaching? Rate the extent to which these statements are applicable.

	Applicable	Not Applicable
a) To increase contact with my students	1 <input type="checkbox"/>	2 <input type="checkbox"/>
b) To increase student-student contact and cooperation	1 <input type="checkbox"/>	2 <input type="checkbox"/>
c) To encourage active e-learning	1 <input type="checkbox"/>	2 <input type="checkbox"/>
d) To provide students with prompt feedback	1 <input type="checkbox"/>	2 <input type="checkbox"/>
e) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>

19) What do you think are the major **advantages of e-learning**? Please rate the extent to which you agree with these statements with regard to your specific modules.

	Agree	Neutral	Disagree	Not applicable
a) E-learning provides a framework to organize my course materials	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
b)E-learning provides module security (only students enrolled in the module can see the materials)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
c)E-learning supports useful communication tools	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
d) Other: (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

20) What do you think are the major **disadvantages of using e-learning**? Please rate the extent to which you agree with these statements.

	Agree	Neutral	Disagree	Not applicable
a) E-learning is too inflexible	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
b) E-learning is unsuited to the e-learning outcomes of my specific course	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
c) E-learning is time consuming to use	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
d) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

21) Please rate the extent to which you believe that these institutional incentives **motivate you to use e-learning**.

	Important	Not important	Not applicable
a) Demonstrated student benefits– improved student learning	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
b) More training in the effective use of e-learning in teaching and learning (pedagogical)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
c) More support (technical and pedagogical)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
d) Release time from teaching to create online modules	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
e) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

22) What type of **training and support** do you prefer? Please rate the different types of training and support according to your preference.

	Important	Not important	Not applicable
a) Face-to-face	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
b) E-mail	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
c) Telephone	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
d) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

23) a) Have you **redesigned your course/program** as a result of your use of E-learning? (Choose one)

1 Yes, I have 2 No, everything is still the same

b) If you have changed anything, what did you change?

24) Do you think the **use of e-learning has had an effect** on the amount of contact you have with students? (Choose one)

- 1 Yes, the contact has increased
 2 Yes, the contact has decreased
 3 No, the contact has stayed the same

25) Do you think **e-learning** has the potential to **include interactive activities** in your class / class materials?

- 1 Yes 2 No 3 Don't know

26) Do you think **e-learning has the potential** to provide a way for you to accommodate **more diverse e-learning styles / levels** of preparation of your students with regard to the following statements?

	Strong potential	Some potential	No potential at all
a) Module materials in a variety of formats (text, graphics, sound, video)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
b) Students can work at their own pace	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
c) Students can review additional / remedial material if they feel it is necessary	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
d) Students have access to more advanced content	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
e) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

27) Any additional **comments or recommendations** with regards to e-learning in general?

THANK YOU.

APPENDIX C
STRUCTURED DISCUSSION GUIDE: STUDENTS

Dear respondent,

This questionnaire solicits responses regarding **“E-learning practice in teaching learning and research in selected East African universities.”**

E-learning is to improve the quality of instruction, learning and research. You have been purposely selected to participate in the study because you have relevant data. Please objectively answer the questions. The information you give is confidential and is only going to be used for academic purposes.

- 1). **Faculty**..... **University**.....
- 2) How long have you been **using computers** (e.g. Word, Excel, Internet searches)? (Choose one)

1 <input type="checkbox"/> Less than 1 year	2 <input type="checkbox"/> 1 year	3 <input type="checkbox"/> More than 2 years
---	-----------------------------------	--
- 3) How would you **rate your computer skills**? (Choose one)

1 <input type="checkbox"/> Beginner	2 <input type="checkbox"/> Intermediate	3 <input type="checkbox"/> Expert
-------------------------------------	---	-----------------------------------
- 4) Since when have you **been using e-learning**? (Choose one)

1 <input type="checkbox"/> Before 2002	2 <input type="checkbox"/> Since 2003	3 <input type="checkbox"/> Since 2004
--	---------------------------------------	---------------------------------------
- 5) How would you **rate your e-learning skills**? (Choose one)

1 <input type="checkbox"/> Beginner	2 <input type="checkbox"/> Intermediate	3 <input type="checkbox"/> Expert
-------------------------------------	---	-----------------------------------
- 6) Do you **understand e-learning**? (Choose one)

1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Unsure
--------------------------------	-------------------------------	-----------------------------------
- 7) How did you learn how to use a learning platform: **Blackboard/ any other**? (Choose one)

1 <input type="checkbox"/> My lecturer gave us training on the use of the e-learning platform
2 <input type="checkbox"/> I taught myself
3 <input type="checkbox"/> My friends showed me how to use the e-learning platform
4 <input type="checkbox"/> Other (Specify):
- 8) If you have access to a Computer which one of the following **do you use**? (Choose one)

1 <input type="checkbox"/> Learning platform	2 <input type="checkbox"/> Internet	3 <input type="checkbox"/> Other (Specify)
--	-------------------------------------	--

9) Where do you **access computers**? (Check one in every case)

	Always	Mostly	Sometimes	Never
a) University Laboratories	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
b) Home	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
c) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

10) How often do **you use the computer applications** listed below?

	Daily	About once a week	A few times a month	Once a semester	Never
a) E-mail	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
b) Learning platform	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
c) Microsoft office	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
d) Other (specify).....	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

11) How many of your courses are on **a learning platform**? (Choose one)

1 None 2 One 3 Two 4 More than two

12) a) Would you like **more of your courses** on a learning platform? (Choose one)

1 Yes 2 No 3 Unsure

b) If No, why not?

13). How would do you rate the **designed course materials** in your courses?

(Choose one)

1 Adequate 2 Inadequate 3 Unsure

14). Please rate the whether you agree or disagree with the following statements regarding e-learning.

	Agree	Neutral	Disagree
a) E-learning increases contact between the lecturer and students	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
b) E-learning increases contact and cooperation between students	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
c) E-learning enables interactivity between	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

students and materials

d) E-learning enables the lecturer to give more **prompt feedback** 1 2 3

e) E-learning enables study at convenience 1 2 3

h) Other (Specify): 1 2 3

15) With regard to the e-learning platform components of your courses, please indicate the extent to which a **learning platform is important in your courses**.

	All my courses on platform	Some of my courses on platform	None of my courses on platform
a) The learning platform component is an integral part of the course	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
b) The platform component is essential to passing the course	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
c) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

16) What do you think are the major advantages of using e-learning? Please rate the extent to which you agree with these statements with regard to your specific **modules on a learning platform?**

	Agree	Neutral	Disagree	Not applicable
a) Access to content (Word, PowerPoint, PDF, Excel etc files)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
b) Access to simulations / interactive content	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
c) Access to more advanced additional content.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
d) Increased contact / interactivity with lecturers (Bulletin Board, Chat)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
e) Increased contact with fellow students (Bulletin Board, Chat)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
f) Feedback from lecturers and fellow students	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
g) Access to content outside university	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

h) Other (Specify): 1 2 3 4

17) With regard to barriers / **challenges you experience to the use of e-learning** and computers in general, how much do you agree that the following statements represent possible barriers?

	Agree	Neutral	Disagree	Not applicable
a) Access to computers in computer laboratories	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
b) Platform is too difficult to use	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
c) Not enough training to use E-learning	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
d) Not enough help and support	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
e) Platform is too slow	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
f) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

18) What kind of support do you prefer in e-learning? Please rate the different types of support according to your preference.

	Important	Not important	Not applicable
a) A person in the computer user area	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
b) Telephone support	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
c) E-mail support	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
d) A central e-learning helpdesk	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
e) Other (Specify):	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

19) Any other comments / suggestions? Please write it here.

THANK YOU.

APPENDIX D

LETTER FROM UNIVERSITY OF DAR ES SALAAM

UNIVERSITY OF DAR ES SALAAM

Dean's Office

Faculty of Informatics and Virtual Education

Telephone : 2410500-8 Ext 2023/2384

Direct/fax: 255-2410556

E-Mail: deanfive@udsm.ac.tz



Address: P.O Box 35194
Dar es salaam

Our Ref: O.2/FIVE/05


Date: 22/02/06

Mr. Michael Walimbwa (Email: mwalimbwa@educ.mak.ac.ug)
Makerere University
Kampala, Uganda

Re: Your M.Sc. Research on E-learning in EA Universities

We have received an e-mail dated 15 February 2006 in connection with your request to visit the University of Dar es Salaam to conduct research work for five days on E-learning in EA universities. You are invited to proceed with your research work as soon as you are ready to do so. It is understood that you will meet your travel and lodging costs and any other costs related to your research work.

Sincerely,


.....
Prof. J.R. Ikingura

Dean, Faculty of Informatics and Virtual Education

c.c. Director, AVU-LC
c.c. Head, Computer Science Department
c.c. Dr. W. Komba (ITRU)

APPENDIX E**LETTER FROM UNIVERSITY OF NAIROBI****UNIVERSITY OF NAIROBI
SCHOOL OF COMPUTING AND INFORMATICS**

Telephone: 4447870/4444919/4446544
Telegrams: "Varsity" Nairobi
Telefax: 254-2-4447870
Email: tonyr@uonbi.ac.ke

**P. O. Box 30197
Nairobi
Kenya**

OUR REF: SCI/AJR/REF

23rd February 2006

Mr Michael Walimbwa
Faculty of Education
Makerere University
Kampala
Uganda

Dear Mr Michael Walimbwa

Re: LETTER OF INVITATION for RESEARCH:

As per the request made concerning your research project on e-learning, I hereby invite you for the same purpose. You can come to University of Nairobi where you will be received by Dr Elijah Omwenga (Lecturer at SCI) who will advise you on other valuable contacts. I advise you get in touch with him for details before you arrive. The set dates for you are tentatively from 15th-to 21st March 2006. We do not have a University guest house but would advise that you arrange to stay at the Meridian Hotel or guest houses that are near the University. We shall provide details in due course.

I look forward to our collaboration with you and hope to see you soon

Yours Sincerely.

Handwritten signature of Anthony J. Rodrigues in cursive script, underlined.

PROF. ANTHONY J. RODRIGUES,
SCHOOL OF COMPUTING AND INFORMATICS

Cc Dr Elijah I Omwenga

APPENDIX F

LETTER FROM DICTS

MAKERERE
P.O Box 7062
Kampala – Uganda
Phone: + 256-41-531343, 531437
URL: <http://www.makerere.ac.ug/dicts>



UNIVERSITY
Director: tusu@dicts.mak.ac.ug
Dep. Director: nora@dicts.mak.ac.ug
Helpdesk: helpme@dicts.mak.ac.ug

**DIRECTORATE FOR
INFORMATION AND COMMUNICATION TECHNOLOGY SUPPORT**
"The Knowledge Centre"

To: The Instructional Technology Resource Unit
University of Dar es Salaam

The Research Committee,
University of Nairobi




RE: WALIMBWA MICHAEL REG: 2003/ HD04/2618U

This is to introduce to you the above named who is a post-graduate student at the Department of Higher Education pursuing a Masters degree in Education, Information Communication Technology (M.Ed.ICT).

He is carrying out a research entitled *"Empirical perspective and analysis of the practice of e-learning at Makerere University"* and is now collecting comparative data for his dissertation. The research covers aspects of e-learning at Universities of Nairobi and Dar es Salaam.

The purpose of this letter is to request you to accord him the necessary co-operation in the process of data collection for the same research. We shall be grateful if you could render any possible assistance to him.

Thank you in advance for your assistance.


F F Tsubira, PhD
Associate Professor and Director, DICTS

cc: Mr Michael Walimbwa ✓
Mr A Ndiwalana, Ag E-learning Manager

APPENDIX G

LETTER FROM THE DEAN

MAKERERE

P. O. Box 7062 Kampala, Uganda
E-Mail: deaneduc@educ.mak.ac.ug

UNIVERSITY

Tel: 256 - 540733
Cables: "MAKUNIKA"DEAN'S OFFICE
SCHOOL OF EDUCATION

Your Ref:

Our Ref:

TO WHOM IT MAY CONCERN

Mr./Mrs./Ms./Sr./Rev. WALIMBWA MICHAEL

is our M.Ed./M.A Degree student who is collecting data for his/her
Dissertation titled:

Empirical perspectives and analysis of E-learning
 practice in Makerere, Dar-es-Salaam and
 Nairobi Universities

We shall be grateful if you could render assistance to him/her in collecting
 the necessary data for his/her Dissertation.

Thank you in advance for your assistance.

Assoc. Prof. C.M. Ssebbunga
 Dean
 School of Education



APPENDIX H

LETTER FROM HOD, HIGHER EDUCATION

MAKERERE

P. O. Box 7062 Kampala-Uganda
Cables: "MAKUNIKA"

UNIVERSITY

Tel: 256 - 41 -532992
E-mail: highereduc@educ.mak.ac.ug
Fax: 256-41-541303OFFICE OF THE HEAD
DEPARTMENT OF HIGHER EDUCATION
SCHOOL OF EDUCATION

15/03/2006

The Dean
School of Computing and Informatics
University of Nairobi
P. O. Box 30197
NAIROBI
Kenya

Dear Sir,

RE: WALIMBWA MICHAEL REG: 2003/ HD04/2618U

This is to introduce to you the above named who is a post-graduate student at the Department of Higher Education pursuing a Masters degree in Education, Information Communication Technology (M.Ed.ICT).

He is carrying out a research entitled "*Empirical perspective and analysis of the e-learning in selected East African Universities*" at this level collecting data for his dissertation. The research covers aspects of e-learning at Universities of Nairobi and Dar es Salaam.

The purpose of this letter is to request you to accord him the necessary co-operation in the process of data collection for the same research. We shall be grateful if you could render any possible assistance to him.

Thank you in advance for your assistance.

Yours sincerely

Dr. J. L. Nkata
Head, Department of Higher Education



SOME PHOTOS DURING THE RESEARCH PROCESS

The following photos were taken during the data collection activity in the three universities



