FACTORS INFLUENCING THE CHOICE OF TECHNOLOGY FOR DEVELOPMENT OF INSTRUCTIONAL MATERIALS FOR DISTANCE EDUCATION: A CASE OF THE SCHOOL OF CONTINUING AND DISTANCE EDUCATION, UNIVERSITY OF NAIROBI

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IN DISTANCE EDUCATION

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DECLARATION

This research project is my original work and has not been submitted for any degree award in any other University.

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L45/8448/2006

This research project has been submitted for examination with my approval as University supervisor.

Signature…… Date: …….

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DEDICATION

I dedicate this work to my mother who gave up all for my sake. My wife Stellah and children who have endured my numerous absences from the house and to my father who nurtured me.

ACKNOWLEDGEMENT

I would like to express my sincere thanks to my supervisors, Dr. Joyce Mbwesa and Dr. Guantai Mboroki for their guidance, comments and suggestions on this research. Without their input, it would be practically impossible to complete the work successfully. I am also grateful to staff in the school for their moral support. My tutors for enduring with unending patience and courage to instill learning discipline in my busy working schedule and my fellow students on distance Education Progam for responding to the questionnaires and providing valuable data. Many thanks to Esther Wanjiru, the typist, for enduring with me thorough the research period and lastly I am grateful to Jetlinks computers for formatting, proofreading and providing me with statistical knowledge and software to analyse the final work.

Finally I want to thank my family, wife and children for their patience and outstanding support and understanding during this difficult period of my persistent absence from the house.

LIST OF ABBREVIATION AND ACRONYMS

ASCDE	School of Continuing and Distances Education
CEES	College of Education and External Studies
ODL	Open and Distance Learning
WWW	World Wide Web

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ABSTRACT

Scientific and technological advances lead to fundamental changes in social and economic life in the one hand, and also in the concepts and approaches acquired in the process of education on the other hand. One of those concepts and approaches is distance education. Kenya has a long history of distance education and it's clearer in East Africa. Since Independence, a number of commissions and reports have highlighted Open Distance Learning (ODL), as an alternative mode of educational provision. The purpose of this study was to explore factors that influence the choice of technology for the development of instructional materials for distance education at the School of Continuing and Distance Education. The study adopted a descriptive survey research design as it aimed at exploring factors. The target population for this study included distance learners, course administrators and course tutors at the University of Nairobi. Data collected was analyzed both qualitatively and quantitatively. Qualitative data was analyzed by organizing it into categories on the basis of the themes, concepts or similar features. Quantitative data was analyzed using the Statistical Package for Social Sciences SPSS. The computed data was then analyzed using descriptive statistics. The statistics that was calculated included frequencies, means and percentages. Interpretation of the data was then done within the frame of reference of the research problem. Regarding the technological based factors, the findings revealed that the following technologies were being used at a Very great extent: (Print Mean=4.53; SD=0.9874) and Email (Mean= 4.55; SD=0.9665). The technologies that were found to be used at a very little extent included: Voicemail (Mean=2.38; SD=0.9978), Audio files/CD (Mean=2.36; SD=0.9780), Audio conference (Mean=2.36; SD=0.9780), Satellite Videoconference(Mean=2.42; SD=0.9456), Telephone tutoring (Mean=2.34; SD=0.9452). On institutional Related Factors influencing the adoption of technologies for distance learning, the findings revealed that the development of appropriate technologies for distance learning is part of the college strategic planning; the staff in the department have adequate skills on modern distance learning technologies (Mean=4.57; SD=0.9874); the university has facilitated the acquisition of modern distance education technologies (Mean=4.52; SD=0.9686); the staff in the department have adequate skills on modern distance learning technologies, the university has programmes for training tutors to use of newer technologies for distance learning (Mean=4.50; SD=0.9963), and that the university has hired adequate technical personnel to support the use of emerging technologies for distance learning (Mean=4.52; SD=0.9796). On learner related factors, the findings revealed that the learners strongly agreed that development of appropriate technologies for distance learning is part of the college strategic planning (M=4.58; SD=0.9976), the department has adequate financial resources for adoption of appropriate technologies for distance learning (M=4.60; SD=0.9876), and that the organizational structure of the University allows for the development of the distance education mode (M=4.65; SD=0.9963). The course tutors however disagreed that the department has adequate staff to spearhead the adoption and use of appropriate technologies for distance learning (M=2.33; SD=0.9979), Based on the findings of the study, the researcher recommended that the university should enlighten the staff involved with distance learning on the importance of reliability and the criticality of the distance learning equipment, its integration into the programmes offered, and its maintenance. It was concluded that learning through experience influences the creation of new values which become attitudes that have a strong impact on the adoption of learning technology.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The idea of distance learning as the concept of learning at one's own pace independent of time and place, originated in 19th century. The Open University of United Kingdom, which introduced blended learning in 1969, had the crucial role in introducing the distance learning into the higher education. The term e-learning (electronically supported learning) was introduced in 1995, and its most common definition is: learning and teaching using information and communications technology, or more broadly, e-learning technology. Blended model of learning combines different models of learning and teaching: in traditional classroom (which provides e-learning technologies) and virtual learning environment. Virtual Learning Environment (VLE) is a component or subsystem of the Managed Learning Environment (MLE), where students and teachers take part in different types of online interaction, and whose focus is on managing and facilitating the learning process while providing the required resources. The commonly used synonym for VLE is Learning Management System (LMS). MLE includes various information systems and processes of the higher education, and together with VLE they make a part of virtual campus (The Joint Information System Committee [JISC], 2011).

Today, rapid changes and advances occurring in social, cultural, economic, technological and political areas affect the aspects of social life; hence, education systems need to be renewed UNESCO (2002). Moreover, scientific and technological advances lead to fundamental changes in social and economic life in the one hand, and also in the concepts and approaches acquired in the process of education on the other hand (Alkan, 1996). One of those concepts and approaches is distance education. Kenya has a long history of distance education and its clearer in East Africa. Since Independence, a number of commissions and reports have highlighted Open Distance Learning (ODL), as an alternative mode of educational provision. For example, the Ominde commission of 1964/65 just after Independence recommended the establishment of an advisory commission on distance education. The same recommendations were followed by subsequent reports of Gathathi (1976), Mackay and Kamunge (1978) among others.

It was until 2005 that Kenya government made a bold step by initiating a Sessional paper No.1 with recommendations of establishment of an open university in human resource development at all levels. Even before then, many institutions had already established distance learning programmes in their curriculars. The University of Nairobi alone through its ODL programmes had by 2004 attracted 3000 B.Ed all based at home but undertaking their studies at a distance.

The School of Continuing and Distance Education spearheaded the programme. It was the earliest and the only school whose work was cut out of the regular learning having been established in 1986 and a Faculty of Distance Education. The programmes offered were focused on students who wanted a second chance at higher education level. Other East African countries including Uganda and Tanzania came up later using learning materials developed in Kenya.

Internationally, Distance Education traces its origins to mid- 19th century where the pioneers use the best technology of their day; the postal system to open educational opportunities to people who wanted to learn but were not able to attend conventional schools. It was an Englishman, Isaac Pitman that is accredited as an early pioneer. He started teaching shorthand lessons at a distance in 1840. It was until 1874 that university level distance education began. It was at Illinois Wesleyan University where Bachelor and graduate degrees could be obtained in absentia.

The intention of educational radio in the 1920s and the advent of television in the 1940 created new forms of communication for use in distance education. The introduction of new teleconferencing technologies in the 1980s and 1990s. The systems made it possible for teachers to talk with, hear, and see their students in real time with no delays in the transmissions- even if they were located across the country or around the world.

At continental level, Africa Virtual University (AVU) is a learning programme whose main mission is to bridge the digital divide and knowledge gap between Africa and the rest of the world. This has been achieved through the integration of Satellite technology and the internet to allow cost-effective and efficient delivery of educational programmes throughout the continent and increase access to global educational resources in Africa.

UNESCO (2002) define distance education as any educational process in which all or most of the teaching is conducted by the teacher removed in space and/or time from the learner, with the effect that all or most of the communication between the two is through an artificial

medium, either electronic or print. According to Garrison & Shale, (1987) distance education implies that the majority of educational communication between the teacher and the students occurs non-contiguously (at different times and at separate places – separating the instructor-tutor from the learner). It must involve two-way communication for the purpose of facilitating and supporting the educational process. It uses technology to mediate the necessary two-way communication.

According to Bowa and Kidombo, (2005) the purpose of distance education is based on the principle of equality of opportunity for all. This is largely the mission of distance education which emphasizes the expansion of education for self – employment and for quality life. The philosophy of distance education also emphasizes the need for individually educated population that can contribute to social and economic development of the society. They contend, distance education is particularly attractive and affordable to a majority of adult learners. According to Levin (1998), distance learning is a viable investment for adult learners who may have only had access to lower level or non-degree courses. Distance education is also helping universities serve a formerly unservable audience, (Barker, 2000).

Bowa and Kidombo (2005) report that distance education appeals to adult learners since they do not have to give up their jobs during study, they do not have to be away from their families for a long period of time, or have to worry about lecturers and sessions and have an opportunity to attend residential sessions for shorter periods. According to Phelan, Mendoza-Diaz, and Mathews (2000), distant learners always enjoy flexibility in terms of choosing the place and time of study. According to Common Wealth of Learning (2005), adult learners seek higher education through distance learning primarily to get a job, gain a better job or a promotion, and earn a higher income.

For employers, open and distance learning offers the possibility of organizing learning and professional development in the workplace itself, which is often more flexible and saves costs of travel, subsistence etc. The use of distance learning often puts both the firm and employees in a position of co - investment (of money and time) in the pursuit of common goals, based on shared values and culture. It increases productivity and supports the development of communication and other work-related skills. With sufficient numbers of employees being trained, open and distance learning is usually cost-effective. Other advantages for the employer

include the increased availability of the employee during the course of the training programme, and the portability of training programmes and processes (UNESCO, 2002).

Distance learning also serves many good purposes from an institution's point of view. Through technology, students who live great distances from an institution can be served. Adult learners can enroll in college course work at convenient times and in more convenient locations. College and university administrators recognize that instructors can teach more students without increasing the need for additional staff. Full-Time- Enrollment increases with distance education, thus, providing schools with additional state income with little additional expense (Major & Levenburg, 1997).

The place of distance education in increasing access to higher education worldwide cannot be understated. According to Kanwar & Uvalić-Trumbić, (2007), higher education has expanded remarkably in recent decades. Growth is, by all means, faster than anticipated. Van der Wende, (2008) reports that 120 million students are expected to be enrolled in higher learning institutions worldwide by 2020, but that number has already been achieved. Santiago, Tremblay, Basri, & Arnal, (2008) report that in 2004, 132 million students were enrolled worldwide, up from 68 million in 1991. Average annual growth from 1991 to 2004 was 5.1 per cent. Most of this growth has been in Africa, Asia, Latin America and the Caribbean, the Arab countries, and in Eastern and Central Europe.

UNESCO, (2009) reports that distance education represents an area of enormous potential for higher education systems around the world struggling to meet the needs of growing and changing student populations. For several decades the sector has been dominated by large-scale 'open' universities (Indira Gandhi National Open University in India counts 1.8 million students). The University of South Africa UNISA claims to be the continent's premier distance learning institutions with approximately 250,000 students. The African Virtual University works across borders and language groups in over 27 countries Cambridge UK. UNESCO (2009) further notes that much of the appeal of distance education is attributed to its ability to accommodate the needs of a wide variety of learners (students located far from educational centers, employed adults, women who are attempting to balance family and school commitments) and even the incarcerated.

According to Mehrotra, Hollister, and McGahey, (2001), distance education, is not a future possibility for which higher education must prepare, it is a current reality creating

opportunities and challenges for educational institutions; a reality offering students expanded choices in where, when, how, and from whom they learn; a reality making education accessible to ever larger numbers of persons. Lockwood, 1993 contends that since the learners and the instructors are geographically isolated, distance learning relies largely on electronic devices and print materials for instructional delivery.

Mbwesa (2010) Journal of Continuing Open and Distance Education, states that the extent, to which teachers perceive a certain pedagogic approach as being effective, will influence greatly the extent to which they appreciate and adopt new innovations. Quoting from her research on the use of WEDUSOFT software as a learning management system, it can be noted that many of her respondents perceived it as an effective management learning system in the University of Nairobi. Gakuu, and Kidombo, (2010) in the same journal on pedagogical integration of ICT in curriculum delivery notes that it is influenced by the ownership of the institutions, ICT policy and the manager's level of ICT skills. That the Kenya government should develop and implement as ICT policy on education.

Traditionally, the University of Nairobi College of Education and External studies CEES has been offering programmes through both face to face and distance learning delivery modes. The Centre for Open and Distance Learning was created in 2005 following the restructuring of the College. It is designed to cater for all programmes offered at the University which can be conducted through distance learning including Bachelor of Education, Bachelor of Commerce, B.Com. and Bachelor of Arts (B.A.) (Varsity Focus, 2006). In her strategic plan 2005 – 2010, Faculty of External Studies and currently School of Continuing and Distance Education outlines a large student population, highly experienced staff in distance learning, and innovative and adaptive approaches to the provision of open and distance learning as some of her key strengths. In terms of the weaknesses, the school identifies shortage of learning resources and inadequate knowledge of modern Information Technology. However the college has a strong mission to provide adult and continuing education using appropriate and enriching technologies. It is against this background that the study seeks to investigate factors that influence the choice of technology for the development of instruction for distance education pedagogy at the School of Continuing and Distance Education.

1.2 Statement of the problem

According to Manrique and Bressler (2006), in spite of the increase in the number of Distance Learning Programs (DLP) offered by higher education institutions, not all programs have been successful. Successful programs use different types of media resources for instructional delivery. Holden & Westfall, 2010 argue that when selecting the most appropriate instructional media for distance learning, consideration must be given to a number of variables that may influence the selection of one medium over another.

Bates (2001) reports that despite the increased capacity of information and communication technologies to support distance education, their impact in higher education has been "slow and marginal" particularly in least developed countries. The tendency in higher education is to "fit" technology into traditional university structures and use it to deliver education in traditional ways rather than to use technology as a change lever to help create new teaching and learning paradigms (Olcott, 2000).

Jurich (2000) associates the slow and marginal uptake of technology in distance learning to faculty "fear of technology" that limits the faculty's ability to take full advantage of learning technologies in support of distance learning. Merisotis & Phipps, (1999) also note that students may be inexperienced with using technology, particularly educational technology. This study therefore seeks to explore factors that influence the choice of technology for the development instruction materials for distance education at the School of Continuing and Distance Education, University of Nairobi.

1.3 Purpose of the study

The purpose of this study was to explore factors that influence the choice of technology for the development of instruction materials for distance education at the School of Continuing and Distance Education.

1.4 Objectives of the study

The study was guided by the following objectives:

i. To determine how institutional related factors influence the choice of technology for the development of instructional materials for distance education.

ii. To establish how learner related factors influence the choice of technology for the development of instructional materials for distance education.

iii. To assess how technology related factors influence the choice of technology for the development of instructional materials for distance education.

1.5 Research questions

The study sought to answer the following research questions

i. How do institutional related factors influence the choice of technology for the development of instructional materials for distance education?
ii. How do learner related factors influence the choice of technology for the development of instructional materials for distance education?
iii. How do technology related factors influence the choice of technology for the development of instructional materials for distance education?

1.6 Significance of the study

By examining institutional related factors affecting choice of technology for developing distance learning pedagogy, this research may be important to those who are concerned about how technology should be included in the decision-making process of establishing distance-learning programmes. Developing concrete insights on learner, school and instructional design factors affecting the choice of technology for distance education pedagogy may enable institutions to better balance their traditional formal programs with non-traditional distance education alternatives. The study may also reveal the dilemma of higher learning institutions in adopting new technologies for the development of distance learning pedagogy. The findings will therefore be invaluable to those planning for distance education programmes.

The findings of the study will also create a basis for future research on technology in distance education in Kenya and other developing countries. This research is expected to be useful to in private institutions such as those offering continuous in house on job training such as banks, mobile staff in order to improve manpower service provider skills, universities offering adult learning programmes. Cooperative societies offering entrepreneurship knowledge to its retiring members, government ministries offering programmes that aims at improving staff performance, international organizations offering further education support in developing countries, among stakeholders in education sector.

1.7 Limitations of the study

One of the limitations of the study is that the school may not provide critical information especially on their knowledge and skills on education technology as this by extension will be an assessment of their competencies in handling distance education programmes. To overcome this limitation, the researcher will assure the school of confidentiality by re - assuring them that their identity would not be revealed in the findings. This assurance may make them provide genuine responses to the questions. The same will apply to respondents required to provide information on institutional factors. The other limitations are time allocated to this work is not enough to complete an elaborate research work. Financial (research) and financial constraints that may limit the scope of the research project.

1.8 Delimitations of the study

The study will be concerned with factors that influence the choice of technology for the development materials for distance education pedagogy at the School of Continuing and Distance Education, University of Nairobi only. Other public and private higher learning institutions delivering distance education and their opinions on the study topic would also be important for the study. The institutions will not be investigated due to time and financial constrains. Considering that education institutions are open systems and their operational environment may be under different internal and external influences, the findings of the study should be generalized.

1.9 Basic assumptions

The study makes several assumptions. It is assumed that the respondents are aware of the factors influencing the choice of technology for the development of instruction materials for distance education at the School of Continuing and Distance Education and the contents of their responses will therefore be valid. That the respondents will give truthful and honest responses which are genuine indicators of the factors that influencing the choice of technology for the development of instruction materials distance education. That the results of this research will be valid and reliable and would help in improving the use of technology in distance education. I also assume that staff will give objective responds without fear as used in the study.

1.10 Definition of significant terms used in the study

Audio material: The software materials which produce pleasant sound or produce materials on both sound and picture.

Choice of technology for Development of instructional materials for distance education – These are sets of methods for optimum realization of communication between teacher, content and student for effective teaching and learning.

Institutional related factors – These are a group of extrinsic motivational factors influencing academic teacher's acceptance of technology such as capacity reliability availability infrastructure and adequacy of support.

Learner related factors – These are factors that motivate students to maintain interest in learning using a variety of technology.

Technology related factors - These are teachers related competence and attitude towards technology that propel the learning process.

Distance learning (DL): This is an educational model in which the student and instructor are separated by time and place, is currently the fastest growing model of domestic and international education.

E- learning: learning that utilizes ICT as the main medium of instruction.

Instructional Design: This is the systematic process of translating general principles of learning and instruction into plans for instructional materials and learning (Potter, 2004).

Multimedia: It's the use of several in combination in order to with objective or improving learner perception and learning.

Open Learning: This is the provision of education, training or learning programmes where learners have some control regarding how they learn, where they learn, when they learn, what they learn, the pace at which they learn, how they learn and whether their learning will be assessed.

Teleconferencing Refers to software electronic media both audio and visual used to address large number of crowd at a distance.

1.11 Organization of the study

The study has been organized into five chapters. Chapter one covers introduction and comprised of the background, the statement of the problem, purpose of the study, objectives of the study, research questions, significance, limitations, delimitations, basic assumptions of the study, definition of significant terms and the organization of the study. Chapter two covers definition of distance education, characteristics of distance education, historical development of distance education, theories of distance education, technologies used in distance education, instructional design in distance education, learner, faculty, and technology related factors that influence choice of technology in distance education and conclusion.

Chapter three describes the research methodology used. These include the research design, target population, sample and sampling procedure, research instruments, validity of the instruments, their reliability (instruments), pilot testing data collection procedure and data analysis techniques. Chapter four describes data presentation, questionnaire return rates, demographic information of the correspondents, institutional technology and learner factor interpretation, and learner adoption of distance learning technologies and their proficiency in computer applications and their adoption of the technologies. Chapter five deals with summary and discussion of the findings, conclusions, recommendations and areas for further research. The research then end with references and appendices

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter focuses on definition of distance education, characteristics of distance education, historical development of distance education, theories of distance education, technologies used in distance education, instructional design in distance education, learner, faculty, and technology related factors that influence choice of technology in distance education and conclusion.

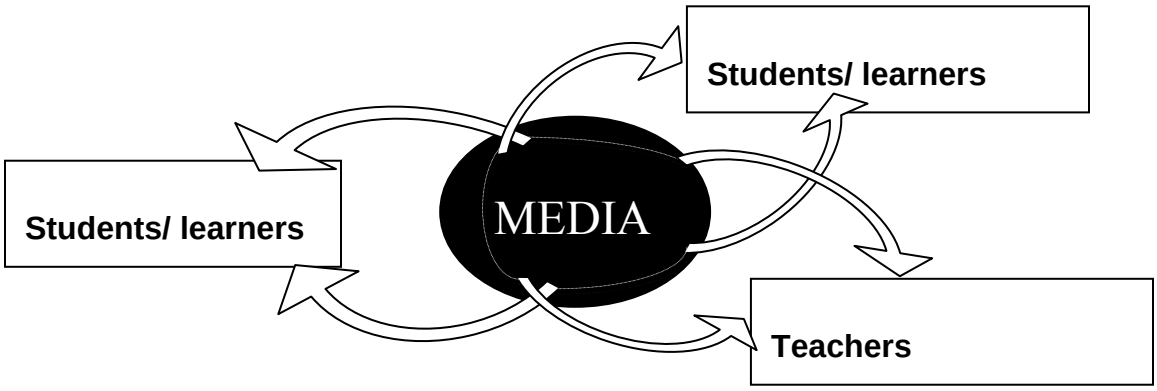
2.2 The concept of choice of technology for Development of Distance Education Materials

Critical analysis of distance education and technology shows that media and curriculum that support interaction with the instructor and other students are more important that those that are used to establish individual student interaction with the content only. This shows that interactive technologies function is different learning ways from non interactive once. It also important to note that many studies have been contacted on both synchronous instructor directed distance education and asynchronous methods.

It is good to note that in asynchronous distance learning, independent DE pedagogy alone is in general less effective that one that is supported by collaborative discussion among students. Its delivery media have also changed dramatically as technology has advanced. Traditionally, DE has been designed to support individualized self directed learning. This was true for the early correspondence model that used print based media. The individualized self directed learning method afforded the highest degree of flexibility for anytime, anywhere and any place learning but low in interaction.

According to Simonson, Smaldino, Albright, & Zvacek (2000), the term distance education has been applied to a tremendous variety of programmes serving numerous audiences via a wide variety of media. Students in distance education system communicate with the teachers and other fellow students through several media. The place of media/technology can thus be summarized.

Figure 2.1: The place of media/technology in distance education



Source: Mendoza-Diaz, and Mathews, (2000).

Mendoza-Diaz, and Mathews (2000) note that selection of appropriate technology is crucial in the success of distance and open learning. For this, it is absolutely necessary to have sufficient understanding and comprehension of the available technologies and their appropriate applications. Waits and Lewis (2003), among other important characteristics, successful distance education programs use different types of technological resources for instructional delivery and concentrate in the use of just a few of them. Morse (2002) stated that a variety of distance learning methods does exist. These approaches range from traditional correspondence courses to real time interactive videoconferencing. In delivering distance education, the varieties of media used include print, Bates, 1995, e-mail and facsimile, Romiszowski (1993), video conferencing, interactive video technology, audio graphics, audio conferencing, and the Internet, Moore & Kearsley (1996).

The relationship between pedagogy and educational technology is questionable and controversial. Clark, 1994 argued that pedagogy is the key factor in learning effectiveness whereas technology is only a delivery medium. This claim is supported by many studies that found no significant difference in learning outcomes between traditional and technology-mediated instruction, Russell (1999). Kozma (1994), however, suggests an opposite notion, claiming that media and pedagogy are inseparable.

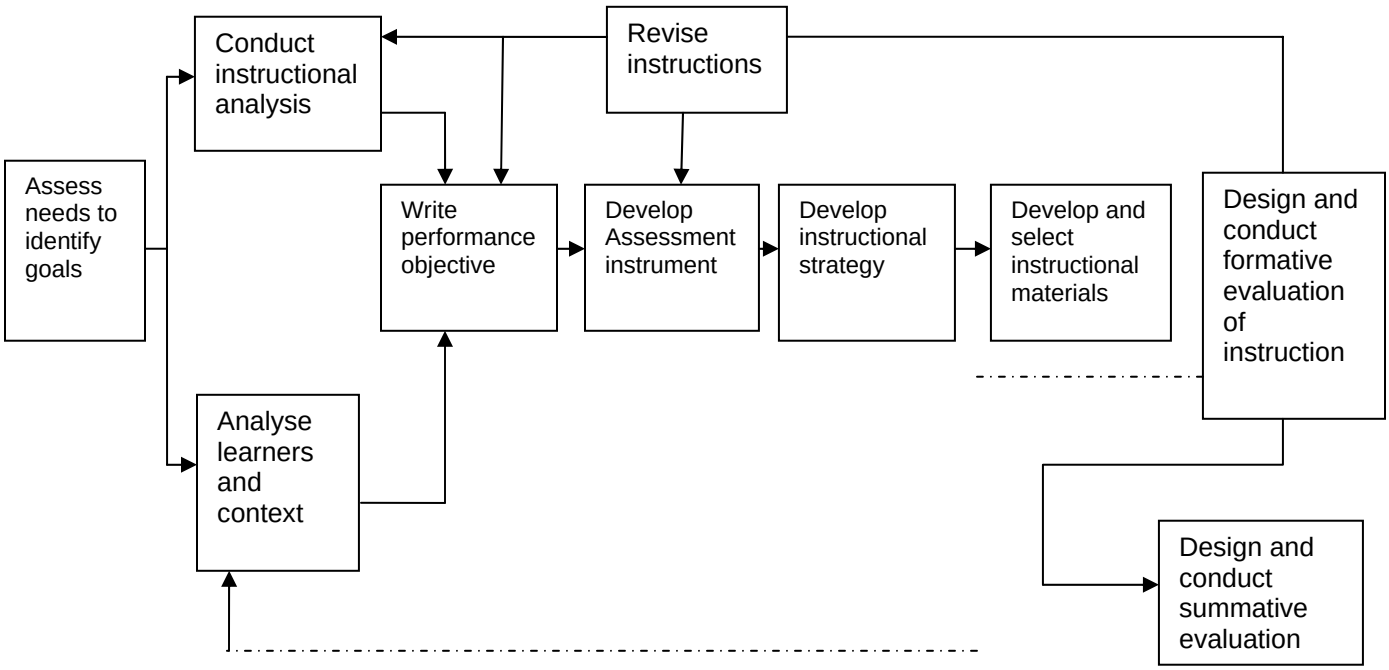
Major and Levenburg (1997) note that technology wizardry, by itself won't produce desired learning outcomes. Creating and implementing successful learning systems — ones that actually enhance learning — requires a thoughtful blend of educational philosophies, new technology, and solid instructional design. Schrum (1996) also notes that creating lessons and

courses for distance learning is not a trivial activity, and it is not merely a matter of applying distance learning technologies to a successful traditional classroom lesson.

There are a number of factors that need to be taken into consideration before deciding on the appropriate use of media and technology for use in distance learning. Siddique (1987) stated that selection of appropriate media for a learning package is a complex decision influenced by a variety of considerations, such as the specific learning objectives of the unit, the nature of subject matter, learner's, background and experiences and the characteristics of the target group as well as practical constraints including availability of infrastructure and financial resources.

Coulter and Sarkis (2005) listed four main factors of media selection and each factor has its sub factors to evaluate the media. In this model media pass through the first filter, which is quality, and the sub factors of quality are attention, simulation, content, credibility, and clutter. The second filter is time that has exposure and leads time as sub factors. The third one is flexibility that has appeal, personalization and interactivity as detail factors. Coverage is the fourth factor and this factor has selectivity, pass-along, frequency, and reach. The last of the factors is cost and development. Cost and delivery cost are the sub factors that should be considered during the selection.

Figure 2.2: Model for Designing Instruction



The Dick and Carey Systems Approach

The major purpose of instructional system design is to make sure that it confirms to a set of interrelated parts, all of which work together towards a define goal. It depends on each other for both in part and output. It also uses feedback approach to determine if its desired goals have been reached. If it has not, then it is modified until it does reach the goals.

Romiszowski (1989) classified the criterion of media selection into four main concerns. These criteria are: (1) effective communication which can be related to content, objectives, and learners (2) reasonable cost which can be related to objectives, market, and availability (3) practical tool which can be related to availability, time, and facilities and (4) human factors which can be related to facilities, teachers, and learners. On the other hand, Barnes, Mosgrove, and Rassouli (1982) list the following media selection criteria: the objectives to be achieved by use of the instructional technology; availability of the media in the targeted area; uncontrollable factors such as government restrictions; the behavioral aspects of targeted customer-learner; and cost factors of candidate media. Holden & Westfall, (2010) also note that an analysis of available technologies must include a thorough examination of the advantages and limitations that each presents within the learning environment. Consideration must also be given to instructional objectives, development and deployment of instructional strategies, level and type of interaction between the instructor and the student, display of visual images, responsiveness to changes in course content, efficiency of the delivery system, and total system cost.

According to Hancock (1993), appropriate media options should be given full consideration because all media are not appropriate in the interests of developing countries. Advances in technology have greatly increased the number of media options currently available. Also, technological developments driven primarily by market forces do not always run parallel to the interests of developing nations. Kinyanjui (1997) observes that developing countries cannot afford not to experiment with new media and technologies. By borrowing from the experiences of industrially-developed countries, developing countries will be able to tap the potential of communications technologies and apply them in modified forms to suit their needs and circumstances. He argues that despite certain barriers to technology-based learning, efforts must be somehow directed towards increasing resources needed for such development.

2.3 Characteristics of distance education

In order to develop a definition of distance education, Keegan (1996) analyzed the earlier definitions of distance education cited above and incorporated this form of education into five characteristics: The quasi-permanent separation of teacher and learner throughout the length of the learning process (this distinguishes it from conventional face-to-face education; The influence of an educational organization both in the planning and preparation of learning materials and in the provision of student support services this distinguishes it from private study and teach-yourself programmes; The use of technical media – print, audio, video, or computer – to unite teacher and learner and carry the content of the course; The provision of two-way communication so that the student may benefit from or even initiate dialogue (this distinguishes it from other uses of technology in education; and the quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals rather than in groups, with the possibility of occasional meetings, either face-to-face or by electronic means, for both didactic and socialization purposes.

Distance education has gone through several stages of development. Taylor, (1999) has proposed five generations of distance education: Correspondence education; Integrated use of multiple, one-way media such as print, broadcasting or recorded media such as videocassettes; Two-way, synchronous tele-learning using audio or video-conferencing; Flexible learning based on asynchronous online learning combined with online interactive multimedia; Intelligent flexible learning, which adds a high degree of automation and student control to asynchronous online learning and interactive multimedia.

2.4 Theoretical Framework

Distance education theories, developed from leading scholars in the discipline, such as Holmberg, Wedemeyer, Moore and Peters. It can be categorized into three broad groups (Saba, 2003): Theories of autonomy and independent study; Theory of industrialization; and Theories of interaction and communication.

2.4.1 Theories of Autonomy and Independence

These set of theories emphasizes on individualization of study. Keegan (1996) summarizes the distance education in this perspective as: Learning should be self-pacing: the learner should pace his studies in accordance with his/her circumstances and needs; Learning

should be individualized and the learners should be free to follow any or several courses of learning; and the learner should have freedom in the selection of goals and activities. Wedemeyer and Lofstrom (1990), state that the essence of distance education was the independence of the student. He preferred to use the term "independent study" for distance education at the college or university level.

According to Saba, 2003, the centrality of the learner is one of the distinguishing features of distance education, and understanding this fact is essential for discerning why it is essentially different from other forms of education. Wedemeyer (1981) noted that in successful independent study, there must be greater student responsibility, widely available instruction, effective mix of media and methods, adaptation to individual differences, and a wide variety of start, stop and learn times. He focused on freedom and choice for the learner, on equity and access. His vision of independent study was consistent with self-directed learning and self-regulation.

2.4.2 Theory of Industrialization

In the Theory of Industrialization of Teaching Peters (1988) viewed distance education as an industrialized form of teaching and learning. Peters suggested that distance education allowed principles of economic and industrial theories to be applied in the design and delivery of instruction. Peters concluded that principle of the division of labor is an integral part of distance teaching.

Peters characterized distance education as a method of imparting knowledge, skills and attitudes which is rationalized by the application of division of labor and organizational principles as well as by the extensive use of technical media, especially for the purpose of reproducing high quality teaching material which makes it possible to instruct great numbers of students at the same time wherever they live. Distance education was therefore described as an industrialized form of teaching and learning. This model emphasizes instructional units as products which can be mass produced and distributed like cars or washing machines.

2.4.3 Theories of Interaction and Communication

Interaction and communication is central to these theories. The communication and interaction as a concept is used in distance education is discussed below:

The two ways communication was placed by Baath, (1982) as central to the process of distance education (Rashid 1992). Interaction with the study material takes place by means of

exercise, questions or self-assessment questions. Tutor's role is more than of correction of errors and assessing assignments. This theory says that at the beginning of the course in distance education, interaction and communication between students and tutors is important as there is a risk of drop out.

Holmberg (1983) presented this theory for the first time in 1960.Distance education is self-study but student can seek help from tutors and other representatives of the organization. Here correspondence, telephone and assignments make two-way communication possible. These serve as facilitator not an instrument of assessment. Rashid (1992) further supported it by saying that didactic two-way communication is characterized by simulated dialogue brought about by study materials, assignments, self-checking exercises, review questions and inserted questions, and real communication through writing (letter), telephone or face to face.

This theory is by John Daniel as identified by Rashid (1992) and is based on independent and interactive activities. Major function of distance education is to achieve the synthesis between these two. Theory of interaction and independence comprises of two economic structures: one for independent activities, other for interactive activities. Independent activities include reading a text, watching television at home, conducting a home experiment and writing an assignment while interactive activities include discussion on telephone, marking and commenting on assignments, group discussion and residential sessions.

2.5 Technologies used in distance education

A range of technologies have been used in distance education since it started. The first distance education courses leading to college-level degrees were offered by correspondence in 1873, (Lombard & Ditton, 1997). As new communications technologies were developed in the early 20th century, instructional programming expanded to include radio, lantern slides and the phonograph. In the years that followed, a number of media, including radio, television, videotape, audiotape, telephone and a variety of print forms were introduced as these technologies became available and cost effective. These media were introduced to help create the illusion of the classroom, to enhance the sense of 'being there' McCluhan (1964) and to try foster two-way communication where students had no face-to-face contact with their instructors or peers (Biocca, Kim & Levy, 1995).

Depending upon the level of technology used, distance education can be described as either

synchronous or asynchronous. Asynchronous methods generally involve significant delays in time between message transmission and receipt. In an asynchronous system, learners can work at their own places and preferred times (Hiltz, & Goldman, 2005). The most important aspect is that all learners are not present at the same time or in the same place as other learners with whom they are communicating or from whom they are learning, although they are online at the same time by chance or plan (Hunter, Deziel-Evans, & Marsh, 2003). Bates and Poole, 2003 identify websites, CD – ROMs, DVDs, learning objects, multimedia clips, video and audio cassettes, books, lecturer notes, mail, email, and discussion forums as asynchronous technologies.

Synchronous interaction involves the parties (learners, or learner and tutor) being online at the same time and communicating in real-time. All participants are "present" at the same time requiring a timetable to be organized (Hiltz, & Goldman, 2005). Bates and Poole, (2003) also provide examples of synchronous technologies which include seminars, audioconferencing, telephone tutoring, web conferencing, radio broadcast TV, web casting, and audio or video streaming.

According to Latchem & Lockwood, (1998), no one technology can support all types of teaching and learning at a distance – the most effective approach is to combine a range of technologies. Using multiple technologies ensure that all learning styles are catered for and that significant opportunities for interaction between the learner and the tutor are provided.

Bates and Foley (2003) proposed 12 “golden rules” for the use of technology in education. These “rules” offer guidance in the broader areas of designing and developing distance education: Good teaching matters. Quality design of learning activities is important for all delivery methods. Each medium has its own aesthetic. Therefore professional design is important.

Education technologies are flexible. They have their own unique characteristics but successful teaching can be achieved with any technology. A number of these “rules” are overlapping. Three of them (1, 2, and 11) address course and program design. Any examination of “first principles” should first examine instructional design. While it has been noted that instructors, even those new to distance education, can learn to adapt courses and create materials for online delivery, Ko & Rossen (2003), and the author-editor model has long been an element of correspondence study programs, “what is strikingly missing in these arrangements, usually, is an instructional designer and many good features of the instructional design approach” Moore & Kearsley (1996). The team-based approach to distance education course development is

generally regarded as more likely to result in high-quality materials, experiences and, hence, more satisfactory teaching and learning experiences, (Hirumi, 2000). Many studies on impact of technology on teaching and learning have a common agreement that it has an important role to play in education at all levels. It should be noted that technology alone can be left to solve education needs.

Nipper, (1989) characterized distance education into three generations as well; in the first generation be refers to distance education as one that was characterized by print-based correspondence study. The second is when print-materials were integrated with boundaries TV and radio, radio and video cassettes and increased student support and thirdly one that was heralded by the invention of hypertext and arise in the use of teleconferencing i.e audio and video but Taylor, (2001) added. The fourth generation, characterized by flexible learning e.g computer mediated communication, internet accessible courses and the first generation. The main objective of this study is to look at issues relating to the choice of technologist for effective learning at the school of continuing and education University of Nairobi. The main assumption of the study is that effective instructional delivery for distance education is depended on the choice of technology. Its infrastructure accessibility by students and tutors, proficient in the media. The extend to which students and tutors are selected and quality of content. In this conceptual framework, it is assumed all these factors leads to improved learning outcomes for the students and the schools enrolment.

According to NCST report, (2010) concerning use of ICT in schools, there is need to search, select and respond to a mass of information learners need to get in touch with their tutors, fellow students as other people in order to share ideas to enrich their knowledge. This creates collaborative learning process with other who are more knowledgeable in the areas they want. This will enhance knowledge sharing, providing a framework of peer networking, giving rise to learning communities; and creating innovative collaborative linkages. It will also trigger creativity and innovation if used well to support learning.

2.6 Adopting new technology

Institutions vary in their orientation towards using technology. Some institutions face staff resistance or lack of confidence in new technology which affects the investment in technology and prevents or impairs performance improvement (Dias, 1998). The Technology

Acceptance Model (TAM) created by Davis (1989) tries to explain the adoption process and underlying influencing factors in technology acceptance. TAM theorized that the effects of external variables (e.g., system characteristics, development process, training) on intention to use are mediated by perceived usefulness and perceive ease of use. Perceived usefulness is also influenced by perceived ease of use because if other things are equal, the easier the system technology is, the more useful it can be, (Venkatesh & Davis 2000).

The model suggests that when users are presented with, for instance, a new software package, a number of variables influence their decisions about how and when they will use it. There are two specific variables, perceived usefulness and perceived ease of use, are hypothesized to be fundamental determinants of user acceptance, (Davis and Arbor, 1989).

Perceived usefulness is defined as the degree to which a tutors/learners believe that using a particular technology will enhance his or her job performance. Tutors/learners believe tend to use or not to use an application to the extent they believe it will help them perform their job better, (Davis & Arbor, 1989). Phillips and colleagues defined perceived usefulness as; the prospective adopter's subjective probability that applying the new technology from foreign sources will be beneficial to his personal and/or the adopting company's well-being" (Philips, Calantone, Roger & Lee, 1994). Perceived usefulness explains the user's perception to the extent that the technology will improve the user's workplace performance (Davis et al., 1989). This means the user has a perception of how useful the technology is in performing his job tasks. This includes decreasing the time for doing the job, more efficiency and accuracy.

Perceived ease of use refers to the degree to which a person believes that using a particular technology will be free of effort. Users believe that a given application is useful, but they may, at the same time, believe that the technology is too hard to use and that the performance benefits of usage are outweighed by the effort of using the application (Davis and Arbor, 1989). Phillips and his colleagues defined perceived ease of use as the degree to which the prospective adopter expects the new technology adopted from a foreign company to be free of effort regarding its transfer and utilization (Phillips et al., 1994). Perceived ease of use explains the user's perception of the amount of effort required to utilize the system or the extent to which a user believes that using a particular technology will be effortless, (Davis et al., 1989).

One assumption made by TAM is that usage of a particular technology is voluntary (Davis 1989). Another assumption is that, given sufficient time and knowledge about a particular behavioural activity, an individual's stated preference to perform the activity i.e. behavioural intention will in fact closely resemble the way they do behave. This assumption only applies when the behaviour is under a person's volitional control, (Ajzen & Fishbein 1980). Moreover, TAM has strong behavioural elements; it assumes that when someone forms an intention to act, they will be free to act without limitation. However, in the real world there will be many constraints, such as limited ability, time constraints, environmental or organizational limits, or unconscious habits which will limit the freedom to act (Bagozzi, 1992).

2.7 Instructional Design in Distance Education

The key process of improving the quality of teaching and learning according to Braden (1996) is instructional design. Instructional design (ID) is a system of procedures for developing education and training programs in a consistent and reliable fashion (Gustafson & Branch, 2002). According to Seels & Glasgow (1998), instructional design is the process of solving instructional problems by systematic analysis of the conditions for learning and is based on the "premise that learning should not occur in a haphazard manner, but should be developed in accordance with orderly processes and have outcomes that can be measured.

Successful distance education instructional design involves interactivity between tutor and students, between students and the learning environment, and among students as well, Biocca, Kim & Levy (1995). Technology is means to increase learning efficiency. Originally, according to Wagner (1990) technology was used in distance education to provide some equity in information access. In its traditional forms such as print, television, radio and audiotapes it was hardly interactive, while other forms of media such as audio conferencing, teleconferencing, and facsimile transmission are more interactive and address the needs of distance learners in a better way. Suen and Parkers (1999) add that e-mail, computer networks and internet access has made distance education a "virtual" mirror image of face to face education with perhaps even some improvement". Thus through the application of new technologies distance education has become leader in educational innovations during last twenty years.

Instructional design is primarily based on learning principles. Gagne and Briggs (1979) have

listed these as: Contiguity, repetition and reinforcement. The above stated principles are related to external factors while internal factors cover factual information, intellectual skills and strategy. The designing of instruction pays attention to the conditions under which learning occurs i.e. external and internal to the learner. The selection of technology in instructional design must therefore also lend itself to an analysis based on learner characteristics, faculty characteristics, institutional characteristics and the inherent characteristics of the technology that makes it appropriate for use in achieving instructional objectives.

Foley (2003) has noted there are general principles of good design that can be applied to all distance learning activities but noted the following influences: the target audience of the activity; the content of subject matter to be delivered; and the outcomes or objectives desired. Other considerations having profound effects on the design of the learning activities include: the cost effectiveness of the system; the opportunity costs of alternative systems and methods; the availability of technology to the provider and to the learners; the geographical location of the learners; and the comfort level of the learners with any technology that is used.

2.8 Factors Influencing the Choice of Technology for Development of Instructional Materials For Distance Education

Factors influencing the choice of technology for development of instruction materials for distance education cuts across all levels, from institution, group, to every stakeholder in higher education environment. The concept assumes knowledge, skills and attitude as the basis for performance, which can be looked at from the aspect of pedagogical, technical, organizational and socio-cultural dimension, and the action competence can be seen through four core competences: subject matter, methodology, social competence and personal competence. It is important to emphasize that the teacher's personal competence for e-learning application cannot be defined without identifying situational variables in specific education scenarios which are determined by the following elements (Schneckenberg, 2007): pedagogical model (set of methods for optimum realization of communication between teacher, content and student), choice of e-learning technology, student competences for using ICT in learning activities and the characteristics of the education content, i.e., the course. Education scenario is performed in specific context with specific characteristics, therefore the more specific and less specific

education contexts are the key elements of the aforementioned competence model. Assuming that a competent person will not apply and develop his or her competences unless motivated, the motivation component is of crucial importance and it can be intrinsic (instructor's personality, attitude and values) and extrinsic (situational and institutional factors).

2.8.1 Technology Related Factors

In the process of accepting innovation in teaching, teacher's belief about the usefulness of the innovation plays one of the main roles and it encourages changes in the curricula (Colorado & Eberle, 2009). Teacher's attitude and values are important motivational factor in developing and applying e-learning competence. There have been many researches about teacher's attitude towards e-learning technology: positive (confirmation) or negative (anxiety) (Mihhailova, 2006). Fewer researches are oriented towards beliefs which form certain values and attitudes (Agarwal, 2000). Researchers have shown that users' behavior is influenced by different beliefs or e-learning technology attributes, and according to Moore and Benbast (1991) they are: relative advantage, compatibility, trialability, ease of use, result demonstrability, observability. Most frequently confirmed attributes are: ease of use and usefulness (Gibson et al., 2008; Renzi, 2008; Keller, 2009).

Ozkan and Findik (2010) confirm the importance of the e-learning technology compatibility attribute in relation to the differences in certain academic departments, where the difference has been confirmed. Kundu et al. (2010) confirm the importance of compatibility attribute through the following obstacles in accepting e-learning technology: integration with other systems in organization, incompatibility in technology use and existing work practice, the problem of integrating technology and existing practice in traditional classrooms. Moscinska and Rutkowski (2011) confirm the attributes: flexibility and “user-friendly” which influence the acceptance and use of e-learning systems, and present technical characteristics of the elearning system.

It is well known that different beliefs about the value of e-learning encourage teachers to apply e-learning technology on different levels (Renzi, 2008). The perception of e-learning usefulness is formed under the influence of intrinsic and extrinsic factors, and numerous authors list: belief in institution's competitiveness, increased number of enrolled students (Osika et al., 2009), facilitated student cooperation in educational context (Lofstrom & Nevgi, 2008),

communication and additional support for students, distribution of study material, the ease of administration, the value of collaborative online work (Keller, 2009), belief in information sharing, automated activities of the learning process, value of social learning as an important part of learning in general (Renzi, 2008). Successful pedagogical use of e-learning technology depends on teacher's attitude towards technology (Mihhailova, 2006). Research results show that teacher's attitude has been studied more from the technical and less from the pedagogical aspect (Mahdizadeh et al., 2008).

Certain knowledge and skills encourage changes in individual's values and attitudes which influence the user's behavior, as well as belief about self-efficacy. The main prerequisite for the use of e-learning technology is: computer literacy and the lack of computer knowledge is closely related to computer anxiety and the level of perceived usefulness of e-learning technology (Liu, 2005). Computer literate person is more likely to experiment with new software. Therefore, the level of experience in working with e-learning system (LMS) is the powerful motivator in teacher's adoption of e-learning (Gautreau, 2011).

It is well known that after having accepted the e-learning system, it is used on different levels. Renzi (2008) proved the existence of differences in competences between certain groups of teachers. Teachers who create virtual learning environments according to the instructional design principles transform their way of teaching. Knowledge and skills from using the instructional design model, i.e., designing the education scenario, are related to the following factors: formal education, teacher's experience and perceived technology usefulness (Renzi, 2008).

E-moderating is the key teacher competence influencing the success of the online part of the lessons, and which according to Salmon (2000)) refers to: knowledge and skills of online moderating and online mentoring. On the organizational level of e-learning, besides the pedagogical and technical dimension of the teacher competence, Shenckenberg (2008) points out the importance of the socio cultural and organizational dimension of the competence profile when adopting e-learning. In this case, socio-cultural dimension refers to the teacher's readiness to adopt new knowledge from the field of e-learning, as well as communication and sharing of knowledge within certain networks, and the competence profile of academic teachers in organizational dimension includes taking part in deciding about implementation of e-learning at institutional level, working in interdisciplinary teams on solving problems due to the complexity

of education using e-learning technology and managing e-learning projects which are a part of university's elearning strategy (Shenckenberg, 2008).

2.8.2 Learner Related Factors

While creating virtual learning environment the choice of e distance learning technology depends on pedagogical model, and its choice is influenced by: field of study characteristics and characteristics of the students, which both represent situational factors. Kanuka (2006) stresses out the importance of the following factors: value and culture within certain discipline, understanding unique problems within each field of study as crucial elements when designing learning environment. Keller (2009) proved that the culture within the discipline represents the obstacle of distance learning technology application. Before using the virtual learning environment, reasons for the use of e-learning technology need to be defined, where, according to Rebman Jr et al. (2004), certain physical educational activities require classical approach in a traditional classroom. Knowledge is hierarchically organized and therefore it is essential to define learning outcomes within each course using knowledge taxonomy, and based on the outcomes define educational strategies and student activities (Donnelly, 2005). Numerous models of instructional design can be found in literature, however, Donnelly (2005) emphasizes that teachers mostly use non-systemized personal models because the planning of the educational structure requires: time, commitment and careful systematic approach. One characteristic of the study object (any segment of the digital study material) is: multiple use in different educational contexts; however, Parrish (2007) brings up the problem of intellectual property which limits the distribution of the study objects. Learning happens in predictable patterns that can be modeled using algorithms, which influences the development of the intelligent tutoring systems (Parrish, 2007).

Student characteristics can act as motivators for application and development of e-learning in teaching, and student capabilities (Osika et al., 2009) can be an obstacle in using e-learning technology in teaching. Each student has his or her own learning style and there are various instruments that can measure those styles (Grasha, 1994). A very important student characteristic is motivation; a motivated student shows greater interest in information, the quality of information, confidence when accessing information and technology, satisfaction in work (Kumarawadu, 2011). Colorado and Eberle (2009) conclude that the level of student self-

regulated learning is related to demographic data: gender, status, certify cates, completed degree of education and characteristics of the self-regulated learning: learning strategy, critical thinking, knowledge sharing, asking for help, where students who have graduated have a higher level of self-regulated learning.

2.8.3 Institutional Related Factors

Institutional factors belong to a group of extrinsic motivational factors influencing academic teacher's acceptance of e-learning technology. Numerous study results indicate that factors which influence academic teachers differ depending on the current phase of e-learning introduction into the academic institution in question. One of the key factors is the capacity and reliability of the ICT infrastructure (Nanayakkera & Whiddett, 2005). In practice, instructors frequently list the following conditions as obstacles: access to the computer classroom, number of computers in a classroom, computer network, Internet (access and speed) (Osika et al., 2009). After solving the problem of infrastructure, there are other negative factors that influence e-learning application. Thus, perceived adequacy of support (for example technical, pedagogical, personnel), as facilitating circumstance, has an important impact on applying e-learning in distance education (Timothy, 2009). Availability of information about the manner of applying e-learning technology in distance education process can positively influence instructors' adoption of e-learning (Kundi et al., 2010).

Since introduction of distance learning technology into academic institutions causes changes in structure, policies and organizational culture, it also brings about changes in organizational learning. Keller (2009) proved that organizational culture has the strongest impact on distance learning technology integration by academic instructors through the level of organizational learning, thus the expected effort and observability have stronger connection with the lower level of organizational learning, while social influence and facilitating circumstances relate to the higher level of organizational learning. Numerous authors confirmed that institutional strategy is an important obstacle in adopting distance learning technologies (Keller, 2009; Marwan & Sweeney, 2010; Samarawickrema & Stacey, 2007). Teacher's academic freedom and organizational culture of teaching also represent obstacles in e-learning acceptance (Keller, 2009).

After accepting e-learning technology, instructors still point out the following obstacles in its use: work overload, question of property, required resources, professional growth and management (Marwan & Sweeney, 2010). The academic institution's management has a great role in introducing and developing e-learning. Gautreau (2011) confirms the importance of adequate support and training factors, but also proves that reward and encouragement system and recognition of accomplishments are very important motivational factors in teachers adopting and developing e-learning.

However, even after removing many of the aforementioned obstacles, numerous study results indicate that time is the crucial factor that needs to be invested when changing to blended distance learning model, and it is connected to acquiring new knowledge, adjusting and implementing the course material to e-learning system, as well as to the lack of time for the requirements of the scientific research (Samarawickrema & Stacey , 2007).

Instructor's personality is a powerful intrinsic motivational factor which influences e-learning technology acceptance. It represents a set of characteristics which make every teacher unique in education process and it is strongly influenced by the surroundings. The most commonly studied teacher's features are: self-efficacy and anxiety, more often approached from the technical aspect. Computer anxiety is closely connected to the teacher's attitude, author suggests the possibility of understanding computer self-efficacy as a construct of perceived ease of use (Timothy, 2009). Malik et al. (2010) mention teacher's organizational commitment as an important factor in quality teaching process and Baia (2009) confirmed the influence of commitment to the pedagogical quality on the e-learning technology acceptance.

Teacher's personality is evident through teaching and learning style applied in the education process and which includes certain teaching methods and techniques, and represents a mechanism responsible for quality conveyance of the educational content influencing the student success (Grasha, 1994). Changes in the teacher's belief, attitude and values influence the teaching style. Lucas & Wright (2009) predicts the possibility of connection between teaching style and the attitude towards the use of e-learning technology. Dugas (2006) determined a slight connection of teaching style and the degree of innovation with accepting e-learning technology.

Apart from the teacher's personality, great importance lies in the demographic and situational variables. The experience with LMS and computer experience are strong motivators in teachers' acceptance of e-learning (Gautreau, 2011). In his research Timothy (2009) did not

find significant link between attitude, age and gender, which contradicts the hypothesis by Houtz and Gupta, Cully et al. (Timothy, 2009), he found a significant difference in the attitudes of the female computer users. However, Marwan and Sweeney (2010) point out to a significant connection between gender, department and academic title with the teacher's attitude towards e-learning technology. Academic title and years of work experience influence the commitment to the pedagogical quality which influences acceptance of e-learning technology (Baia, 2009).

2.9 Conceptual Framework

This study was guided by the following conceptual framework.

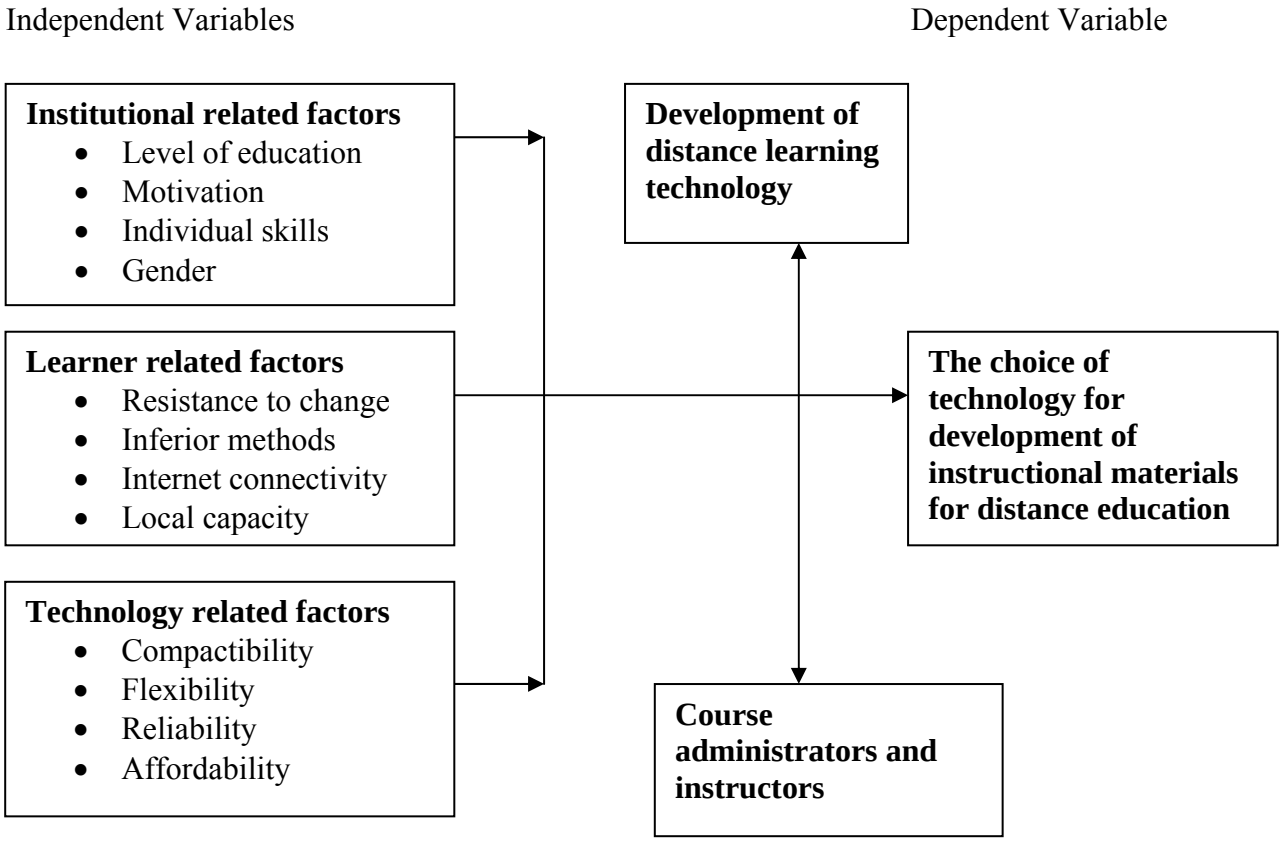


Figure 2.3: Conceptual Framework

The history of distance education can be seen as a progression towards modes of instruction that are presented as versatile as classroom teaching. From the epistolary nature of correspondence study and the orality of radio instruction through the great enhanced representational capabilities of television, it has been accepted that at every step of the

technological path, there is the promise of closeness to classroom.

The conceptual framework illustrates the variables influencing choice of technology for development of instruction materials for distance education. The variable include: Instructor's personality, Attitudes and Values, Characteristics of students and field of study, Institutional Factors and Instructors personality.

2.10 Summary of Literature

Technology plays a key role in the success of distance education. In its absence, the distance, both academic and geographical cannot be broken and distance education is impossible. This therefore calls for a critical analysis of the factors that are considered while making decisions on the most appropriate technology to use in distance education programmes. The learner characteristics such as experience with use of technology, technological skills, the cost to students, and credibility of the technology with the learner among other factors should be taken into consideration. The faculty also plays a key a key role in terms of their attitudes, skills, time, and support received from the institution. Technology also has its own aspects such as cost, interactivity, ability to meet instructional objectives, and ability to meet the demands of students in wide geographical distribution. None of these factors operate in isolation.

Successful distance education instructional design involves interactivity between tutor and students, between students and the learning environment, and among students as well. Technology is means to increase learning efficiency. Originally, according to Wagner (1990) technology was used in distance education to provide some equity in information access. In its traditional forms such as print, television, radio and audiotapes it was hardly interactive, while other forms of media such as audio conferencing, teleconferencing, and facsimile transmission are more interactive and address the needs of distance learners in a better way.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology addresses the research design, target population, samples selected and sampling methods. It also looks at the data collection process, data collection tools, and data analysis plan. In this chapter, the process that was followed in conducting the study is explained under the following subtopics; Research design; Target population; Sample and Sampling Procedures; Research instruments; Validity and Reliability of instruments; Data collection and Data Analysis Techniques.

3.2 Research design

Kothari, (2004) describes research design as the structure of the research. He defines research design as an arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance in the research purpose. It is the conceptual structure within which research is conducted. It is the blueprint for collection of data measurement and analysis of data. This study adopted a descriptive survey research design. According to Mugenda and Mugenda, (1999), descriptive research is designed to obtain pertinent and precise information concerning the state of a phenomenon, and wherever possible, to draw valid conclusions from the facts discovered. This study aimed at exploring factors that influence the choice of technology for the development instructional materials for distance education pedagogy at the School of Continuing and Distance Education, University of Nairobi.

3.3 Target Population

A population is a group of individuals, objects or items from which samples are taken for measurement. It is the entire group or elements that have at least one thing in common, (Kombo & Tromp, 2006). Mugenda & Mugenda, (2003) also defines a population as a set of individuals, case or objects with some common observable characteristics. The study focused on three categories labeled A, B and C. These categories are A to represent course coordinators who are 15 in number, B to represent the tutors that are 65 members and 500 third year students in the school of continuing and Distance Education.

3.4 Sample Size and Sampling Procedure

A sample is a smaller group obtained from the accessible population. It is a representative group which enabled the researcher to gain information about a population, (Mugenda & Mugenda, 2003). According to Orodho & Kombo (2002), sampling is the procedure the researcher uses to gather people, places or things to study. It is the procedure of selecting a number of individuals or objects from a population such that the selected group contains elements representatives of the characteristics found in the entire group.

To identify the sample size for the study, the table by Krejcie and Morgan , Mulusa, (1988), was used. According to the table, a population of 15 requires a sample size of 10, 65 require 25 while 500 require a sample size of 100 respondents. Simple random sampling was used to identify the respondents to participate in the study.

Table 3.1 Representing the sample size

Category	Population	Sample	%
A	15	10	67
B	65	25	42
C	500	100	20
Total	**575**	**135**	**24%**

The researcher used 135 correspondents chosen at random from the various categories of the population.

3.5 Research Instruments

The research instruments used for the study were questionnaires which entailed written down items to which the respondent individually responds to in writing. The questionnaire for this study was based on specific objectives and written down in form of statements of questions since the researcher is area is to do with distance education. The questions were well planned may be modified and adapted where necessary. This research tool is versatile in that it can either be open ended while others may be closed depending on the respondents. Other tools and may be administered by face-to-face and mail. For this particular research, the self-completion

questionnaire survey was used as the main method for data collection as questionnaires can be used to identify variables of the domain and to establish relationships between variables. Accordingly, this method can be used for descriptive or explanatory research, which was in line with my research inquiry, (Ghauri and Gronhaug, 2002).

3.5.1 Pilot Study

This was done in one public university within Nairobi before actual data collection for study was done. The university was used because it was assumed that the experiences of the course instructors, administrators and students were similar to those at University of Nairobi and as such, the responses of the course administrators, instructors and students in the two universities would be reasonably similar.

3.5.2 Validity of the instruments

Validity of an instrument represents the extent to which the instrument measures what it purports to measure, Borg and Gall, 1989. The study used content validity. Content validity is a measure of the degree to which data collected using a particular instrument represents a specific domain of indicators or content of a particular concept, Borg and Gall, 1989. The researcher arrived at content validity through the results and comments of the pilot study conducted in a public university offering distance education other than the University of Nairobi. Items that failed to measure the variables they were intended to measure were modified and others discarded completely. Consultations and discussions with the supervisors were done to establish content validity.

3.5.3 Reliability of the instruments

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials, (Mugenda & Mugenda, 1999). To test for the reliability of this study's research instrument, a pilot study will be conducted in a public university offering distance education other than the University of Nairobi. To determine reliability of instruments, internal consistency technique was used. Reliability in this case was determined from scores obtained from a single test administered by the researcher to a sample of subjects. A score obtained in one item was correlated with scores obtained from other items. The reliability of the

instruments was determined during the pilot study. The reliability was computed using Cronbach's Coefficient Alpha or KR 20 formular which is as follows:

KR 20= (K) (S^2 - $\sum s^2$) / (S^2) (K -1)

Where KR 20 = reliability coefficient of internal consistency

K = Number of items used to measure the concept

S^2 = Variance of all scores

s^2 = Variance of individual items

All the three sets of questionnaires were found to be reliable since they had a high coefficient of above 0.7 (course administrartors' 0.8423, course tutors' 0.7315 and students' 0.7943). This implied that items correlated highly among themselves meaning that there was consistency among the items in measuring the concept of interest.

3.6 Data Collection Procedures

A research permit was obtained from the permanent secretary, Ministry of Education Science and Technology. The researcher booked appointments with sampled respondents for administration and collection of the instrument. The researcher then administered and collected the instrument from the respondents on the same day. Researcher formulated data collection instruments that were simple enough to follow standard information to be extracted from all the respondents and those are; questionnaires, interview, filed visits, listening and observation.

3.7 Data Analysis Techniques

Data analysis refers to the interpretation of collected raw data into useful information, (Kombo & Tromp, 2006). Data collected was analyzed both qualitatively and quantitatively. Quantitative data analysis considers inferences that are made from opinions of respondents. Qualitative data will be analyzed by organizing it into categories on the basis of the themes, concepts or similar features. Quantitative data was analyzed using the Statistical Package for Social Sciences SPSS. The computed data was then analyzed using descriptive statistics. The statistics that was calculated included frequencies, means and percentages. Interpretation of the data was then done within the frame of reference of the research problem.

CHAPTER FOUR

DATA ANALYSIS PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of the analyzed data together with their interpretations. All themes discussing the same research questions were presented and analyzed together. The chapter begins with the demographic information of the respondents followed by presentations, interpretation and discussions of research findings based on the research questions.

4.2 Questionnaire Return Rate

Completion rate is the proportion of the sample that participated as intended in all the research procedures. All the 10 course administrators sampled returned the questionnaires; which was a 100% return rate. All the 25 course tutors returned the questionnaires; which was a 100% return rate. Out of 100 learners sampled, 96 returned the questionnaires; which was 96% return rate. These return rates were deemed adequate for the study.

4.3 Demographic Information of the Respondents

The demographic information of the course administrators and tutors was based on their gender, academic qualifications, and years of experience. The demographic information of the course administrators and tutors is presented in this section.

4.3.1 Distribution of Respondents by Gender

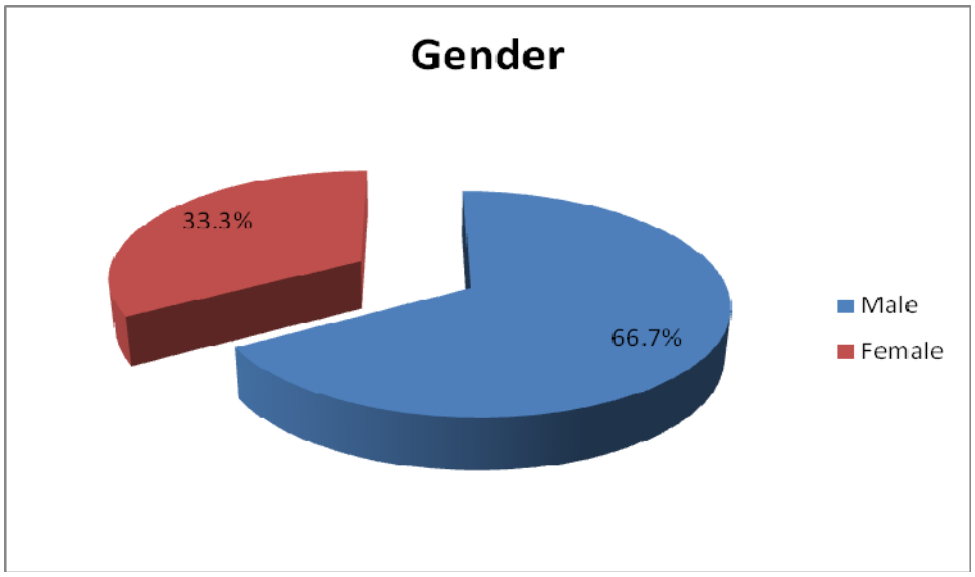
The course administrators and tutors were asked to indicate their gender. The data is presented in Table 4.1. Data on the gender of the course administrators indicated that 7(70%) were males while 3(30%) were female. Data on the tutors showed that 15(60%) were male while 10(40%) were female. This shows that there was balance in terms of gender among the course tutors but there were more males among the course administrators. The gender distribution was however deemed appropriate to give information on distance learning.

Table 4.1: Gender of course administrators and course tutors

Gender	Administrators		Tutors	
	F	%	F	%
Male	7	70	15	60
Female	3	30	10	40
Total	**10**	**100**	**25**	**100**

The researcher sought to establish the gender distribution of the learners, from the findings on figure 4.1, a greater proportion of the learners (66.7%) were male while 33.3% were female. The findings imply that a greater proportion of male learners enrolled for the distance learning programme.

Figure 4.1: Gender distribution of learners



4.3.2 Distribution Respondents by Level of Education

The course administrators and tutors were asked to indicate their highest academic qualifications. The data is presented in Table 4.2. Findings indicated that majority of the course administrators 8(80%) had PhD while 2(20%) had Masters Degrees, None of the course administrators had Bachelors degree. Majority of the tutors 17(68%) also had PhD Degrees, 6(24%) had Masters Degrees while only 2(8%) had bachelors degrees. These findings show that a greater proportion of the course administrators and tutors were highly qualified. The course administrators and tutors were deemed informed enough to answer the questionnaires.

Table 4.2: Distribution of course administrators and Tutor' Responses on Academic Qualifications

Qualifications	**Administrators**		**Tutors**	
	F	**%**	**F**	**%**
PhD	8	80	17	68
Masters Degree	2	20	6	24
Bachelors Degree	-	-	2	8
Total	**10**	**100.0**	**25**	**100.0**

4.3.3 Distribution of Responses by years of Experience

The course administrators and tutors were asked to indicate the years of experience in their respective positions. The data findings on the tutors' and course administrators' years of experience as tabulated in Table 4.3 indicated that majority of the course administrators 6(50.5%) had between 11-20 years of experience. 7(58.3%) of the course tutors also had 11-20 years of experience while none of the course administrators or tutors had over 30 years of experience. The findings imply that the course administrators and tutors targeted for the study provided reliable and accurate information necessary for the study.

Table 4.3: Distribution of administrators' and Tutors' Responses on years of experience

Years	Administrators		Tutors	
	F	**%**	**F**	**%**
1-10 years	4	33.3	3	25.0
11-20 years	6	50.5	7	58.3
21-30 years	2	16.7	2	16.7
Above 30 years	-	-	-	-
Total	**10**	**100.0**	**25**	**100.0**

4.3.4 Distribution of Respondents by Age

The researcher sought to establish the age distribution of learners enrolled in the distance education programme, from the findings on table 4.4, a greater proportion 31(32.3%) were aged between 41-45 years, 26(27.1%) were aged between 36-40 years, while only 2(2.1%) were aged above 55 years. The findings imply that learners aged above 36 years of age were more likely to enroll for distance education programmes due to the responsibilities they had.

Table 4.4: Age distribution of learners

Age Bracket	F	%
31-35 years	20	20.8
36 -40 years	26	27.1
41-45 years	31	32.3
46-50 years	14	14.6
51-55 years	3	3.3
Above 55 years	2	2.1
Total	**96**	**100.0**

The researcher further sought to establish the learners' working status, from the findings on table 4.5, a greater proportion of the learners 45(46.9%) of the learners were engaged in formal employment while 24(25.0%) were self employed, only 27(28.1%) indicated that they were neither in formal employment or self employed. The findings imply that the learners usually enrolled for the distance learning programme as a result of the busy occupational schedules.

Table 4.5: Learners' working status

Working status	**F**	**%**
Formal Employment	45	46.9
Self employment	24	25.0
None	27	28.1
Total	**96**	**100.0**

Based on the findings on table 4.6, a greater proportion of the learners 35(36.5%) were married while 31(32.3%) were separated, the findings imply that married learners were more likely to enroll for the distance learning programmes due to parental and other marital related responsibilities.

Table 4.6: Learners' Marital status

Marital status	**F**	**%**
Never married	21	21.9
Married	35	36.5
Separated	31	32.3
Divorced	9	9.4
Total	**96**	**100.0**

The researcher sought determine the highest level of education attained by learners before enrolling for distance learning, the results on table 4.7 shows that a greater proportion of the learners 39(40.6%) had college Diplomas before they enrolled for the programme while

30(34.4%) had undergraduate degrees. The findings imply that a greater proportion of the learners enrolled had attained some level of college/university education.

Table 4.7: Highest levels of education attained by learners before enrolling for distance learning

Level of Education	F	%
High School	3	3.1
College Certificate	17	17.7
College Diploma	39	40.6
Undergraduate Degree	30	34.4
Post graduate Qualifications	7	7.3
Total	**96**	**100.0**

4.4 Influence of Technology Based Factors

The course administrators were instructed to respond to the statements on a 5 point Likert scale and indicate the extent to which some of the distance learning technologies are used: 5-Very Great Extent, 4-Great Extent, 3-Not Opinion, 2-Little Extent, 1-Very Little Extent. A mean (M) score of 0-1.5 means that the respondents indicated very little extent, between 1.50 to 2.50 means they indicated Little Extent 2.50 to 3.50 means the respondents had no opinion, 3.50-4.50 means they indicated Great Extent, and a mean above 4.50 means they indicated Very Great Extent. Based on the findings on table 4.8, the respondents indicated that the following technologies were being used at a Very great extent: (Print M=4.53; SD=0.9874) and Email (M= 4.55; SD=0.9665).The course administrators indicated that the following technologies are used at a very little extent: Voicemail, Audio files/CD, Audio conference, Satellite Videoconference, Internet Videoconference, Cable/Broadcast Television, Telephone tutoring, and Radio broadcast.

Table 4.8: Course administrators' opinions on the Extent of using technologies

Media of learning	Mean	Standard Deviation	N
Print	4.53	0.9874	10
Voicemail	2.38	0.9978	10
Audio files/CD	2.37	0.9172	10
Audio conference	2.36	0.9780	10
E-mail	4.55	0.9665	10
Online Chat	4.57	0.9696	10
Web-based Education	3.78	0.9435	10
Videotape/DVD	3.63	0.9763	10
Satellite Videoconference	2.42	0.9456	10
Internet Videoconference	2.29	0.8941	10
Cable/Broadcast Television	2.37	0.9764	10
Telephone tutoring	2.34	0.9452	10

4.5 Influence of Institutional Related Factors

The course administrators were instructed to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Not Sure, 2-Disagree, 1-Strongly disagree. A mean (M) score of 0-1.5 means that the respondents strongly disagreed, between 1.50 to 2.50 means they disagreed, 2.50 to 3.50 means the respondents were not sure, 3.50-4.50 means they agreed, and a mean above 4.50 means the respondents strongly agreed. The findings on table 4.9 revealed that the course administrators strongly agreed with the following statements: Development of appropriate technologies for distance learning is part of the college strategic planning, The staff in the department have adequate skills on modern distance learning technologies, The university has facilitated the acquisition of modern distance education technologies, The staff in the department have adequate skills on modern distance learning technologies, The university has facilitated the acquisition of modern distance education technologies, The university has programmes for training tutors to use of newer technologies for distance learning, and that The university has hired adequate technical personnel to support the use of emerging technologies for distance learning.

The course administrators disagreed with the following statements: The department has adequate financial resources for adoption of appropriate technologies for distance learning, and that the department has adequate financial resources for adoption of appropriate technologies for distance learning. They were however not sure that the organizational structure of the University allows for the development of the distance education department.

Table 4.9: Course administrators' opinions on issues regarding adoption distance learning technologies

Statements	Mean	Standard Deviation	N
Development of appropriate technologies for distance learning is part of the college strategic planning	4.57	0.9874	10
The department has adequate financial resources for adoption of appropriate technologies for distance learning	2.38	0.9998	10
The department has adequate staff to spearhead the adoption and use of appropriate technologies for distance learning	2.39	0.9972	10
The staff in the department have adequate skills on modern distance learning technologies	4.86	0.9686	10
The organizational structure of the University allows for the development of the distance education department	2.75	0.9875	10
The university has facilitated the acquisition of modern distance education technologies	4.52	0.9686	10
The staff in the department are well motivated as to allow innovation on distance learning technologies	4.78	0.9775	10
The university has programmes for training tutors to use of newer technologies for distance learning	4.50	0.9963	10
The university has hired adequate technical personnel to support the use of emerging technologies for distance learning	4.52	0.9796	10

The course tutors were instructed to respond to the statements on a 5 point Likert scale and indicate the extent to which the factors affected the performance of refugee students: 5-Very Great Extent, 4-Great Extent, 3-Not Opinion, 2-Little Extent, 1-Very Little Extent. A mean (M) score of 0-1.5 means that the respondents indicated very little extent, between 1.50 to 2.50 means they indicated Little Extent 2.50 to 3.50 means the respondents had no opinion, 3.50-4.50 means they indicated Great Extent, and a mean above 4.50 means they indicated Very Great Extent. Based on the findings on table 4.10, the respondents indicated that the following technologies were being used at a Very great extent: (Print M=4.53; SD=0.9874) and Email (M= 4.55; SD=0.9665).The course tutors indicated that the following technologies were being used at a very little extent for presenting course materials for distance education in the departments: Print (M=4.59; SD=0.9974) and E-mail (M=4.65; SD=0.9965).According to the course tutors, the following technologies are used at a very little Extent: Audio files/CD, Online Chat, Web-based Education, Satellite Videoconference, Cable/Broadcast Television, Telephone tutoring and Radio broadcast.

Table 4.10: Course tutors' opinions on the Extent of using technologies

Media	Mean	Standard Deviation	N
Print	4.59	0.9974	25
Voicemail	2.38	0.9878	25
Audio files/CD	2.47	0.9970	25
Audio conference	2.46	0.9794	25
Email	4.65	0.9965	25
Online Chat	2.37	0.9695	25
Web-based Education	2.38	0.9495	25

Videotape/DVD	3.63	0.9768	25
Satellite Videoconference	2.22	0.9856	25
Internet Videoconference	2.34	0.9984	25
Cable/Broadcast Television	2.30	0.9784	25
Telephone tutoring	2.29	0.8794	25
Radio broadcast	2.34	0.9786	25

4.6 Influence of Learner Related Factors

The researcher sought to establish the opinion of course tutors on some issues regarding the adoption distance learning technologies. The course tutors were instructed to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Not Sure, 2-Disagree, 1-Strongly disagree. A mean (M) score of 0-1.5 means that the respondents strongly disagreed, between 1.50 to 2.50 means they disagreed, 2.50 to 3.50 means the respondents were not sure, 3.50-4.50 means they agreed, and a mean above 4.50 means the respondents strongly agreed. The findings on table 4.11 revealed that the course tutors strongly agreed with the following statements: Development of appropriate technologies for distance learning is part of the college strategic planning (M=4.58; SD=0.9976), the department has adequate financial resources for adoption of appropriate technologies for distance learning (M=4.60;SD=0.9876), and that the organizational structure of the University allows for the development of the distance education department (M=4.65;SD=0.9963). The course tutors however disagreed with the following statements: The department has adequate staff to spearhead the adoption and use of appropriate technologies for distance learning (M=2.33; SD=0.9979), The staff in the department have adequate skills on modern distance learning technologies (M=2.46; SD=0.9793).

Table 4.11: Course tutors' opinion on issues influencing the adoption distance learning technologies

Factors	Mean	Standard Deviation	N
Development of appropriate technologies for distance learning is part of the college strategic planning	4.58	0.9976	25
The department has adequate financial resources for adoption of appropriate technologies for distance learning	4.60	0.9876	25
The department has adequate staff to spearhead the adoption and use of appropriate technologies for distance learning	2.33	0.9979	25
The staff in the department have adequate skills on modern distance learning technologies	2.46	0.9793	25
The organizational structure of the University allows for the development of the distance education department	4.65	0.9963	25
The university has facilitated the acquisition of modern distance education technologies	2.37	0.9695	25
The staff in the department are well motivated as to allow innovation on distance learning technologies	2.48	0.9495	25
The university has programmes for training tutors to use of newer technologies for distance learning	3.63	0.9768	25
The university has hired adequate technical personnel to support the use of emerging technologies for distance learning	2.22	0.9856	25

4.6.1 Extent of Learners adoption of distance learning technologies

The learners were instructed to respond to the statements on a 5 point Likert scale and indicate the extent to which the factors affected the performance of refugee students: 5-Very Great Extent, 4-Great Extent, 3-Not Opinion, 2-Little Extent, 1-Very Little Extent. A mean (M) score of 0-1.5 means that the respondents indicated very little extent, between 1.50 to 2.50 means they indicated Little Extent 2.50 to 3.50 means the respondents had no opinion, 3.50-4.50 means they indicated Great Extent, and a mean above 4.50 means they indicated Very Great Extent. Based on the findings on table 4.12, the respondents indicated that the following technologies were being used at a Very great extent: Print (M=4.53; SD=0.9874) and Email (M= 4.55; SD=0.9665).The learners indicated that the following technologies were being used at a very little extent for presenting course materials for distance education in the departments: Voicemail, Audio conference Online Chat, Internet Videoconference and Telephone tutoring.

Table 4.12: Learners' opinions on the Extent of using technologies

Factors	Mean	Standard Deviation	N
Print	4.59	0.9094	96
Voicemail	2.38	0.9798	96
Audio files/CD	4.67	0.9172	96
Audio conference	2.32	0.9389	96
E-mail	4.55	0.9867	96
Online Chat	2.37	0.9496	96
Web-based Education	3.78	0.9095	96
Videotape/DVD	4.63	0.9793	96

Satellite Videoconference	4.62	0.9576	96
Internet Videoconference	2.32	0.9874	96
Cable/Broadcast Television	2.37	0.9564	96
Telephone tutoring	2.39	0.9276	96
Radio broadcast	2.34	0.9998	96

4.6.2 Learners' Proficiency in Computer Applications

The learners were instructed to indicate their level of computer proficiency on a 5 point Likert scale and indicate the extent to which the factors affected the performance of refugee students: 5- Proficient, 4- Above average, 3-Average, 2-Fair, 1-Poor. A mean (M) score of 0-1.50 means that the respondents indicated poor, between 1.51 to 2.50 means they indicated Fair 2.51 to 3.50 means the respondents indicated average, 3.51-4.50 means they indicated above average, and a mean above 4.50 means they indicated Proficient. Based on the findings on table 4.13, the learners are proficient in: Creating/editing a document on a computer, saving a computer document or file, printing a computer document or file, Copy or download files from the internet, attaching file to an email address, creating a presentation e.g. using power point, Create a multi- media presentation (with sound, pictures, video) and writing and send e-mails. The findings imply that the computer learners' computer skills facilitate the adoption of distance learning technologies.

Table 4.13: Learners' response on computer proficiency

Statement	Mean	Standard Deviation	N
Create/edit a document on a computer	4.57	0.9760	96
Save a computer document or file	4.58	0.9978	96
Print a computer document or file	4.57	0.9172	96
Copy or download files from the internet	4.66	0.9780	96
Attach file to an email address	4.58	0.9665	96
Use spreadsheet to plot a graph	2.57	0.9696	96
Create a presentation e.g. using power point	4.78	0.9435	96
Create a multi- media presentation (with sound, pictures, video)	4.63	0.9763	96
Write and send e-mails	4.42	0.9456	96

4.6.3 Issues Influencing Learners' Choice of Distance Learning Technologies

The researcher sought to establish the learners opinions on the distance learning technologies, The learners were instructed to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Not Sure, 2-Disagree, 1-Strongly disagree. A mean (M) score of 0-1.5 means that the respondents strongly disagreed, between 1.50 to 2.50 means they disagreed, 2.50 to 3.50 means the respondents were not sure, 3.50-4.50 means they agreed, and a mean above 4.50 means the

respondents strongly agreed. based on the findings, the respondent strongly agreed that: The technologies currently being used for development of instructional materials allows for flexibility in terms of choosing the place and time of study (M=4.51;SD=0.9765), The technologies currently being used for development of instructional materials are user friendly (M=4.63;SD=0.9890), I have the technical expertise required to use all the distance learning technologies that the university has (M=4.52;SD=0.9754) and that newer technologies can improve the development and quality of instructional materials for distance learning (M=4.61;SD=0.9869).

The learners however disagreed that: The technologies currently being used for development of instructional materials are allows for interaction between the learner and tutor (M=2.43; SD=0.9878), The technologies currently being used for development of instructional materials gives the learner freedom to select learning goals and activities (M=2.32; SD=0.9686) and The university provides exposure to newer technologies in distance learning (M=2.20; SD=0.9941).

Table 4.13: Learners' opinions on issues regarding adoption of distance learning technologies

Factors	Mean	Standard Deviation	N
The technologies currently being used for development of instructional materials are allows for interaction between the learner and tutor	2.43	0.9878	96
The technologies currently being used for development of instructional materials gives the learner freedom to select learning goals and activities	2.32	0.9686	96
The technologies currently being used for development of instructional materials caters for individual differences in learning	4.38	0.9874	96
The technologies currently being used for development of instructional materials allows for timely feedback	4.34	0.9780	96

from the tutors			
The technologies currently being used for development of instructional materials allows for flexibility in terms of choosing the place and time of study.	4.51	0.9965	96
The technologies currently being used for development of instructional materials are user friendly	4.63	0.9790	96
The technologies currently being used for development of instructional materials are affordable	4.58	0.9891	96
The college provides adequate technical support to learners to facilitate the use of newer technologies	3.63	0.9878	96
I have the technical expertise required to use all the distance learning technologies that the university has	4.52	0.9674	96
The university provides exposure to newer technologies in distance learning	2.20	0.9941	96
Newer technologies can improve the development and quality of instructional materials for distance learning	4.61	0.9869	96

The findings on table 4.13 above revealed that the respondents strongly agreed that: The technologies currently being used for development of instructional materials allows for flexibility in terms of choosing the place and time of study, the technologies currently being used for development of instructional materials are affordable, the technologies currently being used for development of instructional materials are affordable, the technologies currently being used for development of instructional materials are user friendly and that newer technologies can improve the development and quality of instructional materials for distance learning.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the researcher presents the summary of the important elements of the study, discussion of the findings and interpretation of the results. The chapter further presents the conclusions drawn from the research findings as well as recommendations for improvement and suggestions for further research.

5.2 Summary of findings

The purpose of this study was to explore factors that influence the choice of technology for the development of instruction materials for distance education at the School of Continuing and Distance Education. The study was guided by the following objectives: To find out the institution related factors influencing the choice of technology for the development of materials for distance education; To explore learner related factors affecting the choice of technology for the development of materials for distance education; To investigate technology related factors influencing the choice of technology for the development of distance education materials and To identify related factors influencing the choice of technology for development of distance education materials.

The findings revealed that knowledge on ICT applications by the course administrators was the major important factor in determining the of adoption distance learning technologies by the university. Two other, similar factors were also rated as important in terms of adoption: difficulty in using the technology and difficulty in learning to use the technology.

The course administrators strongly agreed with the following statements: Development of appropriate technologies for distance learning is part of the college strategic planning, The staff in the department have adequate skills on modern distance learning technologies, The university has facilitated the acquisition of modern distance education technologies, The staff in the department have adequate skills on modern distance learning technologies, The university has facilitated the acquisition of modern distance education technologies, The university has programmes for training tutors to use of newer technologies for distance learning, and that The

university has hired adequate technical personnel to support the use of emerging technologies for distance learning.

The course administrators disagreed with the following statements: The department has adequate financial resources for adoption of appropriate technologies for distance learning, and that the department has adequate financial resources for adoption of appropriate technologies for distance learning. They were however not sure that the organizational structure of the University allows for the development of the distance education department.

The course tutors indicated that the following technologies were being used at a very little extent for presenting course materials for distance education in the departments: Print (M=4.59; SD=0.9974) and E-mail (M=4.65; SD=0.9965).According to the course tutors, the following technologies are used at a very little Extent: Audio files/CD, Online Chat, Web-based Education, Satellite Videoconference, Cable/Broadcast Television, Telephone tutoring and Radio broadcast. the learners are proficient in: Creating/editing a document on a computer, saving a computer document or file, printing a computer document or file, Copy or download files from the internet, attaching file to an email address, creating a presentation e.g. using power point, Create a multi- media presentation (with sound, pictures, video) and writing and send e-mails.

5.3 Discussion of the Findings

The findings of the study revealed that the course administrators strongly agreed that: Development of appropriate technologies for distance learning is part of the college strategic planning; the staff in the department have adequate skills on modern distance learning technologies; the university has facilitated the acquisition of modern distance education technologies; the staff in the department have adequate skills on modern distance learning technologies; the university has facilitated the acquisition of modern distance education technologies; the university has programmes for training tutors to use of newer technologies for distance learning, and that the university has hired adequate technical personnel to support the use of emerging technologies for distance learning.

The course administrators disagreed that: The department has adequate financial resources for adoption of appropriate technologies for distance learning, and that the department has adequate financial resources for adoption of appropriate technologies for distance learning.

They were however not sure that the organizational structure of the University allows for the development of the distance education department.

The findings further revealed that the respondents indicated that the following technologies were being used at a Very great extent: Print (M=4.53; SD=0.9874) and Email (M= 4.55; SD=0.9665). Institutional factors belong to a group of extrinsic motivational factors influencing academic teacher's acceptance of e-learning technology. Numerous study results indicate that factors which influence academic teachers differ depending on the current phase of e-learning introduction into the academic institution in question. One of the key factors is the capacity and reliability of the ICT infrastructure (Nanayakkera & Whiddett, 2005). In practice, instructors frequently list the following conditions as obstacles: access to the computer classroom, number of computers in a classroom, computer network, Internet (access and speed) (Osika et al., 2009). After solving the problem of infrastructure, there are other negative factors that influence e-learning application. Thus, perceived adequacy of support (for example technical, pedagogical, personnel), as facilitating circumstance, has an important impact on applying e-learning in education (Timothy, 2009). Availability of information about the manner of applying e-learning technology in education process can positively influence teacher's adoption of e-learning (Kundi et al., 2010).

The learners indicated that the following technologies were being used at a very little extent for presenting course materials for distance education in the departments: Voicemail, Audio conference Online Chat, Internet Videoconference and Telephone tutoring, this implies that the university is not using these technologies adequately in distance learning.

On computer proficiency, the findings revealed that the learners are proficient in: Creating/editing a document on a computer, saving a computer document or file, printing a computer document or file, Copy or download files from the internet, attaching file to an email address, creating a presentation e.g. using power point, Create a multi- media presentation (with sound, pictures, video) and writing and send e-mails. The findings imply that the computer learners' computer skills facilitate the adoption of distance learning technologies.

The technologies currently being used for development of instructional materials allows for flexibility in terms of choosing the place and time of study (M=4.51;SD=0.9765), The technologies currently being used for development of instructional materials are user friendly (M=4.63;SD=0.9890), I have the technical expertise required to use all the distance learning

technologies that the university has (M=4.52;SD=0.9754) and that newer technologies can improve the development and quality of instructional materials for distance learning (M=4.61;SD=0.9869).

The learners however disagreed that: The technologies currently being used for development of instructional materials are allows for interaction between the learner and tutor (M=2.43; SD=0.9878), The technologies currently being used for development of instructional materials gives the learner freedom to select learning goals and activities (M=2.32; SD=0.9686) and The university provides exposure to newer technologies in distance learning (M=2.20; SD=0.9941). Student characteristics can act as motivators for application and development of e-learning in teaching, and student capabilities (Osika et al., 2009) can be an obstacle in using e-learning technology in teaching. Each student has his or her own learning style and there are various instruments that can measure those styles (Grasha, 1994). A very important student characteristic is motivation; a motivated student shows greater interest in information, the quality of information, confidence when accessing information and technology, satisfaction in work (Kumarawadu, 2011). Colorado and Eberle (2009) conclude that the level of student self-regulated learning is related to demographic data: gender, status, certificates, completed degree of education and characteristics of the self-regulated learning: learning strategy, critical thinking, knowledge sharing, asking for help, where students who have graduated have a higher level of self-regulated learning.

5.4 Conclusions

Numerous studies have tried to understand the problem of acceptance of e-learning technology by discovering and confirming the influence of many factors studied from different aspects, while using existing theories and models of innovation acceptance (as well as their combination) as basis for empirical research. Study results frequently confirm the factors: usefulness and ease of use of the e-learning technology. Researchers have in different ways adapted the constructs from the existing theories and models, in which greater significance was given to the technical aspect of the e-learning technology, and not so much to the pedagogical aspect, which will only later gain more significance. Also, researchers include more institutional factors and less situational ones (such as field of study characteristics and student characteristics) which represent important extrinsic motivational factors influencing the course instructors and

administrators when creating virtual learning environments. The researchers are increasingly focused on the institutional factors, as a motivational factor, after certain institutional obstacles have been removed with the aim of creating encouragement measures for developing and applying e-learning technologies. The training has been singled out as a separate category regarding that, apart from the required ICT infrastructure, acquiring new knowledge and skills is one of the essential factors in adopting e-learning.

Learning through experience influences the creation of new values which become attitudes that have a strong impact on teacher's behavior towards e-learning technology. Therefore, the attitude and values are singled out as a separate category as well, linking together certain factors that influence them. Because of the manner of academic teaching process, the most commonly used is blended learning model where a course instructor chooses the e-learning technology based on certain elements. The practice has shown that creating a blended learning environment is not easy and that course instructors have problems in many stages of designing the virtual learning environment, from the analysis of the course requirements, analysis of the student requirements, application of instructional design model, e-learning technology use, not understanding the concept of the quality of e-learning process and many other factors.

5.5 Recommendations

Based on the findings of the study, the researcher recommends that:

The university should enlighten the staff involved with distance learning on the importance of reliability and the criticality of the ICT equipment, its integration into the programmes offered, and its maintenance.

The university should purchase highly reliable technologies that would enhance the use of e-learning by students without challenges.

The university administration should establish clear lines of responsibility for checking and maintaining quality control of distance learning technologies, especially for programmes with a high number of students.

The ICT department at the university should regularly check and maintain the distance learning technology equipment being used by doing software upgrade as well as installation of

other devices that may improve the use and adoption of the technologies by both students and course tutors.

The university should maintain supplies of distance learning technology equipment properly and take new approaches including staff training to assure rapid responses to break-downs. Based on the findings, many staff and students were not familiar with some technological applications.

To support the course administrators and instructors in learning new technologies, the university should have a faculty with different levels of proficiency test new classroom technology setups before implementing them in other classrooms. Such testing can assure that the distance learning technologies are easy for faculty to learn. The faculty must have opportunities to reveal problems and get them corrected before the technologies move into regular use.

Students are ready to adopt distance learning technologies, it is therefore recommended that more courses should be integrated in distance learning so as to cover all the courses offered to students. There is also need for students to enroll in practical classes for computer training. This will enable the less net savvy students to brace up so as to avoid being left behind by others. There is no doubt that a lot of pressures are facing our students when it comes to distance learning technology adoption, especially distance barrier. There is therefore, need for e-learning to be fully put in place to enable the group of students that their homes are far away from the school to participate in classes even when they are not able to make it to school.

Finally, there should be availability of ICT infrastructure, the absence or inadequacy of which will totally hamper the idea of e-learning adoption in universities. There should be provision of computers and high bandwidth to enable the easy flow of classes online. This goes in line with the recommendation given by Abdel-Wahab (2008) that ‘if the high ICT infrastructure for e-learning is unavailable, the sequential use of predecessor distance learning technologies from correspondence courses to radio, TV, CD-ROM, Internet and World Wide Web is recommended. Such a sequential use of predecessor distance learning technologies is poised to leverage the experience into a significant use of learning.

5.6 Areas for further research

Future research should look into the influence of cultural factors on distance learning adoption. Secondly, future research should focus a comparative study on distance learning platforms used by universities and in particular the University of Nairobi school of continuing and distance education. Finally a study should be done to evaluate the attitudes of learners on the adoption of technology in distance learning.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION TO RESPONDENTS

Boaz Amuhaya
College of Education and External Studies,
Department of Distance Learning,
University of Nairobi,
P.O. Box 30197,
Nairobi.

Dear Respondents,

I am Boaz Amuhaya, a master student in Distance Education at the University of Nairobi. I am conducting a final project research on the factors that influence choice of technology for development of instructional materials for distance education pedagogy at the School of Continuing and Distance Studies, University of Nairobi.

Kindly and honestly respond to all the items of the questionnaire. The questionnaire is basically for research purposes only and hence utmost confidentiality will be observed.

Thank for your co-operation.

Yours faithfully,

Boaz M. Amuhaya

APPENDIX II: QUESTIONNAIRE FOR COURSE ADMINISTRATORS

Section A: Demographic information

1. Gender ☐ Male ☐ Female
2. Age

(*Tick where appropriate*)

☐ 18-24 years ☐ 25-34 years ☐ 35-44 years ☐ 45-54 years ☐ Over 55 years

3. Education level

(*Tick where appropriate*)

☐ Bachelors Degree ☐ Masters Degree ☐ PHD

☐ Other (Specify)……

3. How many years have you worked within the institution?

(*Tick where appropriate*)

☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ Over 16 years

4. Indicate the course that you coordinate

……

5. For how many years have you been a course coordinator at the department of external studies, CEES, University of Nairobi?

Below 1 year [ ] 1 – 5 years [ ] 6 – 10 years [ ]

11 – 15 years [ ] Above 15 years [ ]

6. Indicate the extent to which the following technologies are used for presenting course materials for distance education in your department

1-Very little extent 2 -Little extent 3- No opinion 4- Great Extent 5 -Very Great

Technology	**1**	**2**	**3**	**4**	**3**
Print					
Voicemail					
Audio files/CD					
Audioconference					
E-mail					
Online Chat					
Web-based Education					
Videotape/DVD					
Satellite Videoconference					
Internet Videoconference					
Cable/Broadcast Television					
Telephone tutoring					
Radio broadcast					

Extent

7. To what extent do you agree with the following statements? Respond using the following key: **SA - Strongly Agree A - Agree N – Neutral**

D – Disagree SD – Strongly Disagree

Statement	**SA**	**A**	**U**	**D**	**SD**
Development of appropriate technologies for distance learning is part of the college strategic planning					

The department has adequate financial resources for adoption of appropriate technologies for distance learning					
The department has adequate staff to spearhead the adoption and use of appropriate technologies for distance learning					
The staff in the department have adequate skills on modern distance learning technologies					
The organizational structure of the University allows for the development of the distance education department					
The university has facilitated the acquisition of modern distance education technologies					
The staff in the department are well motivated as to allow innovation on distance learning technologies					
The university has programmes for training tutors to use of newer technologies for distance learning					
The university has hired adequate technical personnel to support the use of emerging technologies for distance learning					

8. Are tutors consulted while choosing the technology to be used in distance education in your department? To a large extent [ ] To some extent [ ] Not at all [ ]
9. Are tutors provided with training on use of distance learning technologies in your department?

   To a large extent [ ] To some extent [ ] Not at all [ ]
10. List the various technologies that tutors have been trained for use in developing instructional materials in your department.

    ……

    ……

    …….
11. Rate the skills of the tutors in your department in use of the following distance learning technologies.

Technology	**Very Low**	**Low**	**Moderate**	**High**	**Very High**
Print					
Voicemail					
Audio files/CD					
Audio conference					
E-mail					
Online Chat					
Web-based Education					
Videotape/DVD					
Satellite Videoconference					
Internet Videoconference					
Cable/Broadcast Television					
Telephone tutoring					
Radio broadcast					

12. List the various technologies that tutors have been trained for use in developing instructional materials in your department.

    ……

    ……

    ……..

13. List the various distance learning technologies that tutors prefer most for the development of instructional materials for distance learning in your department.

    ……

    ……

    ……..

14. To what extent do you agree with the following statements? Respond to the statements using the following key: **SA - Strongly Agree A - Agree N – Neutral**

D – Disagree SD – Strongly Disagree

Statement	**SA**	**A**	**U**	**D**	**SD**
Resistance to change by tutors has reduced the range of technologies to use for distance learning					
Tutors have adequate time to explore/ use new technologies for development of instructional materials for distance learning					
Tutors express much apprehension towards use of new technologies for development of instructional materials for distance learning					
Tutors have access to adequate technologies for development of instructional materials for distance learning					
Tutors support each other in using newer technologies for development of instructional materials for distance learning					
Majority of tutors in our department are computer literate					
The college recognizes and rewards tutors for innovative practice in use of newer technologies for development of instructional materials for distance learning					
There is adequate technical support available for tutors in the use of newer technologies for development of instructional materials for distance learning					
The cost of technology to the institution has limited the range of possible technologies for development of instructional materials for distance learning					
The cost of technology to the learner has limited the range of possible technologies for development of instructional materials for distance learning					

Majority of the learners in our department are computer literate					
Familiarity of learners with the learning content limits the range of technologies for development of instructional materials for distance learning					
Majority of the learners in the department are familiar with newer technologies used in distance learning					
There are adequate support services available to learners to enable them use newer technologies for distance learning					
The department has the capacity to adapt all the range of technologies available for distance learning to the local context					
Newer technologies can improve the for development and quality of instructional materials for distance learning					

15. What recommendations would you provide in order to improve the uptake of newer technologies for the development of instructional materials for distance learning.

    ……

    ……

    …….

Thank you for your cooperation

APPENDIX III: QUESTIONNAIRE FOR COURSE TUTORS

Section A: Demographic information

1. Gender ☐ Male ☐ Female
2. Age

(*Tick where appropriate*)

☐ 18-24 years ☐ 25-34 years ☐ 35-44 years ☐ 45-54 years ☐ Over 55 years

3. Education level

(*Tick where appropriate*)

☐ Bachelors Degree ☐ Masters Degree ☐ PHD

☐ Other (Specify)……

4. How many years have you worked within the institution?

(*Tick where appropriate*)

☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ Over 16 years

5. Indicate the courses that you develop

……

……

……

6. For how many years have you been a tutor in distance education?

   Below 1 year [ ] 1 – 5 years [ ] 6 – 10 years [ ]

   11 – 15 years [ ] Above 15 years [ ]

7. For how many years have you been a course development specialist at the department of external studies, CEES, University of Nairobi?

   Below 1 year [ ] 1 – 5 years [ ] 6 – 10 years [ ]

   11 – 15 years [ ] Above 15 years [ ]

Section B: Factors Influencing the Choice of Technology

8. Indicate the extent to which the following technologies are used for presenting course materials for distance education in your department.

1-Very little extent 2 -Little extent 3- No Opinion 4- Great Extent

5 -Very Great Extent

Technology	**1**	**2**	**3**	**4**	**5**
Print					
Voicemail					
Audio files/CD					
Audio conference					
E-mail					
Online Chat					
Web-based Education					
Videotape/DVD					
Satellite Videoconference					
Internet Videoconference					
Cable/Broadcast Television					
Telephone tutoring					
Radio broadcast					

9. To what extent do you agree with the following statements? Respond using the following key: **SA - Strongly Agree** **A - Agree** **N – Neutral**

D – Disagree **SD – Strongly Disagree**

Statement	**SA**	**A**	**U**	**D**	**SD**
Development of appropriate technologies for distance learning is part of the college strategic planning					
The department has adequate financial resources for adoption of appropriate technologies for distance					

learning					
The department has adequate staff to spearhead the adoption and use of appropriate technologies for distance learning					
The staff in the department have adequate skills on modern distance learning technologies					
The organizational structure of the University allows for the development of the distance education department					
The university has facilitated the acquisition of modern distance education technologies					
The staff in the department are well motivated as to allow innovation on distance learning technologies					
The university has programmes for training tutors to use of newer technologies for distance learning					
The university has hired adequate technical personnel to support the use of emerging technologies for distance learning					

10. Which of the following technologies do you have access to? Insert a tick [ ] for the technologies. Print [ ] Voicemail [ ] Audio files/CD [ ] E-mail [ ] Online Chat platforms [ ] Videotapes/DVDs [ ] Satellite Videoconference [ ] Computers [ ]

Internet Videoconference [ ] Cable/Broadcast Television [ ] Radio broadcast [ ]

11. Are tutors consulted while choosing the technology to be used in distance education in your department? To a large extent [ ] To some extent [ ] Not at all [ ]
12. Are tutors provided with training on use of distance learning technologies in your department? To a large extent [ ] To some extent [ ] Not at all [ ]

13. List the various technologies that tutors have been trained for use in developing instructional materials in your department.

……

……

14. List the various distance learning technologies that tutors prefer most for the development of instructional materials for distance learning in your department.

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15. To what extent do you agree with the following statements? Respond to the statements using the following key: **SA - Strongly Agree A - Agree N – Neutral D – Disagree SD – Strongly Disagree**

Statement	**SA**	**A**	**U**	**D**	**SD**
Resistance to change by tutors has reduced the range of technologies to use for distance learning					
Tutors have adequate time to explore/ use new technologies for development of instructional materials for distance learning					
Tutors express much apprehension towards use of new technologies for development of instructional materials for distance learning					
Tutors have access to adequate technologies for development of instructional materials for distance learning					
Tutors support each other in using newer technologies for development of instructional materials for distance learning					

Majority of tutors in our department are computer literate					
The college recognizes and rewards tutors for innovative practice in use of newer technologies for development of instructional materials for distance learning					
There is adequate technical support available for tutors in the use of newer technologies for development of instructional materials for distance learning					
The cost of technology to the institution has limited the range of possible technologies for development of instructional materials for distance learning					
The cost of technology to the learner has limited the range of possible technologies for development of instructional materials for distance learning					
Majority of the learners in our department are computer literate					
Familiarity of learners with the learning content limits the range of technologies for development of instructional materials for distance learning					
Majority of the learners in the department are familiar with newer technologies used in distance learning					

There are adequate support services available to learners to enable them use newer technologies for distance learning					
The department has the capacity to adapt all the range of technologies available for distance learning to the local context					
Newer technologies can improve the development and quality of instructional materials for distance learning					

16. What recommendations would you provide in order to improve the uptake of newer technologies for the development of instructional materials for distance learning

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……..

Thank you for your cooperation

APPENDIX IV: QUESTIONNAIRE FOR LEARNERS

Section A: Demographic Information

1. Indicate your gender? ☐ Female ☐ Male
2. Indicate your age bracket below?

   ☐ 31 – 35 years ☐ 36 – 40 years ☐ 41 – 45 years ☐46 – 50 years

   ☐ 51 – 55 years ☐ Above 55 years
3. What is your work status?

   ☐ Formal employment ☐ Self employment ☐ None
4. What is your current marital status?

   ☐ Never married ☐ Married ☐ Married with children ☐ Single with children

   ☐ Others: Specify …….
5. What was your highest level of education before enrolling for your current distance learning programme

   ☐ High School ☐ Certificate ☐ Diploma ☐ Degree ☐ Post Graduate

Section B: Factors Influencing the Choice of Technology

6. Indicate the extent to which the following technologies are used for presenting course materials for distance education in your course

1-Very little extent 2 -Little extent 3- No opinion 4- Great Extent

5 -Very Great Extent

Technology	**1**	**2**	**3**	**4**	**5**
Print					
Voicemail					
Audio files/CD					
Audioconference					
E-mail					
Online Chat					
Web-based Education					
Videotape/DVD					

Satellite Videoconference					
Internet Videoconference					
Cable/Broadcast Television					
Telephone tutoring					
Radio broadcast					

1 Which of the technologies stated in question 6 had you used before joining the current programme?

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.....

2 Insert a tick [ ] on the technologies that you most prefer for presentation of distance learning materials. Print [ ] Face to face interaction [ ] Audio files/ CDs [ ] Radio lessons [ ] Television broadcasts [ ] Computer based technologies [ ]

Which of the following best describes your previous experience with a computer?

I never use computers [ ] I occasionally use computers [ ] I always use computers [ ]

Which of the following best describes your access to a computer?

I do not have access to a computer [ ] I have my own computer at home [ ] I share a computer at home [ ] I have my own computer at work [ ] I share a computer at work [ ]

Which of the following best describes your access to internet? I do not have access to the internet [ ] I access the internet from my home [ ] I access the internet from my workplace [ ] I access the internet from a cyber café [ ]

3 What is the reliability of electricity in your home area? Very reliable [ ] Reliable [ ] Not reliable [ ] Not available [ ]

4 How well can you do each of these tasks on a computer

Task	**Proficient**	**Above average**	**Average**	**Fair**	**Poor**
Open a file on a computer					
Create/edit a document on a computer					
Save a computer document or file					
Print a computer document or file					
Copy or download files from the internet					
Attach file to an email address					
Use spreadsheet to plot a graph					
Create a presentation e.g. using power point					
Create a multi- media presentation (with sound, pictures, video)					
Write and send e-mails					

5 Indicate the extent to which you agree with the following statements using the following key: **SA - Strongly Agree A - Agree N – Neutral D – Disagree SD – Strongly Disagree**

Statement	**SA**	**A**	**U**	**D**	**SD**
The technologies currently being used for development of instructional materials are allows for interaction between the learner and tutor					
The technologies currently being used for development of instructional materials gives the learner freedom to select learning goals and activities					
The technologies currently being used for development of instructional materials caters for individual differences in learning					

The technologies currently being used for development of instructional materials allows for timely feedback from the tutors					
The technologies currently being used for development of instructional materials allows for flexibility in terms of choosing the place and time of study					
The technologies currently being used for development of instructional materials are user friendly					
The technologies currently being used for development of instructional materials are affordable					
The college provides adequate technical support to learners to facilitate the use of newer technologies					
I have the technical expertise required to use all the distance learning technologies that the university has					
The university provides exposure to newer technologies in distance learning					
Newer technologies can improve the development and quality of instructional materials for distance learning					

6 What recommendations would you provide in order to improve the uptake of newer technologies for the development of instructional materials for distance learning?

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Thank you for your cooperation