UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

E-Learning Development in Kenya
An Empirical Analysis of Critical Factors that Affects Learners' Satisfaction in
E-Learning in institution of higher learning in Kenya

By

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Information Systems

DECLARATION

This project, as presented in this report, is my original work and has not been presented for any other award in any other university.

Student's Declaration

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Supervisor Declaration

I confirm that the work reported in this project research was carried out by the candidate under my supervision as university supervisor. This research project has been submitted with my approval as university supervisor.

Signature .... Date 27/10/2012.........

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DEDICATION

This research project is dedicated to my wife, Mrs Monicah Ndungu, My son Peterson Ndigirigi and my parents Mr and Mrs Peterson Ndigirigi. May this project serve as my sincere reflection of your sacrifices and support towards my study.

ACKNOWLEDGEMENT

ABSTRACT

The trend of using e-learning as learning and /or tool is rapidly expanding in education sector both in developing and developed countries. In Kenya e-learning has been adopted in both private and public institutions of higher learning. Although there is tremendous growth in e-learning both in developed and developing countries the demand for learning is increasing rapidly. This have prompted researcher to research on different aspect on learners' satisfaction. This study has analyzed different models and extended Technology Acceptance Model (TAM) which was used to investigate the underlying factors that affects learners' satisfaction in e-learning.

The developed model covered three dimensions namely: course management dimension, technology dimension and institution arrangement dimension. The model was populated by data gather from a survey of 337 learners (diploma, undergraduate and post graduate learners) from University of Nairobi, Kimathi University and Inorero University. The model was estimated using structured equation modeling (SEM). A path model was developed to analyzed relationship between the factors to explain learners' satisfaction toward e-learning. The result showed that course management dimension (instructor factor and course factor) had a strong effect to perceived usefulness. Technology dimension (software quality and internet quality) showed a strong significance to perceived usefulness and perceived ease of use. Institution management dimension (diversity in assessment and interaction with other) also showed a strong effect to perceived ease of use.

This paper contributes to literature and research on factors that affects learner's satisfaction in e-learning. The paper proposes further research for learners with special needs and learner who are undertaking e-learning tailor made professional course. Also future research can be done where score card will be included as a dependent variable.

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LIST OF ABBREVIATIONS

IT	Information Technology
ICT	Information Communication Technology
TAM	Technological Acceptance Model
ISS	Information System Success Model
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behavior
UTAUT	Unified Theory of Acceptance and Use of Technology
PU	Perceived Usefulness
PEU	Perceived Ease of Use
CM	Course Management
CD	Course Dimension
SQ	Software Quality
IQ	Internet Quality
INST	Institutional Arrangement.
IA	Instructor Attitude
LI	Learners' Interaction
LCD	Learners Course Diversity

CHAPTER I: INTRODUCTION

1.0 Introduction

This chapter gives a brief review which introduce the reader to the background of the research about e-learning. Under problem definition the foundation and the direction of the research is established. After problem definition the study affirm the fundamental reasons for the project assumptions and the limitation of the study.

1.1 Background

During the last two decades, there have been dramatic changes toward the new methods of teaching and learning due to proliferation of Information Communication Technology (ICT) which has enabled the realization of faster and reliable distributed structure of knowledge transfer. This mushrooming of the advancement in technology has resulted in a revolutionary way of learning where e-learning is emerging as the new paradigm of the modern education cappel and Hayen, (2004).

Hazel Associates, (2005) stated that "the interest in educational use over the internet and its world wide web (WWW) has increased tremendously and he suggested that e-learning industry is the fastest- growing subsector of a $2.3 trillion global education market, and the market for online higher education is estimated to exceed $69 billion by 2015". They stressed that the increased demand has been as a result of high demand for higher education and new trends where there is shift globally from labor intensive to a more knowledge based workforce that have resulted to the rapid growth and expansion of e-learning.

Interestingly Peter (1993) noted that there have been high advancement in information technology and the university education is evolving where universities are no longer places where students attended classes but a knowledge centers for transmitting information through adoption of e-learning. He stresses that the demand for education is increasing day by day and

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universities offering conventional education need to implement e-learning to cope with the demand.

O'Hara and Johansen, (1994) argued that e-learning is a revolutionary method of learning in this global age using the internet, collaborating with learners, instructors and content for study at any time and any place using the internet. They highlighted that e-learning have a special value in realizing meaningful learning and achieve equal education opportunities to everyone regardless of their ethnic, local difference and income gap. However, Thurmond et al., (2002) explained that there is a need to implement new communication tools in order to achieve meaningful educational experiences and exchange. They stressed that this can be achieved by exchanging information and knowledge beyond the limit of time and space, by taking advantage of the opportunities brought about by e-learning.

Webster and Hackley, (1997) indicated that people can no longer be competitive if they depend upon off-line, formal education from the traditional institutions because of the extensive growth of information and knowledge. E-learning can be considered one of the best alternatives which enables people not only to get the limitation of time and space, to have a good education anytime and anyplace, but also to build learning communities with other people including peers, teachers, and professionals.

O'Hara and Johansen, (1994) in his study explained that e-learning is presenting itself as an appealing alternative to the traditional way of developing human resources. He argues that apart from merits of e-learning which enable people to get opportunity to learn beyond the limitation of time and space, being an internet based system of education and training it gives a room for continuous upgrades as swiftly as the development in information and technology occur and also as the increase in demand occur. The internet has also expanded the scope of education in terms of opportunity, content and methodology from what have been in the analogue era.

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According to Roffe (2002) e-learning do not only improve access, but also it help to improve engagement, boost learning, extending experiences in exploring, and empower the learner to take the responsibility for scheduling and managing the learning journey. However in his research he assumed that learners already have the skill and attribute to use the technology and adequately contextualize, integrate and apply the content to create new knowledge and understanding and be transformed by the experience. Butson (2003), in his research argued that the assumption cannot hold and learners should not be left at the mercy of the of the system but there is a need for a holistic approach in e-learning where the participation of learners, instructors, content material and other learners is important for the success of e-learning programs. He emphasized that satisfaction of the e-learning plays a great role in the success of this mode of learning and advised for more research on learner satisfaction. He stressed that e-learning have emerged as the new way of disseminating knowledge.

Dutton & Perry, (2002) highlighted that e-learning and relevant technologies have gained momentum and the research of e-learning has become vital for its success and smooth implementation. Despite the perceived benefits associated with e-learning researches indicates that there is still high rate of student who commence the e-learning course but they do not finish the course. Apart from that they highlight that with this kind of trend it was an indication that there was a problem in implementation of e-learning system that affect the satisfaction of the learner.

Williams (1996) argued that allowing learners to engage in learning activity when and where they prefer to learn at their own pace, and to focus on the material they deem important tend to stimulate positive responses but he point out that the positive effects of learners control and satisfaction must be weighed against potential feeling of frustration student may experience. He

stressed more research need to be done on this line to enhance learners' satisfaction to be able to achieve the enormous advantage brought about by the adoption.

Laurillard (2001) in his analysis caution the way in which teaching is approached and suggested that it should be considered more than the technology medium so as to achieve optimum satisfaction from the learner taking e-learning courses so as to guarantee the continuous use of the system. This argument was supported by Butson (2003) who stressed that technology is limited in helping learners to understand how to think and added that a lot research need to be done to raise the satisfaction of learners toward e-learning.

Neal (2001) highlighted that when e-learning is done well can be as good as or better than being in a classroom. He stress that e-learning offers students with compelling and motivating experiences but also pointed out that satisfaction of learners taking e-learning should be paramount to have continuity of use and he proposed that research on learners dimension need to be taken to unearth any factor that might hinder learners satisfaction during the e-learning course.

1.2 Problem Statement

The government of Kenya has realized the importance of Information Communication Technology (ICT) in education sector. The government is setting up ICT structures in primary, secondary and tertiary institution in order to build an ICT –literate community. In national ICT policy the government envisions to create an enabled and knowledge- based society by the year 2015. The Ministry of education policy on ICT is to integrate Information Technology (IT) into education and training systems in order to prepare the student and staff to a knowledge based society. Due to high number of students competing for few vacancies in our public university, some students have opted to undertake e-learning courses as mode of their study. This mode of

study is faced with challenge where student complaining of not being satisfied with e-learning course.

According to Lindgaard and Dudek (2003) they explained that in the past many scholars have attempted to measure satisfaction. The results of their effects reveal that user satisfaction is a complex construct and its substance varies with the nature of the experience or case. According to Lindgaard and Dudek (2003) more research on learners' satisfaction need to been done and he supported his argument by stating that each case has its uniqueness considering the diverse cultural background, level of education and technology penetration among other factors.

From Lindgaard and Dudek (2003) perspective, I have based my research on unearthing the critical factors that contributes to learners' satisfaction. These results of the study will help for successive implementation of e-learning in Kenya. The factors affecting e-learning satisfaction that have been presented by previous researchers are basically from descriptive and analytical studies with a certain dimension. For feasibility of practice, the study will undertake an empirical analysis of critical factors that affects learners' satisfaction in e-learning in institution of higher learning in Kenya.

1.3 Objective of the Study

The critical objective of this study was to indentify the factors that affect satisfaction of learners who are undertaking e-learning course at institutions of higher learning in Kenya.

Other objective of this study is:-

a) To be able to give policy recommendation to e-learning stake holders.

1.4 Research Questions

This study is based on: - *An Empirical Analysis of Critical Factors that Affects Learners' Satisfaction in E-Learning in institution of higher learning in Kenya.* In order to achieve this, the following questions were considered.

Q1. How does a learner perception toward Course Management factors affect his or her satisfaction in e-learning?

Q2. How does a learner perception toward Technology factors affect his or her satisfaction in e-learning?

Q3. How does a learner perception toward institutional management factors affect his or her satisfaction in e-learning?

1.5 Purpose of the Study

The purpose of this study was to indentify critical factors that contributed to learners satisfaction from a holistic point of view by considering first, course management factors which include:- instructor perception (instructor response timeliness, instructor altitude toward e-learning), and course perception (e-learning course flexibility, e-learning course quality). Secondly the research considered the technology factor (system quality, internet quality). Lastly the study considered Institution management factor (learners' interaction with others, diversity in assessment).

1.6 Research Outcome

The research outcome from this study highlights the key significant factors that affect the satisfaction of learners who are undertaking e-learning course.

1.7 Significance of the Study

This study has multiple implication of practice and provides an insight to the universities and e-learning software developer to strength the e-learning implementation and development. First the study highlights the perception of learners' toward the quality of e-learning courses offered by

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universities. The study also shows the perception of learners' toward instructors offering the e-learning course and give recommendation appropriately.

Secondly the study highlights perception of learner toward internet quality at the universities and gives required recommendation from the outcome of the study. Due to the flexibility offered by the e-learning course in terms of time, location and method of administration this study analyzes the perception of the learners and gives recommendation for improvement.

Lastly this study is beneficial to e-learning stakeholders and it will propel for better implementation and development as we gear to achieve knowledge based economy as stipulated in vision 2030.

1.8 Assumptions of the Research

The study assumed that all the data collected from the target population was valid and without bias. Further, it is assumed that the learner were willing to participate in the study. The study had assumed that weather and socio-political condition in the study will be favorable for data collection within the specified period and time frame.

1.9 limitation of the Research

The study was limited to learners in the institutions of higher learning who have undertaken e-learning for more than one year. This study did not cover special e-learning courses that are offered to student with disability and learner undertaking tailor made professional courses at the universities.

1.10 Definition of Significant Terms

1.10.1 E-learning

Is a system based on technology that provides opportunity for both synchronous and asynchronous interaction among learners'-content, learners-to-learners and learners-to-instructor.

1.10.2 Learner

It's a student who is undertaking e-learning course in the institutions of higher learning. The student needs to have taken e-learning course for more than one year.

1.10.3 Instructor

In context of this study, an instructor refers to a lecturer facilitating e-learning course.

1.10.4 Learner's satisfaction

This refers to the sum of learners feeling and attitudes that result from aggregating all the benefits that a learner hopes to receive when he/she is undertaking an e-learning course.

CHAPTER II LITERATURE REVIEW

2.0 Introductions

The chapter on literature review presents the concepts, definitions, model and theories relevant to this study. E-learning learning environment have been discussed and a conceptual framework developed. Variables have been operational zed and hypothesis developed.

2.1 E-learning Theories

The field of e-learning is inundated with a number of terms used either interchangeably or with little difference as defined by the contributors. Nick Rushby says *"E-learning by any name smell sweet –or at least smells no difference"* Rushby, (2001). Though many scholars discuss about it there is no common terminology or agreement in the definition. Rushby goes on to relate the situation with that of the semantic debate on computer and its application to learning in the 1970s and buzz of phases that were used to explain this kind of learning where difference combinations of words were used: computer {aided/assisted/based/managed/enable} {instruction/learning/education /training} without much difference.

Kaplan-Leiserson, (2000) defines e-learning as the acquisition and use of knowledge distributed and facilitated through computer technology, particularly involving digital technologies. The research indicated that the system may incorporate a variety of channels (e.g., Wireless and satellite), technologies (e.g., cellular phones, personal digital assistants) as they are developed and adopted.

Kaplan-Leiserson, (2000) also explains that e-learning can use the mode of asynchronous learning where interaction between instructors and students occurs intermittently with a time delay. Examples are self-paced courses taken via the internet or CD-Rom, questions and answer mentoring, online discussion groups, and email or Synchronous learning which refers to a real-

time, instructor-led online learning event in which all participants are logged on at the same time and communicate directly with each other. In this e-learning setting, the instructor maintains control of the class, with the ability to "call on" participants. In most platforms, students and teachers can use a whiteboard to see work in progress and share knowledge. Interaction may also occur via audio- or videoconferencing, Internet telephony, or two-way live broadcasts.

Moore & Kearsley (1996) define e-learning as ``planned learning that normally occurs in a deferent place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as organizational and administrative arrangements." Also in their study they highlighted that Organizational and administrative support is a key element of the implementation of e-learning highlighting the need for concerted effort as a prerequisite for the successful distance education delivery.

Graham (2006) explained that apart from complete online e-learning system there is also blended online e-learning system. He defines the blended e-learning as the combination of instruction from two historically separate models for teaching and learning: traditional face-to-face learning system and e-learning system. He pointed out that it is an important distinction because it is certainly possible to enhance regular face-to-face courses with online resources without displacing classroom contact hours. He emphasizes the central role of e-learning system in blended learning focusing on enabling access and flexibility, enhancing traditional teaching and learning practices, and transforming the way individuals learn. He explains further that blended learning as the combination of online and face-to-face instruction and the convergence between traditional face-to-face learning and e-learning environments. He argued that blended e-learning emerges as perhaps the most prominent instructional delivery solution. Apart from that he

acknowledges that it is vital to explore what determines learners' satisfaction in an e-learning environment.

Horton (2000) considers an e-learning course as the combination of mainly lessons, activities and collaboration mechanisms. A lesson is seen as a collection of experiences that accomplish one of the sub-goals of the course, and in this context the author describe the most common lesson structures and offers tips and guidelines for their use. Also he presented e-learning activity as a coordinated action that exercise basic intellectual skills and can be used to teach, to exercise, and to test skills and knowledge. On the other hand he stresses that collaboration can energize students, promote deeper learning, and make student more self-reliant. Finally apart from these three factors Horton indicates that there was a need to monitor progress of students and providing feedback as soon as possible hence increasing the level of satisfaction in their study.

Rosenberg, (2000) defines e-learning as a combination of training and knowledge management. He further elaborated that training is the way the instructions are transmitted in order to shape the learning process, whereas knowledge management refers to the use of additional information and performance support tools that helps the students to learn and improve their work. Table 2.1 presents other notable e-learning definitions of e-learning.

TABLE 2.1 Notable E-learning Definitions

E-LEARNING DEFINATIONS
Khan 1997 Web-based instruction: - described as a "hypermedia based instructional program which utilizes the attributes and resources of the world wide web to create a meaningful learning environment where learning is fostered and supported"
French et.al., 1999 Virtual learning: - "the education process of learning over the internet without face to face contact".
Mashra 2001 Online learning: -"it is synonymous to web-based learning where learning is fostered via WWW only, in an intranet or internet. It has been recognized as the new generation in the evolutionary growth of open, flexible and distance learning"
Armitage et.al, 2003 "use of digital technology and media to deliver support and enhance teaching, learning, assessment and evaluation"
Naidu 2003 "systematic use of network information and communication technology in teaching and learning"

Rossen & Hartley, 2001
"teaching and learning "delivered enabled or mediated by electronic technology for the explicit purpose of learning"
Hambrecht & Co., 2000
"wide set of applications and processes including computer based learning, web based learning, virtual classroom, and digital collaboration"
Arbaugh, 2002
"Incorporation of either synchronous or asynchronous access and may be distributed geographically with varied limits of time"
Chiu and Lee 2009
" is the acquisition and use of knowledge distributed and facilitated primarily by electronic means"

Proposed definition

E-learning is a system based on technology that provides opportunity for both synchronous and asynchronous interaction among learners'-content, learners-to-learners and learners-to–instructor.

2.2 Models of E-learning Learning Environments

Broady, (1996) explained that for e-learning to successes in meeting the demand of all kinds of learners and to be successful as a new education paradigm that supports synergistic learning and

active participation of learners then there is a need to follow a number of key element and principles which are: learning goals and content presentation, interactions, assessment and measurement, instructional media and tools, learner support and services.

Blythe, (2001) stated that in an e-learning environment there are three fundamental models and each model have a distinct characteristic in its means of control with respect to the actual teaching space and the pace of training. In some models learners possess complete control and responsibility over their progress, while other models are base on strict control by the teacher or another central party Massicotte, (1997). The environments are as follows:-

2.2.1 *The Distributed Classroom Model*
This form of teaching imitates that of a convectional classroom as far as both the teachers and learners are concerned. Learning process is centralized in this model and the control rest with the teacher. According to Bourdeau and bates (1996) they highlighted some of the characteristics of the model as; first the class sessions involve synchronous communication. The students and faculty are required to be in a particular place at a particular time (once a week at a minimum). Second the number of sites varies from two (point-to-point) to five or more (point to multiple) although the greater the number of site the greater complexity-technically, logistically and perceptually.

Third the student may enroll at any sites more convenient to their homes or work locations than the campus and instructions are able to serve small numbers of students in each location. Finally the nature of the experience mimics that of the classroom for both the instructor and the student.

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2.2.2 The Independent Learning Model

Piccoli et al., 2001 explained that the model alleviates the burden of the learners' presence in a particular location for a long time. Learners are provided with a wide variety of learning material including a study guide and access to member of the teaching staff. These members perform the role of a tutor, offering guidance, solving problems and evaluating the learners' performance. Communication between the learner and tutor may include both conventional mean (telephone, postal mail, etc) as well as electronic (e-mail, teleconferencing, online forums, etc).

According to Piccoli et al., 2001some of the characteristic of this model were; first there are no class sessions and student study independently following the detailed guideline in the syllabus. Secondly the student interact with the instructor and other students and presentation of course content is through print, computer disc or video tapes, all of which student can review at their own time. Finally the course materials are used over a period of several years, and generally are the result of a structured development process that involves instructional designers, content experts and media specialist.

2.2.3 The Open Learning and Classroom Model

Koumpouros et al. (2000) discussed that utilization of this model combines the usage of a print study guide with additional education material in electronic form, enabling individual learners to compete studying in their own pace. The model is integrated with modern communication technology so as to facilitate virtual class meeting between the learners. Teaching materials are found in different form and it the prerogative of the learner to choose when and where to study. In some cases learners are gathered in a predefined location to attend lecture via interactive teleconferencing.

Koumpouros et al. (2000) explained that the characteristics of open learning and classroom included; first, presentation of the course is through print, computer disk, or video tape, all of

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which student can review at a place of their choice either individually or as a group. Secondly course materials are used for more than one semester and learners come together periodically in a group for an instructor led class session through interactive technology. Finally the class sessions are for learners to discuss and clarify concepts and engage in problem solving activities, group work, laboratory experience or assimilation.

2.2.4 Analysis of Models for E-learning Learning Environments

The above models for e-learning learning environment highlight the different option that exist for the leaner to chose from after considering their time schedule and this plays a great role in enhancing learner's satisfaction to an e-learning course. Each of the diverse models discussed above needs to play a critical role of by ensuring that the participation, responses, provision of effective feedback and team work or collaboration learning is effective between the learners and the instructors. From the above models learners' interaction with other learner is important because it helps in understanding of the course content and stimulates critical thinking. Collaborative projects may lessen feeling of isolation and promote a sense of a learning community and hence raising the level over satisfaction. Technology quality and reliability as well as access to the appropriate hardware and software equipment are also determinant factors for learning effectiveness. Due to novelty of e-learning best content that suits the learning is required. Irrespective of the model learner's satisfaction plays a critical role for continues use of the system.

2.3 E-learning Models and Information System Theories

E-learning is a special type of information system which has adopted various defined models and theories for its successful implementations, adoption and continuous use Wang et al., (2007). The following model and theories have been used have been used in various research to explain different aspects of e-learning satisfaction and adoption.

2.3.1 Technology Acceptance Model

Davis, (1986) developed the Technology Acceptance Model (TAM) which represents an important theoretical contribution toward understanding information system usage and information system acceptance behaviors. He explains how users come to accept and use technology. Studying the acceptance and use of IT has been the focus of many studies in IS research and among a variety of theoretical perspectives to explain the adoption and usage of IS. Technology Acceptance Model (TAM) is popularly used to explain the user's intention to adopt a target information system Davis and Wiedenbeck, (2001). The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably the perceived usefulness and perceived ease of use Kim et al., (2009)

Perceived usefulness (PU) is defined as the degree to which a person believes that using a particular Information System could enhance his or her job performance. It is the extent to which an individual believes that using the Information System enhances his/her performance Davis, (1989).Perceived ease of use (PEU) refers to the degree to which a person believes that using a particular system is free of effort. Previous research has shown that individuals are more likely to use a new technology if they perceive that it is easy to use Davis, (1989). The model is shown below.
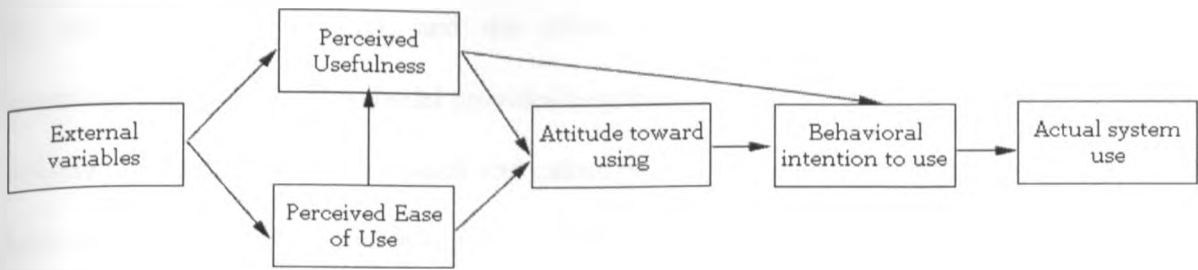
FIGURE 2.1 Technology Acceptance Model

Source: Hamner and Qazi, (2009)

The Technology Acceptance Model has been considered as the most comprehensive attempts to articulate the core psychological aspect associated with technology use based on the generic model of attitude and behavior. This model has proved to be a valuable model when considering information technology acceptance Karahanna and Straub, (1990). Technology Acceptance Model applicability and reliability have been tested empirically in different settings and using different samples. The model have been widely adopted and there have been previous researchers who have used this model to evaluate different aspects of successive implementation, adoption and satisfaction of e-learning hence making the model very important in the field of e-learning Liaw, (2007) and Davis and Wiedenbeck, (2001).

2.3.2 Information Systems Success Model
Delone and Mclean (1992) made significant breakthrough when they undertook a comprehensive review of information system and successively they were able to propose a model that could be able to evaluate multi-dimensional aspects that are integrated in an information system Wu and Wang, (2006).

This model identified six interrelated dimensions of IS success. It proposed that the dimension of IS success can be represented by the system quality, the output information quality, consumption (use) of the output, the user's response (user satisfaction), the effect of the IS on the behavior of

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the user (individual impact), and the effect of the IS on organizational performance (organizational impact). This model provided a system for classifying the multitude of IS success measures and suggested the temporal and causal interdependencies between the six dimensions Petter and McLean, (2009) and Wang et al., (2007).

The model is shown below:-
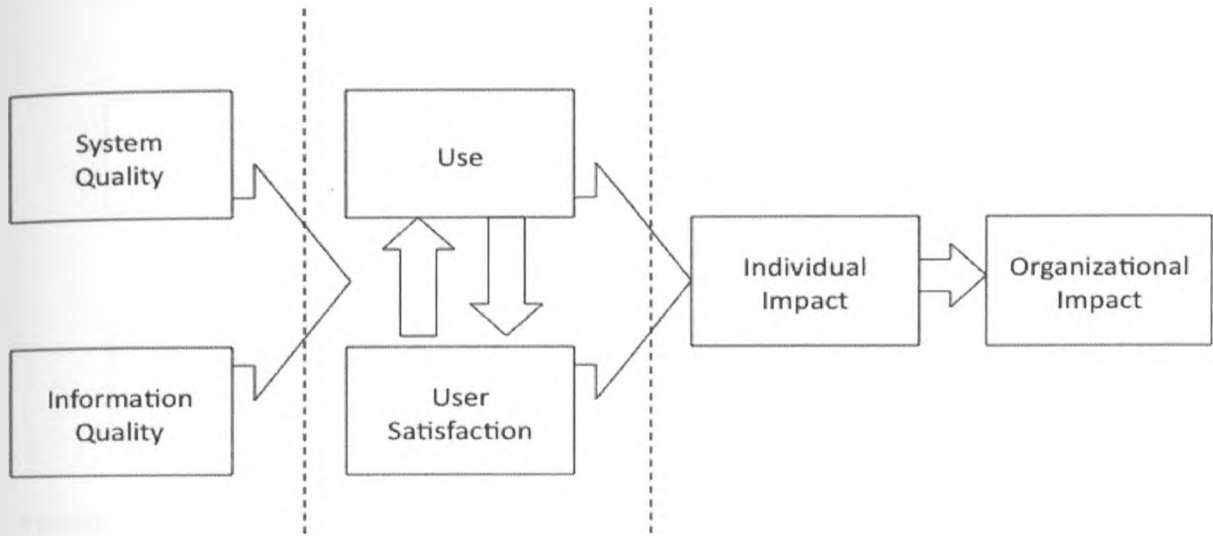
FIGURE 2.2 Information Systems Success Model DeLone & McLean, (1992);

Source: DeLone and McLean, (2003).

The original IS success model needed further validation to address some of the limitations of the original model. Based on a review of the literature and recognizing these potential improvements over their model, DeLone and McLean acknowledged these modifications and proposed an updated model. The updated model is shown in the figure 2.3 below. The primary differences between the original and updated models includes:-

1) The inclusion of service quality to reflect the changing nature of IS required the need to assess service quality as additional aspect of IS success,

2) the addition of intention to use to measure user attitude, and

3) the collapsing of individual impact and organizational impact into a more parsimonious net benefits construct Wu and Wang, (2006).
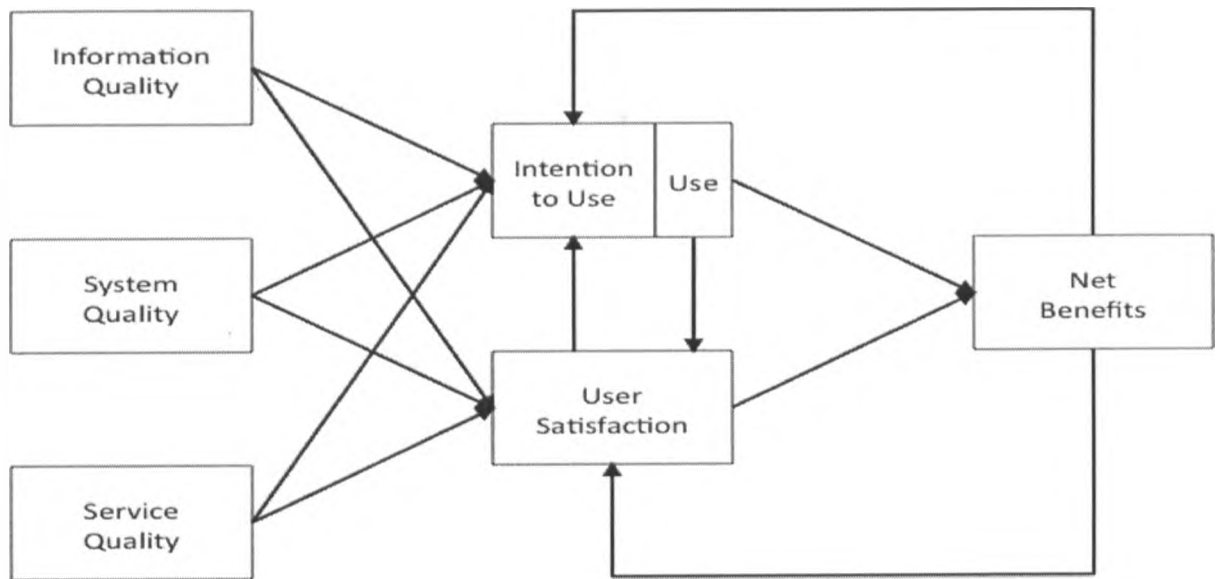
FIGURE 2.3 DeLone and McLean's Updated IS Success Model (2003)

Source: Petter and McLean, (2009)

Reflecting on the new model DeLone and McLean explains that "Use must precede 'user satisfaction' in a process sense, but positive experience with 'use' will lead to greater 'user satisfaction' in a causal sense" Petter and McLean, (2009) . They felt that, given the variability of IS and their contexts, it may sometimes be appropriate to measure Intention to Use (an attitude) rather than Use (a behavior). They went on to state that if Intention to Use was a measure, then increased User Satisfaction would lead to a higher Intention to Use, which would subsequently affect Use. This resulted in the addition of Intention to Use in the updated model DeLone and McLean, (2003).

This IS success model has become very effective and it is used not only in the IS success but also other related field like e-learning assessment model.

2.3.3 Theory of Reasoned Action (TRA)

The theory of reasoned action has been used widely in technology adoption research. This theory suggests that an individual's intention to adopt an innovation is influenced by attitude toward the behavior and subjective norm. Subsequently person's behavior is determined by his intention to perform the behavior.
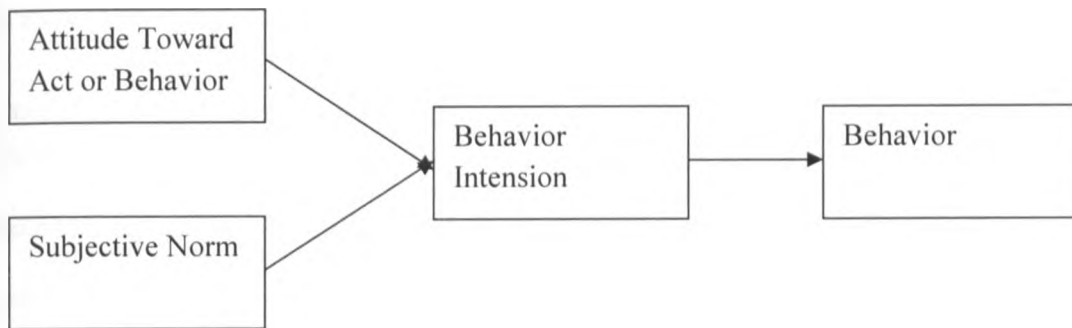
FIGURE 2.4 Theory of Reason Action (TRA)

Source: Fishbein and Ajzen (1975)

The theory of reason action was developed by Martin Fishbein and Icek Ajzen (1975, 1980), derived from previous research that started out as the theory of attitude, which lead to the study of attitude and behavior. The theory was "born largely out of frustration with traditional attitude–behavior research, much of which found weak correlations between attitude measures and performance of voluntary behaviors" Hale *et.al*, (2003).

TRA proposes that the behavioral intention of an individual to perform (or not perform) a certain target behavior, is solely and directly responsible for influencing that individual's target behavior. In turn, an individual's behavioral intention is said to be jointly determined by two factors: attitude towards behavior and subjective norm. Attitude towards behavior can be

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described as an individual's subjective forecast of how positive or negative he / she will feel when performing the target behavior, whereas subjective norm can be viewed as an individual's perception of the social pressure on him / her to perform the target behavior Fishbein and Ajzen, (1975), Ajzen and Fishbein, (1980).

The key application of the theory of reasoned action is prediction of behavioral intention, spanning predictions of attitude and predictions of behavior. In this theory personal voluntary behavior is predicted by his/her attitude toward that behavior and how he/she thinks other people would view them if they performed the behavior.

2.3.4 Theory of Planned Behavior (TPB)

The theory of planned behavior is an extension of the theory of reasoned action Azjen (1985). According to Azjen the theory of planned model resulted from limitations on the TRA. Theory of Planned Behavior (TPB) extends TRA to account for conditions where individuals do not have complete voluntary control over their behavior. Ajzen added a third element to this model which according to him has an influence on a person's intention to perform a behavior which he called perceive behavioral control. At the heart of TPB is the individual's intention to perform a given behavior. For TPB, attitude toward the target behavior and subject norms about engaging in the behavior are thought to influence intention. TPB includes perceived behavioral control over engaging in the behavior as a factor influencing intention.

This difference results in TPB recognizing that not all behavior may be under an individual's voluntary control, with behavior ranging on a scale from complete control through to total lack of control Ajzen, (1991). Although TPB was formulated to predict behavior across many settings, it has been shown to be suitably relevant in explaining Information System use.
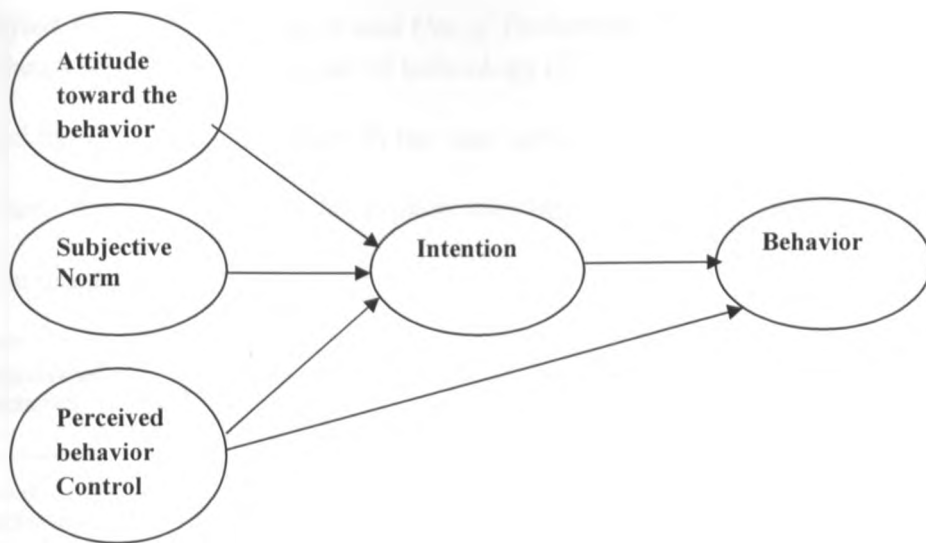
FIGURE 2.5 Theory of Planned Behavior (TPB)

Source: Ajzen (1985)

According to TPB, an individual's performance of a certain behavior is determined by his or her intent to perform that behavior. Intent is itself informed by attitude toward the behavior, subjective norms about engaging in the behavior, and perception about whether the individual will be able to successfully engage in the target behavior. In this model behavior is determined by the intention to perform the behavior. In turn, the intention to perform is determined by three factors: attitude toward behavior, subjective norm, and perceived behavioral control.

In an IS context, where the behavior to be performed can be quantified as system usage, attitude toward behavior can then be described as an individual's favorable / unfavorable evaluation of using a specific system, while subjective norm can be seen as the perceived social pressure to use (or not to use) said system. The last of these three antecedents, perceived behavioral control, relates to the degree to which an individual believes that he / she has control over personal or external factors that may facilitate or constrain system use.

2.3.5 Unified Theory of Acceptance and Use of Technology (UTAUT)

Unified theory of acceptance and use of technology (UTAUT) is a technology acceptance model formulated by Venkatesh and others in the user acceptance of information technology toward a unified view. The UTAUT aims to explain user intentions to use an information system and subsequent usage behavior.
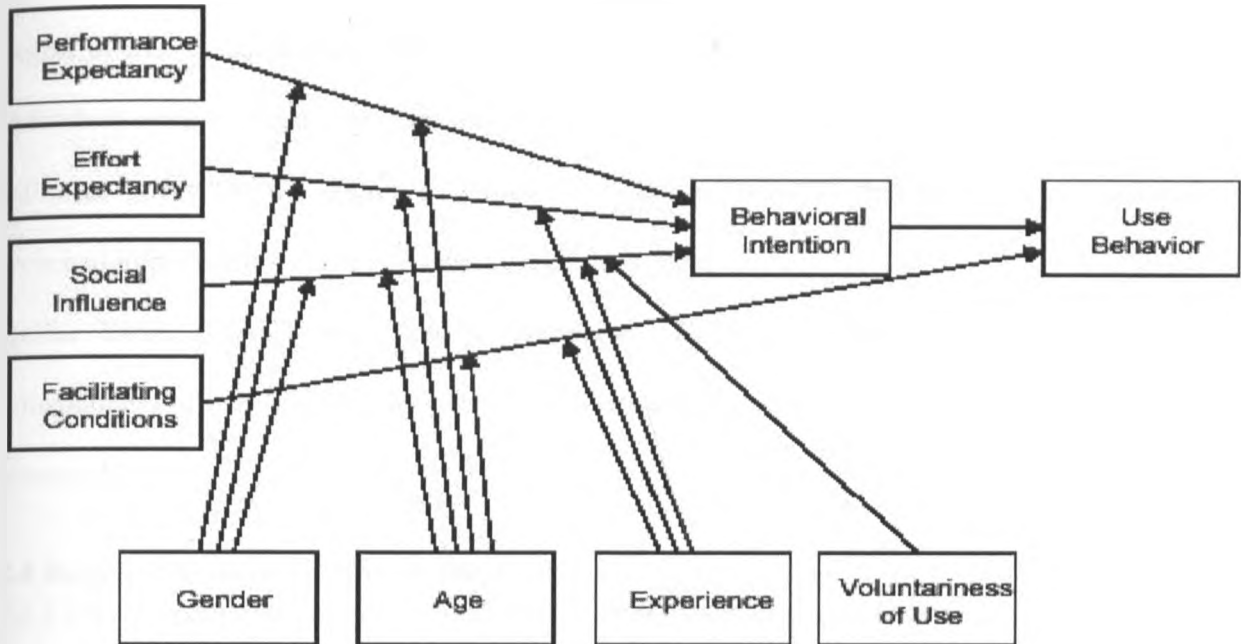
FIGURE 2.6 Unified Theory of Acceptance and Use of Technology (UTAUT)

Source: Venkatesh et al. (2003)

The theory holds that four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of usage intention and behavior (Venkatesh et. al., 2003). Gender, age, experience, and voluntariness of use are posited to mediate the impact of the four key constructs on usage intention and behavior (Venkatesh et. al., 2003). The theory was developed through a review and consolidation of the constructs of eight models that earlier research had employed to explain IS usage behavior (theory of reasoned action, technology acceptance model, motivational model, theory of planned behavior, a

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combined theory of planned behavior/technology acceptance model, model of PC utilization, innovation diffusion theory, and social cognitive theory).

In UTAUT, performance expectancy is similar to TAM's perceived usefulness, and is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance". Like perceived ease of use in TAM, effort expectancy refers to "the degree of ease associated with the use of the system". Social influence "the degree to which an individual perceived that important others believe he or she should us the new system". Social influence refers to "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system".

Unlike TAM, UTAUT introduced 4 moderators. There are gender, age, experience, and voluntariness of use. These factors can help to explain the behavior differentiation on different relationships

2.4 Review of E-learning Models and Theories
As e-learning gains attention, it is important to establish an appropriate framework for research to enhance the effectiveness of this new trend. This study establishes the relevance of applying the above models and theories to learner's satisfaction in e-learning in institutions of higher learning and each model stress a different aspect as explained. Satisfaction have been widely adopted as an important determinant for the success of the IS DeLone and McLean, (2003). Satisfaction is one of the import concepts in the success of e-learning which have attracted a great deal of research in the past. Bolton and Lemon, (1999) empirically demonstrated that if a learner with higher levels of satisfaction (in time t) will have higher usage (in time t+1) than a learner with lower levels of satisfaction.

Information system success (ISS) model has been used mostly in researches that help to analyze the success of an information system in different organizations Johnson et al, (2001). Delone &

McLean's (2003) in their later study revealed that ISS model has three major dimensions which includes; Information quality, system quality and service quality, each dimension should be measured or controlled and each will affect "use "and "user satisfaction. The inclusion of service quality in the updated model highlighted the important of service and support in the success of e-commerce systems. Although the model is mostly used to evaluate user's satisfaction toward adoption of an information system, this study have borrowed the dimension of system quality from ISS model.

Researchers have adopted TAM over the years in order to predict and understand user acceptance of new technologies. TAM prides itself in its seeming parsimony and applicability across various organizational to investigate the level of satisfaction of information systems. Introduced to the academic world by Davis et al., (1989), the Technology Acceptance Model (TAM) is merely an adaptation of Fishbein & Ajzen's TRA. Nevertheless, TAM has proved to be an exceptionally useful tool at predicting future system usage, specifically during the user acceptance of an IS. In a comparison of TAM and TPB conducted by Venkatesh & Davis, (2000), found TAM to have a slight empirical advantage over TPB. However, he found that despite being easier to apply, TAM only supplies information on users' opinion about a satisfaction of the system. Venkatesh & Davis, (2000) highlighted that there have been relatively few empirical tests regarding the effectiveness of TBP, with more test of TRA (on which TPB is based). They further stated that TAM matches up quite favorably to alternative models such as TRA and TPB.

The TPB model does have some limitations with regards to measurement which has prevented it from being sufficiently tested in empirical studies. One of these limitations is ambiguity that surrounds the definition of perceived behavioral control (PBC). The seeming lack of a standard

definition makes the comparison of measurements from different studies irrelevant.TPB is grounded on the belief that people think rationally, making logical decisions based on the information available to them, unconscious motives are not taken into consideration.

TAM is comparable to TRA in that it hypothesizes that actual system usage (behavior) is directly influenced by behavioral intention to use. However, the models differ in the sense that TAM reasons that behavioral intention is jointly determined by perceived usefulness and attitude instead of being jointly determined by subjective norm and attitude, as is the case in TRA. The direct effect of perceived usefulness, a type of belief, on attitude towards use, is not in agreement with TRA Wetzels, (2003).

Davis et al. [1989] found that the subjective norm construct from TRA was non-significant, and hence excluded it from TAM. Further investigation by Thompson et al. (1991) and Davis (1993) revealed that it was sometimes necessary to exclude behavioral intention, linking attitude directly to actual behavior. Thompson et al. (1991) argue that the exclusion takes place when the sole interest is satisfaction with system usage that has already taken place.

UTAUT have been formed from unifying conceptual and empirical similarities from the existing theories. Due to the development of UTAUT being so recent, it's yet to be adopted and validated by a significance number of studies at this stage Venkatesh *et al.* (2003). Also UTAUT like TAM is a predictive model of human behavior and share the same limitation as TAM.UTAUT and TAM being predictive tools has proven restrictive when seeking motives for specific behaviors. In that regard, however, more flexible models such as the Theory of Planned Behavior (TPB) do exist, but that flexibility comes at the expense of being far more complicated to apply to real-life situations. On the other hand, TAM's great advantage is that its constructs are always measured in the same fashion, regardless of circumstance.

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Ahmed (2008) in his research on modeling learners intention to adopt e-learning in Egypt highlighted that e-learning is becoming prominent in higher education, with universities in Africa increasing provision and learners are signing up. In his analysis he insisted that learner satisfaction plays a key role in adoption and continuous use of e-learning system. In his analysis he used TAM and TRA to develop his frame work for his study.

Kort and Gharbi, (2005) did a research on an experimental approach of satisfaction in e-learning in Tunisia. In their study they analyzed the factors that influenced e-learning satisfaction. They adopted a conceptual model which they developed from TAM, TRA and ISS models. From the above analysis TAM and TRA models were used for this study. These models have been used in research both in developed and developing countries to study the satisfaction and adoption of e-learning.

2.6 Conceptual Framework

The conceptual framework that has been used in this study has been developed from Technology Acceptance Model and Theory of Reason Action. TAM is the main model for this study that states that for actual usage of the system there are external variables that relates to perceived ease of use and perceived usefulness. These external variables play a pivot role in enhancing the adoption and satisfaction of users of the system. This study have extended the same where external variables are chosen by considering three major factors;-course management factor, technological factor and institutional arrangement factor.

According to Lindgaard and Dudek (2003) explained that many scholars are trying to measure the satisfaction of learners who are taking e-learning course. Some of the results they are getting are reveling that satisfaction is a complex construct and its substances vary with the nature and experience the case is subjected to. They argued that different researchers have used different

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instruments and method to unearth and understand this occurrence but they suggested that more research need to be done as satisfaction is a critical factor which affects consideration for continuous use of the system which results to smooth implementation of the program. In their analysis they highlighted that different researcher have used different variables in their analysis on learners' satisfaction in e-learning. The table below shows the different variables that have been used in to measure the learners' satisfaction.

TABLE 2.2 Variables used by other Researchers

Author(s)	Variables
Vygotsky (1978)	The importance of group interaction
Arbaugh (2000)	Perceived usefulness and perceived ease of use, flexibility of e-Learning, interaction with class participants, student usage, and gender
Passerini and Granger, (2000)	Identify learner characteristics, such as attitudes, motivation, belief, and confidence
Clyde and Anita (2006)	System Quality, System Usage, Services, Content Quality
Arbaugh (2007)	Learner attitude toward computers, learner computer anxiety
Liaw (2007)	Instructor and learner attitudes toward e-learning

The conceptual framework for this study have been drawn from the analysis of TRA and TAM model, related theories on learner satisfaction as explained in literatuer review and other diverge research perspectives on learners satisfaction. The figure below represent the conceptual framework that have been used in this study.
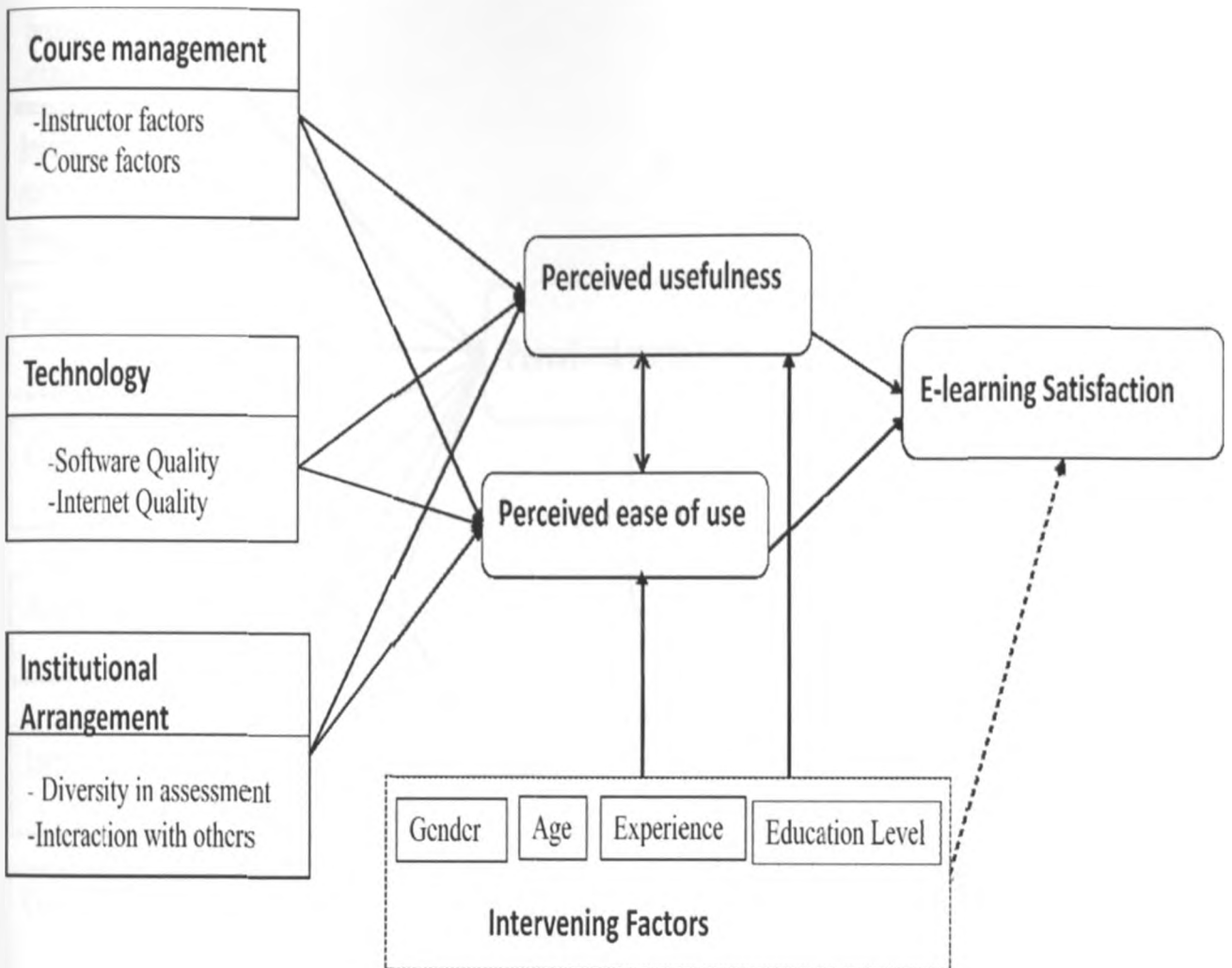
FIGURE 2.7 Conceptual Framework
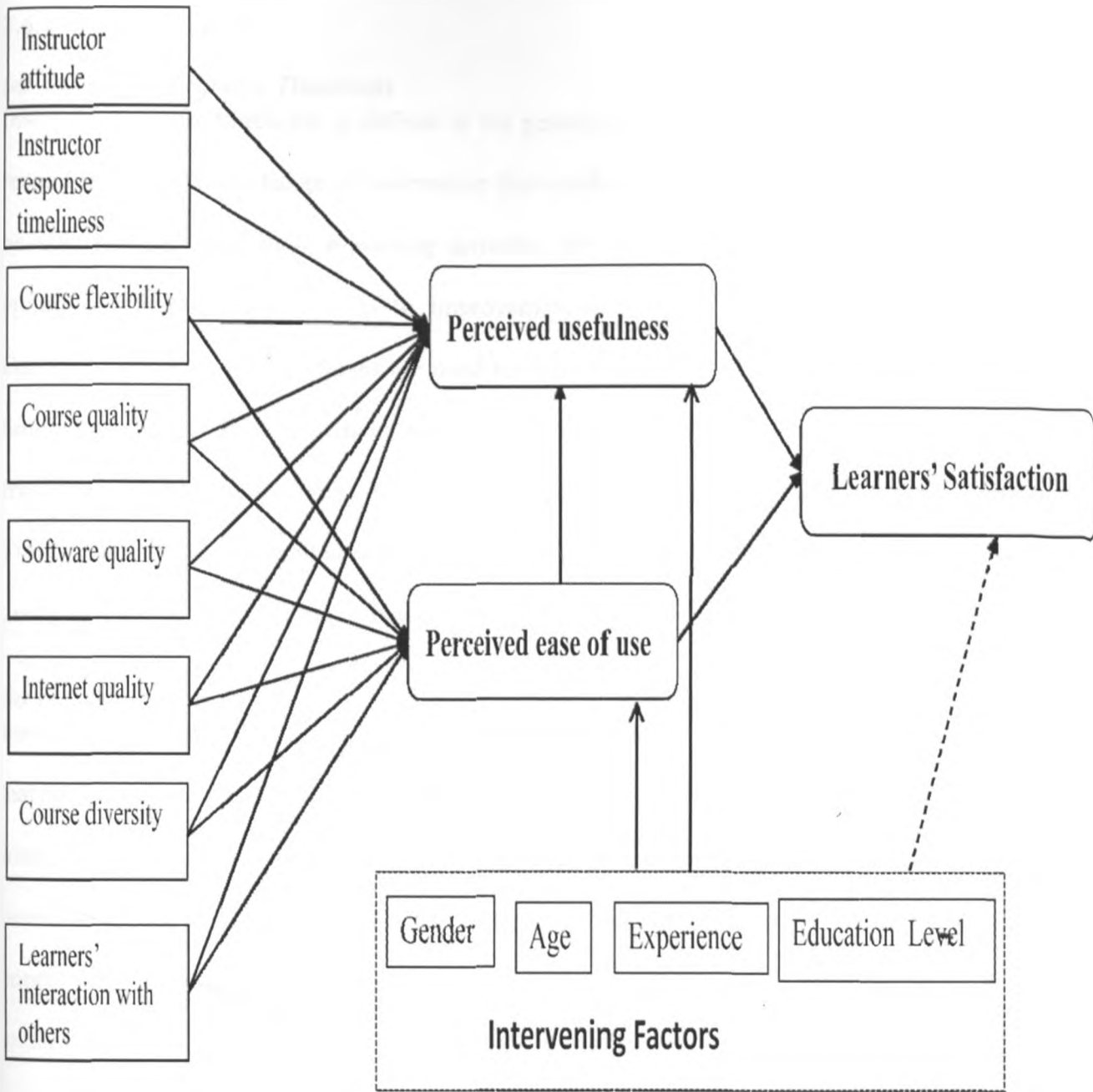
FIGURE 2.8 Extended Conceptual Frame Work

2.6 Definition of Variables

Eight variables are discussed below.

2.6.1 Instructor Factors

(a) Instructor Response Timeliness

Instructor response timeliness is defined as the perception of the learner toward the instructors' response toward the exchange of information that enhances leaner's learning. Instructors need to be able manage and handle e-learning activities. He should be able to respond to learners' enquiries promptly which results to improvement of learners' satisfaction Chickering and Gamson, (1987). In online courses the need for quality feedback is paramount and lack of this timely response can lead to learners' ambiguity about their performance which can contribute to frustration resulting to less online learning course satisfaction Thurmond and Wambach, (2004). Timely feedback is important because learners can have a clear picture of their progress and how they can improve their performance in class Chickering & Ehrmann, (1996).

(b) Instructor Attitude

Instructor behaviors that arise through attitudes and actions can play a role in influencing learners' own reactions to the online learning environment Piccoli et al., (2001). Thus, when the instructors demonstrates more positive attitude toward online learning then the more behavioral intension to use it Liaw et al., (2007). Collis, (1995) in her review on education literature concerning the impact of the media concluded that the instructional implementation of the technology plays a critical role in determining the effect on learning. She emphasized that instructor plays a key role in adoption of an e-learning system and his/her attitude would affect the satisfaction. Therefore the instructor attitude toward e-learning is defined as how learner perceives their instructors' attitude toward e-learning.

2.6.2 Course Factors

(a) Course Flexibility

E-learning offers course flexibility and freedom to decide when each online course will be taken irrespective of the distance Raab et al., (2002). The flexibility in time, location, unlimited freedom to express thought, ask questions and online availability of course's material for learners' selection are benefits associated with e-learning Bouhnik and Marcus, (2006).In e-learning environment courses design offers an opportunity to the learner to take great control of the course and he/she is able to make use of the available technologies to suit him/her in terms of delivery, timing and accessibility Piccoli et al., (2001). The flexibility of time, distance and both in e-learning has facilitated learners' satisfaction in e-learning Arbaugh, (2002). Therefore course flexibility is defined as the learners' perception of efficiency in learning established by media being both place and time independent.

(b) Course Quality

The quality of e-learning course is critical factor that learner take into account when considering e-learning. Quality has been established as a factor that affects learners' satisfaction in e-learning Piccoli et al., (2001). E-learning courses incorporate multiple media content, interactive communication and brainstorming thus attracting learners Wua et al., (2008). The study proposes that course quality will play a great role in learners' satisfaction.

2.6.3 Technology Factor

(a) Software Quality

Compeau and Higgins (1995) suggested that the belief that one has the capability to interact with a given technology plays a significant role in users' expectations and performance. Learners' opinion relating to system and distance learning has a great effect on the success of e-learning course Webster and Hackley, (1997). Delone and Mclean, (2003) in his research indicated that "higher system quality is expected to lead to higher user satisfaction and use leading to

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individual productivity". Therefore software quality is considered a significant factor in learner satisfaction.

(b) Internet Quality

In an e-learning environment the availability of reliable communication channel among (learners'-content, learners-to- learners, learners-to –instructor and learners-to –hypermedia content) is an important factor that affects e-learning Passerini and Granger, (2000). Therefore the internet quality is a critical factor in e-learning Piccoli et al., (2001). Internet reliability and quality are important attributes which influence e-learning outcome thus affecting learners' satisfactions Webster and Hackley, (1997). Therefore internet quality is a significant factor that affects learners' satisfaction.

2.6.4 Institution arrangement

(a) Diversity in Course Assessment

Assessment has been identified as a key element in e-learning that empower, direct and motivate learner and provide a benchmark against which learners can measure their progress Siozos et al., (2009). Proper feedback mechanisms are critical element in e-learning process in relation to learners' academic performance and also for internal process such as their knowledge and beliefs, goals-setting processes, strategy use and self-regulation Butler and Winne, (1995). Diversity in course assessment helps in creating interest and motivation among learners Zeidner, (1992). Study carried out indicated that environmental variable such as diversity in assessment and perceived interaction plays a great role in e-learning satisfaction Thurmond et al., (2002). Diversity in assessment is defined as diverse evaluation methods as perceived by the learners. Therefore this study proposes that diversity in assessment affects learners' satisfaction in e-learning.

(b) Learners' Interaction with Others

Learner interaction is explained as learners' engagement with other learner, course material, instructor, and the communication channels used in the e-learning course Thurmond and Wambach, (2004).When there is increased interaction among the learners' and learners', learners' and instructor they increase the chances of building their own knowledge through social context and this interaction is essential factor for learning satisfaction and success Liaw et al., (2007).

A research carried out to examine the relationship between online participation and grade among the learners concluded that learners who failed in one or more subject had less times of interaction compared to those who passed all the subjects Davies and Graff, (2005). Also in another research carried out showed that learners' with high frequency of interaction with other learners' reported highest levels of perceived learning in the course Hong, (2002). Studies have suggested that higher learner interaction activity leads to high learners' e engagement resulting to better learning outcome and high level of satisfaction Northrup, (2001).

TABLE 2.3 Operational Plans for the Research

Objective	Variable	Indicators	measurement	Measurement Scale	Study Design	Data collection tool	Data analysis
Independent Variables							
To examine the extent to which a learner perception toward instructor's response timeliness (timely feedback) affect his/her satisfaction in e-learning.	Instructor response timeliness	Time taken for instructor to give feedback.	-if learner receive comment, exam results and feedbacks in time.	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)
To examine the extent to which a learner perception toward instructor's attitude on e-learning course will affect his or her satisfaction in e-learning	Instructor Attitude	The attitude of the instructor instructing an e-learning class.	-The instructor positive attitude towards e-learning	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)
To examine the extent to which a learner perception toward course flexibility (time, location and material) in an e-learning course will affect his/her satisfaction in e-learning.	Course flexibility	Time saved due to taking a course through e-learning	-if course flexibility saves learner time and give them opportunity to do other related no activities	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)

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TABLE 2.3 Operational Plans for the Research

Objective	Variable	Indicators	measurement	Measurement Scale	Study Design	Data collection tool	Data analysis
To examine the extent to which a learner perception toward course quality in an e-learning course will affect his/her satisfaction.	Course quality	The quality of the e-learning course.	-if e-learning improve the quality of the course. -if e-learning did affect the quality of the course. -if e-learning course meets the learners expectations	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)
To examine the extent to which a learner perception toward the quality of e-learning software will affect his/her satisfaction in e-learning.	Software quality	Required software function. Flexibility and easy to use.	-if the e-learning software has the required functions, it's flexible and easy to use.	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)
To examine the extent to which a learner perception toward the quality of internet while undertaking e-learning course will affect his/her satisfaction in e-learning.	Internet quality	Speed of the internet and communication quality of the internet	-If learners are satisfied with the speed of internet and the communication quality of internet.	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)

TABLE 2.3 Operational Plans for the Research

Objective	Variable	Indicators	measurement	Measurement Scale	Study Design	Data collection tool	Data analysis
To examine the extent to which learner's perception toward the diversity of e-learning course will his/her satisfaction in e-learning.	Course diversity	Variety ways of accessing quizzes and learning materials	-if e-learning course offers a variety of ways of assessment.	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)
To examine the extent to which learner's perception toward interaction with others (instructor, course material, communication channels) during e-learning course will affect his/her satisfaction in e-learning.	Learners interaction with others	Interaction between the instructor and learner. Interaction between the learners.	-if e-learning courses offers interactive communications between the instructors and the learners.	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)
<td colspan="8" align="center">dependent Variables</td>
To examine the key independent variables that affects learner satisfaction in e-learning.	E-learning Satisfaction	Course efficiency and flexibility.	-The level of satisfaction of e-learning course through the effectiveness and efficiency of the course.	Ordinal (likert scales)	Exploratory research (survey)	Questionnaire	Structural equation modeling (SEM)

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CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter describes the methods used and how the study was conducted. The chapter gives an explanation of research design, research approach, unit of analysis, data collection tools, data collection procedure, data analysis methods and the limitation of the methodology.

3.1 Research Design

Every researcher has his/her own motivation to perform a scientific study with an aim of finding a result to solve the intended purpose. According to Yin (2003), McNabb (2008) the research purpose can be classified in three categories: Exploratory research, Descriptive research and Explanatory (or Casual) research. In each of the above mentioned approach one or more of a variety of statistical tools are used during the test of ideas or concepts and to communicate research findings.

3.1.1 Exploratory Research

As mentioned in the first chapter, this study will concentrate on an empirical analysis of critical factors that affects learners' satisfaction in e-learning. However in explaining how the defined variable will affect the learners' satisfaction this study will use explanatory research. According to Saunders et al, (2000), exploratory research is undertaken when u want to clarify an understanding problem.

The goal of exploratory research is to explore something and its appropriate for when the research is difficult to delimit. McNabb (2008) explains that exploratory approach should be applied when the researcher is not sure about the correct model to use and the kind of relations and characteristics that are more suitable. Exploratory studies are used to clarify and define the nature of a problem. It is used to analyze a situation to gain a better understanding of the dimension of a problem.

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Chisnall (1997) stated that explanatory design are concerned with identifying the real nature of the research problems and, perhaps, of formulating relevant hypotheses for later test. He further explained that exploratory studies are variable means of finding out "What is happening; to seek new insights; to ask questions and to assess phenomenon in a new light". So an explorative research is suitable when a problem is difficult to demarcate.

3.2 Research Approach
The purpose of the study and the accompanying questions determines the best approach for the study as Yin (2003) explains. Research approaches can be divided in two categories, first deductive verses inductive research and secondly qualitative or quantitative. The quantitative approach was found to be the more suitable for the purpose of this study.

3.3 Unit of Analysis
The unit of analysis is the target sample in this research study. The unit of analysis of this study is university learners' who have under taken e-learning course for a period not less than one year. Although the study is concerned with the success of e-learning education in Kenya, the unit of analysis I have chosen will help unearth the critical factors that affects learners' satisfaction in e-learning.

3.4 Sample Size and Sampling procedure
A sample size was taken from the population of the learners who were undertaking e-learning course at three institution of higher learning namely; University of Nairobi, Inorero University and Kimathi University. The population of 2770 e-learning learners was considered. This sample size was calculated using the formula as outlined below;

$$n_o = \frac{Z_{\frac{\alpha}{2}}^2 * P(1-P) * DEFF}{\delta^2}$$

$$= \quad 384 \qquad \text{Minimun Number to be Sampled}$$

$$n = \frac{n_0 N}{n_0 + (N-1)}$$

$$= \quad 337 \qquad \text{Minimun Number to be Sampled after Finite Population Corretion}$$

The number of students to be surveyed was arrived at using the proportional to size allocation as shown in the equation () below,

$$n_h = \frac{N_h}{N} \times n$$

Where Nh = no. of students in University h. (h = 1,...,3): N_1 = *University of Nairobi;* N_2= *Inorero University;* N3 = *Kimathi University*

$$N_1 = \frac{1300}{2770} \times 337$$
$$= \quad 158.4$$
$$\approx \quad 159$$

$$N_2 = \frac{400}{2770} \times 337$$
$$= \quad 48.6$$
$$\approx \quad 49$$

$$N_3 = \frac{1070}{2770} \times 337$$
$$= \quad 130.2$$
$$\approx \quad 131$$

3.5 Data Collection Tool

Questionnaires were used as data collection tool for this study. The questionnaire was developed from questionnaires used by other researcher to test related variable that are used in this project. The method that was adopted for questionnaire scaling is the five likert scale. The respondent was asked to indicate his or her degree of agreement with the statement or any kind of subjective or objective evaluation of the statement. In this study five likert scales was used, although many psychometricians advocate using seven or nine levels, a recent empirical study found that a 5- or 7- point scale may produce slightly higher mean scores relative to the highest possible attainable score, compared to those produced from a 10-point scale, and this difference was statistically significant. In terms of the other data characteristics, there was very little difference among the scale formats in terms of variation about the mean, skewness or kurtosis.

3.6 Questionnaire Piloting

Piloting of the questionnaire took place to help to understand if the factors selected (Factors that affects learners' satisfaction) are meaningful to learners' taking e-learning course. The process was necessary to help in screening the understandability of the questionnaire. The pilot questionnaire was distributed to ten learners from each of the three universities who are undertaking e-learning course. When collecting the questionnaire the respondents we interviewed to understand their opinion toward the questionnaire. The necessary adjustments were made. The validity and reliability of the data collected was tested. The consistency of measurement of the scale was considered using the Cronabach's coefficient alpha. According to Gable and Wolf (1993) he suggested that a Cronabach's coefficient of above 0.7 is acceptable as the internally consistent scale. After all the necessary adjustment were made the process of collecting data started.

3.7 Data Collection Procedures

Suanders et al., 2000 explained that when you are conducting a survey, questionnaires are administered in different way according to the amount of the contact you have with the respondents. He stated that the questionnaires are self administered either, online, postal or delivery and collection one. In this study questionnaire were sent electronically and others were handed over to them.

3.8 Limitation of the methodology

Suanders et al., (2000) explains that when undertaking research, it's usually impossible, impractical or too costly to collect data from all the potential units of analysis which are included in the research problem. Due to this reason a smaller number of units, a sample population are often chosen to represent the relevant attribute of the whole set of unit, in this case the learners undertaking e-learning at institution of higher learning. In this situation a sufficiently random sample of the sample population becomes the representative of the larger population and the results generalized on statistical ground.

3.9 Data analysis method

Structural equation modeling (SEM) method was used to analyze data in this study using Amos 8.0.SEM provides a powerful, flexible and comprehensive technique for investigating relationships between measured variable and latent constructs. It's a comprehensive statistical approach for testing hypotheses about relations among observed and latent variables.SEM is a methodology for representing, estimating, and testing a theoretical network of (mostly) linear relations between variables. SEM Also tests hypothesized patterns of directional and nodirectional relationships among a set of observed (measured) and unobserved (latent) variables.

CHAPTER 4: DATA ANALYSIS AND RESULTS

4.0 Introduction

This chapter presents the analysis findings of the study, describes the result of data collected and presents findings on the factors affecting e –learning satisfaction.

4.1 Presentation, Interpretation and Data Analysis

The study used primary data sampled from three institutions of higher learning composed of the learners who are undertaking e-learning course. The general information captured in the study design included the institution of higher learning, course discipline, level of education, gender of the respondent, age in years and the experience respondents had in e-learning.

4.1.1 General Characteristics

The table below show the general characteristics of the respondents which were intervening factors in the learner's satisfaction on e- learning. Further, it shows the sample distribution of various intervening factors.

TABLE 4.2 General Characteristics **(n = 336)**

General Information	Frequency	Percent
University		
UoN	158	47.0
Inorero	48	14.3
Kimathi University	130	38.7
Course discipline		
Computer Science	22	6.5
Bachelor Commence	119	35.4
Bachelor Of Information Science	7	2.1
Bachelor Procurement	5	1.5
Bachelor of Education Science	46	13.7
Engineering	36	10.7
Diploma	15	4.5
Information Technology	37	11.0
Business Administration	49	14.6
Education Level		
Postgraduate	65	19.3

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Undergraduate	256	76.2
Diploma	15	4.5
Gender		
Male	188	56.0
Female	148	44.0
Age (in years)		
18-21	109	32.4
22-25	131	39.0
26-29	45	13.4
30-33	31	9.2
> 35	20	6.0
Experience with E-learning		
> 1 Year	139	41.4
> 2 Year	134	39.9
> 3 Year	40	11.9
> 4 Year	16	4.8
> 5 Year	7	2.1

Source: Author, 2012

4.1.1.1 University response

The questionnaires were distributed to three institution of higher learning namely: University of Nairobi, Kimathi University and Inorero University. Table 4.1 shows that University of Nairobi had the highest number of learners undertaking e-learning while Inorero University had the least. University of Nairobi and Kimathi University had 47% and 39% respondents respectively. The number of respondent in Inorero University was 14 %. The percentages samples were drawn from the ratio of learners who are undertaking e-learning courses in their respective university.

4.1.1.2 Education Level of Respondents

The study considered three levels of education in higher institutions of higher learning which included Post-graduate, undergraduate and diploma. Respondents indicated their education level to facilitate the study on establishing the satisfaction on e-learning visa viz the level of education. From the analysis in table 4.1, majority of the respondents i.e. 76% were

undergraduate, 19% of the respondents were post graduate and 4.5% were diploma students. Undergraduate had the higher percentage due to their high population in the institution of higher learning.

4.1.1.3 Gender of the respondents

According to table 4.1, the study established the gender of the respondents. 56% of the respondents were male and 44% were female. This indicates gender disparity in the institution of higher learning regarding course undertaken on e-learning.

4.1.1.4 Age of the respondents

Findings in table 4.1 indicates that majority (71%) of the respondent were between the age of 18 and 25 years. This can be attributed to the fact that this is the average age for students who are joining universities. 29% of the respondents were above 25 years. According to the cross tabulation, the majority of the respondents who were above 25 years, most of them were master's student.

4.1.1.5 E-learning experiences of the respondents

Table 4.1 above indicates that 41% of the respondents had an e-learning experience of more than one year but less than two years. 40% had an experience of above two years but less than three years, 11% had an experience of more than three years but less than four years, 5% had an experience of between four and five years and 2% had an experience of over five years.

The analysis shows that 81% of the respondents had not more than three years e-learning experience. The cross tabulation on experience of the respondents and level of education explained that a high percentage of respondents had been enrolled for undergraduate course.

4.2 Descriptive Analyses

The descriptive information of the study on e-learning is summarized below. The respondents provided feedback in all question measured by a five point Likert scale ranging from 1 being "Strongly agree" to 5 being "strongly disagree".

4.2.1 Course Management Factors

The respondents assigned a rank (1-5) to each of the aspects of course management. Majority of the respondents had a mean score of 2 translating to agree, except for Instructor Positive attitude toward E-learning which scored an impressive score of a strongly agree at 1.9. Question "I feel the quality of the course I took was largely unaffected by conducting it via the Internet" had the highest mean score of 2.8.

TABLE 4.2 Course Management Factors

Course Management	Mean Score
I receive comments on Assignment in timely manner	2.0
I receive enquiries Feedback on time	2.0
Instructor Positive attitude toward E-learning	1.9
Due to el-earning Spend more time on non-related activities	2.0
I Save time by E-learning	2.1
E-learning help in arranging class work more Effectively	2.1
E-learning Improved Quality of the Course	2.2
E-Learning met my expectation	2.4
Quality of the course was unaffected by the E-learning	2.8

Source: Author, 2012

4.2.2 Technology Dimension

The table below indicates that the question "I feel the information technologies used in e-Learning are very easy to use" had the lowest mean score of 1.8. "I feel satisfied with the speed of the Internet" and "I feel the communication quality of the Internet is good" had a mean score of 3.1 and 2.9 respectively, implying the level of satisfaction on internet speed and communication quality was average.

Table 4.3 Technology Factor

Technology Dimension	Mean Score
E-learning easy to use	1.8
E-learning has required functions	2.0
E-learning has good flexibilities	2.1
Speed of internet is satisfactory	3.1
Quality of communication	2.9

Source: Author, 2012

4. 2.3 Institutional Arrangement Factors

Most of the respondents agreed with most of the statements for institutional arrangement factors (means score of between 2.1 to 2.4). Question "This e-Learning course offers a variety of ways of assessing my learning (quizzes, written work, etc.)" had the lowest mean score and question "E-learning enabled easier interactive communication between instructor and the student" had the highest mean score.

Table 4.4 Institutional Arrangement Factors

Institutional Arrangement	Mean Score
E-learning has many varieties of assessing	2.1
Has interactive communication among instructors and students	2.4
Has interactive communication among students	2.3
Effective Communication tools	2.3

Source: Author, 2012

4.2.4 Perceived Usefulness and Ease of Use

The analysis in table 4.5 indicates that there was a strong perception on the usefulness and easy use of the e-learning from the respondents with a mean score range between 1.8 and 2.1. Question on "Using e-learning system would increase my productivity in e-learning" had a mean score of 1.8 while Question on "Using e-learning system allows me to accomplish

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learning task quickly" had a mean score of 2.1. Questions on other variables on perceived

usefulness and ease of use had mean score ranging from 1.9 to 2.0.

.**Table 4.5** Perception of Usefulness and Easy Use

Perceived usefulness and use		Mean Score
Usefulness	E-learning has enhanced my effectiveness	2.0
	Has enabled my accomplishment of tasks effectively	2.1
	Increased Productivity	1.8
Ease to use	Clear and understandable	2.0
	Easy in Information assess	1.9
	Easy access system overall	1.9

4.2.5 E-Learning Satisfaction

The findings on e-learning satisfaction are provided below.

Table 4.6 E-learning Satisfaction Levels

Satisfaction with the E-learning Aspects	Mean Score
E-learning in meeting needs	3.1
Satisfied with e-learning efficiency	2.9
Satisfied with e-learning effectiveness	3.2
Satisfied with my choice for taking e-learning	2.5

4.3 Reliability of Measurement Scales

The reliability of measure is the extent to which data it's free from random error. According to

Gable and Keilty (1998) referred to the scale of reliability as to the proportion of variance

attributed to the true score of the latent construct. They further explained that the internal

consistency reliability normally indicates the homogeneity of items comprising a measurement

scale. The consistency of measurement of the scale was considered using the Cronabach's

coefficient alpha. According to Gable and Wolf (1993) they suggested that a Cronabach's

coefficient of above 0.7 is acceptable as the internally consistent scale.

Table 4.7 Reliability of Measurement Scales

		Scale Mean	Scale Variance	Total Correlation	SMC	Cronbach's Alpha	Overall Cronbach's Alpha
Corse Management	ID1	18.9	20.5	0.4	0.4	0.6	
	Feedback	18.8	20.5	0.4	0.4	0.7	
	Positive attitude on E-learning	19.3	21.0	0.4	0.3	0.6	0.65
	CD1	18.4	23.9	0.0	0.0	0.7	
	Save time by E-learning	19.1	21.3	0.3	0.2	0.7	
	Working ones work more Effectively	19.1	20.2	0.5	0.3	0.7	
	Improved Quality of the Course	19.1	20.8	0.4	0.4	0.7	
	CD2	18.8	19.8	0.5	0.4	0.6	
	Quality of the course was unaffected by the E-learning	18.4	20.2	0.3	0.2	0.6	
Technology	Easy to use	10.0	9.4	0.4	0.2	0.7	
	SQT1	9.8	8.8	0.5	0.3	0.7	
	Good flexibility	9.8	9.2	0.4	0.2	0.7	0.72
	IQ1	8.8	6.5	0.6	0.4	0.7	
	Quality of communication	9.1	6.7	0.6	0.5	0.7	
	E-learning has many varieties of assessing	6.9	7.0	0.5	0.3	0.8	
	I1	6.6	5.5	0.7	0.5	0.7	
Institutional	Has interactive communication among students	6.8	6.0	0.6	0.5	0.7	0.79
	Effective Communication tools	6.8	6.2	0.6	0.3	0.7	
Perceived Use	E-learning has enhanced my effectiveness	15.7	25.2	0.6	0.4	0.8	
	PU2	15.6	24.0	0.7	0.4	0.8	
	Increased Productivity	15.8	24.9	0.7	0.2	0.8	0.85
	Usefulness	11.7	14.0	0.9	0.2	0.8	
	Clear and understandable	15.6	25.1	0.6	0.3	0.8	
	Easy in Information assess	15.8	25.0	0.6	0.2	0.8	
	PE3	15.8	25.8	0.6	0.4	0.8	
E-Satisfaction	E1	6.5	6.5	0.7	0.5	0.9	0.88
	E2	6.3	5.9	0.8	0.6	0.8	
	E3	6.3	5.9	0.8	0.6	0.8	
	E4	6.6	6.1	0.7	0.5	0.8	

4.4 Correlation Analysis

The summary of correlation coefficient among the variable was done to check if the data used have the possibility of collinearity problem (table 4.8). After the analysis, the result shows that multicollinearity issue does not exist, since high correlations of greater than 0.7 or 0.8 do not exist.

Table 4.8 Correlation Analysis

		Satisfaction levels	IS	CD	SQ	IQ	D	I	Usefulness	Us
Satisfaction levels	Pearson Correlation	1								
	p value									
CM										
IA	Pearson Correlation	0.4	1							
	p value	0.000								
CD	Pearson Correlation	0.3	0.3	1						
	p value	0.000	0.000							
Technology										
SQ	Pearson Correlation	0.3	0.2	0.3	1					
	p value	0.000	0.000	0.000						
IQ	Pearson Correlation	0.5	0.1	0.3	0.4	1				
	p value	0.000	0.008	0.000	0.000					
Institutional										
LCD	Pearson Correlation	0.3	0.5	0.4	0.4	0.3	1			
	p value	0.000	0.001	0.000	0.000	0.001				
LI	Pearson Correlation	0.3	0.3	0.4	0.5	0.3	0.5	1		
	p value	0.000	0.000	0.000	0.007	0.000	0.000			
Perceived Usefulness	Pearson Correlation	0.5	0.3	0.3	0.3	0.2	0.4	0.5	1	
	p value	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Use	Pearson Correlation	0.6	0.3	0.2	0.3	0.4	0.3	0.3	0.5	
	p value	0.000	0.012	0.000	0.000	0.017	0.000	0.000	0.000	

4.5 Factor Analysis for the Survey Factors
Table 4. 9 Factors Analysis of E-Learning

Main Factor of E-learning	E-learning Sub-factors	Factors Analysis						
		Component	Initial Eigen value			Extraction Sums of Squared Loadings		
			Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Course Management	Instructors factors	1	2.0	65.3	65.3	2.0	65.3	65.3
		2	0.6	21.4	86.7			
		3	0.4	13.3	100.0			
	Course Factors	1	2.3	38.2	38.2	2.3	38.2	38.2
		2	1.1	17.5	55.8	1.1	17.5	55.8
		3	0.9	14.2	69.9			
		4	0.8	14.0	84.0			
		5	0.6	9.8	93.7			
		6	0.4	6.3	100.0			
Technology	Software Quality	1	1.8	60.5	60.5	1.8	60.5	60.5
		2	0.6	21.6	82.1			
		3	0.5	17.9	100.0			
	Internet Quality	1	1.7	82.9	82.9	1.7	82.9	82.9
		2	0.3	17.1	100.0			
Institutional Arrangement	Assessment	1	2.4	59.9	59.9	2.4	59.9	59.9
		2	0.8	19.0	78.9			
		3	0.5	13.4	92.3			
		4	0.3	7.7	100.0			
Perceived Usefulness & Ease of Use	Usefulness	1	2.0	65.4	65.4	2.0	65.4	65.4
		2	0.6	20.6	85.9			
		3	0.4	14.1	100.0			
	Ease of Use	1	2.2	72.1	72.1	2.2	72.1	72.1
		2	0.5	15.9	88.0			
		3	0.4	12.0	100.0			
E-learning Satisfaction levels	E-learning Satisfaction levels	1	2.9	73.5	73.5	2.9	73.5	73.5
		2	0.5	11.8	85.2			
		3	0.3	8.6	93.8			
		4	0.2	6.2	100.0			

For instructors factors only one factor (receiving comments in timely manner at 86%) was extracted which score a cumulative score of 65%. In course dimension, two factors were extracted which include " spending more time on non related activities" at 84% and "the quality of e-learning course met my expectation" at 78% with cumulative score of 38% and 56% respectively. In Software quality dimension only one factor ("I feel the information technologies used in e-Learning have the required functions" at 81%) was extracted which score a cumulative score of 61%. In internet quality only one factor ("I feel satisfied with the speed of the Internet" at 90%) was extracted which score a cumulative score of 83%. In institution arrangement dimension only one factor ("E-learning enabled easier interactive communication between instructor and the student" at 86%) was extracted which a cumulative score of 60%.

Perceived Usefulness and Perceived Ease of Use dimension had two factors that were extracted which includes:- "using e-learning system allows me to accomplish learning task quickly" at 85 % with accumulative score of 65% and "Overall I find e-learning system easy to use" at 87% with accumulative score of 72%. For e-learning satisfaction dimension only one factor ("I am satisfied with e-learning course efficiency" at 90%) and cumulative score of 74%.

4.6 Univariate Analysis

4.6.1 Level of E-learning Satisfaction by General Information

Aggregated scores for e-learning satisfaction were matched with the different baseline information to assess whether there exists any significant differences in the satisfactions. Table 4.8 below indicates that there was a significance relationship between e-learning satisfactions and gender. Also there was a significance relationship between e-learning satisfaction and education level. University type and age didn't show significance relationship with e-learning satisfaction.

Table 4. 10 Level of E-learning Satisfaction by General Information

	Source of Variation	Sum of Squares	df	Mean Square	F	P value
University	Between Groups	12.6	2	6.3	0.6	0.549
	Within Groups	3477.3	333	10.4		
	Total	3489.8	335			
Education level	Between Groups	167.4	2	83.7	8.4	*<0.001*
	Within Groups	3322.5	333	10.0		
	Total	3489.8	335			
Gender	Between Groups	57.3	1	57.3	5.6	*0.019*
	Within Groups	3432.5	334	10.3		
	Total	3489.8	335			
Age	Between Groups	83.0	4	20.8	2.0	0.092
	Within Groups	3406.8	331	10.3		
	Total	3489.8	335			

Education level and gender had a significant difference in the mean scores for e-learning satisfaction (p value <0.05). Further analysis shows Students undertaking diploma were more satisfied with the e-learning than undergraduates and postgraduates students.
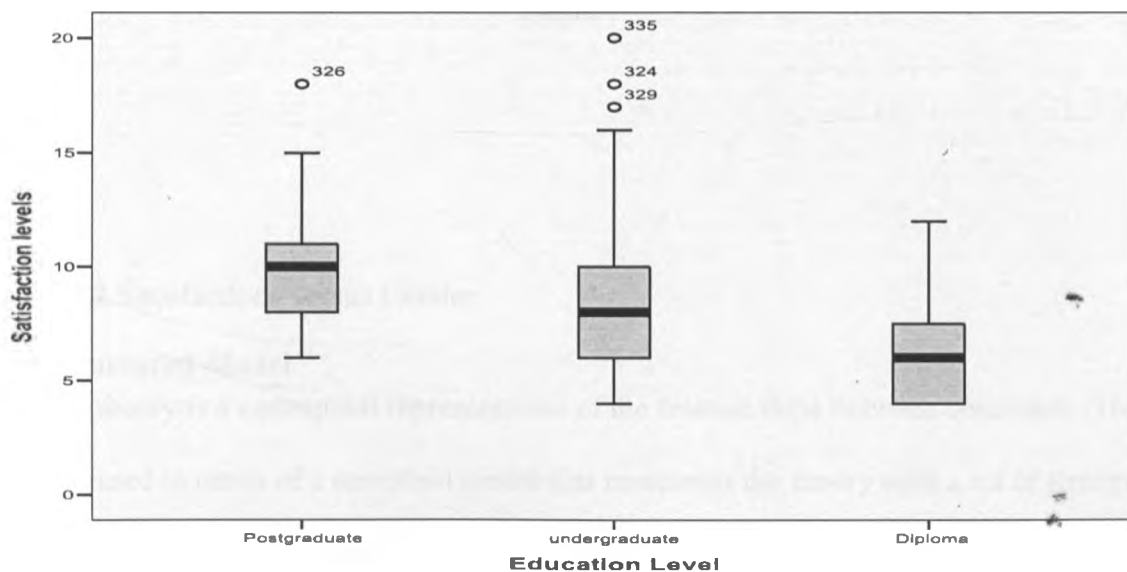
FIGURE 4.1 Satisfaction versus Education Level

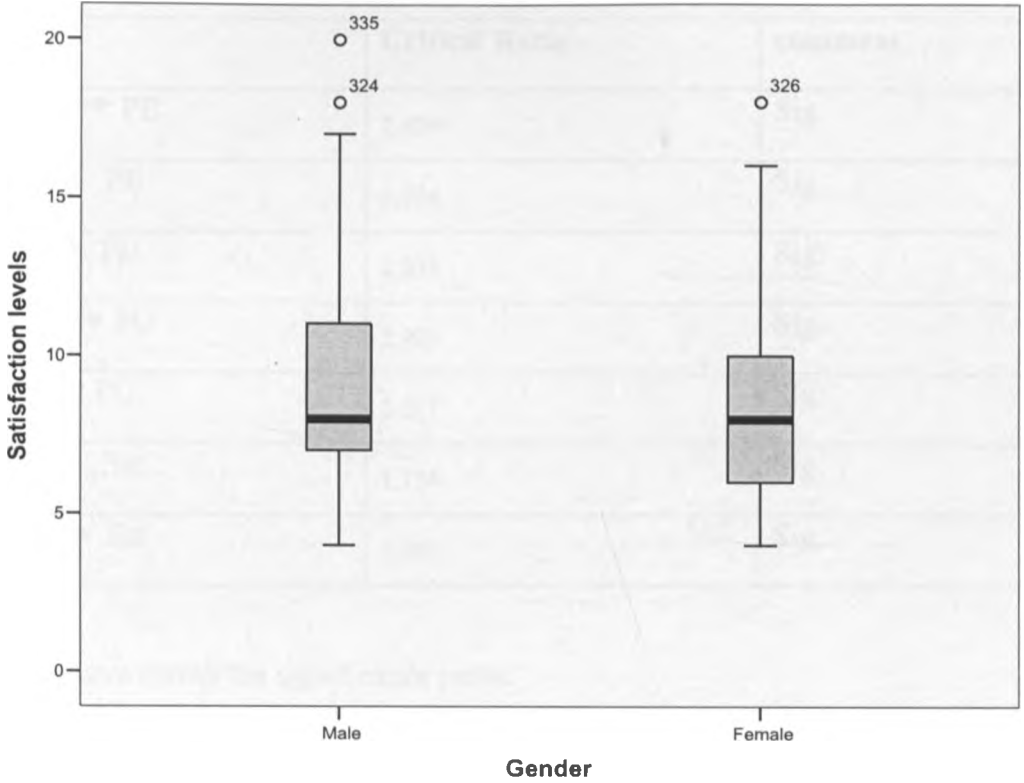The figure below further indicates that male students were more satisfied more than their female counterparts.

FIGURE 4.2 Satisfactions versus Gender

4.8 The Structured Model

A structural theory is a conceptual representation of the relationships between constructs. This can be expressed in terms of a structural model that represents the theory with a set of structural equations and expressed in a visual form. A path analysis for the structural equation model was performed to evaluate the relationships that help predicts learners' satisfaction in e-learning.

Table 4.11 Results of Path Test

path	Critical Ratio	comment
Tech ⟶ PE	2.339	Sig.
Inst ⟶ PE	5.704	Sig.
CM ⟶ PU	2.033	Sig.
Tech ⟶ PU	2.903	Sig.
PE ⟶ PU	2.017	Sig.
PE ⟶ Sat	1.734	Sig.
PU ⟶ Sat	1.285	Sig.

The table above shows the significance paths.

4.9 Analysis from the Model

The model is summarized in figure 4.3 below. The bold line indicates the strong effects; thinner lines indicate small effect. The paths that were significant after path test and standard casual test have been bolded. Only path which show significance in both test are regarded being significant.
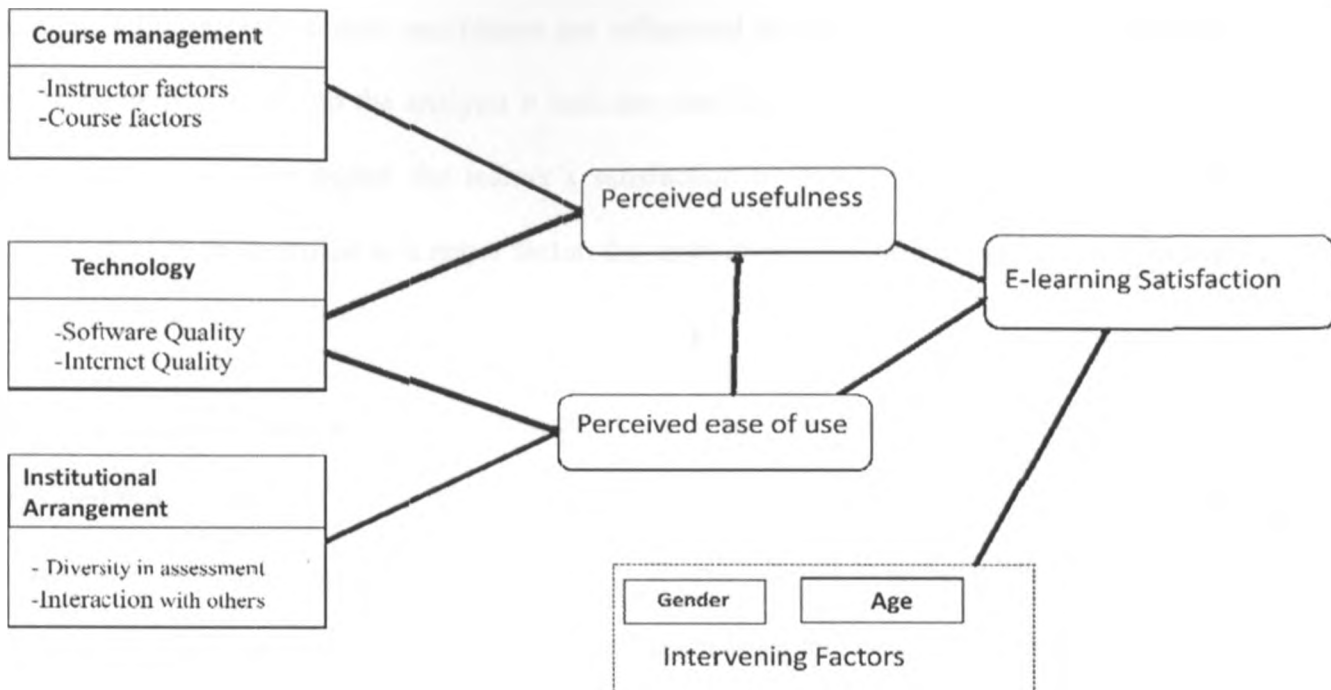
Figure 4.3 Improved Conceptual Frameworks

4.9.1 Course Management dimension

Course management dimension had two factors; the instructor factor and course management factor. From the structural model it shows that course management is an important determinant factor of perceived usefulness. This is in consistence with Chickering & Gamson, (1987), Piccoli et al., (2001) and Wu et al., (2008). Course management didn't show a significant relationship with perceived ease of use. This finding is of variance with those finding of Arbaugh, (2002) who found out that course management had a significance direct influence to perceived ease of use. This implies that learners undertaking e-learning course their level of satisfaction will be affected by how useful they think their course will enhance performance.

Instructor positive attitude toward e-learning shows significance to perceived usefulness. This indicates that an instructor plays a key role in the students learning processes in either traditional face to face teaching environment or in online learning environment. The effect of

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learning activities and student satisfaction are influenced by the instructor's attitude handling the learning activity. From the analysis it indicates that the more the positive the instructor is toward the course, the higher the learner's satisfaction toward the course. Since instructor attitude have been identified as a major factor, the institutions should be careful when selecting their instructors.

Instructor response timeliness showed significance to perceived usefulness. This observation indicated that instructor response timeliness affected learner's e-learning satisfaction. This result corresponds to Chickering and Gamson (1987), Thurmond and Wambach (2004). Instructor timely response is an important factor that helps the learner to know their performance early enough so that they can make improvement and consult their instructor for clarification. In an e-learning environment, learners always don't have a physical interaction with the instructor so timely response is important it deviate the student from becoming discouraged especially when their request are not attended to. Timely feedback is important, it help the learners to maintain their own pace and schedule in their learning. When learner's perceives that the instructor does not respond in timely manner they feel discouraged especially when the feedback concerns their exam result they feel frustrated. Apart from that timely feedback is critical because learners need to know how they are progressing as well as have an idea on how they can improve their performance on the course.

E-learning course quality showed significance to perceived usefulness. Course flexibility has shown a strong indication of student satisfaction in e-learning. This result corresponds to Piccoli et al. (2001) and Wu et al. (2008). Course quality includes overall course design, teaching materials, interactive discussion arrangements, multimedia material, etc. To increase the course quality satisfaction, the course scheduling, discussion arrangement and types, and

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course material must be properly prepared, and the e-learning instructional expertise and technical assistance need be put in place.

E-learning course flexibility showed significance to perceived usefulness. This score indicates that course flexibility affects e-learning satisfaction. This result corresponds to Raab et al. (2002), Arbaugh, (2002), and Bouhnik and Marcus (2006) findings that e-learning course flexibility played an important role in e-learners' satisfaction. Learners perceive course flexibility useful because it helps them to self pack their learning opportunities. The flexibility of the course gives learners the opportunity to balance their jobs, family and still be able to attend the e-learning course. Institution offering e-learning need to explore more on the advantages of learning phenomena and design courses with maximum flexibility to accommodate learners' needs.

4.9.2 Technology Dimension
Technology dimension had two factors; software quality factor and internet quality factor. From the structural model internet dimension showed a statistically significant influence upon perceived ease of use and perceived usefulness. These findings were in consistency with Webster and Hackley, (1997) and Piccoli et al., (2001). *Software quality* showed significance to perceived usefulness and perceived ease of use. This implies that the software quality is a significant factor that affects the level of learner's satisfaction. *Internet quality* showed significance to perceived usefulness and perceived ease of use. The findings suggest that the institutions offering e-learning should improve the quality of internet and the down time of e-learning platform.

4.9.3 Institutional Arrangement Dimension

From the structural model Institutional arrangement (diversity in assessment and interaction with other) is an important determinant of perceived ease of use. These finding were in consistency with Thurmond and Wambach, (2004) and Liaw et al., (2007). Institutional arrangement did not show determinant to perceived usefulness. This result shows that learners' satisfaction are affected by how the instructor provides an easy way of accessing learning material and how easy is it possible for student to be able to interact with the instructor. A teaching style that has a high level of interaction especially between the learners and the instructors is very important because it create conducive environment to promote understanding of the course content and also stimulate critical thinking. Interaction with instructor helps students clarify nebulous points and reinforce correct interpretation of the course. Diversity in assessment motivates the learners to exhibit their best efforts in different evaluation scheme so as to proceed with e-learning activity effectively.

CHAPTER 5: CONCLUSION AND RECOMMENDITION

5.0 Introduction

This chapter concludes the findings of the research question posed in chapter one through our finding. In relation to research questions the study explained the contribution to the existing knowledge, as well as indentifies policy recommendation. The limitation of the study highlighted and suggests further research.

5.1 Conclusions

According to the finding, the study concluded that a well structured e-learning course that offers a high degree of flexibility where there is prompt feedback and good quality course that incorporate learning models and interactive communication raises the level of learners satisfaction in e-learning. Instructor response timeliness and attitude toward e-learning was perceived useful for satisfaction of e-learning. Technology factor which include software and internet quality was perceived useful and should be easy to use. Learners believed that an e-learning system will be more useful to them if it is easy to use. Learners who have confident in accessing learning material and interaction with other are more likely to use e-learning system. Learners who ease of access to internet are more likely to use e-learning system.

5.2 Recommendations

5.2.1 Instructor dimension

Instructor timeliness and attitude toward e-learning was significant to learners' satisfaction. This calls for institutions to ensure that there is a clear time framework addressing assignment and feedback aspects. Timely response to learners' questions or request is certainly beneficial to the student. Regarding the instructor attitude there is a need for periodic instructor sensitization to enhance and sustain e-learning mode. Teaching online differs from face-to-face education.

Professional expertise should not be the sole criterion in selecting online instructors. Attitude toward using computer and network technology in delivering education and training will impact learners' attitudes and affect their performance.

5.2.2 Course dimension

Flexibility and course quality were perceived useful to learner satisfaction. Due to the flexibility offered by the e-learning course in terms of time, space and location learners should have a high degree of flexibility to allow self paced learning opportunity. Institution with e-learning should design courses with maximum flexibility to accommodate learners' needs. Institutions should develop a course framework that ensures that the quality of course is maintained and course materials are properly prepared. Institutions also need to build capacity on e-learning instructional expertise and technical assistance.

5.2.3 Technology dimension

Due to significance of software and internet quality in e-learning the institute should ensure the dynamism of the e-learning system in use. The developer of e-learning system should design software that are easy to use and have graphical user interface that user can customize. Apart from that the institutions offering e-learning should ensure that it have a reliable internet connection and bandwidth so as the learners can be able to connect to the system without any problems. Internet being the most used mode of communication plays a critical role and the administrator of the e-learning system should make sure that the internet is reliable and always available.

5.2.4 Institutional arrangement

Diversity in assessment and learners interaction with other was signification to learners' satisfaction. Instructor should ensure a variety of assessment of learning materials. The instructors should create a learning environment that encourages interaction between learner to learner and learner and the instructor. Although creating an environment that encourages information sharing though interaction (e.g. reading, posting, or replying to discussions, chatting, emailing, etc.) is an important way to improve e-learning outcomes, this alone may not reveal enough about the types and strength of the connections that are occurring in the course. Instead, instructors may wish to encourage richer communication through the development of small project groups that must work together to solve course-related projects and this will enhance the learners satisfaction of the course.

5.3 Limitations of the Study and Suggested Further Studies

Although the results of this study provide insight into satisfactions of learners who are undertaking e-learning course, a number of limitations were considered when interpreting the results. First this study represents the first test of the theoretical model and should be subjected to further testing with different participants, different cultural background, contexts, and technological architectures covering a variety of factors influencing e-learning satisfaction, it might not be comprehensive due to the limitation of time and resources. Secondly, the research participants were diploma, undergraduate and master's students who were completing their course as part of a degree or diploma requirement, so the results may not be generalize to other settings and contexts .eg learners with special needs and learners who are undertaking tailor made professional courses. Also the research used dependant variable on this course as the indicator of learners' satisfaction, further research can be done and learners score can be included as dependent variable.

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APPENDIX I: Structural Model
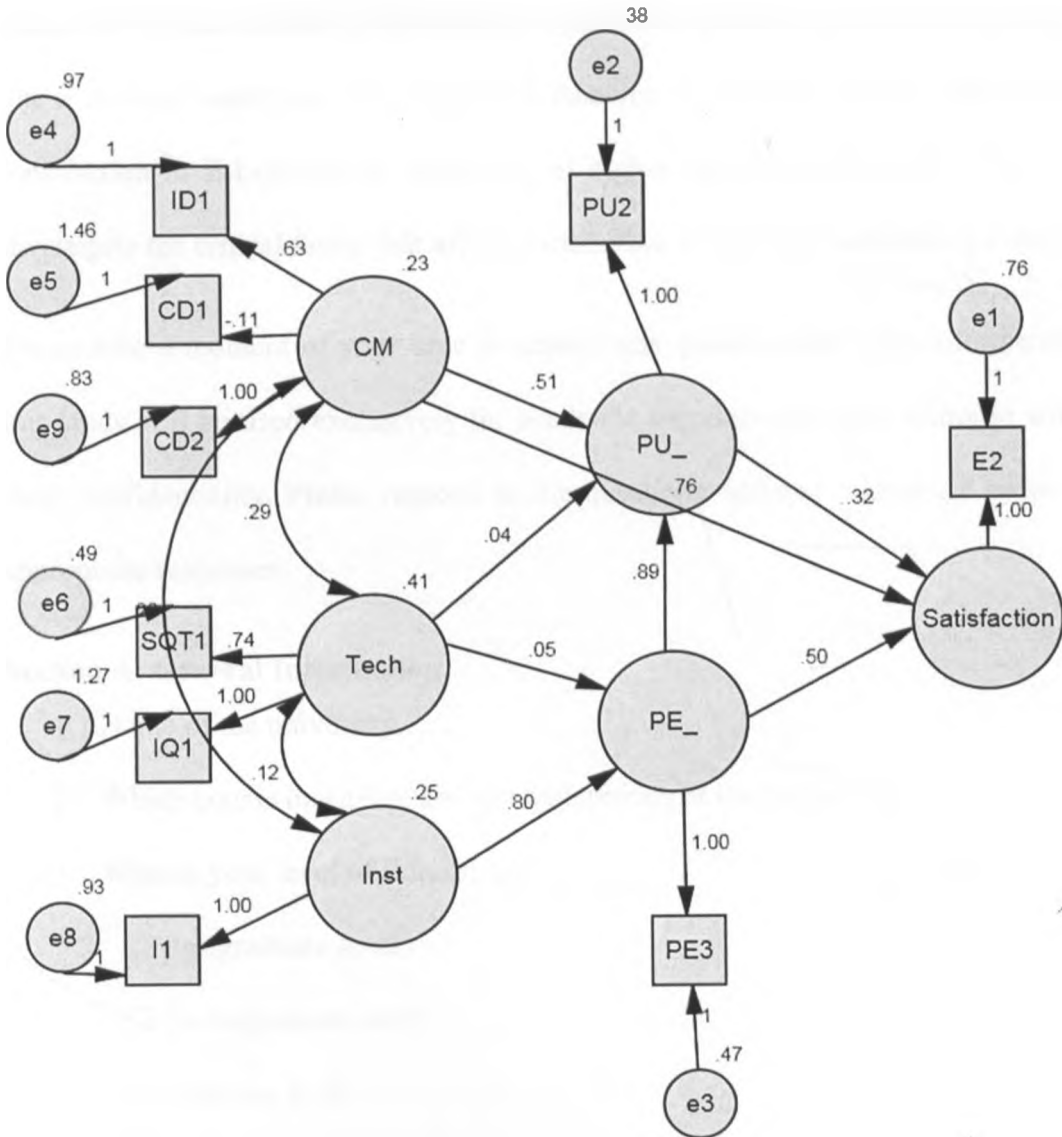
APPENDIX II: Questionnaire

E-learning satisfaction survey

My name is Alexander Ndigirigi, a final year student in the University of Nairobi undertaking a Master of Science course in Information System. As part of my course I am required to carry out a research study on "An Empirical Analysis of Critical Factors that Affects Learners' Satisfaction in E-Learning in institution of higher learning in Kenya". This study seeks to investigate the critical factor that affects satisfaction of learners undertaking e-learning course.

Please take a moment of your time to answer this questionnaire. The information collected in this study will be used exclusively for academic purposes and your response will be accorded strict confidentiality. Please respond to the questions/ statement honestly by ticking the most appropriate responses.

Section A: General Information

1. Name of the university...................................

2. Which course discipline are you undertaking at the university...............................

3. What is your level of Education?

   ☐ Postgraduate level

   ☐ Undergraduate level

   ☐ Diploma level

4. Gender: ☐Male   ☐Female

5. What is your age?

   ☐ 18-21 years ☐ 22-25 years ☐ 26-29 years ☐ 30-33 years ☐ Above 35

6. What is your experience with e-learning course?

   ☐ Above 1 year ☐ Above 2 year ☐ Above 3 years ☐Above 4 years ☐Above 5 years

Section 2: Course Management factors

Instructor Dimension	
a) **Instructor response timeliness**	1. I received comments on assignments or examinations for this course in a timely manner. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. I received feedback to my enquiries in time. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
b) **Instructor attitude toward e-learning**	1.My instructors demonstrate a positive attitude toward e-learning course ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree

Course dimension	
a) **E-Learning course flexibility**	1. Taking this class via the Internet allowed me to spend more time on non-related activities ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. Taking this class via the Internet saved me a lot of time commuting to class ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	3. Taking this class via the Internet allowed me to arrange my work for the class more effectively. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
b) **E-Learning course quality**	1. Conducting the course via the Internet improved the quality of the course. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. The quality of e-learning course met my expectation. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	3. I feel the quality of the course I took was largely unaffected by conducting it via the Internet ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 3: Technological factors

Technology dimension	
	I feel the information technologies used in e-Learning ....
a) **Software quality**	1. are very easy to use ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. have the required functions ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	3. have good flexibility ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
b) **Internet quality**	1. I feel satisfied with the speed of the Internet ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. I feel the communication quality of the Internet is good ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 4: Institutional Arrangement factor

Institutional Arrangement Dimension	
a) **Diversity in assessment**	1. This e-Learning course offers a variety of ways of assessing my learning (quizzes, written work, etc.) ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
b) **Learner perceived interaction with Others**	1. E-learning enabled easier interactive communication between instructor and the student. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. E-learning enabled easier interactive communication among the student. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree

	3. Communicational tools (e-mails, chat rooms, forums, etc) in e-learning system are effective to use ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 5: Perceived Usefulness and Perceived Ease of Use

	1. Using e-learning system enhance my effectiveness in learning. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
a) **Perceived usefulness**	2. Using e-learning system allows me to accomplish learning task quickly. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	3. Using e-learning system would increase my productivity in e-learning ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
b) **Perceived ease of use**	1. My interaction with e-learning system is clear and understandable. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. Getting the information from the e-learning system is easy. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	3. Overall I find e-learning system easy to use. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree

Section 6: Dependent Variable

Dependent Variable	
E-Learning satisfaction	1. I am satisfied that e-learning meet my learning needs. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	2. I am satisfied with e-learning course efficiency.

	☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	3. I am satisfied with e-learning course effectiveness. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree
	4. I am satisfied with my decision to take e-learning course. ☐ Strongly Agree ☐ Agree☐ Neutral ☐ Disagree ☐ Strongly Disagree