

**ACCESS TO AND USE OF INFORMATION AND COMMUNICATION
TECHNOLOGIES IN THE PROVISION OF INFORMATION TO DISTANCE
LEARNERS AT THE UNIVERSITY OF NAIROBI AND KENYATTA
UNIVERSITY LIBRARIES**

BY

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OF INFORMATION SCIENCES**

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DECLARATION

Declaration by the candidate

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DEDICATION

This work is dedicated to my family - my loving husband Kamau, our children: Kaniaru & Mumbi, Muthoni, Wacu, and our late son, Chege. Our grand children: Jona, Elsa, Ahadi, Imani and the late Natalie.

To my late parents, Duncan Chege and Mrs. Gladys Wacu Chege (May the souls of the departed rest in eternal peace).

They all have influenced my life in one way or another.

ABSTRACT

Distance education is becoming popular for accessing higher education due to its flexibility. Unfortunately public university libraries in Kenya have not responded to this change by providing information access for distance learners which can be achieved through ICTs. Although these libraries are adopting the use of ICTs, distance learners are disadvantaged because of limited access to and use of ICTs occasioned by scarcity and small range of ICTs, low level of e-readiness for distance learners, absence of or unsuitable policies for distance learning and challenges experienced by distance learners in accessing information. The aim of the study was to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries and to propose a model for improvement. The objectives of the study were to: examine the range of ICTs at the selected universities; explore the level of e-readiness of the libraries for distance learners; establish the adequacy of information literacy skills of distance learners; establish the policies that the university libraries have developed for providing information to distance learners; identify the challenges experienced by distance learners in accessing information through ICTs; make recommendations and propose a model of improving access and use of ICTs by distance learners in public universities. The study was informed by the Diffusion of Innovation (DoI) Theory supplemented by the Constructivism Learning Theory. It employed a mixed method research design. A multiple case studies research design was used. Stratified, purposive and census sampling techniques were variously used to select key participants namely: distance learners, Directorate of Distance Education, Deans of Schools and Chairmen of Departments, University librarians and senior library staff. A sample of 200 distant learners and 56 respondents from the other strata was selected. Data was collected through a semi structured questionnaire administered to distance learners, semi-structured interviews with the other respondents and documentary review. It was analysed using descriptive statistics and thematically. The key findings of the study were that: distance learners had limited access to and use of ICTs; they could not access e-resources from the university library remotely and they experienced challenges in accessing information through ICTs such as internet connectivity, inadequate electricity in rural areas, inadequate library services at regional centres and inadequate computer skills and information literacy skills. The study concludes that there is a gap in distance learners' access to and use of ICTs at both universities and this affected their access to information. The study provides the following recommendations: improvement of the national ICT infrastructure; review of institutional ICT policies; improvement of university ICT infrastructure; development of library portals and e-services accessible remotely and information literacy development of distance learners among others. A model for improving access to information through ICTs for distance learners is proposed.

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LIST OF ACRONYMS & ABBREVIATIONS

ACRL	Association of College and Research Libraries
ADEA	Association for the Development of Education in Africa
AGORA	Access to Global Online Research in Agriculture
AVU	African Virtual University
CCK	Communications Commission of Kenya
CGIAR	Consultative Group on International Agricultural Research
CEES	College of Education and External Studies
CMC	Computer Mediated Communication
COL	Commonwealth of Learning
CUE	Commission for University Education
DATAD	Database for African Theses and Dissertations
DE	Distance Education
DL	Digital Library
EIFL	Electronic Information for Libraries
E-Learning	Electronic Learning
EIU	Economist Intelligence Unit
FTE	Full Time Equivalent
HE	Higher Education

HINARI	Health Internetwork Access to Research Initiative
HTML	Hypertext MarkUp Language
ICTs	Information and Communication Technologies
InfoDev	Information for Development Programme
IP	Internet Protocol
INASP	International Network for the Availability of Scientific Publications
IR	Institutional Repository
ITU	International Telecommunication Union
JKML	Jomo Kenyatta Memorial Library
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KU	Kenyatta University
KENET	Kenya Education Network
KLISC	Kenya Library and Information Services Consortium
MDGs	Millennium Development Goals
Mbps	Megabits per second
OA	Open Access
OARE	Online Access to Research on Environment
ODEL	Open Distance and E-learning
ODL	Open and Distance Learning
OPAC	Online Public Access Catalogue
PC	Personal Computer

PERI	Programme for Enhancement of Research Information
PKP	The Public Knowledge Project
PDA	Personal Digital Assistant
RSS	Really Simple Syndication
SCECSAL	Standing Conference of East, Central and Southern Africa Library & Information Association
SPSS	Statistical Package for Social Sciences
UNESCO	United Nations Education, Scientific & Cultural Organization
UON	University of Nairobi
USIU-A	United States International University – Africa
VLE	Virtual Learning Environment
VSAT	Very Small Aperture Terminal
Wi-Fi	Wireless Fidelity Technology
WSIS	World Summit on Information Society

CHAPTER ONE

INTRODUCTION AND BACKGROUND INFORMATION

1.0 Introduction

Distance Education (DE) has been described by various terminologies such as university without walls, extramural studies, experimental learning, off-campus education, open learning, extended campus, the external degree, or university extension. Keegan (1996) highlights the following six characteristics for any comprehensive definition of distance education: separation of teacher and students; influence of an educational organization especially in the planning and preparation of learning materials; use of technical media; provision of two-way communication; possibility of occasional seminars; participation in the most industrialized form of education.

According to the Commonwealth of Learning (2015), Distance Education refers to the delivery of learning to those who are separated mostly by time and space from the teachers mediated by technology for delivery of learning content with possibility of face-to-face interaction for learner-teacher and learner-learner interaction. Open Learning refers to learning with no or minimum barriers such as age, gender or time constraints. E-learning refers to the application of ICTs to enhance distance education. Virtual education includes aspects of both online and e-learning but goes somewhat further. While it is largely web-centric it does not necessarily limit itself to learners outside a conventional classroom. Open and Distance Learning (ODL) refers to delivery of learning to those who are separated mostly by time and space from the teachers, uses

multiple media for instruction, involves two way communication and occasional face-to-face meeting for tutorials and learner-learner interaction. Distance education courses that require a physical on-site presence for any reason including the taking of examinations is considered to be a hybrid or blended course or program.

The origin of distance education was the teaching and learning by correspondence which dates back to the early 1720s (Holmberg, 1989a). In correspondence education the teaching was in writing by means of self-instructional texts, combined with communication in writing. The main mode of communication between the learners and the instructors was writing. As time progressed, media other than the content grew in importance and the term correspondence was felt to be too narrow. Since the early 1970s, there has been new technological developments including the convergence of digital media and the term distance education has been adopted internationally. These new technological developments have resulted in a new mode of distance education referred to as e-learning. In e-learning, the technology that drives the internet allows for the integration into computer-presented instruction of multimedia, for example, photographs, animation, audio and video media in ways not available in print form. Distance education systems typically use technology to mediate learning, for example, printed study materials, audio, computers, TV, mobile and wire telephones and the web. Advances of technology have led to a paradigm shift in the instructional processes where education is being delivered using ICTs or e-learning (Nafukho, 2007).

E-learning offers opportunities as well as challenges. E-learning offers students opportunities to learn at anytime, anywhere, at home or in the workplace and at their own pace as long as they have access to a properly configured computer (O'Lawrence, 2007;

Mungania 2006). According to Kaye (1981), distance education has been a popular means for providing access to higher education for working families, military personnel and other people in remote areas for well over a century. Distance education allows learners to study what they want, where they want and whatever age they want it. O'Lawrence (2007) opines that distance education has become popular in higher institutions because of its flexibility and availability to learners and teachers at anytime, regardless of geographic location. Other advantages include self-tailored learning for students which implies that students learn at their own pace, and for instructors, they are able to combine lecture material with specific modules offering computer learning tools. For institutions, it reduces operational cost and allows course standardization.

Arguments have been raised that there is lack of discipline in e-learning. Furthermore, it is associated with cost of computer and the internet and that learners suffer loneliness due to absence of face-to-face contact with students (O'Lawrence, 2007). However, e-learning can be interesting real-time chat technology. Internet-based phone telephony and online meeting software allow boundless opportunity for collaborative e-learning. Students need not be alone when they study online. Classes can be held virtually and everyone logs on at the same time.

The challenges facing e-learning in Africa identified by various scholars revolve around the lack of a clear comprehensive ICT policy, inadequate infrastructure and related support for Open and distance learning (ODL) such as electricity, telecommunications, computers and trained personnel. Yieke (2005) observes that: most African countries lack a clear and comprehensive ICT policy; most institutions in Africa lack integrated campus networks; high telecommunication costs are also a challenge in Africa; most African

countries have low bandwidth and experience slow internet connectivity which leads to high costs of using the internet; most academic institutions have either a small or no ICT budget; most African countries have an underdeveloped or non-existent telecommunication infrastructure; the academicians and students lack the necessary ICT skills and there is a scarcity of computing resources.

Open and distance learning is one of the most rapidly growing fields of education, and its potential impact on education delivery systems has been greatly accentuated through the development of internet-based information technologies, and in particular the World Wide Web. ODL offers the flexibility to continue academic and training pursuits at an individual's own pace and time, especially for working adults. ODL in virtual universities is supported by a comprehensive network of services from Academic Management System, Libraries, Student Portal as well as tutors, student services and support staff. Students are able to learn independently with the support of self-instructional materials (Internet, CDs, books, journals) and minimal supervision from lecturers as self-managed learning.

On the African continent where resources are scarce and higher education provision is poor, open and distance learning has been accepted as a viable, cost effective means of expanding provision without costly outlay in infrastructure (Pityana, 2009). Through e-learning, access can be increased, quality can be improved, and costs can be cut, all at the same time (Kanwar and Daniel, 2010). Gunga and Ricketts (2007) sum up the opportunities of e-learning as follows:

“e-learning has the potential to enable Africa to achieve education for all. As Africa faces a severe shortage of trained teachers, e-learning is increasingly gaining universal acceptance as a viable means of enabling large numbers of students to access education” (p. 896).

1.1 Background of the Study

Distance education in Kenya started with the admission of 594 students to the University of Nairobi in 1995 (Kavulya, 2004). The mode of instruction was by correspondence and few contact hours when lecturers visit the regional sites. The learning resources used consisted of self-instructional materials in print, video and audio-cassettes. From the humble beginnings, the Correspondence Course Unit rose to become the College of Adult and Distance Education comprising an Institute of Extra Mural Studies located and coordinated at the Kikuyu Campus of the University of Nairobi. In recent years, patterns of learning in higher education in Kenya have changed with greater numbers of students taking part-time and distance learning programmes. Many universities including the public universities have opened satellite campuses across the country and are also offering distance learning in addition to the regular programmes.

Kenya has 22 public universities and 28 private universities that have either a full charter or a letter of interim authority from the Kenya government (Commission for University Education, 2012). The demand for university education in Kenya remains very high and enrolment has grown dramatically in the past ten years. However, the growth is mainly confined to the privately sponsored full-fee paying students, either enrolled in the private universities or public universities. The public universities for example have increased their enrolment by admitting evening and weekend degree seeking students in what is commonly referred to as Module II or Privately Sponsored programs. Another method

used by both private and public universities to increase enrolment is establishing satellite campuses in major cities and towns. Most of universities have established campuses in various towns in the country. Another method being used by public universities to increase enrolment and expand access to university education is to offer degrees in partnership with local middle-level colleges. Consequently, about 50% of the students enrolled in public universities in Kenya are privately sponsored non-residential students (Kenya Education Network, 2007). In 2001, Kenyatta University launched a School of Distance Learning. The mode of instruction is by correspondence. Self-instructional materials in print, video and audiocassettes are used as learning resources. At specified periods, students go to the centres for formal lectures and examination (Kavulya, 2004)

Lately, there has been a trend toward e-learning. In 1997, the World Bank launched the African Virtual University (AVU), a satellite-based distance education project whose main mission is to bridge the digital divide and knowledge gap between Africa and the rest of the world by increasing access to global educational resources in Africa (Juma 2004). The AVU delivers distance education at over 57 learning centres in 27 African countries. The need for this initiative was the awareness that higher education in Sub-Saharan Africa suffers a severe crisis that manifests itself through inadequate inputs, declining staff to student ratios, low level of research and low internal and external efficiency (Kavulya, 2004). In Kenya, Kenyatta University and Egerton University are the participants in this initiative which by 2003 had evolved from a project of the World Bank to an independent non-profit making organization with headquarters in Nairobi. Among the private universities, Strathmore University first opened a Distance Learning Centre in 1992 to offer correspondence courses in Accountancy and is currently offering

e-learning. USIU-A has also introduced e-learning whose delivery methods include video-taped lectures, live video lectures, web-based course notes, textbooks, CD-ROMs and interactive sessions using internet delivery systems. As institutions of higher learning in Kenya realize the importance of ICTs for learning and teaching, they will adopt e-learning. In the e-readiness survey of higher education in institutions in Kenya carried out by the Kenya Education Network (KENET) in 2006, one of the major recommendations was the urgent need for e-learning (KENET 2007). We are therefore likely to see e-learning becoming more and more widespread in Kenyan universities. This will necessitate students and faculty to becoming more exposed to online information resources.

The promise of Information Communication Technology (ICT) in public university libraries is enormous in the country. In Kenya training opportunities such as mixed mode of delivery (face-to-face and Distance Education) have been provided using ICTs such as the internet, CD-Roms, computers, video-conferencing, mobile telephones and electronic communication such as e-learning. Currently, such learning approaches are in use in the University of Nairobi and Kenyatta University.

Distance learning in virtual universities is supported by a comprehensive network of services from Academic Management System, Libraries, Student Portal as well as tutors, student services and support staff. Libraries promote critical thinking and the ability to conduct independent research among students. This study is based on the premise that ICTs will greatly help in developing digital or electronic libraries which will provide easy access to information resources and services to learners remotely. The basic building

blocks of a digital library include automation of library systems, sufficient ICT facilities (computers, networks) and adequate connectivity (Rosenberg, 2005). The ultimate product should be the electronic “library portal” or a “web portal”. One way in which libraries can actively participate in distance education is to become the chief content provider for all online resources which can be achieved by the development of web portals. Library portals offer an integration of sources for searching and for the location and delivery of materials. The content may be located anywhere – internal or external to the organization and may be in any format, physical or digital.

1.1.1 The University of Nairobi

The University of Nairobi was established in 1952 as the Royal College of East Africa (University of Nairobi Calendar, 2011/2012). In 1964, the Royal College of Nairobi was re-named “University College of Nairobi”, and it thereby started to prepare students for University of London degrees. It was then affiliated as a constituent college of the University of East Africa, located in Kampala, Uganda. The University of East Africa was dissolved on 1st July 1970, thereby creating an opportunity for each of the East African countries to establish their own autonomous universities and thus the university of Nairobi was created under the act of parliament.

From the humble beginnings, the University of Nairobi has grown in strides, steadily establishing new faculties, institutes and schools and also new departments as the national needs arose up to the present moment. Two constituent Colleges which were established under the University Act of 1970 and 1985 Act namely Kenyatta University College and Egerton University College respectively were elevated to full university status through individual Acts of Parliament. Under the University of Nairobi 1985 Act

of Parliament, six colleges were established within the University (See Appendix 8). From a student population of 2,764 in 1970/71 academic year, the university undergraduate and postgraduate student population at the time of this study was approximately 63,000 (Daily Nation, Wednesday, 14th August, 2013).

1.1.2 College of Education and External Studies

The first Department of Extra-Mural Studies was founded in Makerere in 1953, and under this Department, the first resident tutor for Kenya was appointed in 1956 (University of Nairobi Calendar, 2011/2012). In 1963 the responsibility for organizing the extra-mural studies in Kenya was transferred to a new Extra-Mural Department of the then University College, Nairobi. In the same year, the College of Social Studies, Kikuyu, which had run an independent centre for residential adult education since 1961, was absorbed into the University College, Nairobi. The centre was then amalgamated with Extra-Mural Department, thus forming the Institute of Adult Studies. In 1966, the two departments were integrated under one director and the residential centre was renamed the Adult Studies Centre.

In 1967, the Correspondence Course Unit was established as another arm of the Institute. The three departments of the institute were officially referred to as Extra-Mural Division, the Adult Studies Centre and the Correspondence Course Unit. In 1983, the Institute of Adult Studies was accorded College status and became the College of Adult and Distance Education during the establishment of the six Colleges of the University of Nairobi. Meanwhile, a new faculty of External Studies was established. The School of Distance Studies and the Institute of Adult Studies were moved to the new Faculty as departments.

The Institute of Extra-Mural Studies also became a department of the Faculty of External Studies.

In 1988, the University of Nairobi revived the Faculty of Education and situated it at the College of Adult and Distance Education. The College was then, re-organized, re-structured and renamed the College of Education and External Studies. In the year 2004, a Centre for Open and Distance Learning was created. In the year 2006, the College was restructured into Schools and a Centre. These include: School of Education, School of Continuing and Distance Education and the Centre for Open and Distance Learning. A newly established unit is the E-Learning Centre whose mandate is to implement the University's strategic plan by facilitating greater access and enhancing the quality of education through the use of e-learning technologies in teaching and learning.

The College is located at the Kikuyu Campus, 21 Kilometres West of Nairobi. The Department of Extra-Mural Studies has 11 regional centres with full-time staff in Nairobi, Mombasa, Kisumu, Kakamega, Nakuru, Nyeri, Meru, Thika, Kisii, Kapenguria and Garissa. Other regional centres as well as sub-centres are being created and developed throughout the country. At the time of this study, the student population on the Distance Education programme was about 6,000.

1.1.3 University of Nairobi Library System

The University of Nairobi Library System has developed in line with the development of the parent organization. The mission of the University Library is to provide students and staff of the University with access to an extensive range of information resources to enhance the academic work of the University. The Library, therefore undertakes the

functions of acquisitions, processing, organizing, storing and disseminating information in line with the mission of the University: teaching, learning and research, consultancy and community service (University of Nairobi Calendar, 2011/2012).

The University of Nairobi Library System comprises the main library, Jomo Kenyatta Memorial Library (JKML) and eleven branch libraries. The branch libraries are:

- College of Agriculture and Veterinary Sciences, Upper Kabete Campus
- College of Architecture and Engineering, Main Campus (ADD)
- College of Biological and Physical Sciences, Chiromo Campus
- College of Health Sciences at Kenyatta National Hospital (KNH)
- College of Education and External Studies, Kikuyu Campus (CEES)
- Institute for Development Studies Library, Main Campus (IDS)
- Institute of African Studies Library, Museum Hill (IAS)
- Population Studies and Research Institute Library, Main Campus (PSRI)
- School of Business Library, Lower Kabete
- School of Law Library, Parklands Campus
- Kenya Science Campus Library

JKML caters for both the College of Humanities and Social Sciences and the College of Architecture and Engineering, Main Campus. JKML also houses the administration, central services such as acquisitions, cataloguing co-ordinating unit, the union catalogues, the bindery and the archives. The system has a total stock of over 600,000 volumes, inclusive of books, periodicals and other non-print materials. In addition, the University Library subscribes to over 20,000 electronic journals.

The Library stock includes collections on the various disciplines taught at the university such as Social Sciences, Humanities and the Sciences. The stock is divided into a general lending materials and specialized research collections. The Library's special collections include: an East Africana Studies collection; Legal Deposit Collection consisting of Kenyan publications; United Nations Publications; mainly from FAO, WHO and UNEP and the Archives. Books in the library system are classified by the Library of Congress Classification Scheme. The library system had a staff of about 150 at the time of this study.

The Library System plays an active role in the dissemination of information to the university community and beyond. It offers a wide range of facilities in support of both traditional services and modern ICT applications. The services include lending, inter-lending, reference, specialized research and accessing electronic resources. The university library has also made some headway in the application of ICTs. The libraries in the system are on-line. The Library has an electronic catalogue, Online Public Access Catalogue (OPAC) which is web-based and can be accessed through the library website or from the University website (The University of Nairobi, 2012).

1.1.4 Kenyatta University

Kenyatta University is situated about 20 kilometres from the city of Nairobi on the Nairobi-Thika highway on 1,100 acres of land. The long journey to University status started in 1965 when the British Government handed over the Templer Barracks to the Kenya Government (Kenyatta University Calendar 2011-2014). These were converted into an institution of higher learning known as Kenyatta College. Initially, Kenyatta College was divided into two sections, the Secondary Education Division (SED) and the Teacher Education Division (TED). The Secondary Education Division had classes from

Form I to Form VI. Forms I and IV and the Advanced level Arts classes were phased out in 1969 to give way to seven Advanced level Science classes which earned the institution high reputation for its excellent performance in the Advanced level examinations. It became the main supplier of undergraduates in Science oriented courses at the University of Nairobi where they performed extremely well. The Secondary Education Division was phased out in 1973.

The first courses offered in the Teacher Education Division in 1965 were the three-year Post-Ordinary level Secondary Teacher's Certificate (SI) and a one-year post-Advanced Secondary Teacher's Certificate (SA). Following an Act of Parliament of 1970, Kenyatta College became a constituent College of the University of Nairobi. Consequently, the name changed from Kenyatta College to Kenyatta University College. It admitted its first batch of 200 students in 1972 to pursue studies leading to the award of the Bachelor of Education degree of the University of Nairobi. Due to these developments, SI and SA Teachers' Certificate courses were phased out by 1975 to give way to the Bachelor of Education degree programme and a two-year undergraduate Diploma in Education programme. The Diploma programme was implemented to alleviate an acute shortage of Science and special subjects (Kiswahili, Music, Fine Art etc.) teachers in the Secondary Schools. There were insufficient number of students with degree entry qualifications and no degree programmes existed then in some of those areas. In July, 1978, the Government transferred the Faculty of Education of the University of Nairobi to Kenyatta University College Campus. As a result, the College became the only institution training teachers at both undergraduate and postgraduate levels.

The University status was achieved on August 23, 1985, when the Kenyatta University Act received Presidential assent making the institution a full - fledged University. The Act became operational on September 1, 1985 and the new University was inaugurated on December 17, 1985. Kenyatta University immediately started establishing new Faculties and constituent colleges. In this pursuit, Jomo Kenyatta College of Agriculture and Technology (JKUAT) became a constituent College of Kenyatta University in 1988 before becoming a full – fledged university. At the time of this study, Kenyatta University had 14 teaching schools and a Graduate School which co-ordinates all postgraduate programmes (See Appendix 9).

Kenyatta University has various campuses which include: Ruiru, Parklands, Nairobi City Centre, Nakuru, Migori, Nyeri, Mombasa, Kitui and KU/KIST. From a student population 200 in 1972, the university undergraduate and postgraduate student population at the time of this study was approximately 30,000.

1.1.5 Institute of Open, Distance & e-Learning

In December 2002, Kenyatta University established the Institute of Open Learning (IOL) to offer non-residential mode of delivery of programmes (Kenyatta University Calendar, 2006-2009). The Institute's mandate was to co-ordinate non-residential programmes offered through open learning delivery mode. The aim of the Institute was to expand access to education by offering alternatives to those qualified applicants who are unable to enroll for full time programmes, those who have financial limitations and those who, for various reasons cannot take up residential programmes. The mode of delivery was mainly through the print media i.e. Modules, recorded audio and video tapes and face-to-face tutorials conducted at various centres.

In June 2005, the University launched e-learning in a bid to further enhance open and distance learning programmes and expand access to qualified Kenyans (Daily Nation, Tuesday, June 14, 2005). In 2009, the Institute of Open Learning (IOL) was rebranded to become the Institute of Open Distance & e-Learning (ODEL) to include the e-learning component. ODeL offers programmes through various Schools (see Appendix 9) (ODEL Student Guide, 2010).

Currently the Institute of Open Learning has nine regional Centres located in Nairobi, Nakuru, Kisumu, Kakamega, Nyeri, Embu, Garissa, Mombasa and Marsabit that offer administrative support to students. The modes of delivery include: print Media or Modules, recorded Audio and Video tapes, Television Broadcast, Radio, Teleconferencing, Computer Mediated Learning, Field-Based Practicals, Lab-Based Practical and Face-to-face tutorials conducted at various regional centres. The e-learning platform is the Moodle e-platform. ODeL also aims at having students' discussion forums in form of e-Debates, e-Tutorials, e-Workshops and e-Conferencing (Kenyatta University, Institute of Open Distance & E-Learning, 2011).

Kenyatta University also houses the African Virtual University (AVU) and Centre for e-Learning. AVU started as a World Bank satellite-based distance education project in 1997. Today the AVU at Kenyatta University offers Diploma in Computer Science/Computer Engineering to those in schools, colleges, other learning institutions, those involved in management of education and those intending to develop a career in computing.

1.1.6 Kenyatta University Library

Kenyatta University Library developed alongside the parent organization. It started as Kenyatta University College Library (Old Library) which was set up through the University of Nairobi Act of 1970. It was housed in a two-floor building which had been designed as a canteen for soldiers in transit. In 1978, the Faculty of Education was transferred from the University of Nairobi to Kenyatta University College. The stock that was previously held by Education Library, University of Nairobi, was also transferred to Kenyatta University College Library. Space became a challenge due to the increased stock and user population and this led to the construction of the new Library funded jointly by the Government of Kenya and the United Kingdom whose construction started in 1982. In July 1984, the Library moved into the new building which was later named Moi Library in 1985. With further increase in library stock and user population, the new library was found to be inadequate. The need for space necessitated the construction of the Post-Modern Library which was completed in August 2011. In September 2011, the Library again moved to the Post-Modern Library. It was officially opened by H.E. the President Honorable Mwai Kibaki on 7th October, 2011 (Kenyatta University, 2011). The Library has three branch libraries namely Mombasa, Kitui and Parklands.

The Post-Modern Library is a five (5) storey building which is equipped with cutting edge information technology. It has a seating capacity of about 6,000. The Library has a rich collection of information resources in both print and electronic formats. These include over 350,000 volumes of books and bound periodicals, current journals, magazines and dailies. In addition, the Library subscribes to over 20,000 electronic journals. The Post-Modern Library provides information and library services for the

entire University community including those in Ruiru, Parklands and Mombasa campuses and Open Learning.

The services are user focused, subject based services and are organized as follows:

Basement: Acquisitions, Bindery and Stack area for information resources not in high demand

Ground Floor:

- Education and Information Science
- Circulation Services
- Reprography Services
- Service point for users with special needs
- Information Communication and Technology (ICT) section
- Students lounge where library users can relax and read newspapers and magazines

1st Floor: Social Sciences

2nd Floor: Humanities

3rd Floor: Science and Technology

4th Floor: Research and Special collection, Health Sciences collection

5th Floor: Reading Space for Postgraduates and Staff

The library had a staff of 106 at the time of this study. The catalogue is available electronically through Online Public Access Catalogue (OPAC) which is web-based and can be accessed through the library website (Kenyatta University, 2011).

1.1.7 Status of ICTs for Information Provision in Kenya

A study by Rosenberg (2005) on public university libraries in English speaking Africa revealed that only 15% of libraries provided more than one computer for every 100 Full Time Equivalent (FTE) students (the recommended ratio in Africa is one computer to every 25 students) and over half of the libraries, less than 75% of the computers were internet connected. In 1999, the Kenya Education Network (KENET) was created as one response to the challenges of national and institutional ICT infrastructure (KENET, 2007). This is a membership organization and Trust whose main objectives are: setting up a cost-effective and sustainable private network with high-speed access to the global internet; facilitating electronic communications among students and faculty in member institutions; sharing teaching and learning resources; providing a platform and infrastructure for electronic teaching and learning; collaboration in research and development of educational content.

In 2006-2007, KENET carried out an e-readiness survey of higher institutions in Kenya. The e-readiness survey revealed that off-campus access to library resources by users in Kenyan public universities was limited. Only 20% could access OPAC outside their universities (KENET, 2007). An update of the e-readiness survey of higher institutions in East Africa carried out by KENET in 2008 revealed that there was no significant accession to higher stages for the Kenyan universities surveyed. However, Kenyan universities surveyed on average, were at higher stages of readiness compared to universities in the other East African countries. Examples of Kenyan universities that recorded the most dramatic accession in staging included Strathmore University (private) and Kenyatta University (public). The study also revealed that most libraries were not

automated and OPAC was not available off campus despite the fact that most of students did not reside in university campuses. Odero-Musakali and Mutula (2007) also observe that while most Kenyan university libraries have access to the internet, very few appear to have integrated the technology into their routine operations.

University libraries in Kenya are at various stages of computerizing their services. Examples of public university libraries with OPAC include the University of Nairobi, Moi University and Kenyatta University and the private universities include Strathmore and USIU-A. However, few have developed library portals. The University of Nairobi and Kenyatta University, have well developed library portals. However, it is not clear whether the ICTs at the selected universities benefit the distance learners. A number of initiatives for promoting access to electronic information resources in the developing countries have been established in the last few years and most countries in Sub-Saharan Africa region including Kenya are beneficiaries. These initiatives include:

- PERI (Programme for Enhancement of Research Information)

This is a programme of the International Network for the Availability of Scientific Publications (INASP) which is based in Oxford. It was established in 2001 to enable worldwide access to information and knowledge with particular emphasis on the needs of developing and transitional countries. The PERI programme makes available through discounted pricing thousands of e-journals to academic and research institutions in Sub-Saharan Africa (PERI, 2011).

- In 2003, the Kenya Library and Information Services Consortium (KLISC) was formed as a result of the PERI programme. One of the objectives of KLISC is to

enhance the provision of learning resources and access to information. The consortium members jointly share the cost of the online information resources and engage in other activities such as workshops, training and information sharing (Mwanzia, 2013).

- AGORA (Access to Global Online Research In Agriculture)

This programme is led by FAO and went live in October 2003. It provides free or low cost access to journals and key databases in Agriculture. AGORA provides a collection of 1171 journals to institutions in 107 countries (AGORA, 2011)

- HINARI (Health Internetnetwork Access to Research Initiative)

This programme was launched in 2002 under the leadership of WHO. It provides free or low cost access to journals and key databases in health, medicine and related biosciences. HINARI provides over 3750 journal titles institutions in 113 countries (HINARI, 2011).

- OARE (Online Access to Research on Environment)

This programme focuses on environment and was launched in October 2006 under the leadership of UNEP (OARE, 2011).

The objective of these initiatives is to level the playing field in access to scientific scholarship in low-income countries, so that they are better equipped to solve their own problems in these sectors and therefore try to achieve the Millennium Development Goals (MDGs), more equitable participation in global research fora, and greater South-South collaboration (Lwoga et.al. 2007). However, it is not clear how distance learners benefit from these initiatives.

1.2 Statement of the Problem

The increase in distance learners' enrolment in Kenya has led to a change in learning patterns in higher education. This in effect is calling for a paradigm shift in information delivery by university libraries to this category of users. The existing library services in public university libraries in Kenya were originally designed for the on-campus users and are not suited for the needs of distance learners. Unfortunately, public university libraries in Kenya have not responded to this change by providing information access for distance learners which can be achieved through ICTs. A study by Aseey (2004) found out that access to the University of Nairobi library was a big problem facing distance learners. Most of them came from far and remote areas where libraries are not available. According to Cooper (2000), less attention has been given to providing information services for the distance programmes during the planning for distance education. Instead the attention has focused on the logistics and methodology of teaching of these programmes only.

Although public university libraries in Kenya are adopting the use of ICTs in information services delivery, distance learners are disadvantaged because of limited access to and use of ICTs occasioned by scarcity and small range of ICTs, level of e-readiness for distance learners, absence of or unsuitable policies for distance learning. Distance learners also experience challenges in accessing information through ICTs because they lack information literacy skills. Distance learners need to access relevant and up-to-date research information in order to achieve superior academic skills in their study. Lack of systems that can provide distance learners with access to information negatively impacts on their study. The Association of College and Research Libraries (ACRL) guidelines

state that distance learners are entitled to the same library services and resources as the regular students on campus (ACRL, 2008).

Research studies on the information needs and expectations of distance learners conducted both internationally and nationally established that distance learners' information needs were not being adequately met (Dew, 2001; Kazmar, 2002; Moyo and Cahoy, 2003; Mabawonku (2004); Boadi and Letsolo (2004); Maclean and Dew (2008). A study by Kavulya (2004) on selected universities in Kenya, investigated the methods used in providing library services to distance learners and the challenges the libraries faced. Similarly, using focus group discussions with librarians, Wachira and Onyancha (2012) investigated the preparedness of selected public universities in Kenya in providing library services to remote users. These studies established that the libraries were not providing adequate services to distance learners. The e-readiness survey of KENET also revealed that off-campus access to library resources by users was limited. Only 20% could access OPAC outside their campuses (KENET, 2007). Although the University of Nairobi library system and Kenyatta University Library have web-based OPAC and provide access to electronic resources, it is not clear how distance learners benefit from the e-resources. The result is that students and researchers more and more are using Google.com and in so doing miss out on vetted and relevant information resources provided by the library which can be delivered in real-time in many cases. Murray (2003) opines that "if the academic library profession is to avoid becoming sidelined by Google-type search engines and commercial database services, then they must offer a web presence that delivers relevant, quality, approved and personalised access to resources and library services - irrespective of format and location" (p. 146).

One of the major pillars of ICT is content. The National ICT policy (Kenya, Ministry of Information and Communication, 2006) identifies content development as the main challenge since ICT is a conveyor of information. KENET (2007) observed a general lack of development of content among university libraries in Kenya. The highly publicized fibre optic link is already in place. Since June 2009, Kenya has four undersea cables. These include, The East African Marine Cable System (TEAMS), the East African Marine Cable System (EASSy), Seacom and Lion2. Between them, these cables have a total capacity of 8.56 Terrabytes per second (TBps). A fifth undersea fibre optic cable is set to land doubling the country's internet capacity (Daily Nation, November 20, 2012). This should make it possible to establish a national high-speed educational network at an affordable cost. KENET was started with an aim to establish sustainable communication and networking among educational institutions in Kenya that facilitates wide use of internet technology in teaching, research and sharing of other information resources to the general populace at an affordable cost. However, is not clear whether KENET has assisted the university libraries in providing information to distance learners through ICT tools and services.

Finally, there is the challenge of information literacy skills for distance learners (Kavulya, 2004; Akande, 2011). Libraries have commonly provided training and support to students through mechanisms like bibliographic instruction, workshops and on an individual basis as needed most of which happens on-site. With distance education and the electronic library environment, the mode of training should be electronic asynchronous training through computer-based tutorials. Distance learners need information literacy skills in order to identify and obtain relevant information for study

and lifelong learning. Letting students loose on a library web page is like letting them loose on the internet. Information literacy trainings have been conducted by the University of Nairobi library especially for KLISC members. However, it is not clear how these literacy programmes benefit the distance learner.

This study set out to investigate the accessibility and use of ICTs in accessing information by distance learners at the University of Nairobi and Kenyatta University libraries. Unlike the earlier empirical studies carried out in Kenya that were based on interviews with librarians only, this study employed a mix of methods by surveying distance learners as well as interviewing the faculty, Directorate of Distance Education, ICT Directorate, University Librarians and senior librarians. This helped in counteracting any bias in any one data source. It was particularly important to gain insight into the students' perspective of the phenomenon under study. The current study also investigated new issues by focusing on access and use of ICTs by distance learners. This study will be of benefit to distance learners through improved access to information useful for their study, thereby increasing the quality of their education. It will be of particular interest to university library managers, university management, educators, researchers and the government in planning and management of ICTs in order to facilitate information access to distance learners.

1.3 Aim of the Study

The aim of the study was to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries and to propose a model for improvement.

1.3.1 Objectives of the Study

The specific objectives of the study were to:

1. Investigate the range of ICTs at the University of Nairobi and Kenyatta University Libraries.
2. Explore the level of e-readiness of the University of Nairobi and Kenyatta University libraries in providing information for distance learners.
3. Establish the adequacy of information literacy skills of distance learners.
4. Establish the policies that the University of Nairobi and Kenyatta University Libraries have put in place for supporting provision of information for distance learners.
5. Identify the challenges experienced by distance learners in accessing information through ICTs.
6. Make recommendations and propose a model of improving access and use of ICTs for information provision for distance learners in public universities.

1.4 Research Questions

To address the stated objectives, the study sought to answer the following research questions:

1. What is the status of ICTs application in support of distance education at the University of Nairobi and Kenyatta University libraries?
2. What is the level of e-readiness of the University of Nairobi and Kenyatta University libraries in support of distance education and e-learning?

3. What is the level of information literacy of distance students at the University of Nairobi and Kenyatta University libraries?
4. What policies if any have the University of Nairobi and Kenyatta University libraries put in place for supporting provision of information for distance learners?
5. What challenges are experienced by distance learners in the University of Nairobi and Kenyatta University in accessing information through ICTs?
6. What measures should be put in place to improve the access and use of ICTs for information by distance learners?

1.5 Assumptions

The study was based on the following assumptions:

1. Distance learners do not get adequate information services and this impacts negatively on their studies.
2. Lack of access to information by distance learners is occasioned by scarcity and small range of ICTs at the case study organizations, level of e-readiness for distance learners, lack of information literacy skills, absence of or unsuitable policies for distance learning and challenges distance learners experience in accessing information through ICTs.
3. That proper application of ICTs would help distance learners to access information services needed for their study programmes. A model which can help to address the problem is proposed.

1.6 Significance of the Study

The study is of significance to various stakeholders:

1. Distance learners – It is expected that the recommendations of this study will benefit distance learners through improved access to information services through ICTs.
2. Information Professionals – It is expected that the findings of this study will inform university libraries in Kenya in general and the University of Nairobi and Kenyatta University in particular on improving their information services for distance learners through access to ICTs. This will result in the marketability of their information products and services.
3. University Management – It is hoped that the findings of this study will sensitize the University of Nairobi and Kenyatta university management in developing policies and strategies that can facilitate information access to distance learners.
4. Educators - It is hoped that Educators will benefit from useful information for planning and management of ICTs for distance education.
5. The government - It is hoped that the government will benefit from this study in planning and management of ICTs.
6. Researchers – It is expected that the study will contribute to the generation of knowledge in this subject area that would trigger further empirical research to benefit students.
7. The study provides a model of the use of ICTs in providing access to information for distance learners. The recommendations of this study, if

adopted and implemented, may lead to the re-engineering of the provision of library and information services to distance learners in all university libraries in Kenya.

1.7 Scope and Limitations

1.7.1 Scope

The study was confined to two public universities, namely the University of Nairobi and Kenyatta University. These universities were selected as case studies because they had well established distance education programmes among public universities in Kenya. In addition, their libraries had adopted the application of ICTs to a certain degree. The study was confined to distance students who were on course at the time of data collection. It did not deal with graduates who had already completed their programmes.

Originality was addressed by investigating the role and potential of using ICTs in facilitating access to information for distance education as opposed to traditional library services as has been the focus of past studies. The methodology of the study also reflected originality through triangulation. The study further suggested an improved model of the use ICTs for providing access to information for distance learners.

1.7.2 Limitations

Distance learners were generally scattered and not available at any one centre. This involved a lot of travelling to reach the distance learners. Coverage of all areas was therefore a challenge. Timing was also a limitation. Distance learners did not go to the centres at the same time. It was therefore not possible to find the students together at the

times scheduled to visit the centres. These limitations were addressed by engaging research assistants who assisted in administering the questionnaire for students.

1.8 Summary

Chapter one provided the background to the study and introduced the issues that the current study investigated. The background information contextualized the study and provided an overview of the historical development of the two selected cases namely the University of Nairobi and Kenyatta University. The overview included the development of the institutes of open and distance education and the university libraries. The background also included the status of the use of ICTs in information provision in Kenya. This chapter also provided other key issues. These included the study rationale, aim and objectives of the study, research questions, assumptions, significance of the study, scope and limitations and definition of key terms.

The key themes that emerged from Chapter one are that in recent years, patterns of learning in higher education in Kenya have changed with more and more students taking distance education programmes. The other theme is that less attention has been given to providing access to information via ICTs for distance students during the planning stages. It emerged that although the University of Nairobi and Kenyatta University Libraries have adopted ICTs, it is not clear how these benefit the distance learners in accessing information from the library. Another theme is that distance students lack information literacy skills. Finally, it emerged that current policies and practices in Kenyan public university libraries favour full time students on campus but are unfavourable for off-campus distance students. Chapter one narrowed the research problem and provided the

context of the current study paving the way for the theoretical framework and the literature review in Chapter Two.

1.9 Definition of Key Terms

Access

In this study, access to ICTs should be understood to mean the opportunity to use ICTs and includes availability, financial capacity and technical capacity.

Asynchronous Interaction

Asynchronous Interaction does not require everyone to be online at the same time. Rather, a participant posts a message at a convenient time and then others read it when they are online and post their response. Sometimes this takes place using electronic mail, where each student e-mails everyone their message, while others use electronic message boards (Baker, 1999). In asynchronous e-learning, students can access the online materials at anytime.

Computer Mediated Communication

Computer Mediated Communication (CMC) refers to communication where computers are used as facilitators of communication, allowing people to communicate across space and time. CMC media encompasses such technological tools as e-mail, intranets and social media sites (Kettinger and Grover, 2007).

Digital/Electronic Libraries

A digital library as defined by Arms (2005) is a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network. The term digital and electronic library is used interchangeably.

Distance education

Distance education is the delivery of learning or training to those who are separated mostly by time and space from those who are teaching or training. The teaching is done with a variety of "mediating processes" used to transmit content, to provide tuition and to conduct assessment or measure outcomes (Commonwealth of Learning, 2015)

E-learning and Online Learning

E-Learning (Electronic learning) and Online learning refers to the application of information and communication technologies (ICTs) to enhance distance education, implement open learning policies, make learning activities more flexible and enable those learning activities to be distributed among many learning venues (Commonwealth of Learning, 2015)

EzProxy

EzProxy is a web proxy program which allows access from outside the institution's computer network to restricted access websites that authenticate users by IP address. The server and EZProxy software acts as an intermediary between users and the Internet. It allows an authorized user to access almost all restricted electronic resources available

through the library Web pages from home or any location off-campus. This type of remote access is often referred to as "proxy" access.

Higher Education

The Unesco definition of higher education and which this study adopts is that higher education includes all types of studies, training or training for research at the post-secondary level provided by universities or other educational establishments that are approved as institutions of higher education by the competent state authorities (Unesco, 1998).

Information Communication Technologies (ICTs) is defined as the application of appropriate (enabling) technologies to information processing (The British Computer Society glossary of ICT and computing terms, 2005). There are two categories of ICTs, the old and the new. Old ICTs include radios, televisions, public address systems etc. New ICTs include computers, fax, e-mail, internet etc. In this study, ICTs refer to computer systems i.e. the whole range of components which includes computer hardware, software, peripherals, power supply and communication links.

Internet Protocol (IP) Address

An Internet Protocol address is a unique number assigned to a computer. The IP address helps to identify the computer and indicates where it is located. Thus it serves as the ID of the computer connection when it is accessing the internet.

Intranet

This is a communication system providing similar service to the internet solely within a particular company or organization. The services of the intranet are accessible only to authorized users and has good security for confidential information (The British Computer Society glossary of ICT and computing terms, 2005).

Open Learning

Open learning refers to policies and practices that permit entry to learning with no or minimum barriers with respect to age, gender, or time constraints and with recognition of prior learning. These policies need not be part of a distance education system but are complementary to it (Commonwealth of Learning, 2015)

Portal

According to The British Computer Society glossary of ICT and computing terms (2005), a portal is a website designed to carry links to pages the user is likely to want to access; it may even be customizable so that the user can specify which links to see. A library portal provides links to information and other web sites. It offers users one place where they can search across a multitude of information resources and get electronic information resources.

Synchronous Interaction

Synchronous Interaction is a term used in e-learning which refers to online interaction that happens at the same time. This means that everyone in class gets online at the same

time and then logs on to a chat room for discussion (Baker, 1999). Synchronous e-learning allows for real time interaction between students and the instructor.

Virtual Education

Virtual education includes aspects of both online and e-learning but goes somewhat further. While it is largely web-centric it does not necessarily limit itself to learners outside a conventional classroom. It uses multimedia and, besides delivering content, also enables a high level of interaction among learners, content, teachers, peers and administration both synchronously and asynchronously (Commonwealth of Learning, 2015)

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This Chapter provides the theoretical framework of the study as well as a review of the literature and empirical studies. It reviews a number of theories highlighting their strengths and weaknesses. The literature review aids the researcher in putting the problem of study into the context of previous work in the field of study, giving a summary of literature read in relation to the topic under investigation and citing the authorities in the field. Newman (2006) provides a summary of the goals of a literature review as follows: to demonstrate a familiarity with a body of knowledge and establish credibility; to show the path of prior research and how a current project is linked to it; to integrate and summarize what is known in an area and to learn from others and stimulate new ideas. In this study, the literature review was conducted to position the study within other similar studies and explore the body of knowledge in the area of study so as to understand the relationship between the problem and the area of study. Secondly, conducting the literature review would aid in establishing the need for this kind of research and acquaint the researcher with the methodologies that have been used by others to address similar research questions. The literature review plays an important role in shaping the research problem, because in the course of reviewing the literature, the researcher understands the subject area better and this helps the researcher to conceptualise the research problem clearly and precisely.

The review of the literature is structured under the following themes guided by the objectives of the study and the research questions as outlined in Chapter 1: a general overview of models of distance education, models of distance education from a global and African perspective, challenges facing distance education in Kenya, digital libraries for distance education, library portals for distance education/e-learning in Kenya, library services models for distance education and models of virtual/digital library support to distance learners.

2.1 Theoretical Framework

A theoretical framework is a collection of interrelated ideas based on theories. According to McBurney and White (2007), the concept of theory can be defined either broadly or narrowly. Broadly speaking, a theory is a statement or a set of statements about the relationships among the variables. More often, the term theory is used in a second and stricter sense. According to this view, a theory is a statement or a set of statements about the relationships among variables and includes at least one concept that is not directly observed but that is necessary to explain the relationships. The purposes of theories in research are: description, explanation, prediction and control. Theories enable researchers to draw new conclusions, improve action and generate most of the theories. Theories are drawn from observation and confirmed by observation. Models can be used to explain theories. From a general perspective, a model can be viewed as a likeness to something. In the Social Sciences, models provide a logical arrangement among concepts and simplify the view of reality by helping to visualize phenomena (Frankfort-Nachmias and Nachmias, 1996).

A number of theories were reviewed namely: the “Systems Theory (ST Theory)”, the “Social-technical Systems Theory (STS Theory)”, the “Diffusion of Innovation Theory (DOI Theory)” and “Constructivism (Learning Theory)”. This study was largely informed by the “Diffusion of Innovation Theory (DOI Theory)” supported by the Constructivism Learning Theory.

2.1.1 Systems Theory

System theory was used by Ludwig von Bertalanffy, a biologist, as the basis for the field of study known as ‘general system theory’, a multidisciplinary field in 1968. A system is a set of interrelated components working together towards some kind of process (Glossary of terms, 2007). Systems theory is an interdisciplinary field of science and the study of the nature of complex systems in nature, society, and science. More specifically, it is a framework by which one can analyze and/or describe any group of objects that work in concert to produce some result. This could be a single organism, any organization or society, or any electro-mechanical or informational artifact. A system can be said to consist of four things namely:

- i. The objects – these are the parts, elements, or variables within the system. These may be physical or abstract or both, depending on the nature of the system.
- ii. Attributes – these are the qualities or properties of the system and its objects.
- iii. Internal relationships – these are the internal relationships among its objects.
- iv. Environment – systems do not exist in a vacuum. They are influenced by the environment around them (University of Twente, 2007).

The system is therefore composed of parts (sub-systems) all of which are interdependent. If one sub-system is affected, all other sub-systems will be affected.

The system receives inputs which it processes and outputs back to the environment. The system receives feedback from the environment and makes the necessary change. Senge (2006) argued that the 'systems' perspective subscribes to looking beyond personalities and events and described systems thinking as a conceptual framework that reveals "wholes", make the full patterns clearer, and argued that one can only understand the 'system' by contemplating the "whole". This author pointed out that 'systems thinking' lies in the shift of the mind, which entails seeing interrelationships between components in the place of linear cause-effect chains, and seeing processes of change as opposed to snapshots. Systems thinking starts with understanding the construct "feedback", and eventually a rich language for describing an orderly arrangement of interrelationships and patterns of change is formed (Senge, 2006). Systems Theory has however been criticized for being too vague and general, making it difficult to operationalize and evaluate empirically, for poor explanatory power because, although it provides conceptualization, it is difficult to clearly identify and measure constructs. There is also the criticism of subtle assumption that all parts of a system have equal power.

2.1.2 Social-technical Systems Theory (STS Theory)

Socio-technical Systems Theory was established in the 1960's by Eric Trist and prominent Australian psychologist Fred Emery at the Tavistock Institute (Liu and Errey, 2006). The Socio-technical Systems Theory draws from the Systems Theory in that parts of an organization are inter-related. The Socio-technical Systems (STS) theory considers that every organisation is made up of people (the social system) using tools, techniques and knowledge (the technical system) to produce goods and services valued by customers (who are part of the organisation's external environment).

This is a theory about the social aspects of people and society and technical aspects of machines and technology. Socio-technical refers to the interrelatedness of *social* and *technical* aspects of an organization. A Socio-technical system in organizational development is the term for an approach to complex organizational work design that recognizes the interaction between people and technology in workplaces. The term also refers to the interaction between society's complex infrastructures and human behaviour. In this sense, society itself, and most of its sub-structures, are complex socio-technical systems. Its role is to foster the program of shaping both the technical and the social conditions of work in such a way that efficiency and humanity would not contradict each other any longer (Liu and Errey, 2006).

The STS provides a clear understanding of what drives performance in the organisation and the complex dynamic between people and technology. It can identify what needs to be changed and the expected performance improvement. It provides clear advice on organisational change. The only limitation is that STS does not inform on how to design the technology to support performance. It is therefore necessary to integrate the social requirements of individuals with the technical requirements needed to keep the work functional. Systems that are implemented without an analysis of how the people will interact with the system fail. This is because the technology is just imposed on the users. For users to feel that they own the process and so utilize the system, the needs of the users must be established first. What this means is that technology will never exist in isolation, rather, human beings have to be part of the system.

2.1.3 The Diffusion of Innovation Theory (DoI Theory)

The Diffusion of Innovation (DoI) Theory also known as Rogers's theory is a general theory of how new ideas are spread and adopted in a community and it seeks to explain how communication channels and opinion leaders shape adoption. Rogers (1995) defines diffusion as the process by which an innovation is communicated through certain channels over time among members of a social system. An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption.

Rogers (1995) identifies four main elements of the diffusion process namely:

- i. Innovation
- ii. Communication channels
- iii. Time
- iv. Social elements.

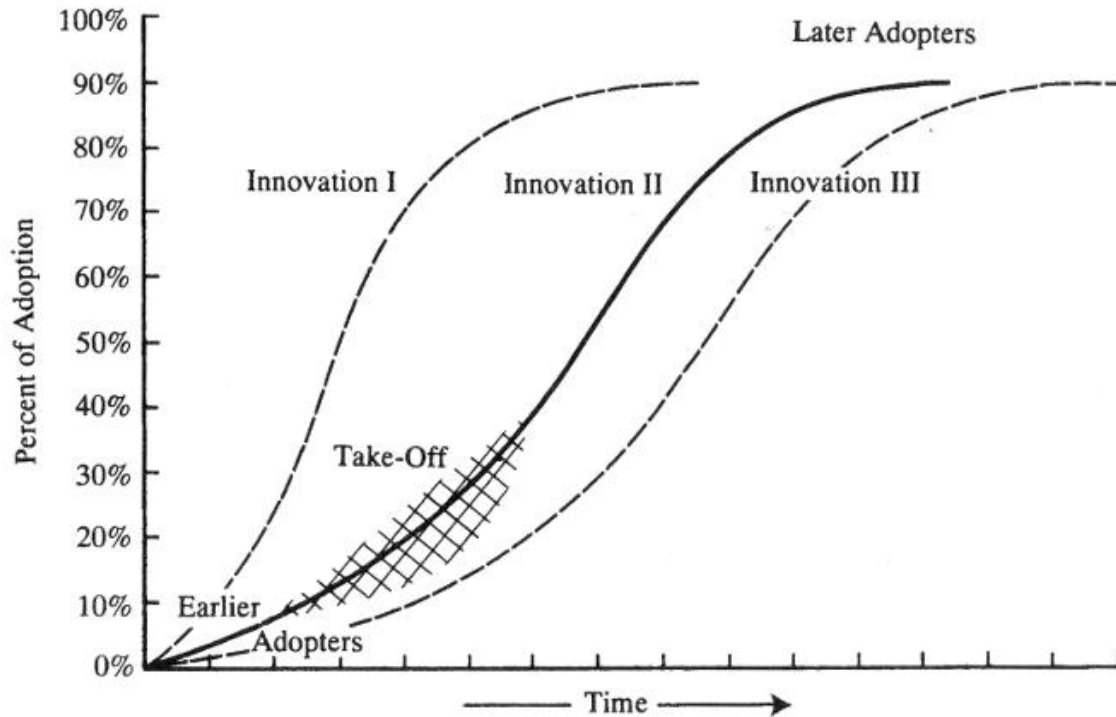


Figure 2-1: Rogers' Diffusion of Innovations Theory

Source: Rogers, E.M (1995, p. 11)

Diffusion Is the Process by Which (1) an Innovation (2) Is Communicated Through Certain Channels (3) Over Time (4) Among the Members of a Social System

Innovation is as an idea, practice, or object that is perceived as new by an individual or other unit of adoption. Newness in an innovation may be expressed in terms of knowledge, persuasion or a decision to adopt. According to the DoI theory, ideas that are simpler are adopted more rapidly than complicated ones because the complicated ideas require learning new knowledge and skills before adoption. The rate of adoption is the relative speed with which an innovation is adopted by members of a social system and it is measured as the number of individuals who adopt a new idea in a specific period. The

rate of adoption is the numerical indicator of the steepness of the adoption curve for an innovation. Most innovations have an S-shaped rate of adoption.

According to Rogers (1983), there are five perceived attributes that influence the rate of adoption of an innovation. These include relative advantage, compatibility, complexity, triability and observability. Relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes. Compatibility is the degree to which an innovation is perceived as consistent with existing values, past experiences and the needs of potential adopters. Complexity is the degree to which an innovation is perceived as relatively difficult to understand and use. Triability is the degree to which an innovation may be experimented with on a limited basis. Observability is the degree to which the results of an innovation are visible to others. In addition to the five perceived attributes, other variables affect an innovation's rate of adoption. These include the type of innovation-decision, the nature of communication channels, and the nature of the social system and the extent of change agent's promotion efforts.

The individuals in a social system do not adopt an innovation at the same time. The criterion for adopter categorization is innovativeness, the degree to which an individual is relatively earlier in adopting new ideas than other members of a social system. There are five adopters categories based on innovativeness namely the innovators, early adopters, early majority and laggards. Dominant attributes of each category are: Innovators - venturesome and active information-seekers about new idea, their interpersonal networks extend over a wide area, reaching outside of their local system ; early adopters – respect - has the greatest degree of opinion leadership in most systems, localites; early majority – deliberate - may deliberate for some time before completely adopting a new idea; late

majority - skeptical – approach innovations with caution and do not adopt until others in their system have done so; and laggards – traditional, their innovation-decision process is relatively lengthy, with adoption and use lagging far behind awareness-knowledge of a new idea.

Rogers equates the term ‘technology’ to ‘innovation’. In the current study, ICTs are viewed as an innovation. Minishi-Majanja and Kiplang’at (2005) opine that the adoption of innovation theory is relevant in explaining aspects of ICT innovation process in the field of Library and Information Science. The second element of DoI theory, **communication channels** refers to the means by which messages about innovation are transmitted among members of a social system. The essence of the diffusion process is the information exchange by which one individual communicates a new idea to others. Indeed, communication pervades the entire diffusion process and it is viewed as one of the factors that can influence the adoption of ICTs at the two university libraries under study.

The third element is **time** of diffusion. This focuses on three dimensions: the decision-making process, the individual innovativeness and the rate of adoption. This study involves decision making by a number of individuals in a university. This includes the librarians, the university management, the lecturers and students. In this study the types of innovation decisions made will influence the adoption of ICTs.

The fourth element is the **Social system** which deals with the social and communication structures of a system and which facilitates or impedes the diffusion of innovations in the

system. In a social system, there are norms, opinions leaders and change agents which variously influence the diffusion process.

In this study, the University is regarded as the social system. The communication channels among the various participants in the distance education programme will influence the diffusion of ICTs in the University.

The history of diffusion research dates back to the 1940s in rural sociology. Since the 1960s, the diffusion model has been applied in a wide variety of disciplines such as education, public health, communication, marketing, geography, general sociology and economics. Studies on diffusion process in organisations go back to the early 1970s, and proliferated in the 1980s and 1990s mainly due to the widespread introduction of computer-related technologies in organisations. Rogers and Scott (1997) used the DoI theory as a model for outreach projects from the National Network of Libraries of Medicine to Native American communities. More recently, Minishi-Majanja and Kiplang'at (2005) explained how the DoI theory has been incorporated in Library and Information Science research. They provided an analysis of two studies in which the DoI theory has been applied. The first study was carried out by Kiplang'at to investigate the diffusion of ICTs in the communication of agricultural information among researchers and extension workers in Kenya. The second study by Minishi-Majanja was on mapping out the ICTs in LIS education in sub-Saharan Africa. Kiplang'at and Ocholla (2005) also used the DoI theory in their study that investigated the diffusion of ICTs in communication of agricultural information among researchers and external workers in Kenya.

Though the contributions of diffusion research have been impressive, some criticisms have been leveled against it. Rogers (1995) discusses four major criticisms of diffusion research: (1) its *pro-innovative bias*, the implication of most diffusion research that an innovation should be diffused more rapidly, and that the innovation should be adopted by all members of a social system and that it should be neither re-invented nor rejected; (2) the *individual-blame bias*, the tendency to hold an individual responsible for his or her problems, rather than the system of which an individual is a part; (3) the *recall problem* in diffusion research caused by inaccuracies when respondents are asked to remember the time at which they adopted a new idea; and (4) the *issue of equality* in the diffusion of innovations, as socioeconomic gaps among the members of a social system are often widened as a result of the spread of new ideas.

Minishi-Majanja and Kiplang'at (2005) observe that the DoI theory does not adequately provide a basis for predicting outcomes or for providing guidance for accelerating adoption rates. There is also doubt about the extent to which the theory can give rise to readily refutable hypotheses. In addition, many of the theory's elements are specific to the culture in which it was derived. Nonetheless, the broad framework of the theory provides a platform for investigating Library and Information Science innovations even in unique social systems such as sub-Saharan Africa.

In the context of this study, ICTs are the technology or innovation that is being diffused in the University system. The University is the social system. A number of individuals within the university are involved in decision making regarding the adoption of ICTs. These are: the university management, the librarians, the ICT staff, the academic staff and students. Each category will influence the diffusion process. These individuals

communicate through various channels. The time taken for the adoption of ICTs will depend on how quickly the decisions are made and the support given to the library by the management in terms of resource allocation. The change agents are the library management which includes the systems librarians. The adoption of ICTs will also depend on the relative advantage as perceived by the adoptors, in this case the librarians, their compatibility, usability, and observability. As stated earlier, the DoI theory was originally applicable to the developed world where resources are not as scarce as in developing countries. The implementation process of ICTs in a developing country like Kenya takes into consideration scarcity of resources. Besides financial constraints, existing infrastructure to support the use of ICTs by distance learners may be unavailable or inadequate. Electricity and internet are still lacking in most rural areas and where available, the cost can be prohibitive. Another gap in the DoI Theory is that it is focused on independent users who can decide to adopt or reject the innovation. The situation is different in an organization such as the university. The university adopts the technology and then encourages and facilitates its use to potential users in this case the distance learners. Therefore user response to diffusion of innovation will depend on the University's decision.

2.1.4. Constructivism (Learning Theory)

Constructivism is a psychological theory of knowledge (epistemology) which emerged during the 1930s and 1940s. This theory places strong emphasis on the learner rather than the trainer. It argues that humans construct knowledge and meaning from their experiences. According to the constructivist school of thought, learners have the capacity to invent or construct knowledge out of their experiences. Therefore, knowledge is seen

as constructed through intellectual actions based on experience. Thus, from a constructivist perspective, learners, through their interactions with the environment, construct knowledge (Sutton, 2003). Constructivism is a philosophy of learning founded on the premise that by learners reflecting on their experiences, they are able to construct their own understanding of the world and their environments. The trainer becomes a facilitator and helps the learner to construct their own solutions to problems. Learning therefore involves adjustment of mental models in order to make sense of new experiences (Senge, 1990).

Formalization of the theory of constructivism is generally attributed to Jean Piaget (Liu and Matthews, 2005), who articulated mechanisms by which knowledge is internalized by learners. He suggested that through processes of *accommodation* and *assimilation*, individuals construct new knowledge from their experiences. When individuals assimilate, they incorporate the new experience into an already existing framework without changing that framework. This may occur when individuals' experiences are aligned with their internal representations of the world, but may also occur as a failure to change a faulty understanding; for example, they may not notice events, may misunderstand input from others, or may decide that an event is a fluke and is therefore unimportant as information about the world. In contrast, when individuals' experiences contradict their internal representations, they may change their perceptions of the experiences to fit their internal representations. According to the theory, accommodation is the process of reframing one's mental representation of the external world to fit new experiences. Accommodation can be understood as the mechanism by which failure leads to learning: when we act on the expectation that the world operates in one way and it

violates our expectations, we often fail, but by accommodating this new experience and reframing our model of the way the world works, we learn from the experience of failure, or others' failure.

In the Constructivism Learning Theory, the emphasis is placed on the learner rather than the teacher. Compared to the traditional systems of education, distance learning is more dynamic and oriented to the individual and so constructivist theory is found to be most suitable for this study which is on distance learners. In addition, constructivists view learning as the result of mental construction. Students learn by fitting new information together with what they already know (Galatanu, Ghica and Ernu, 2008). Constructivism has been identified as the most suitable school of thought in the use of technology for learning purposes or online learning (Hung, 2001; Mishra, 2002). In this study, the distance learner interacts with information from various online resources such as online databases or what Swan (2005) refers to as knowledge-centred learning environments. The distance learner uses the information from such online sources to construct understanding of topics and disciplines.

Preference for DOI and Constructivism Learning Theory

This study set out to: investigate the range of ICTs at the selected universities; explore the level of e-readiness of the libraries for distance learners; establish the adequacy of information literacy skills of distance learners; establish the policies that the university libraries have developed for providing information to distance learners; identify the challenges experienced by distance learners in accessing information through ICTs; make recommendations and propose a model of improving access and use of ICTs by distance

learners in public universities. A consideration of these objectives of the study suggested a theoretical framework that has components of technological innovation, adoption, diffusion and communication. The DoI Theory has all these components. The theory has been used as the theoretical basis for a number of information projects (Rogers and Scott, 1997; Rogers and Scott, 1999; Minishi-Majaja and Ochola, 2004; Minishi-Majaja and Kiplanga't, 2005). The study looks at diffusion as a process by which ICTs (Innovation) are communicated through certain channels (e.g. information literacy programmes) over time among distance learners (members) at the University of Nairobi and Kenyatta University (Social System). Diffusion research can be directed at either individuals or organizations. This study is focused on the latter.

The "Diffusion of Innovation Theory (DOI Theory)" is supported by the Constructivism Learning Theory in this study. The Constructivism Learning Theory was found suitable in explaining how distance learners learn through interaction with their environment. The emphasis is placed on the learner rather than the teacher. Constructivists view learning as the result of mental construction. Constructivism Theory is found appropriate in this study because it addresses the distance learner. The trainer is at a distance from the learner and acts as a facilitator. Distance learners use the information from various sources to construct understanding of topics and disciplines.

The Systems Theory and the Social-technical Systems Theory were not selected to inform this study as they were found to lack various components discussed above. The Systems Theory does not take into consideration the social aspects of people and society. The Social-technical Systems Theory takes into consideration people and processes. However, it does not inform on how to design the technology to support performance. It

is necessary to integrate the social requirements of individuals with the technical requirements needed to keep the work functional. Systems that are implemented without an analysis of how the people will interact with the system fail. This is because the technology is just imposed on the users. For users to feel that they own the process and so utilize the system, the needs of the users must be established first. What this means is that technology will never exist in isolation, rather, human beings have to be part of the system.

2.2 Models of Distance Education

Distance education is known by a bewildering variety of nomenclature (Reddy, 1994). In Australia, it is known as the “external system”. Unofficially, it is known as “off-campus study”. In some countries, the term “correspondence education” is widely used. But it has increasingly been replaced by the term “independent study” in North America. “Home study” is sometimes used to describe correspondence programmes of private schools both in North America and Europe. “Extramural” refers to distance education in New Zealand. These terms have arisen from the historical background of various countries.

Kaye (1981) describes four models of distance education based on how teaching is organized:

- i. Correspondence tuition - the earliest model provided by an independent organization for degrees awarded by a public university. Thus, the University of London was established in 1836, it had no teaching functions, but merely registered and examined students in the UK and overseas, for external degrees. Various private concerns, such as the University Correspondence

College and Wolsey Hall, soon also arose to provide correspondence tuition for London external degrees. Even today, institutions in various parts of the world are depending upon this model.

- ii. A second model is that of a conventional university which provides correspondence study facilities itself to external students, as well as examining and accrediting these students. The university teaches both face-to-face and at a distance. This model goes back to the University of Queensland in 1911 (Perraton, 1994) and has become largely adopted in Australia and Canada, the universities of Lagos, Nairobi and Zambia. Examples include the School of Education at the University of South Pacific, the University of New England in Australia, the Punjab University in India, Wisconsin, University of Moscow, Leningrad, University of Nairobi, Kenyatta University and the University of Zambia.
- iii. A third model is that of collaboration between a number of different institutions in catering for external studies e.g. El Bushra cites Massey University in New Zealand which provides correspondence education to students at all other New Zealand universities.
- iv. A fourth model which is unique to France is that of a massive centralized state provision of correspondence education at all levels including university level e.g. the Centre Nationale de Tele-Eseignement which is directly under the control of the Ministry of Education.

The model which represents the most recent development is that of autonomous institutions established solely and specifically for external students. The first of this new generation of institutions was Britain's Open University. Other examples include Allama Iqbal Open University, Pakistan (AIOU), Athabasca University, Canada (AU), Everyman's University, Israel (EU), Fernuniversitat, West Germany (FU) and Free University of Iran (FUI) among others.

(Taylor, 1995) identifies five models of distance education based on the delivery technologies:

- i. **The correspondence Model** - is regarded as the first generation of distance education where print is the only medium used. In this system, there is no face-to-face contact. There is very little scope for interaction between the teacher and the learner; it occasionally takes place through correspondence only.
- ii. **The multimedia Model** – is regarded as the second generation. This model suggests the use of print material, audio cassettes, video cassettes, computer based courseware including computer managed learning, computer assisted learning and interactive video. The learning materials are highly designed and developed. There is a lot of flexibility with regard to time, place and pace of study. Only computer-based courseware and interactive video provide flexibility in interacting with the media content. Several institutions in the world operate at this stage of distance education.
- iii. **The Tele-learning Model** – is regarded as the third generation. It is based on the use of information technologies which includes audio-teleconferencing,

audio graphic communication systems, video conferencing and broadcast television radio with audio teleconferencing. Though interaction is possible through such media, there is no flexibility with respect to time, place and pace. Many distance education institutions have accepted this third generation tele-learning model.

- iv. **The Flexible Learning Model** – the fourth generation model suggests the enhancing of interactivity through multi-media, computer mediated communication offered by connection to the internet, and web-based instructions. It provides greater flexibility with respect to time, place and pace of study. The technologies can support contiguous two-way communication between teachers and learners. Highly refined materials can be used through these technologies.
- v. **The Intelligent Flexible Learning Model** – is the fifth generation model. This model is based on further exploitation of new technologies. It incorporates the use of automated response systems and intelligent object databases in the context of internet-based delivery. The delivery technologies include interactive multimedia, internet-based access to www resources and computer mediated communication, using automated response system. This model is capable of increasing access to education and training activities on a global scale.

At the University of South Queensland (USQ), Australia, the essential features of a fourth generation electronic teaching and learning environment support a learning process that is interactive, non-linear and collaborative (Taylor, 1995). These features include the use of an interactive study chart as a basic navigational tool, which sets the broad parameters of the subject matter content to be investigated, and lists a number of exemplary references. References are electronic and hot linked via specific URLs. In addition the students are free to surf the Net for supplementary teaching-learning resources that meet their specific needs. Interaction with other students, teaching staff and other experts, who act as mentors, is achieved through use of computer mediated communication (CMC), using a web-based conferencing system.

2.2.1 U.S. Models of Distance Education

According to Gueverra (2007), higher education in the U.S.A. experienced a drought in students' enrolment from the mid 1980s until the early 1990s but this was followed by a boom in enrollees that has just recently peaked. The overall impact in the past 20 years has been an increase in the number of colleges. In concert with this expansion, public sector colleges were vigorously pursuing the distance education market. Since 2001, there has been a major shift in instructional modes and an increase in the number of distance students. According to Sherman and Beaty (2007), institutions as a whole use just about every type of distance technology available to them including television, satellite cable, and which involve varying degrees of interactivity (e.g. one-way video and two-way audio), or which involve a mixture of print and video as well as synchronous and asynchronous internet programs. However, the most widely used technologies are: asynchronous internet programs, followed by synchronous internet

programs and two-way interactive video and audio. One-way video technologies and audio technologies are less frequently used and correspondence courses based on print only are not very common in the U.S.A. Few institutions are entirely dedicated to distance education, Gueverra (2007). Some of these act as clearing houses for the offer of distance programs from member colleges or universities. These include the Western Governors University (WGU), and California Virtual University (CVU).

Online programs have quickly become a significant part of the educational offerings at many colleges and universities. Texas Tech University, for example, is embracing new technology to encourage and increase student interaction by creating virtual reality classrooms that allow hundreds of students to participate from virtually anywhere on its network. Internet-only institutions include private operators such as Jones International University, Concord University School of Law in Los Angeles and OnlineLearning.net, owned partly by Houghton Mifflin Cl. which has the exclusive rights to market noncredit versions of courses given at University of California at Los Angeles.

Cornell University has a distance learning course that connects students in seven countries across 16 time zones (Friedlander, 2002). Undergraduate and graduate students from the Americas, Europe, Australia and India are linked electronically in a spring semester class that examines international food issues and formulates positions on worldwide agricultural sustainability. Participants in the global classroom communicate using internet-, telephone- and satellite-based video. Cornell organizes the class with equal participation from eight universities, including Wageningen University and Research Centre in the Netherlands; the Open University of the Netherlands; Universidad EARTH in Costa Rica; University Zamorano in Honduras; Uppsala University in

Sweden; the Swedish University of Agricultural Sciences; the University of Melbourne in Australia and Acharya N.G. Ranga Agricultural University in India.

According to Adams (2000) Fairleigh Dickson University has established a model of distance education in which it partners with world class scholars, experts, artists, politicians and business leaders around the world. These individuals are a resource for new ideas, different cultures and alternative views. This new model of distance education was created in furtherance of the university's mission of creating global citizens.

2.2.2 African Models of Distance Education

The South African and Egyptian distance education models represent the best examples of distance education in Africa. According to Glennie and Bialobrzaska (2006), the advent of South Africa's first democratic government in 1994 signaled the beginning of significant policy changes in education, including a notable emphasis on distance education. Distance education was identified as a key mechanism for facilitating access, participation and redress, especially in higher education. Distance learning in South Africa has increased by 40% per annum since 1986 and one third of full time enrolments at South African universities are distance-based.

The University of South Africa (UNISA) (<<http://www.unisa.ac.za>>) is the largest distance education university in South Africa with a population of over 260,000 students. It is also one of the oldest having been established in 1946 and has in many instances paved the way for new approaches in distance education (Lephalala and Pienaar, 2007). As a result of the incorporation over several years of the various dedicated distance teacher education institutions and the merger in 2004 with Technikon South Africa,

UNISA is now the only dedicated distance education public provider in higher education making it possible for students from across South Africa and beyond its borders to enroll at UNISA. UNISA has thus become a comprehensive higher education institution, offering diplomas and the full range of degrees across general, vocational and professional fields (Glennie and Bialobrzaska, 2006). Pityana (2009) notes that although UNISA is generally recognized as having played a pioneering role in the first generation of distance education namely the correspondence model, it currently has all the elements of 4th generation ODL, but needs to integrate them systematically to raise the level to 5th generation.

There are other initiatives in distance education in South Africa that have adopted web technologies. The University of Pretoria, Centre for GeoInformation Sciences established in 1996 has developed a web-based, 2 year GIS post-graduate degree course (Breetzke, 2008). Another model is the collaborative International Outreach Program (IOP) launched by Stanford University. This is a pilot project called Dunia Moja – “One World” in Swahili launched with Makerere University in Uganda, the College of Wildlife Management in Mweka, Tanzania and the University of the Western Cape in South Africa. The project uses state-of-the art mobile phone technology to teach a Stanford-developed interactive course on environmental education Trei (2007).

In Egypt, two significant government initiatives offer an environment conducive for e-learning, namely the internet and personal computer initiative (Abdel-Wahab, 2008). The Ministry of Communications and Information Technology maintains a free internet access nationwide since 2002 and affordable PCs and laptops have been made available to students and professionals within a monthly installment plan that could also be

financed up by a low interest loan. E-learning is considered as a means of alleviating conventional educational problems that face Egypt. The Ministry of Education and the Ministry of Higher Education respectively have undertaken e-learning projects. The Cairo University distance learning system enables students to enroll in courses, on teach-yourself basis using specially designed books, audio-visual aids and regular appointments with teachers (<<http://www.cu.edu.eg>>). The Faculty of Engineering engages in e-learning related activities such as conversion of text books to interactive CD-ROMs and pilot projects in virtual classrooms. The virtual classroom simulates the real classrooms where everything that was available in the classroom is modeled in the 3D software. In the virtual classroom, the student can see the teacher writing on the blackboard, watch colleagues chatting and can even raise a hand to ask a question (Fayek, 2008).

The American University in Cairo is using WebCT as learning management systems (LMS) and provides a centre for helping the university members to convert their materials to web-friendly format. Another example is the Global Campus with objectives to deliver programs using a hybrid model of traditional and unconventional methods based on distance learning. The Global Campus is a partnership between Middlesex University and a number of support centres worldwide, offering a Master of Science degree in Business Information Technology in Egypt since 1998 and currently serving China and Singapore. Within Egypt, the global campus includes modules on CD-ROM and on the web-based in a blended learning environment, in addition to local learning support centres such as the Regional Information Technology Institute. The Arab Open University offers degrees via distance learning in an environment of supported open

learning. It uses print, supporting media such as audio and video cassettes, CD-ROMs and web technologies (Fayek, 2008).

In Kenya, universities have over the last two decades grappled with numerous problems which in turn have hampered the efficient delivery of education. Universities have found themselves struggling to keep afloat in an environment where public and donors funding has been on the decline against a backdrop of increased student enrolment. This has put increasing pressure on universities to optimize the use of available resources and to mobilize additional resources. Assey (2004) opines that the first major advantage of distance education at the University of Nairobi is that it has provided a way of recruiting more students and of shifting the balance of expenditure in education away from the state and towards the learner. Distance education also reduces operational costs for institutions as well as travel and boarding costs for the learners (O'Lawrence, 2007; Mungania, 2006).

The scope of distance education in Kenya has developed enormously over the years. It has become part of the national education systems and an academic discipline in its own right. It is seen as a way of raising the quality of life for those who are already working, those who were not able to get education earlier and others in special circumstances like women, the prisoners, refugees, the army, the police and others. It also provides an alternative and innovative method of learning which is not limited to a particular time and space and gives opportunities to people to learn at their own pace. The distance education units have in the past been largely print-based. However, with new technological developments, technologies such satellite broadcasting cable television, cassettes, and interactive computer terminals are being used and these will help to realize the full

potential of distance education. Today, the mode of delivery of distance education in both the University of Nairobi and Kenyatta University is mixed mode of delivery which means distance education with face-to-face sessions using both print material and ICTs in e-learning.

2.3 Virtual University Reference Model (VURM)

A model of distance education that is relevant to this study is the Virtual University Reference Model (VURM) developed by Aoki and Pogroszewski (1998) – See Figure 2.2.

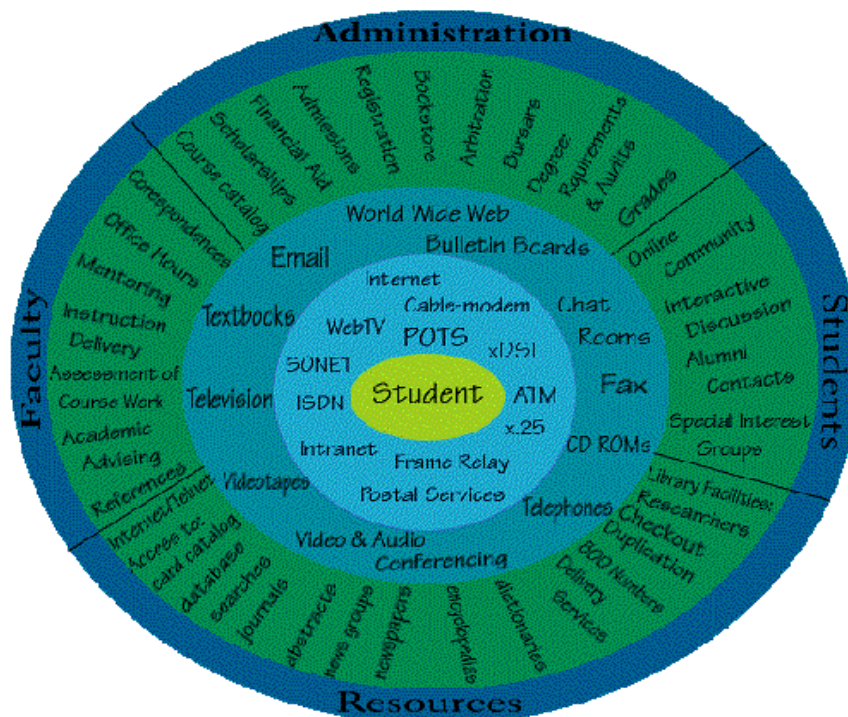


Figure 2-2: Virtual University Reference Model

Source: Aoki and Pogroszewski (1998, p. 4)

The VURM underscores the fact that various components are necessary for the success of online distance education. The model is intended to be a guideline or framework for higher education institutions in planning to deliver instructions and support services to distance learners. In this model, Aoki and Pogroszewski (1998) define the virtual university as the infrastructure for providing students with a learning experience and related support services to complete a degree programme partially or totally online and for providing faculty members with resources for teaching and doing research effectively online. They argue that course delivery is not the only component in a virtual university and that various support services to students and faculty have to be included in the plan as integral part of a virtual university to create a successful academic environment for a distant learner.

The model depicts four components of a virtual university. These include: administrative services, student services, resource services and faculty services. The second outer ring shows the kind of services a student receives from each of the four components. The inner three rings represent (from the innermost): 1) the student and his or her relationship to each of the four areas; 2) transmission systems with which the services can be accessed by students; 3) applications and tools to be used in offering the service elements in the outer ring.

The Administrative Component of the VURM consist of such information as admission, registration, students records, financial aid, Fees payment, exam records and graduation. Systems and services should be seamless. Students should be able to access such information online 24 hours a day, 7 days a week. The Student Component consists of the interaction amongst students. A virtual university should have a system that allows the

student to interact with other students either in discussion groups or on an individual level.

The Resources Component of the VURM provides students and faculty members with library facilities and technical support. The distant student should have access to library resources and services online. This includes checking out materials, being able to access reserve materials and reference materials on-line. Online access to databases, journals and reference material should be provided. The model also outlines several ways in which distance students can satisfy their information needs. These include capabilities of using multiple databases and Online Public Access Catalogue (OPAC) via the internet.

Technical support such as questions regarding access codes, connectivity problems, hardware specifications also fall under the resource services component. The services and resources should be available to students 24 hours a day, 7 days a week. The Faculty Component of the VURM involves pedagogical issues and student services. The faculty should be able to present course material, provide academic advice, mentor students, assess coursework and facilitate discussions with students at a distance.

2.4 Library Services for Distance Education Models

Lebowitz (1997) points out that the models for providing library services at a distance are varied. Whereas some universities have developed library home pages directed specifically toward off-campus/distance students, others have made no provision for them. The most common models that have been used in providing library services at a distance are:

- i. **A department or unit dedicated to providing services** to distance students in which a specific librarian-coordinator is responsible for ensuring access to needed information as well as offering all their services. In addition the librarian-coordinator is the main contact with faculty, promotes library usage and instruction, develops specialized material for distance students (including web pages) and serves as a link between the continuing education unit, the colleges or departments delivering courses and students. Examples of universities with this model include Central Michigan University, Regis University, University of Kentucky, Utah State University, University of Nebraska-Lincoln and New Jersey Institute of Technology.
- ii. **Integrated, or decentralized services** in which no one person coordinates the services to distance students and faculty. Distance students direct their requests for information to the reference desk and requests for materials to the inter-library loan department. Indiana University-Bloomington Libraries use this model (Haynes, 2002).
- iii. **Branch campus structure** in which a branch library maintains the appropriate materials for courses taught on the branch campus. The branch librarian provides assistance including instruction sessions. Examples of multi campus universities include Illinois Institute of Technology, Washington State University and Pennsylvania State University. Taha (2007) presents the E-learning Library Service (ELLS) model for the United Arab Emirates University representing the integration of the e-library functions with the e-learning process as illustrated in Figure 2-3.

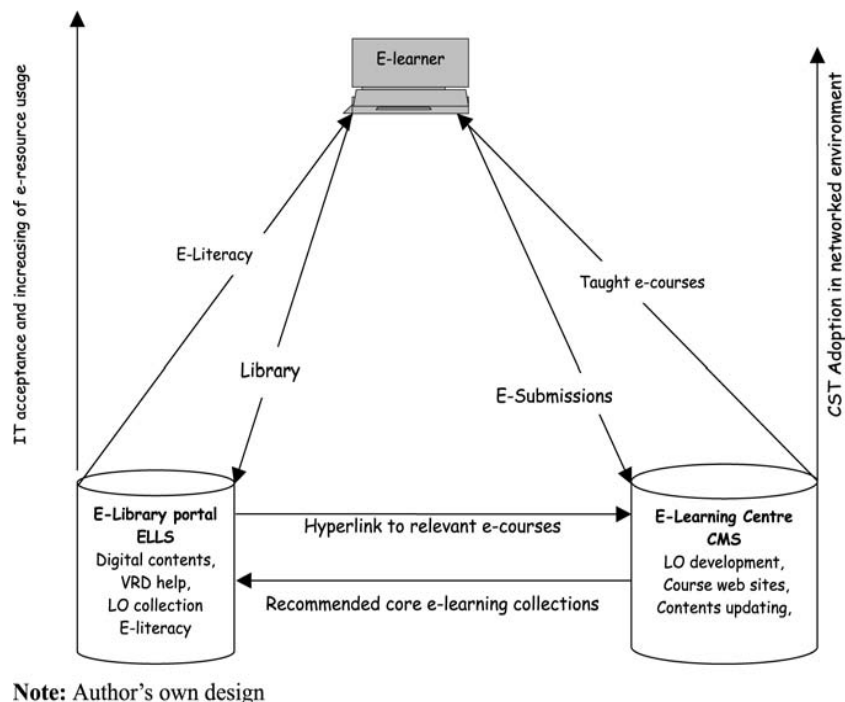


Figure 2-3: E-Learning Library Service (ELLS) Model

Source: Taha (2007, p. 358)

He argues that the strong capabilities of the e-library in the provision of e-information services have made the interoperability with the e-learning process a highly urgent requirement. The model depicts e-library services in academic computing environment with the following functional roles:

Functional roles of the e-library (Taha, 2007):

- hyperlink the e-courses with library e-reference resources such as e-books and e-journals and web open access resources;
- virtual reference desk (VRD) help and e-mail enquiry service (expert librarian);

- designing integrated web portal to provide friendly access to library scholarly e-resources with efficient browsing and research abilities;
- e-literacy programmes to develop e-learning information search skills and
- acquisition of core e-collections specifically that recommended by e-learning initiative.

Functional roles of the e-learning institution (Taha, 2007):

- development of innovative web-based e-courses using multimedia effects and simulation;
- integration of a variety of recommended core e-learning reference readings with the digital resources of e-library;
- digitization of textbooks and other learning resources to create usable learning objects; and
- possible permanent updating of e-course contents

Taha points out that the main limitation of this model would be the librarians' lack of readiness to become involved in ELLS and the gap in computer and web knowledge, which might affect the full utilisation of both e-library facilities and CMS capabilities. Hayne and Mannan (2006) present a case study in statewide cooperation in the delivery of library services to distance students throughout the Indiana State, USA. This is a consortium model where all academic libraries in Indiana State have formed a partnership focusing on services to distance learners.

Sujatha (2008) proposes a consortium of Open and Distance Learning (ODL) digital libraries in India that will plan, coordinate and implement a national level digital library

for distance learners. The proposed Digital Library Network of ODL should have a nodal agency to avoid duplication of resources. This nodal agency will create necessary infrastructure to network the digitized resources of all universities and rationalize the access of high valued electronic journals and other resources. The services to be provided would include: digital/virtual reference services; information services through email; access to OPAC and powerful search tools to retrieve the whole or part of a digital document.

Abdelrahman (2012) investigates the library and information services support available to distance learners in Sudan. The findings of the study reveal that distant learners in Sudan have little available support to them. The study proposes a hybrid library support model consisting of conventional print-based and digital electronic resources and services. The proposed model should consist of: A Distance Learning Library Coordinator (DLLC) who will be responsible for coordinating and providing library resources and services to distance learners; The DLLC should work with faculty members to ensure the provision of courseware in electronic format in order to establish course reserves to be accessible to the learners; Services should include reference and referral services via email or chat, interlibrary loans and electronic document delivery via email; Information literacy for distance learners preferably in their first year; Distance learners should be allowed to use library resources and services in person including borrowing. They should also have access to all relevant electronic and web-based materials that are accessible by regular students; all digital library services to distance learners should be provided through the web pages of the institution.

The present study is guided by the ideas distilled from all the models discussed above. The study will propose a new model based on the objectives and the empirical findings of the study.

2.5 Review of Related Literature and Empirical Studies

This section provides an overview of distance education and e-learning from a global perspective and the African perspective, the challenges of e-learning in Africa and digital libraries for distance education. Studies from USA, Europe, Australia, Asia and Africa including Kenya are reviewed. A review of the literature revealed a dearth of literature and empirical studies on library services for distance learners in Kenya.

2.5.1 Open, Distance Education and E-Learning (ODEL)

Distance education scholars have defined distance education differently. It has been called university without walls, extramural studies, experimental learning, off-campus education, open learning, extended campus, the external degree, or university extension (Holmberg, 1989a; Moore, 1991; Keegan, 1996; Perraton, 1994). But there is a consensus that distance education is a type of instruction in which there is geographic separation between the student and the instructor. Today, the term Open and Distance Learning (ODL) is widely used and covers the various contemporary education themes such as e-learning, lifelong learning, open learning, mobile and flexible learning, Commonwealth of Learning (2013).

Although distance education has been in existence for the last 150 years, it is only in the last 40 years that its growth has been phenomenal and it has emerged as a viable supplement and alternative to the formal system (Kanwar and Daniel, 2010). Since the

creation of Open University in the UK in 1970, the past three decades witnessed the acceleration of distance education development in the USA and other countries (Keegan, 1996).

According to Keegan (2002), distance education began in the second half of the 19th Century. The first courses were proprietary but university courses followed in the late 19th Century. The University of Queensland in Australia in 1909 became the first university with obligations in its charter for the education of the whole population of the state and not just for the city in which the university was located. Giant strides in both quality and quantity of provision of distance education were made with the foundation of the European open universities at the start of the 1970s. The Open University of the United Kingdom at Milton Keynes was founded in 1969, the Universidade Nacional de Educacion a Distancia at Madrid in 1972 and the Fernuniversität-Gesamthochschule in Hagen in Germany in 1975.

The 1990s witnessed the advancement of Computers and telecommunications which made the supply and demand of distance education more effective and productive. This included the establishment of virtual courses which gained rapid expansion throughout the USA in the late 1990s (Keegan, 2002; Wang and Liu, 2003). Distance learning has become popular in higher institutions because of its flexibility and availability to learners and teachers at anytime, regardless of geographic location (O'Lawrence, 2005). In all countries, conventional universities are adding Open and Distance Learning (ODL) to their face-to-face programmes and becoming dual-mode institutions (Kanwar and Daniel, 2010). Examples include: Deakin University, Monash University, and University of

Southern Queensland in Australia; The University of Delhi with a student population in the range of 150,000, The University of South Pacific and the University of West Indies.

Keegan (2002) notes that distance education is currently in the e-learning stage. A review of the literature reveals that e-learning comes in different formats and categories. It is learning enabled by ICTs, could be web-based learning, computer-based learning, or virtual classrooms and content delivery via e-networks and a variety of ICTs. The Commonwealth of Learning (2013) defines e-learning as the application of information and communication technologies (ICTs) in the delivery of distance education programmes but goes further to say that while it is largely web-centric, e-learning does not necessarily limit itself to learners outside a conventional classroom. It uses multimedia and, besides delivering content, also enables a high level of interaction among learners, content, teachers, peers and administration. According to the OCLC E-learning Task Force (2003), e-learning has evolved to include not only courses taught primarily online and over a distance, but also to include the “brick and mortar” courses that have been enhanced with electronic elements.

A further distinction between e-learning and online learning has also emerged. Eke (2010) opines that the term e-learning covers a wide set of applications and processes including computer-based learning, web-based learning, virtual classrooms and digital collaboration. Online learning is a subset of e-learning and refers to web-based learning – learning via the internet, intranet and extranet.

E-learning has been classified into two broad categories, synchronous and asynchronous (Baker, 1999). Synchronous e-learning (two-way) allows for real time interaction between students and the instructor (Baker, 1999). In this model, all participants are required to be online at the same time. It offers activities like lessons, assignments, question and answer, chats, instant messaging, blogging and forums. Though very interactive, synchronous learning could be problematic if it suffers interruption due to system failure in one end caused by power failure. In such instances, the student is cut off from the class activities (Eke, 2010). Asynchronous learning (one-way) on the other hand does not require everyone to be online at the same time. In this model, a participant posts a message at a convenient time and then others read it when they are online and post their response. The instructor can post the course material in the institutional local area network and students access the material at their own time.

Advocates of e-learning maintain that it can cut delivery costs, widen student access and improve the quality of learning materials (Saint, 1999; Nafukho, 2004; Yieke, 2005; Mason, 2006). Education has been constrained by the iron triangle of quality, access, and cost. If access is increased, there is the danger of lowering quality. If this is to be avoided, then the costs would have to be raised. ODEL is revolutionary because it does allow, through division of labor, specialization, and economies of scale, to reconfigure the access–quality–cost triangle. Access can be increased, quality can be improved, and costs can be cut, all at the same time (Kanwar and Daniel, 2010). Mutula (2002) specifies the benefits of e-learning to both learners and teachers as follows: teachers can tailor presentation materials that focus on the questions and problems of learners; students can pursue independent project-based studies at a distance and that e-learning offers the

opportunity for people to link together across distances and share experiences. On the other hand, there are disadvantages associated with e-learning. These are: lack of direct student interaction, lack of interest in the subject by students, limited group participation, low team learning, lack of non-verbal communication, lack of immediate feedback, no eye contact, lack of ability to know the individual responding, focus on technology instead of content, and no direct classroom student engagement (Nafukho, 2007).

The global e-learning market is growing: In the USA, the projected dollar value of the e-learning market was US\$40.2 billion in 2005; In Canada, 57% of universities were offering online courses in 2000, with 3,000 courses offered in total; The European market was forecast to be worth US\$6 billion in 2005, with The Netherlands, Sweden and the UK being the biggest markets; In Japan, 34% of the four-year tertiary institutions were using the internet for online learning by 2003 with 23% more planning to do so (LaRocque and Lathan, 2003). O'Donoghue et.al. (2004) posit that with the implementation of e-learning programmes, the critical factors for the success of learning experience will change. These factors include prior experience of using technology, the technological infrastructure and the lecturer.

The next stage of the development of distance learning is m-learning or mobile learning which has been influenced by the Wireless Revolution of the last years of the 20th century (Keegan, 2002). In the last 10 years, the most exponential growth in ICTs has been in mobile telephony (Kanwar and Daniel, 2010). Statistics by the International Telecommunication Unit (2013) indicate that in 2013, the number of global mobile phone subscriptions stands at 6.8 billion corresponding to a global penetration of 96%. Keegan

(2002) posits that the challenge to distance systems now is to develop didactic environments for mobile phones and mobile computers.

Muhamudally (2010) conducted an assessment of the progress in m-learning across the globe. The report presents case studies and proposes a comprehensive framework for the successful implementation of any m-learning project in the context of the African educational setup. The study has shown that m-learning should be viewed as a paradigm shift rather than a simple extension of distance/on-line learning. M-learning offers several benefits that still need to be exploited on the continent.

2.5.2 E-Learning in Africa

E-learning has the potential to enable Africa to achieve education for all (Gunga and Ricketts, 2006). Though e-learning is at its infancy in Africa, Unwin (2008) observes that many e-learning practices are evident across the continent. Relatively few of these are based on comprehensive Learning Management Systems and most rely primarily on the web for access to information and on e-mail for communicating with students and colleagues. A report by the Association for the Development of Education in Africa (ADEA) (2002) indicates that many African countries especially in sub-Saharan Africa have continued to use mainly print methods and very few have adopted the use of ICTs to support course delivery. However, this is changing and African countries are beginning to use more sophisticated technologies which include telephones, internet connectivity, satellite transmission and e-mail, advanced fibre-linked centres equipped with videoconferencing, software job re-training packages and telecentres (LaRocque and Lathan, 2003). In Ethiopia, all 12 Ethiopian universities have been networked and have e-learning centres under the UniversityNet programme (Gunga and Ricketts, 2007).

In another ADEA report, Saint (1999) notes that the landscape of distance education in Africa is changing rapidly and highlights the following examples of the use of ICTs in distance learning in Africa: Namibia and Ghana have formally declared a dual instruction to be their national policy; Botswana, Cameroon and Zambia are using a university-based internet system to support interactive regional study centres for distance students; Tanzania, Botswana and Zimbabwe have established new tertiary institutions wholly dedicated to distance education; Other countries with established distance education programmes include Zimbabwe, Kenya, Uganda, Madagascar, Senegal and Côte d'Ivoire, Congo, Togo and Benin are in various stages of setting up university-based distance education programs.

The University of South Africa (UNISA) has recently partnered with the two other major South African distance education providers to implement a number of ICT applications. The partnership, dubbed the Confederation of Open Learning Institutions in South Africa (COLISA), is developing Internet-based courseware, a web-based student-teacher interaction system, and a series of local Internet access points for students.

The World Bank's African Virtual University (AVU) initiative is a success story that has contributed to the spread of distance education in Africa (van Brakel and Chisenga, 2003). AVU was established in 1997 as a World Bank – supported initiative which uses ICTs to provide Africa direct access to global knowledge and learning resources. The AVU pilot began in six Anglophone countries – Kenya, Uganda, Tanzania, Ethiopia, Zimbabwe and Ghana. Satellite broadcasting was used instead of webcasting and

internet-based technologies because the ICT infrastructure in Africa was still at its infancy. Initially the content was provided by global content providers. The focus has gradually shifted towards building capacity of local African institutions to generate their own courses for the AVU on local issues (Prakash, 2003). The University of Botswana has an e-learning programme which started in 1999 as a project dubbed the Education, Democracy and Development Initiative (EDDI) (Mutula, 2002).

2.5.3 Challenges of e-Learning in Africa

Despite the fact that online learning might be of most benefit to developing nations, the developing world has challenges that include poor telecommunications infrastructure and insufficient funds to invest in expensive new technology (Mason, 2006). The challenges facing e-learning in Africa identified by various scholars revolve around the lack of a clear comprehensive ICT policy, inadequate infrastructure and related support for ODL such as electricity, telecommunications, computers and trained personnel.

Gunga and Ricketts (2007) note that the three pillars of the ICT revolution namely connectivity, capacity and content are yet to be realized in Africa. Yieke (2005) observes that: most African countries lack a clear and comprehensive ICT policy; most institutions in Africa lack integrated campus networks; high telecommunication costs are also a challenge in Africa; most African countries have low bandwidth and experience slow internet connectivity which leads to high costs of using the internet; most academic institutions have either a small or no ICT budget; most African countries have an underdeveloped or non-existent telecommunication infrastructure; the academicians and students lack the necessary ICT skills and there is a scarcity of computing resources.

The Economist Intelligence Unit (2003) used four Cs as criteria for e-learning readiness ranking for various regions and countries of the world. The four Cs are Connectivity, Capability, Content and Culture. Apart from South Africa, the rest of African countries came at the bottom of the ranking. This low ranking of universities in Africa is a reflection of the challenges that face universities in their distance education programmes.

Yusuf (2006) highlights various problems associated with open and distance education in Nigeria as follows: lack of consistency in policy implementation; lack of electricity; poor telecommunication facilities; poor postal system especially in terms of security; inability by learners to afford computers and inadequate ICT infrastructure. Studies carried out in Kenya provide similar challenges to those facing Nigeria.

The Kenya Task Force on the Re-Alignment of the Education Sector to the Constitution of Kenya, 2010 identifies a number of challenges facing distance education. The Task Force observes that despite the mention of Open and Distance Learning (ODL) in Sessional Paper No. 1 of 2005, the government lacks a policy on Open and Distance Learning (Kenya, Ministry of Education 2010). In addition to this, the draft National ICT policy states the following about e-learning:

“The lack of e-learning policy framework on e-learning has hampered its development and utilization. In this regard, there is need to: provide affordable infrastructure to facilitate dissemination of knowledge and skill through e-learning platforms; promote the development of content to address the educational needs of primary, secondary and tertiary institutions; create awareness of the opportunities offered by ICT as an educational tool to the education sector; facilitate sharing of e-learning resources between institutions; promote centres of excellence to host, develop, maintain and provide leadership of better learning resources and implementation strategy; exploit e-learning opportunities to offer Kenyan education programmes for export and integrate e-learning resources with

other existing resources.” (Kenya, Ministry of Information and Communication, 2006, p. 6).

Another challenge identified by the Task Force is inadequate infrastructure and related support for ODL. The Task Force also identified as a challenge the limited number of skilled manpower in ODL approaches amongst the providers.

The Task Force findings are in agreement with the findings of an earlier e-readiness survey by The Kenya Education Network (KENET) which established that there was scarcity of computing resources both hardware and software in institutions of higher learning. Most of the universities do not also have integrated campus networks. In addition the high telecommunication costs in Kenya are a great challenge to e-learning. Due to the high international tariffs and a lack of circuit capacity, obtaining sufficient bandwidth for delivering web pages over the internet was still a problem. The survey also revealed that educational institutions were not yet ready to effectively use ICTs, even if the national information infrastructure was extended to the institutions and the bandwidth prices reduced. A review of the strategic plans of all the universities showed that they had no explicit reference to developing workforce for the emerging knowledge economy (KENET, 2007).

Kenyan universities need to recognize the availability and access to ICT in higher education institutions as essential for developing the IT workforce and professionals for the knowledge economy. Setting up e-learning is not cheap and requires careful planning. Providing the technical infrastructure and computer resources and training the staff will certainly need enough budgetary allocation. Staff will need to have access to e-mail and the internet on their desktops in the office as well as at home. Kenyan universities should

in fact provide a core team of people to support e-learning on both the technical and the curriculum delivery aspect.

To address the challenges associated with distance education, various scholars have recommended partnerships. Saint (1999) posits that institutional linkages and collaboration are ideal for capacity building. Areas of collaboration would include sharing of instructional materials, development of new courses, capacity building, programme evaluation and technology. Examples include the sharing of course materials between the University of Nairobi and The Open University of Tanzania and the collaborative B.Ed. programme between the Zimbabwe Open University and The University of Botswana.

Another form of partnership that has been discussed by scholars is Public-private partnership. Van Brakel and Chisenga (2003) argue that only through partnerships will Africa tertiary institutions succeed in increasing the output of their much needed graduates. The African Virtual University is a good example of such partnerships. LaRocque and Lathan (2003) posit that partnerships with the private sector will be an essential part of any strategy to bring e-learning into Africa in a systematic and cost-effective way.

2.5.4 Digital libraries for Distance Education

A digital library as defined by Arms (2005) is a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network. The important part of this definition is that the information is managed. Digital libraries range in size from small to huge libraries. They can use any type of

computing equipment and any suitable software. What is common is that information is organized on computers and available over a network, with procedures to select the material in the collections, to organize it, to make it available to the users, and archive it (Kavulya, 2007). The basic building blocks of a digital library include automation of library systems, sufficient ICT facilities (computers, networks) and adequate connectivity. Just as the traditional university library is central in its role of providing information for the traditional face-to-face programmes, so is the digital library central to the e-learning programmes of the university.

The literature review revealed that the area of digital library services for distance learning is rarely considered by institutions as they plan for distance education programmes. Discussing the models for library support of distance education in the USA, Lebowitz (1997) observes that with the advent of technology, the emphasis of reaching distance students has increased as well as the formats for course delivery. Unfortunately, there seems to be little or no correlation between how innovatively an institution delivers distance courses and the way it provides library services for distance students. When library services are discussed in non-library literature, they are not seen as central but are considered as support services like advising and counseling, financial aid, registration and admissions. Lebowitz opines that as academic institutions extend their educational offerings beyond the campus, they need to consider the central role that library plays in the educational process. Similarly, Cooper (2000) observes that outside the library literature, very little attention is given to the problems of providing library services to support distance education programmes in the USA. She asserts that the need for equivalent library support for on-site and distance programmes is rarely addressed by

non-librarians in the USA. Searching several databases, Roccas (2001) concluded that libraries were rarely noted in distance education courses and literature other than a referral to online catalogues and electronic resources. According to Bryne and Bates (2009), there is a notable gap in the literature on studies relating to the information behaviour of distance learning students.

Saint (1999) underlines the special significance of libraries in raising the quality of higher education and research through the application of new technologies. Jones (2003) points out that services off-campus must always be equivalent to those on campus. To achieve this goal, libraries offering services to distance learners should either:

1. Own the resources itself, and provide appropriate, direct services;
2. Provide electronic access; or
3. Have formal agreements in place for provision of materials and services by other organizations.

The role of libraries in distance learning is well spelt out in the Association of College and Research Libraries (ACRL) library standards (ACRL 2008). The Standards state that distant learners are entitled to the same library services and resources as the regular students on campus. The important role of libraries in supporting distance education in Kenya is emphasized by the Commission for University Education (CUE), (2012). The CUE Standards on distance learning library services state that the University shall provide adequate resources to support open and distance learning library services. The requirements for open and distance learning library services shall be the same as those for regular students except for the building.

Scholars of user studies have identified the information needs of distance students and their expectations. From the global perspective, Dew (2001) conducted a survey at the University of Iowa in which off-campus students were asked to rank various library services on basis of importance. The survey revealed that reference services, electronic services and document delivery were ranked high, while user education services were ranked lowest. Dew emphasizes the need for librarians to understand their students and what they want in order to have successful programs for off-campus students. Unlike Dew's study which adopted a survey approach, the current study adopted the multiple case study approach. However, some of the issues addressed in Dew's study were addressed in the current study, for example electronic communication, remote access to full-text electronic resources, electronic services and document delivery from the university library.

A study was conducted by Kazmar (2002) on 17 distance students at The Graduate School of Library and Information Science (GSLIS) at the University of Illinois at Urbana-Champaign, USA. The study sought to establish what distance students said they need and want from the library. The study adopted the interview approach where each distance student was interviewed four times over the course of a school year. The study found that there are a number of factors that distance students feel strongly support them in their learning experience. A number of them relate specifically to library services and two specifically to interpersonal library activities namely responsiveness and single contact point. Regarding library services, distance students expressed the need for either good asynchronous help such as e-mail or web reference, or different reference hours. The current study adopted the case method like Kazmar's study but while Kazmar used a

one case approach and interviewed subjects from one discipline, that is, Graduate Information Science students, the current study adopted a multiple case study approach. In addition, the current study employed triangulation of methods by surveying distance students from various disciplines at both undergraduate and post-graduate level and also interviewing the Faculty, Directorate of Distance Education, ICT Directorate, University Librarians and senior librarians to establish distance students' information needs. Kazmar's study was relevant to this study as it investigated information preferences of distance students.

Similarly, a study was conducted by Moyo and Cahoy (2003) on students of Penn State University's World Campus (virtual campus). The study was a survey in which students were asked to note their use, experiences, preferences, satisfaction and expectations with regard to various web-based library resources and services for remote users. Their findings indicate that the most used web resources were the online catalogue followed by full-text databases. The current study also surveyed distance students to investigate the information resources and services they access and use but unlike the one case study used by Moyo and Cahoy, this study used a multiple case approach. The findings of Moyo and Cahoy's study were relevant to this study as it investigated distance students' use of web resources.

A user needs survey was conducted by Maclean and Dew (2008) to assess the library needs and preferences of distance students at Mona Campus University of the West Indies and University of Iowa, USA. They found that electronic resources were favoured over instruction. The study concludes that the library should create a distance learners website from which a variety of resources and services can be accessed; give distance

learners access to electronic resources; provide students with information literacy and improve delivery of material to students.

The study by Maclean and Dew was similar to the foregoing user needs studies conducted in USA in that it was a user needs survey based on one case and it elicited similar findings on distance learners' preferences, which is, electronic resources and services. In addition, Maclean and Dew's study recommended the increase in the number of titles and copies of supplementary texts, provision of information literacy to distance learners and improvement of the turnaround time for the delivery of material to the sites for use by students. As in Maclean and Dew's study which used two cases, the current study adopted two cases approach but employed triangulation of methods unlike Maclean and Dew's study. The current study also addressed the issue of information literacy among other issues just as in Maclean and Dew's study.

A study conducted by Newton (2007) examined the potential and actual roles that the academic librarians play in supporting the development of information literate off campus learners in Scotland and the United Kingdom. The study used a series of 12 interviews and a questionnaire survey of 70 academic librarians in Scotland and a web survey was used to confirm key findings, extending the study to include academic librarians across the United Kingdom. The study identified the most critical issue to be addressed as the integration of academic library professionals within course teams. This means that librarians must interact with students in the delivery of literacy courses within the same space as academic staff. As in Newton's study, the current study used both the interview and survey methods in data collection but unlike Newton's study whose study population comprised of academic librarians only, the current study surveyed distance

students and interviewed the Faculty, Directorate of Distance Education, ICT Directorate, University Librarians and senior librarians. As in Newton's study, the current study addressed the information literacy level of distance learners as one of the issues of the study.

Byrne and Bates (2009) surveyed a full cohort of Bachelor of Business Studies (BBS) distance students in University College Dublin, Ireland to investigate their use of the university library, elibrary, Virtual Learning Environment (VLE) and other information sources. The findings of the study indicate that distance students had a general preference for internet, primarily Google and content from VLE (Blackboard). However, many students expressed difficulties in finding information on the university library website. The findings also indicate that students relied on lecturers and learning support officers for help in their search for information; librarians did not play a visible role in the information behavior of the BBS students. The study recommends that librarians should play a more active role in the information behavior of students through information literacy. The findings of this study are of interest to the current study. Byrne and Bates' study was relevant to the current study as it investigated distance students' use of the university library, elibrary and internet sources and established that distance students had difficulties in finding information on the university library website.

There is a paucity of literature on digital library services for distance learners in Africa and particularly in Kenya. A study by Mabawonku (2004) was conducted on the use of library and information resources by distance students of three Nigerian universities. The questionnaire and observation methods were used for data collection. The study revealed that the universities selected did not adequately provide for the information needs of

distance students. The study recommended that universities should make provision for distance students to access library and information resources as well as training on information sourcing. The findings of Mabawonku's study were later confirmed by Adesoye and Musa (2010) who also used questionnaires to investigate the information needs of sandwich and part-time students of two public universities in Nigeria. Their study established that the selected institutional libraries fell short of meeting the students' information needs mainly due to inadequate library facilities and inadequate ICT and library use skills. The study recommended that the universities should provide access to accurate information in the desired formats, provide practical oriented ICT and library use skills, subscribe to electronic resources and review students' study packs.

As in the foregoing two studies carried out in Nigeria, the current study used the multiple case studies but unlike the two studies, which utilized questionnaire method, the current study utilized questionnaire and interview methods. The study population of the current study comprised of distance students, the Faculty, Directorate of Distance Education, ICT Directorate, University Librarians and senior librarians unlike in the foregoing Nigerian studies which surveyed distance students only. As in the foregoing two Nigerian studies, the current study investigated the use of ICTs by distance students in accessing information resources but this was based on Kenyan universities. Another study was conducted by Akande (2011) at the University of Ado-Ekiti in Nigeria to investigate the extent to which the sandwich students make use of computer and internet facilities for their programmes. The study findings reveal that 50% of the respondents could not make use of computer and internet facilities on their own due to lack of computer and searching skills. The study also reveals that lecturers did not give the students assignments to

encourage their use of computer and internet facilities. The study was relevant to the current study because it addressed computer and information literacy issues which the current study also investigated.

A study by Boadi and Letsolo (2004) investigated the information needs and information seeking behaviour of distance learners at the Institute of Extra-Mural Studies in Lesotho. The study used questionnaires and interviews as data collection techniques. The study population comprised of distance students, lecturers and librarians. The study established that the students' sources of information were colleagues, personal collections, co-workers and family members as they were unable to access on-campus library and information sources and services. As in Boadi and Letsolo's study, the current study employed a triangulation of methods. In addition, the current study investigated the information seeking behaviour of distance students and the challenges they based on Kenyan universities. The findings of Boadi and Letsolo's study are relevant to the current study as they reveal that distance students are unable to access on-campus library and information sources and services and recommend that everything should be done to have unimpeded access to information.

A study was conducted by Oladokun and Aina (2009) on library and information needs and barriers to the use of information resources by continuing education students of the Extra-Mural Department at the University of Botswana. The focus of their study was on two satellite centres without a university library presence. The study found that the most frequently used sources of information were lecturers and colleagues, followed by references or textbooks and library resources and radio and television. The internet, the telephone and e-mail were used by a minority of respondents. The study recommends that

the University of Botswana library should ask for space in the local public library and school libraries to keep some materials for distance students and should also negotiate access to or install computers with internet facilities in a local library. Distance students should also be given hands-on-training not only in information skills but also in computer skills. Oladokun and Aina's study is relevant to the current study because it investigated the barriers to information resources access by distance students.

In another study, Oladokun and Aina (2011) carried out a study on Open and Distance Learning (ODL) and the impact of digital divide on information access in Botswana. The study used the questionnaire to survey students from four institutions namely, the University of Botswana (UB), the University of Derby (UD), the University of South Africa (UNISA) and the Management College of South Africa (MANCOSA). The study addressed issues like use of ICTS to meet distance learners' information needs, access to information resources and services by distance learners and also investigated on whether distance learners were adequately equipped to utilize the information resources and services available to them. The findings of the study reveal that there exists a digital divide between the students in the city and those in rural location. Accessibility to digital resources by distance learners is seen to have a locational dimension in that it is much more convenient to access information in metropolitan areas than in rural locations.

As in Oladokun and Aina's (2011) study, the current study adopted the case study approach and investigated similar issues to those addressed by Oladokun and Aina's study but based on Kenya. It however, went further and investigated other issues such as the e-readiness of case institutions and the policies in place for supporting provision of information to distance learners. Unlike Oladokun and Aina's (2011) study, the current

study utilized questionnaire and interview methods. In addition, the study population of the current study comprised of distance students, the Faculty, Directorate of Distance Education, ICT Directorate, University Librarians and senior librarians. Oladokun and Aina's (2011) study was relevant to the current study in that it addressed the issue of the use of ICTs to meet distance learners' information needs.

On the Kenyan scene, there is a dearth of literature in the area of library services for distance learning in Kenya. The current study will hopefully contribute in closing this gap. A study was carried out by Aseey (2004) to investigate management of distance education at the University of Nairobi. One of the major findings of the study was that access to library was a big problem to distance students of the University of Nairobi as in most cases they came from far places some from remote areas where libraries were not available, hence they could not do their assignments well or get books for reference. A study was conducted by Kavulya (2004) to investigate the challenges in the provision of library services for distance education. This was a multiple cases study of selected universities in Kenya namely, the United States International University-Africa (USIU-A), University of Nairobi, Kenyatta University and the African Virtual University (AVU). Data collection was done through interviews with the University Librarians of the selected cases. The main challenges unearthed by the study were: lack of institutional policies to guide the provision of information for distance learners; poor planning of distance education programmes; inadequate physical facilities and professional staff; inadequate funding of university libraries and poorly developed internet infrastructure in the country. The study concludes that although efforts have been made, there is room for improvement through adequate planning, financing and especially through collaboration

between information personnel and those who design and implement distance education programmes and improvement of the national telecommunications infrastructure.

As in Kavulya's (2004) study, the current study used a multiple cases study design. Unlike Kavulya's study which interviewed University Librarians only, the current study employed a triangulation of methods and surveyed distance students as well as interviewing other stakeholders such as the Faculty, Directorate of Distance Education, ICT Directorate, University Librarians and senior librarians. The current study also investigated access and use of ICTs by distance learners in meeting their information needs. Kavulya's study was relevant to the current study in that it addressed the challenges faced by libraries in the provision of information services for distance learners.

A study by Wachira and Onyancha (2012) used focus groups discussions with librarians to explore the support services and resources for remote library users in public university libraries in Kenya. This was a multiple cases study of selected university libraries in Kenya namely, University of Nairobi, Kenyatta University, Moi University and Egerton University libraries. The study suggests that public university libraries should ensure that policies on remote library user services are formulated; institutions should design user-centred interfaces as opposed to system approach with ICT section and provide more support to remote users in document delivery. While Wachira and Onyancha's (2012) study focused on remote users and used focus groups with librarians, specifically section heads, the current study focused on distance learners and surveyed distance students in addition to interviewing a diverse study population comprising of Faculty, Directorate of Distance Education, ICT Directorate, University Librarians and senior librarians. The

current study investigated access and use of ICTs by distance learners in meeting their information needs.

Providing library and information services for distance learners, however, faces many challenges. Until very recently most library collections as well as services were designed for on-campus programmes and were not suited for distance learners. Secondly, traditional on-campus library services cannot be stretched to meet the needs of distance education students and faculty. Another issue in developing library services for distance education is putting in place human resources to manage and coordinate these services. This means that staff resources have to be reallocated and staff trained for new roles. According to Kavulya (2004), the most challenging issue is how to ensure that the library services offered to distance learning community are designed to effectively meet a wide range of informational, bibliographic and user needs.

Scholars such as Magara (2002), Mutula (2004), McDonald and Kebell (2004) and Rosenberg (2006) have identified the benefits of digital libraries in Africa as follows: the digital library brings information to the user's desk; computer power is used for searching and browsing; information can be shared; information is easier to keep current; the information is always available even if the library is closed; new forms of information become possible e.g. databases and there is potential in digital libraries saving money.

According to Wang (2003), digital libraries have a strategic role in e-learning. Digital libraries provide access to information globally and help learners to develop the ability to access, evaluate and use information for building new knowledge. Similarly, Sharifabadi (2006) observes that a digital library can link e-learners to library catalogues, licensed

journal databases, e-books, selected internet resources, electronic course reserves, tutorials and forums for communication and interaction with others. According to Kavulya (2007), digital libraries are strategic gateways to global information and tools for bridging the information divide within countries and between countries. He opines that the goal of establishing digital libraries in the Sub-Saharan region can be achieved through the adoption of ICTs, development of digital content, investing in digital skills for library staff and users, strategic partnerships between local institutions and funding agencies and above all government-backed strategy on digital libraries. Akande (2011) argues that distance learning has to be all-embracing and comprehensive. Therefore, universities with distance learning programmes must have well equipped libraries with both print and electronic resources.

Despite the many benefits digital libraries offer, Africa still lags behind in the development of digital libraries. A study by Rosenberg (2005) found that the number of public university libraries in English speaking Africa that could make effective use of e-resources that are made available to them through such initiatives as the PERI programme is small. Only 15% of libraries provided more than one computer for every 100 FTE students (the recommended ratio in Africa is one computer to every 25 students) and over half of the libraries, less than 75% of the computers were internet connected. Most public university libraries in Africa have not attained the basic ICT. Similarly, Odero-Musakali and Mutula (2007) carried out a study on internet adoption in Kenyan university libraries. Their findings corroborate Rosenberg's findings. The researchers noted that while most of Kenyan university libraries had access to the internet, very few appeared to have integrated the technology into their routine operations.

Mutula (2004) discusses the issue of digital divide and digital libraries in Africa and identifies the following main causes: inadequate infrastructure, high cost of access, inappropriate or weak regimes, inefficiency in the provision of telecommunication network, language divides and lack of locally created content. The Economic Intelligence Unit (2003) stresses that:

“People must be able to access library materials, newspapers, corporate information, government databases and much more online. This content makes informal internet learning possible, and contributes to the strength and viability of structured e-learning programmes...” (p. 4)

Similarly, Gunga and Ricketts (2007) observe that the three pillars of the ICT revolution namely connectivity, capacity and content are yet to be realized in Africa. The National ICT policy also identifies content development as one of the challenges and has this to say:

“The main challenge is the underdevelopment of local content. ICT is a conveyor of information, providing opportunities for local people to interact with each other expressing their own ideas, knowledge, heritage and culture in their own languages. Improving local content will entail developing content in local languages; rallying all stakeholders and development partners’ support in creating local content and identifying, selecting and capturing information and knowledge available in various formats” (Kenya, Ministry of Information and Communication, 2006, p. 7).

As the use of electronic resources develops, libraries have deployed electronic portal or systems online to provide services in the digital realm. According to Tatnall (2005), a web portal is a special internet (or intranet) site designed to act as a gateway to give access to other sites and not just to sites on the web, but to all network-accessible resources, whether involving intranets, extranets, or internet. It is a platform where information is aggregated from multiple sources and made available to various users. The

European Library Automation Group (2002) defines a library portal as an application which allows one-stop-shop access/searching and discovery via a unified single-point interface to organized heterogeneous resources and enabling services to a pre-defined community (users). Demsey (2003) describes a portal as an entry point to a world of resources, designed to save the user time, to connect the user with relevant resources and to encourage maximum use of acquired resources.

Information portals offer an integration of sources for searching and for the location and delivery of materials. The content may be located anywhere – internal or external to the organization and may be in any format, physical or digital. Murray (2003) opines that ‘implementing a portal brings the opportunity to develop e-library services as key learning support tool and in so doing make it more appealing and rewarding to use library services’. Portals can also bring new services which include: personalized interaction i.e. “mylibrary.com”; immediate delivery of electronic documents; links to online full text, e-learning materials, interlibrary loans and e-journals articles.

Similarly, Cox (2003) highlights five primary benefits of the portal as follows:

1. Easier access to users – this refers to the ease of searching many sources at once, integrating results from licensed resources and local databases and bibliographic descriptions of digitized material as well as the unfamiliar databases
2. Simplified authentication thereby reducing the barrier of users having to remember multiple log-ons.
3. Unified presentation of quality resources – The portal acts as a tool to channel users towards the preferred resources.

4. Personalization – groups of users can be offered clusters of resources, or they can store their favourite databases and searches for quick access and reuse.
5. The portal may be a mechanism by which to offer services to an institutional portal or Virtual Learning Environment (VLE), so keeping the library to the forefront in larger initiatives in presenting resources

Library portals can be as simple as a set of HTML pages with links to electronic resources or as complex and fully featured as commercial portal systems such as Metalib (ExLibris), ENCompass (Endeavour) and ZPORTALTM (Fretwell-Downing) (Gourley, 2003). Murray (2005) posits that “if the academic library profession is to avoid becoming sidelined by Google-type search engines and commercial database services, then they must offer a web presence that delivers relevant, quality approved and personalised access to resources and library services - irrespective of format and location”.

Library portals are important platforms for distance education/e-learning. Through information portals, distance students can have access to the library remotely. Some of the benefits for the student include easy access to quality, approved resources, one interface to learn and one search across all resources, link from a citation to full text and e-journal and easy sign in through familiar Athens passwords. The portal design should be a user-centered design. It may be customizable so that the user can specify which links he or she wants to see. To know what users desire, it is necessary to conduct surveys, focus group interviews and usability studies. Online tutorials should be posted on the portal to provide information literacy to students of distance education.

2.6 Summary

Chapter two presented the theoretical foundation of the current study and a review of the literature and empirical studies. The chapter discussed various models of distance education from global and African perspectives. The study also discussed specific models of distance education and e-library services that explain the components of a successful distance education programme.

Thereafter, the literature review was organized thematically by using themes and sub-topics related to the study. One of the key themes that arose from Chapter two was that the scope of distance education has evolved enormously over the years. Distance education has been classified in various ways based on how teaching is organized the most recent development being that of autonomous institutions established solely and specifically for external students. The first of this new generation of institutions was Britain's Open University. Another way of classifying distance education is based on delivery technologies. This has evolved from first generation, the Correspondence Model to the fifth generation, the Intelligent Flexible Learning Model. Another theme is that institutions in the U.S.A. use just about every type of technology available to them in the delivery of distance education including television, satellite cable, video, audio, a mixture of print and video as well as synchronous and asynchronous internet programs. In Africa, the South African and Egyptian distance education models represent the best examples. The University of South Africa (UNISA) is the best example. Kenyan universities such as the University of Nairobi and Kenyatta University are currently using a hybrid model which means distance education with face-to-face sessions using both print material and ICTs in e-learning.

Another theme that emerged was that distance education in Kenya is faced with a number of challenges. These challenges include the lack of a clear comprehensive ICT policy, inadequate infrastructure and related support for ODL such as electricity, telecommunications, computers, trained personnel and access to library resources and services by distance learners. Digital libraries or electronic libraries can offer access to information resources. However, there is the lack of well developed electronic libraries or digital libraries with services dedicated for distance students. Various examples of digital library models for support of distance education have been proposed.

The literature review narrowed the research problem, put the problem of study into the context of previous work in the field of study, provided a context for the interpretation of data and established the extent to which research findings related to previous findings of similar studies.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the methodology adopted by the study. This includes the philosophical perspective, the research design, research method, target population, sampling techniques, data collection instruments, pilot study, data collection procedure, problems encountered during data collection, data analysis and research ethical considerations. The current research employed both qualitative and quantitative techniques as discussed in sections that follow.

3.1 Philosophical Perspective of Research

Research is all about assumptions on how the world is perceived and how best we can come to understand it. The nature of research determines the method to be used in collecting and analyzing data. In this respect, three major philosophical assumptions in research have been described (Creswell, 2003). These include positivist, interpretivist and pragmatic research. The three philosophical schools are variably described with other terms which include quantitative or objectivist for positivist research, qualitative or subjectivist for interpretivist research and mixed method for pragmatic research. The three approaches are discussed below.

3.1.1 Positivist Research

Positivism is broadly defined as the approach of the natural sciences. Its history can be traced back to the 19th century to the founder of sociology Auguste Comte (1798-1857). Positivist research is an organized method for combining deductive logic with precise

empirical observations of individual behavior in order to discover and confirm a set of probabilistic causal laws that can be used to predict general patterns of human activity (Neuman, 2006). The positivist paradigm adopts quantitative methods. According to the positivist, there is an objective external world that exists independently of human perception which is amenable to quantitative measurement. Positivist approach in research is one where there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing and the drawing of inferences concerning the phenomena from a representative sample to a stated population. Positivist researchers prefer precise quantitative data and often use experiments, surveys and statistics. They seek rigorous, exact measures and “objective” research, and they test hypotheses by carefully analyzing numbers from the measures. Positivist approaches assume that the relationship between social reality and humans is independent, objective of the cause-and-effect type. This approach has however been criticized in the literature of Information Science for its treatment of organizational reality, which is regarded as complex and not easily amenable to statistical deduction. It is also regarded as being too deeply rooted in functionalism and too concerned with casual analysis at the expense of getting close to the phenomena being studied.

3.1.2 Interpretivist Research

The interpretivist approach developed as a criticism to the dominant positivist approach. One of the earliest advocates of interpretivist research sociologist was Max Weber (1864-1920). He urged that science and social science are different and require different logic and methods (Neuman, 2006). The interpretivist approach is the systematic analysis of socially meaningful action through the direct detailed observation of people in natural

settings in order to arrive at understandings and interpretations of how people create and maintain their social worlds. It is an approach to social research that emphasizes meaningful social action, socially constructed meaning and value relativism (Neuman, 2006). The interpretivist paradigm adopts qualitative methods. The epistemological stance on interpretive approaches is that knowledge of reality is gained only through social constructions such as language, consciousness and shared meanings. Advocates of interpretive approach claim that social phenomena must be understood in the social contexts in which they are constructed and reproduced through their activities. The philosophical base of interpretive research is hermeneutics and phenomenology. The term hermeneutics comes from a Greek word, Hermes, a god of Greek mythology who had the job of communicating the desires of gods to mortals. It emphasizes a detailed reading of the text to dig out the true meaning. Each reader brings his or her subjective experience to a text (Neuman, 2006). Interpretive approaches give the researcher greater scope to address issues of influence and impact and to ask questions such as “why” and “how. The primary goal is to understand human behavior rather than explain it which is a characteristic of interpretivists.

3.1.3 Mixed Methods Research

- Mixed methods research is defined as a research approach that focuses on collecting and analyzing both quantitative and qualitative data in a single study. The epistemological stance on mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (Creswell, 2003). Just as pragmatism is not committed to any one system of philosophy, so does mixed methods research draw liberally from both quantitative and qualitative

assumptions. Individual researchers have a freedom to choose the method, techniques and procedures of research that best meet their needs and purposes. Thus mixed methods researchers use both qualitative and quantitative data because they work to provide the best understanding of a research problem. The advantage of mixed methods design is that it captures the best of both qualitative and quantitative approaches and any bias inherent in any method is counteracted. On the other hand, mixed methods research poses some challenges to the researcher. These include the need for extensive data collection, the time intensive nature of analyzing both text and numeric data, and the requirement for the researcher to be familiar with both quantitative and qualitative forms of research (Creswell, 2003). This study used mixed methods. The triangulation of methods helped to best understand the research problem as well as provide a convergence of results (Cresswell 2003).

3.2 Research Design

A research design is defined as a plan or blue print for conducting a research. It is a strategic framework for action that serves as a bridge between research questions and the execution of the research (Durrheim, 2006). This study employed both qualitative and quantitative research design.

3.3 Qualitative Versus Quantitative Research Method

In an attempt to distinguish the two research paradigms, different research scholars have defined them from different perspectives. Patton (2002) and Neuman (2006) posit that qualitative researchers manipulate “soft data” in form of impressions, words, sentences, photos, symbols etc. whereas quantitative researchers deal with “hard data in the form of

numbers". Patton (2002) opines that qualitative research involves an in-depth understanding of human behaviour and seeks to understand people's interpretations and perceptions. Qualitative methods permit inquiry into selected issues in great depth with careful attention to detail, context, and nuance. Through qualitative research, one can explore a wide array of dimensions of the social world. Durrheim (2006) posits that qualitative research is typically more flexible than quantitative research. These qualities of a research design make it naturalistic, holistic and inductive. Naturalistic implies studying real-world situations as they unfold naturally. Holistic implies that the whole phenomenon under study is understood as a complex system that is more than the sum of its parts. Inductive means immersion in the details and specifics of the data to discover important categories, dimensions, and interrelationships.

Qualitative and quantitative methods also differ in the type of the data collection instrument used (Patton, 2002). Qualitative instruments ask mostly "open-ended" questions that are not necessarily worded in the same way with each participant. With "open-ended" questions, participants are free to respond in their own words, and these responses tend to be more complex than simply "yes" or "no". Quantitative instruments on the other hand, ask more standardized questions which are highly structured and limit responses to predetermined categories. They may be "close-ended" or fixed. Researchers ask participants identical questions in the same order. This has the advantage of making it possible to measure the reactions of many respondents to a limited set of questions, thus facilitating comparison and statistical aggregation of the data. By contrast, qualitative methods typically produce a wealth of detailed data about a much smaller number of people and cases (Patton, 2002).

The general consensus among research scholars is that the main strengths of qualitative research are that: it goes beyond the statistical results unlike quantitative research; human behaviour is best explained in it; qualitative research addresses social and economic problems and it explains phenomena more deeply and exhaustively. The main weakness of qualitative research is its subjectivity which may lead to lack of reliability and validity of the findings. According to Durrheim (2006), however, validity in qualitative research is not defined in terms of the extent to which the operational definition corresponds with the construct definition, but by the degree to which the researcher can produce observations that are believable for her or him, the subjects being studied, and the eventual readers of the study.

The present study used both qualitative and quantitative techniques. Although the epistemological positions of quantitative and qualitative research are generally different, the two paradigms are not fundamentally opposed to each other. They can therefore be used in combination or triangulated to fit the research questions so as to best understand the research problem as well as providing a convergence of results (Cresswell, 2003, 2012; Neuman, 2006).

3.4 Rationale for Choosing Mixed Research Method

Having provided the above overview of quantitative and qualitative research, the researcher chose to adopt mixed methods. Qualitative research involves an in-depth understanding of human behaviour and seeks to understand people's interpretations and perception. This was achieved through interviews with the Directorate of Distance Education, Deans of Schools and Chairmen of Departments, University librarians and senior library staff. Through qualitative research the researcher was able to explore a

wide array of dimensions of the social world such as attitudes, perceptions and behaviours that are best understood in natural settings. This study also combined the qualitative research design with quantitative techniques. This was achieved through the questionnaire administered to distance learners. The quantitative techniques provided objectivity to the study. The application of more than one instrument provided checks and balances with regard to limitations associated with each instrument. The combination of the qualitative and quantitative techniques helped to best understand the research problem as well as provide a convergence of results (Cresswell, 2003, 2012; Neuman, 2006). The methods were applied in a complimentary fashion.

3.5. Research Method - Multiple Case Study

A case study is an in-depth study of a social unit, which may be a person, group of people or social entity that describes the 'as is' in a particular situation (McBurney and White, 2007). A case study investigates a phenomenon within its social context unlike surveys and experiments and is particularly powerful in studies where depth is needed (Kothari, 2004). Yin (2009) defines a case study as comprising an all encompassing method and covering the logic of design, data collection techniques and specific approaches to data analysis. Thus a case study can be an individual person, institution or method or treatment.

The present study used a multiple case study method with a combination of quantitative and qualitative data collection techniques. The study was based on two case organizations, that is, The University of Nairobi and Kenyatta University. Although the case study method is time consuming and thus expensive, resulting in massive quantities of data, it was found suitable for this study because it allowed for in-depth investigation

into the selected cases. The selection of the two cases was based on the amount and quality of information they were expected to generate about the research problem. The two cases have implemented the use of ICTs and they also have well established distance education programmes. The two cases therefore provided a wider scope to base the findings of the study on. Evidence gathered from multiple case studies is more “robust” than from a single case study and this provides a basis for generalization (Yin, 2009). The application of the case method enabled the study to get an in depth understanding of the range of ICTs application at the University of Nairobi and Kenyatta University respectively, the accessibility and use of the ICTs by distance students and the challenges that distance students experience in finding information through ICTs. The results for both cases were compared. According to Linderger (2006), case studies provide rich longitudinal information about individuals or particular situations. A common criticism on case studies is that they provided little basis for scientific generalization. However, Yin (2009) notes that case studies, like experiments, are generalizable to theoretical propositions and not to populations or universe.

3.6 Target Population

A population is a group of individuals, events or objects having common observable characteristics. It is the abstract idea of a large group of many cases from which a researcher draws a sample and to which results from the sample are generalized (Neuman, 2006; Durrheim and Painter, 2006). In order to achieve the study objectives and answer the research questions, it was necessary to obtain data from various categories of individuals who were involved in distance education in one way or another in each of the two case study organizations. Five categories of respondents were identified. These

included: 100 distance learners from each case; 5 Directors at the University of Nairobi and 3 at Kenyatta University from the Directorates of Distance Education; 12 members at each case in the category of Deans and Chairmen of departments; 1 ICT Director at each case, 1 University Librarian at each case and 10 Senior library staff (Senior Librarians and Librarians) at each case. This kind of categorization ensured that the sample was as diverse as possible, representative, accessible and knowledgeable.

The Directorate of Distance Education consists of the managers of the programmes. They plan for resources required for the smooth running of the programmes which should include information access among others. They provided data relating to policy issues including issues on availability of ICTs and the preparedness of the university in this respect. Deans and Chairmen of departments execute the programmes. They were the best placed to inform this study on how they deliver the programmes to distance learners and identify challenges that distance students experience on the use of ICTs for information access.

ICT Directors are the experts on ICTs. They advise on what resources to select acquire and install and manage the resources. They provided data on what ICTs were available in the university. University Librarians are the managers of university libraries and so they have first hand knowledge on the state of preparedness of libraries for distance education/e-learning. They provided data relating to library policy on ICT-based resources and services for distance students. Senior library staff comprising of Senior Librarians and Librarians are directly involved in providing information services to the distance learners. They were the best placed to inform this study of the availability of ICT-based information resources and services for distance students and the challenges

experienced by distance students in accessing information through ICTs. Distance learners need information for their programmes. They are not based on site to access the main university library physically. They were therefore the best placed in providing data on their access and use of ICTs for information and in identifying the challenges they experienced in accessing information.

3.7 Sampling Techniques

Sampling refers to the process of selecting a number of individuals for a study. The main concern in sampling is representativeness (Durrheim, 2006). The selected individuals represent the large group from which they were selected. The selected individuals form the sample and the large group forms the target population.

The study utilized different sampling techniques in order to get information from specific groups in the population. These were stratified, census and purposive sampling methods. Stratified sampling technique was first applied on the two case organizations to come up with 5 strata of the population at each case study. A stratum is a subset of the population that shares at least one characteristic. The strata consisted of the six categories already identified namely: the Directorate of Distance Education; Deans and Chairmen of departments; ICT Directors, University Librarians; senior library staff comprising of Senior Librarians and Librarians and Distance education students. With the exception of the Directorate of Distance Education, samples were derived proportionately from each of the strata between the two cases. The main reasons of using this technique were 1) to ensure that particular groups within the population were adequately represented in the sample and 2) to improve efficiency by gaining control over the relative size of each stratum.

With the first stratum, the Directorate of Distance Education, the sampling technique used was census. This group consisted of 5 respondents from the University of Nairobi and 3 respondents from Kenyatta University, a total of 8 respondents. The second stratum comprised of the Deans and Chairmen of departments. Purposive sampling was utilized on this group to come up with 12 respondents from each case organization, a total of 24 respondents. Purposive sampling is a technique whereby respondents are selected because they are informative. This technique was preferred because it helped to select key respondents who had the required information needed to achieve the objectives of the study. The third stratum comprised of ICT Directors, one for each selected organization. Census was applied to this stratum – 1 respondent from each selected case, a total of 2 respondents. The fourth stratum comprised of the University Librarians, one at each selected organization. Census was applied to this stratum – 1 respondent from each selected case, a total of 2 respondents. The fifth stratum comprised of Senior Librarians and Librarians. Purposive sampling was used on this stratum to come up with 10 respondents from each case, a total of 20 respondents. The sixth stratum comprised of distance learners. Purposive sampling was used for the students' population to come up with 100 respondents in each selected case organization. Consequently, a total of 200 respondents were selected from both universities. Distance students are normally scattered and difficult to reach. This approach was selected because distance students are scattered all over the country and difficult to reach so they could only be reached during residential sessions. According to Neuman (2006), purposive sampling may be used to select members of a difficult-to-reach, specialized population.

3.8 Sample Size

Data derived from the first four strata was qualitative in nature. These strata included: the Directorate of Distance Education; Deans and Chairmen of departments; University Librarians; senior library staff comprising of Senior Librarians and Librarians. For these strata, only a small sample size was required. Patton (2002) posits that there are no rules for sample size in qualitative enquiry. Sample size depends on what the researcher wants to know, the purpose of the inquiry, what's at stake, what will be useful, what will have credibility, and what can be done with available time and resources. Qualitative inquiry typically focuses on relatively small sample. Part of the data derived from distance students was quantitative in nature and the other part qualitative. For this category, the sample size was guided by the rule of the thumb. As a rule of the thumb, a sampling ratio (i.e. sample size/population size multiplied by 100) of about 30% is required for a small population under 1,000. A sampling ratio of about 10% is needed for a moderately large population of approximately 150,000, and a sampling ratio of 0.025% for a very large population of approximately 10 million (Durrheim and Painter, 2006).

3.9 Data Collection instruments

The methods used for data collection were the questionnaire and face-to-face interviews supplemented by documentary sources. The study therefore used a triangulation of data collection methods with the qualitative method being the most dominant and the quantitative method the less dominant. Triangulation refers to the use of more than one approach in the investigation of a research question to enhance confidence in the findings. The two different methods were used in an attempt to confirm, cross-validate and corroborate the findings in a single study. Yin (2009) recommended the use of

triangulation in a case study data collection and pointed out that the use of multiple sources of evidence in a case study far exceeds that in other research methods such as surveys.

3.9.1 Questionnaires

Data collection instruments are tools or devices used in data collection. Data was collected from distance students using a questionnaire. The questionnaire consisted of structured questions or closed-ended questions and unstructured or open-ended questions. Quantitative data was collected from the structured questions while qualitative data was collected from the open-ended questions. The open-ended questions offered the respondents the opportunity to respond in their own words and to express their own personal perspectives (Patton, 2002). The questionnaire had the advantage of making it possible to measure the reactions of many respondents to a limited set of questions, thus facilitating comparison and statistical aggregation of the data.

The questionnaire had a covering letter that explained the aim and significance of the study to the respondents and how it would contribute in improving the application and use of ICTs in providing access to information to distance learners in public university libraries in Kenya. The questionnaire was divided into four sections (see appendix 1). Section A sought general information and provided data for demographic characteristics of the respondents. Section B asked questions on access to e-resources and library services to elicit information relating to the second objective of the study namely exploring the level of preparedness of the two cases in providing information to distance learners. Section C asked questions on access and use of ICTs and sought information that addressed the first objective of the study namely mapping and auditing the range of

ICTs application at the two cases. Some questions in Section C addressed the third objective of the study namely establishing the adequacy of information literacy skills of distance learners. Section D sought information to address the fifth objective of the study namely identifying the challenges that distance learners experienced in finding information. Section A to C consisted of structured questions while Section D contained unstructured questions. Section D therefore offered the students the opportunity to respond in their own words and to express their own personal perspectives (Patton, 2002).

3.9.2 Interviews

The researcher carried out personal (face-to-face) interviews with respondents. This was a two way conversation initiated by the interviewer to collect information from a respondent (Kothari, 2004). The interview is one of the most important sources of case study information Yin (2009). Conducting an interview is a more natural form of interacting with people and therefore fits well with interpretive approach to research (Kelly, 2006).

The interview method for collecting data had various advantages. The major advantage was that the researcher was completely in control of the interview position. Interviews also permit respondents to provide detailed personal information. The response rate is higher and the responses are of a high quality (Wellman and Kruger, 2001). Use of the interview technique facilitated more detailed responses from the respondents and allowed the probing of respondents. The rapport established with the interviewees enabled them to provide more reliable responses. It enabled the researcher to get firsthand information from the respondent. The respondents were highly educated (Phd, Masters and first

degree levels). They were articulate, not hesitant to speak, and could share ideas comfortably.

The data collection instrument associated with interview method is an interview schedule. The interview schedule is a set of pre-determined questions. Data was collected through semi-structured interview schedules in the case of the Directorate of Distance Education, Chairmen of Departments, University Librarians and senior library staff (see Appendices 2 to 5). According to Gorman and Clayton (1997), the questions in an interview schedule can be structured, semi-structured or unstructured. Semi-structured interview includes both closed and open-ended questions. The advantage of the open-ended questions was that they offered the respondents the opportunity to respond in their own words and to express their own personal perspectives (Patton, 2002).

Introductory and explanatory appointments were made with respondents by telephone during which the venue of the interview was agreed upon. The venue was majorly in the respondents offices. A letter of introduction was prepared and given to the interviewee (see Appendix 6). The researcher took into account the interview guidelines proposed by Kelly (2006) in conducting the interview. The researcher started the interview with a short summary of what it was about. It was ensured that the respondents understood all the questions before responding. Clarification, comments and suggestions were sought through probing. Care was taken not to interrupt respondents while they were answering the questions. The researcher also took notes consistently to ensure reliability of the instrument (Gorman and Clayton, 1997).

The interview schedule for the Directorate of Education was divided into four sections (see Appendix 2). Section A provided general information. Section B sought information to address the fourth objective on strategies and policies for distance education. Section C was on ICT infrastructure and sought information that addressed the first objective of the study namely mapping and auditing the range of ICTs application in the university. Section D sought information to address the fifth objective of the study namely identifying the challenges that distance learners experienced in finding information.

The interview schedule for Chairmen of Departments was divided into five sections (see Appendix 3). Section A and B were meant to capture general information. The questions relating to the objectives of the study were in Sections C to E. The questions in Section C were on accessibility and use of information resources by distance students. This addressed the second objective on the level of preparedness of the university in providing information to distance learners. Section D was on ICT infrastructure and sought information that addressed the first objective of the study namely mapping and auditing the range of ICTs application in the university. Section E sought information to address the fifth objective of the study namely identifying the challenges that distance learners experienced in finding information.

The interview schedule for University Librarians was divided into five sections (see Appendix 4). Section A provided general information. Section B sought information to address the fourth objective on strategies and policies that the university libraries had put in place in providing information for distance learners. Section C asked questions on information services offered for distance students and addressed the second objective, that is, level of preparedness of the university library in providing information to distance

learners. Some questions in Section C addressed the third objective of the study namely establishing the adequacy of information literacy skills of distance learners. Section D was on ICT infrastructure and sought information that addressed the first objective of the study namely mapping and auditing the range of ICTs application in the university libraries. Section E sought information to address the fifth objective of the study namely identifying the challenges that distance learners experienced in finding information.

The interview schedule for senior library staff was divided into four sections (see Appendix 5). Section A provided general information. Section B asked questions on information services offered for distance students and addressed the third objective, that is, level of preparedness of the university library in providing information to distance learners. Some questions in Section B addressed the third objective of the study namely establishing the adequacy of information literacy skills of distance learners. Section C was on ICT infrastructure and sought information that addressed the first objective of the study namely mapping and auditing the range of ICTs application in the university libraries. Section D sought information to address the fifth objective of the study namely identifying the challenges that distance learners experienced in finding information.

3.9.3 Documentary Sources

Documentary sources were used to supplement the questionnaire and the face-to-face interviews. The researcher reviewed the primary aspects relating to the vision, mission, role and governance of the selected cases. Data was obtained from the websites of the two cases and from documents such as the strategic plans, annual reports, policies, newsletters and press reports. According to Yin (2009), documents play an explicit role in any data collection in doing case studies because of their overall value. The secondary

materials were used to develop background information which helped to understand the profile of the two cases.

3.10 Reliability and Validity of the Instruments

3.10.1 Reliability

Creswell (2012) posits that a goal of good research is to have measures or observations that are reliable. Reliability of a measurement instrument is the extent to which it yields consistent results when the characteristic being measured hasn't changed (Leedy and Ormrod, 2005). Van de Riet and Durrheim (2006) refer to reliability as the degree to which the results are repeatable. According to Cooper and Schindler (2006), reliability is concerned with estimates of the degree to which a measurement is free of random or unstable error. Several factors can result in unreliable data as stated by Creswell (2012). These include: questions on instruments are ambiguous and unclear; procedures of test administration vary and are not standardized; participants are fatigued, are nervous, misinterpret questions or guess on tests.

In this study, reliability threats were likely to come from questions that could be vague which could lead to misinterpretation by respondents, biases by the researcher, inaccurate coding and instructions that were not explicit. The researcher ensured higher reliability through pre-testing the instrument, consistent note taking (Gorman and Clayton, 1997), accurate coding, issuing accurate explicit instructions to the participants as well as maintaining objectivity throughout the process.

3.10.2 Validity

The Validity of a measurement instrument on the other hand is the extent to which the instrument measures what it actually intended to measure (Leedy and Ormrod, 2005; McBurney and White, 2007). As reliability is linked to repeatability, so the concept of validity is linked to 'truth'. Validity and reliability are related and validity builds upon the foundation of reliability (Leedy and Ormrod, 2005).

The study took into consideration the forms of validity identified by Kothari (2004); Cooper and Schindler (2006). It was ensured that the instruments provided adequate coverage of the topic under study (Content Validity) by ensuring that all issues were investigated. Secondly, the study ensured that the instruments were reliable and free of bias (Criterion Validity) through pre-testing. Finally, the study used multiple sources of evidence in data collection (construct validity) as proposed by Yin (2009).

3.11 Pilot Study

The purpose of a pilot study was to check the reliability and validity of the instruments. Pilot study, also known as Pre-testing refers to a process of administering the data collection instruments on a number of respondents to rule out ambiguity, sensitivity and biases in the instrument (Welman and Kruger, 2001). The pre-test also tested the data-collection method, the time frame of the investigation and the researcher as a research instrument (Gorman and Clayton, 1997).

As stated by Kombo and Tromp (2006), pre-testing the instrument enabled the researcher: to find out if the questions were measuring what they proposed to measure; to find out if the wording was clear and all questions were interpreted in the same way by

respondents; to detect what response was provoked and find out if there was any research bias and to monitor the context in which the data would be collected and the topic areas addressed.

Pre-testing was carried out through a pre-test checklist to test the ambiguity, clarity and sensitivity of questions (see Appendix 7). The suggestions provided by respondents would be used to identify and change confusing, awkward or offensive questions (Cooper and Schindler, 2006). The results of the pre-test were therefore used to modify the instrument in order to improve the validity and reliability.

The researcher carried out the pre-test on respondents from Jomo Kenyatta University of Agriculture and Technology (JKUAT). The selection was on the basis that JKUAT had distance education programmes and was not included in the case studies. Therefore the respondents were not members of the selected sample. This is because if the pre-test is carried out on respondents who are members of the selected sample, there is a likelihood of the same members providing biased data when involved in full study (Mugenda and Mugenda, 1999).

The pre-test of the questionnaire and the interview schedules was done during the first two weeks of April 2009. The respondents asked to participate in the pilot study included two distance students, one academic staff from the Directorate of Distance Education, the University Librarian and two senior library staff. The researcher visited JKUAT, had face-to-face interaction with the respondents and administered the research instruments personally to the respondents. In some cases the respondents provided feedback during the interaction. In other cases the researcher was asked to collect the instruments after

two weeks. All respondents contacted provided feedback. The researcher thanked the respondents for their cooperation. All respondents indicated that the items in the instruments were stated clearly, had no errors and no insensitivity identified. However, one of the senior library staff provided useful suggestions regarding the issues covered. The suggestions were on the following issues: policy on distant learners; access by distant learners wherever they are; awareness of resources by distant learners; information literacy level of distant learners and communication with distant learners. The researcher incorporated the feedback from the pre-test. The instruments were revised accordingly and the final version prepared.

3.12 Data Collection Procedure

The researcher obtained a letter of introduction from the Head, Department of Library and Information Studies of the Faculty of Information Sciences at Moi University. This letter enabled the researcher to apply for a research permit from the Ministry of Education Science and Technology. The research permit was granted by the Ministry of Education Science and Technology on May 11, 2009 (see Appendix 12). The researcher then pre-tested the research instruments.

A preliminary visit was made to the field to introduce the research and establish contact with the key people that would guide the logistics during data collection and to carry out sampling. During these visits, the researcher was advised to seek clearance from the Vice-Chancellor to undertake research at each university. Consequently, the researcher wrote letters to the Vice Chancellor, University of Nairobi and Kenyatta University respectively seeking permission to undertake research at each university. Permission to undertake research at the University of Nairobi was granted on April 21,

2009 (see Appendix 13). Unfortunately at Kenyatta University, this coincided with a students' strike which led to the closure of the university. The clearance request was denied by a letter dated May 28, 2009 from the office of the Deputy Vice Chancellor (Administration) citing the reason that the university was not in a position to offer the right atmosphere for the research at that time (see Appendix 14).

The researcher decided to start collecting data at the University of Nairobi while figuring out how to re-visit the clearance issue from Kenyatta University. Data collection at the University of Nairobi commenced in April 2009. During the month of April 2009, the University of Nairobi had face-to-face sessions with Education distance students in various centres in Nairobi namely Nairobi School on Waiyaki Way, Water Institute in South C and the Railway Training School in South B. The questionnaire was administered to students in these centres. In Nairobi School, the researcher made the initial contact with the Co-ordinator at the Centre with a request to administer the questionnaire. Permission was granted. The researcher engaged a Research Assistant to assist in administering the questionnaire. The Research Assistant was given adequate training before being engaged.

The researcher then proceeded to administer the questionnaire to distance students at the Water Institute in South C and the Railway Training School in South B. The questionnaires were given to the Students Representative through the Lecturer to distribute to other students. Follow-up visits were made to check if the questionnaires had been completed. The completed questionnaires were collected within a period of two weeks. In June 2009, the researcher administered the questionnaire to the Bachelor of Commerce distance students in Lower Kabete Campus. As in the case of Education

students, initial contact was made with the Co-ordinator who endorsed the research. The questionnaires were given to the Students Representative through the Lecturer to distribute to other students. Follow-up visits were made to check if the questionnaires had been completed. The completed questionnaires were collected within a period of two weeks. A response rate of 74% was obtained.

In the meantime, interview sessions were arranged in May 2009 at the Kikuyu Campus. The arrangement was done through face-to-face interactions and telephone calls with the Directorate of Distance Education, Deans, Chairmen of Departments and the College Librarian. Interview sessions usually lasted between forty five minutes to one hour. Interview sessions were also held in Chiromo Campus with the Directorate of ICT and a Lecturer for BEd. (Science) distance students. The researcher had an interview session also with the Co-ordinator of Distance Education Programmes at Lower Kabete Campus.

In addition to interviewing the Kikuyu Campus College Librarian, interview sessions with other librarians were also arranged. Interview sessions were held with The University Librarian and a Deputy University Librarian in June 2009. In August, 2009, interview sessions were held with senior library staff. These included a number of College Librarians and two Senior Librarians from the Main Campus.

The researcher then decided to re-visit the clearance issue with Kenyatta University. In January 2010, a visit was made to Kenyatta University to appeal for clearance. The researcher was advised to submit another request in writing. Fortunately, the response was positive and permission to undertake research at Kenyatta University was granted on January 12, 2010 (see Appendix 15). Around the same time, distance students were on

face-to-face sessions with Lecturers at the main Kenyatta University campus. The researcher approached their lectures from different departments and requested them to distribute the questionnaires to students. Follow-up visits were made to check if the questionnaires had been completed. The completed questionnaires were collected within a period of two weeks. A response rate of 61% was obtained.

Interview sessions were initially held with The University Librarian and a Deputy University Librarian in January 2010 followed by Senior Library staff. However, in September 2011, Kenyatta University opened the Post-Modern Library with upgraded ICT infrastructure. This necessitated a re-visit to the library to update the data. Interview sessions were also arranged with some Deans, Chairmen of Departments, Directorate of Distance Education, and the Directorate of ICT. Interview sessions with Deans and Chairmen of Departments were held during the month of October 2010. Interview sessions with the Directorate of Distance Education and the Directorate of ICT were held during the month of November 2010. Data analysis commenced in November 2011.

3.13 Problems Encountered During Data Collection

Some problems were experienced in the course of data collection. In spite of having the research permit, research clearance had to be sought from both the University of Nairobi and Kenyatta University. At Kenyatta University, the researcher was met with a lot of resistance as the application for clearance coincided with students' riot that led to the closure of the University. Clearance was initially denied. This problem was handled by suspending data collection until the university re-opened. The researcher made an appeal when the university re-opened and this time clearance was granted. The problem caused a

delay of about ten months before commencement of data collection in Kenyatta University.

Distance students are normally scattered. It was only possible to find them together during the face-to-face sessions when they came to Nairobi. Even then, they were not located in one place as in the case of University of Nairobi. They were spread between different centres within the City of Nairobi environs and this meant travelling from one centre to another. In addition, the face-to-face sessions were quite short, about four weeks, and distance students had a tight programme including exams. The students often complained of lack of time to respond to the questionnaire. The researcher handled this problem by engaging research assistants and requesting Lecturers and Students' representatives for help in the administration of the questionnaire.

Getting appointments for the interview sessions particularly with teaching staff was also not easy. Sometimes the researcher would travel to the University after having booked an appointment only to find that the Lecturer was not in the office due to other unexpected engagements such as urgent meetings. This called for patience. The researcher did not give up but insisted on sustained request for interview until it was granted. In the case of Kenyatta University, the Library was transformed to a Post-Modern Library in September 2011. Due to this change, researcher found it necessary to visit the new library to update data on ICT infrastructure.

Despite the problems encountered, sufficient data was collected from all the subjects for the two cases to adequately address the research objectives and this provided a basis for data processing and analysis.

3.14 Data Processing and Analysis

Data analysis is the process of bringing order, structure and meaning to the mass of collected data (Gorman and Clayton, 1997). The aim of data analysis was to transform information (data) into an answer to the research question (Durrheim, 2006). Data analysis was the process through which the raw data was entered, edited, classified, coded, tabulated and subjected to statistical procedures in order to organize it in a form that facilitated its interpretation and enabled the researcher to reach useful theoretical conclusions about the phenomena under investigation. Data analysis procedures can be divided into quantitative and qualitative techniques. Quantitative techniques employ a variety of statistical analyses to make sense of data, whereas qualitative techniques begin by identifying themes in the data and relationships between the themes Durrheim (2006).

3.14.1 Qualitative Data Analysis

Data collected through qualitative method was analysed qualitatively by the use of coding method (Strauss, 1987; Neuman, 2006 and Corbin and Strauss, 2008). Nachmias and Nachmias (1996) define coding as the process by which responses are classified into meaningful categories. According to Corbin and Strauss (2008), coding is deriving and developing concepts from data. It involves interacting with data (analysis) using techniques such as asking questions about the data, making comparisons between data, and so on, and in doing so, deriving concepts to stand for those data, then developing those concepts in terms of their properties and dimensions. Coding makes data manageable and allows the researcher to quickly retrieve relevant parts of it (Neuman, 2006). Data obtained in the unstructured Section D of the students' questionnaire (Appendix 1) was analyzed qualitatively. Similarly, data emanating from interviews

(Appendices 2-5) was analyzed qualitatively. The data was transcribed on the interview schedules, edited, coded and analyzed thematically.

3.14.1.1 Open Coding

The first stage in analyzing qualitative data was to subject it to open coding. Open coding of data means opening up the data to all potentials and possibilities within them (Corbin and Strauss, 2008). It requires a brainstorming approach in order to break up the text into pieces, compare them and assign them to groups that address the same theme. Open coding was done at the end of each day upon completing transcription of the field work. Data was closely scrutinized to bring out the themes to the surface from deep inside the data. The idea was to search for the right word or two that best described conceptually what the researcher believed was indicated by the data. At this stage, the concepts were purely provisional. The open coding encourages a thematic approach. It results in an indexing system that fits the researcher's analytical needs. The coding process provided an opportunity for the researcher to apply the technical, theoretical, experiential and research knowledge so far gained. Both raw and coded data was entered into an Excel spreadsheet. As Kombo and Tromp (2006) posit, an electronic spreadsheet is an excellent place for the researcher to keep the data for the study. The researcher maintained an inventory of codes with their descriptions (a codebook) along with pointers to the text that contained them.

3.14.1.2 Axial Coding

This was the second stage of coding data after the open coding. Axial coding is the act of relating concepts/categories to each other (Corbin and Strauss, 2008). The coding revolves around the 'axis' of one category at a time, hence the term axial coding. The

aim was to determine which elements in the research were the dominant ones and which were the less important ones. The second purpose of axial coding was to reduce and reorganize the data set: synonyms were crossed out, redundant codes were removed and the best representative codes were selected. During axial coding, one tries to determine the properties of the categories. In doing so it becomes clear by which indicators a category can be recognized in the data.

3.14.1.3 Selective Coding

This is the final stage of analysis. Selective coding refers to looking for connections between the categories in order to make sense of what is happening in the field (Boeije, 2010). At this point, the researcher selected the codes that related to the core codes in sufficiently significant ways. Certain categories were therefore adopted as theoretical concepts which became the report of the research.

3.14.2 Quantitative Data Analysis

Data obtained from the students' questionnaire (Appendix 1, Section A-C) was subjected to coding, data entry and checking for accuracy and then analyzed quantitatively using the Statistical Package for Social Sciences (SPSS) version 17. SPSS facilitated the generation of frequency distribution tables, diagrams and graphs.

3.15 Ethical Considerations

Ethics are norms or standards of behaviour that guide moral choices about ones behaviour and relationships with others (Cooper and Schindler, 2006). The goal of ethics in research is to ensure that no one is harmed or suffers adverse consequences from research activities. Ethical issues in research revolve around the following aspects which

must be demonstrated in any research: researcher's accountability, identity and behaviour; informed consent from respondents; anonymity and confidentiality of respondents; avoiding embarrassing questions that cause psychological harm or anguish; concealing research findings after completion of research – this has an impact on intellectual honesty; data analysis – revolves around reporting procedures and research findings accurately; fabrication of research findings; acknowledgements e.g. of assistance and in the literature review; plagiarism - a fraud that occurs when a researcher steals the ideas or writings of another or uses them without citing the source (Creswell, 2003; Cooper and Schindler, 2006 and Neuman, 2006).

When carrying out the research activities the researcher took into consideration the ethical issues indicated above. In line with the government research policy, a research permit was sought and granted by the Ministry of Education Science and Technology. In addition, the researcher sought clearance from both the University of Nairobi and Kenyatta University as required by these institutions. The researcher ensured that there was informed consent by the respondents by explaining to them the aim and significance of the study. Respondents were assured that the information they provided would be treated with utmost confidentiality and would be used for academic purposes only. Research instruments were pre-tested to ensure that there were no embarrassing questions that would cause psychological harm or anguish. To avoid plagiarism, all sources cited in the study were referred to and acknowledged. Data collected was presented and analyzed as accurately as possible. All persons who contributed to the success of the study were acknowledged. Finally, the research findings will be published and are expected to

contribute to the re-engineering of the provision of library and information services to distance learners in all university libraries in Kenya.

3.16 Summary

Chapter Three presented the research design of the study. The topics discussed included: the research design; philosophical stance; quantitative and qualitative research method; multiple case study design; target population; sampling techniques; sample size; data collection instruments; reliability and validity of research instruments; pilot study; data collection procedure; problems encountered during data collection; data analysis; ethical considerations.

A key theme that emerged from Chapter three was the need for researchers to select and state an appropriate research design. Researchers should also ensure instruments reliability and validity. The triangulation technique enabled the researcher to address the weaknesses inherent in each of the research instruments used and also to capitalize on their respective strengths. Researchers should also address ethical issues in their studies. The data collected addressed the objectives of the study and the research questions as presented in Chapter Four.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

CASE STUDY ORGANIZATION 1

4.0 Introduction

This chapter presents data derived from questionnaires administered to distance learners and from interviews with the selected categories at Case Study Organization One – the University of Nairobi. Data derived from questionnaires (See Appendix 1) was of a quantitative nature. It was analysed using SPSS and presented in graphical and tabular form. According to Neuman (2006), frequency tables and graphical representations are common methods of data presentation. Apart from the use of tables, figures were also used to vary the presentation of data. Percentages were rounded up to one decimal place. Data from interviews (see Appendices 2 – 5) was analysed thematically. The data was organized around themes and presented in a descriptive manner. In some cases, phrases and terms used by respondents are indicated.

4.1 Response Rate

Data from questionnaires and interviews addressing a particular research theme in relation to the study objectives are presented together. This approach enabled the researcher to collate research findings from questionnaires and interview schedules. The sample from the University of Nairobi is as shown in Table 4.1. One hundred (100) questionnaires were distributed to distant learners. 74 out of 100 or 74% of the distant

learners surveyed completed and returned the questionnaire. The number of respondents interviewed from the University of Nairobi is as shown in Table 4.1.

Table 4.1: Sample Size from the University of Nairobi

Respondents	Numbers	Percentage
Distance Students (postgraduates and undergraduates)	74	74
Directorate of Distance Education	5	100
Deans and Chairmen of Departments	8	66.7
ICT Directors	1	100
University Librarians	1	100
Senior Library Staff (Senior Librarians and Librarians)	8	80
Total	97	75.2

Data is presented and organized according to the objectives of the study and the research questions (see Chapter One, Sections 1.3.1 and 1.4). The sequence of data presentation is as follows: characteristics of distance learners surveyed; range of ICTs available and extent of their use by distance learners; e-readiness of University Libraries for distance learners; information literacy skills of distance learners; policies for providing information for distance learners; challenges experienced by distance learners in finding information through ICTs and respondents' suggestions to address the issues identified and which affect access and use of ICTs in information access by distance learners.

4.2 Characteristics of Distance Learners

This section presents background information on characteristics of the distance learners surveyed. Understanding the background of the respondents would shed some light on the factors that influence the use or non-use of ICTs by the respondents. Gender and age

were found to be particularly important. The study sought to establish if these characteristics influenced the use or non-use of ICTs.

4.2.1 Distribution by Gender

Findings indicate that the sample from the University of Nairobi consisted of 48 (64.9%) male students and 26 (35.1%) female students, a ratio of 2 male students: 1 female student.

4.2.2 Distribution by Age

Figure 4-1 shows that the age distribution of the sample from the University of Nairobi ranged from 20-50 years with the predominant age being between 31 and 35 years.

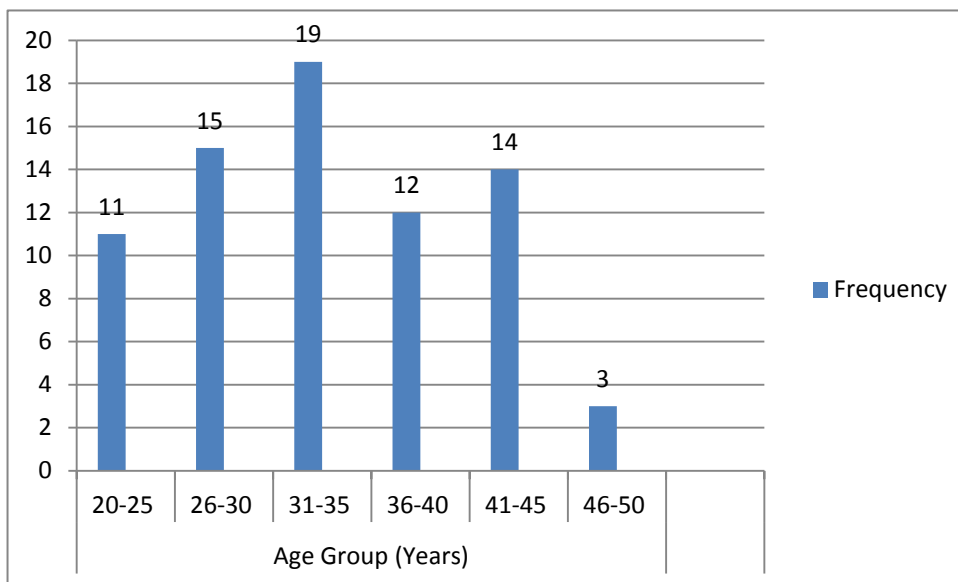


Figure 4-1: Distribution by Age at the University of Nairobi

4.2.3 Distribution by Level of Study

The sample consisted of 4 (5.4%) postgraduate and 70 (94.6) undergraduate students.

4.2.4 Distribution by Study Centres

Distance learners surveyed came from various Study Centres as shown in Table 4.2.

Table 4.2: Distribution by Study Centre: University of Nairobi

(n=74)

Study Centre	Frequency	Percentage
Nairobi	30	40.5
Kisumu	14	18.9
Nakuru	7	9.5
Mombasa	7	9.5
Kapenguria	6	8.1
Nyeri	3	4.1
Kisii	3	4.1
Meru	1	1.3
Kakamega	1	1.3
Busia	1	1.3
No response	1	1.3
Total	74	100

4.3 Range of ICTs Available and Extent of their Use by Distance Learners

The first objective of the study was to map and audit the range of ICTs application at the selected case organization. Distance students were asked to indicate their access and use of ICTs through a number of questions. In addition, the researcher conducted interviews with four categories of university staff to establish the ICT infrastructure in the university. These included the Directorate of Distance Education, Deans, Chairmen of

Departments, University Librarians and senior library staff (Senior Librarians and Librarians).

4.3.1 Access to ICTs by Distance Learners

The first question sought to establish the range of ICTs that distance students had access to (See question 14, in Appendix 1). This was a multiple response question. The responses are as shown in Table 4.3.

Table 4.3: Access to ICTs by Distance Students

(n=74)

Access to ICTs	Frequency	Percentage
Computer with Internet Facilities	65	87.8
Mobile Phone	65	87.8
DVD	40	54.1
Radio Cassette	28	37.8
Other	0	0

(Multiple Responses)

The findings of the study indicate that computer and the mobile phone were ranked highest in terms of access by distance students from the University of Nairobi. 65 (87.8%) had access to a computer and to a mobile phone respectively.

4.3.2 Age Distribution in Computer Use

The study investigated whether there were age differences in access to and use of computers. Figure 4-2 shows the age frequency distribution in access and use of computer. There was no response from 9 respondents. The finding was that the predominant age group using computers at the University of Nairobi was between 31-35 years of age.

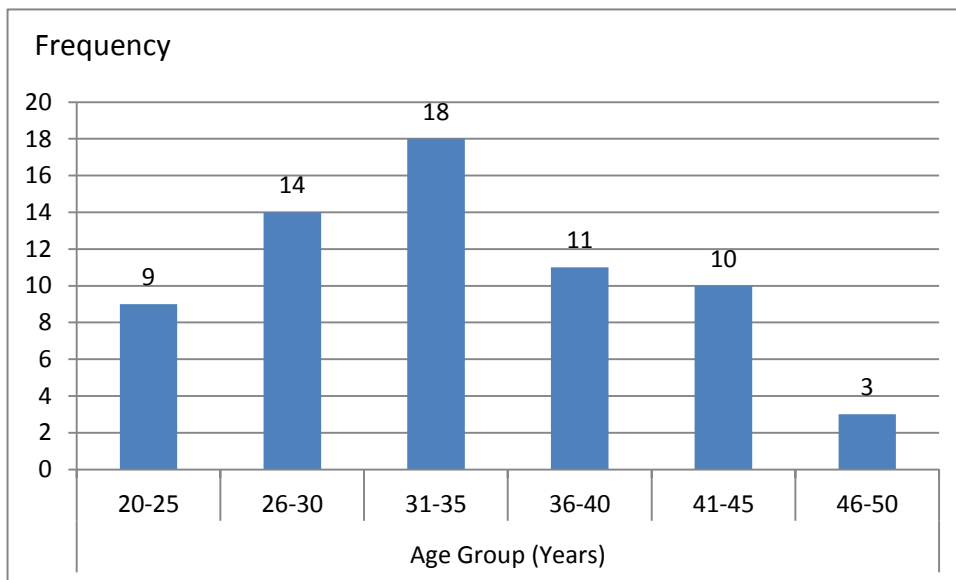


Figure 4-2: Age Distribution in Access to and Use of Computer

4.3.3 Gender Distribution in Computer Use

The study investigated whether there were gender differences among distance students in access to computers. 42 out of 48 or 87.5% of male students and 23 out of 26 or 88% of females had access to a computer. The ratio of male: female students with access to a computer was 2:1. Considering that the male: female ratio in the sample was 2:1, the finding was that there were no gender differences in access to and use of computers.

4.3.4 Location of Use of Computer

The second question sought to establish the location from where distance students get access to a computer (See question 15, in Appendix 1). This was a multiple response question. Responses are as shown in Table 4.4.

Table 4.4: Location of Use of Computer: University of Nairobi

(n=74)

Location	Frequency	Percentage
Commercial Cyber café	43	58.1
Personal laptop	18	24.3
Work Place	16	21.6
Home	13	17.6
University Library	10	13.5
Cyber café Within the University	9	12.2
No Access to a Computer	9	12.2
Study Centre	0	0

(Multiple Responses)

Data reveals that out-of a total of 74 respondents, 43 (58.1%) accessed and used computers from a commercial cyber café, followed by 18 (24.3%) from a personal laptop, 16 (21.6%) from the work place, 13 (17.6%) from home, 10 (13.5%) from the University library and 9 (12.2%) from a cyber café within the university. 9 (12.2%) of the respondents had no access to a computer and no respondent indicated having access to a computer at a study centre.

Findings reveal that majority of distance students made use of computer outside the university library and the study centre.

4.3.5 ICT Infrastructure in the University

The study sought to establish what ICTs were available in the university. This was achieved through interviews with the Directorate of Distance Education, ICT Directors and Deans and Chairmen of Departments. The following multiple responses were obtained:

internet connectivity; computer labs connected to the internet; networked computers in offices; Wireless network; Vsat at AVU; Study Centres on fibre link; laptops for Deans, Chairmen of Departments and Directors; Students Management System; students cyber cafés; e-learning blackboard; Broadcasting Studio; Audio Cassettes and Mobile phones; the ratio of the computers in the labs to students is 3 computers for every 100 students.

Interviews were also conducted with the University Librarian, Senior Librarians and Librarians to establish what ICTs the university libraries had put in place. Their responses were as follows:

the University library is fully automated on Vubis Integrated Library Management System; dedicated server; 200 computers of which 50 are allocated to staff at a ratio of 1:2 and 150 are for library users, a ratio of 3 computers for 100 students; Computers are in all libraries; OPAC; computer labs in all campuses; internet via fibre optic with good connectivity; wireless internet used with laptops; printers; a library website that provides access to e-resources and other information; other information resources such as CD-ROMs, DVDs and audio-visual materials.

Findings indicate that a range of ICTs were available in various departments as well as in the University library.

4.3.6 Access to and Use of ICTs in the University

The researcher interviewed the Directorate of Distance Education, Deans and Chairmen of departments and the ICT Directors to establish the accessibility to ICTs. The

Directorate of Distance Education and the ICT Director indicated that accessibility to ICTs on campus was good but inadequate upcountry due to poor infrastructure. Deans and Chairmen of Departments indicated that accessibility was good but not fully utilized due to computer illiteracy.

When asked to describe the accessibility of ICTs to distance students, Chairmen of departments, multiple responses were obtained as follows:

accessibility of ICTs to distance students from the university is more or less non-existent; distance students can only access computers through the study centres; not sure about access at the study centres.

Further probing revealed that the ICTs put in place were accessible to full time students mainly. Distance students could only access them during residential sessions and even then the timetable was so tight that they rarely found time to use the computers. These findings concur with findings of data collected from distance students which indicates that majority of distance students had accessed a computer mainly from a commercial cyber-café, the workplace and personal computer (see Tables 4.4 above).

The Directorate of Distance Education and Deans and Chairmen of Departments were also asked to indicate how they used the ICTs. Responses obtained were:

ICTs are mainly used in e-mail communication; students' records administration; processing exam marks; word processing; internet access; for presentations; this accounts for 40% use of ICTs; access to library e-resources is still low.

The researcher also interviewed the Directorate of Distance Education, Deans and Chairmen of Departments to establish how content is delivered to distance students. Their responses were as follows:

the main medium for content delivery is the printed modules; other methods include face-to-face mode, audio cassettes and video conferencing.

Further probing revealed that the proportion of content delivered through printed modules was about 80%, through face-to-face 15% and the rest (5%) through Audio cassettes and other ICTs. The interviews also revealed that the University of Nairobi was in the process of converting to e-content on Moodle. The e-content was not accessible outside the campus at the time of this study.

The findings were that the main method of content delivery was largely through the printed modules, a little by face-to-face with delivery through ICTs being negligible. When asked if there was content which cannot be delivered through ICTs, majority of the respondents were not sure but those who responded identified Practicals and Teaching Practice as examples of content that cannot be delivered through ICTs.

4.4 E-readiness of University Libraries for Distance Students

The second objective was to explore the level of e-readiness of the university libraries in providing information for distance learners. To address this objective, data was sourced from distance students, university librarians and senior library staff.

4.4.1 Distance Students' Use of Email for Information Services

The researcher sought to establish whether students used e-mail to get information services from the university library. Findings indicates that 3 (4.1%) respondents used e-mail and 71 (95.9%) did not use e-mail to get information services from the library.

4.4.2 Distance Students Use of Mobile Phone for Information Services

Distance students were asked to indicate whether they used the mobile phone to get information services from the university library. The findings were very similar to those of e-mail use. Findings reveal that 1 (1%) respondents used the mobile phone and 73 (98.6%) did not use the mobile phone to get information services from the library.

The researcher interviewed University Librarians and senior to establish how the library communicates with distance students. Multiple responses were obtained from respondents as follows:

no communication; limited face-to-face communication during session; telephone with residence lecturer; through residence lecturer's visit; e-mail residence lecturer; librarian has given an e-mail address to distance students; through the library e-mail; Information Desk receives queries.

It is clear from the responses that e-mail and telephone were not being used by the the University Library to communicate with distance students. This corroborates the findings from students that majority did not use e-mail and the mobile phone to get information services from the university library.

4.4.3 Electronic Services Offered by the University Library

Distance students were asked to indicate what electronic services were offered to them by the university library from a list of options that was provided. This was a multiple

response question. Some students did not respond to this question. 61 (82.4%) respondents responded to this question. 13 (17.6%) did not respond. This indicates that these were not aware of electronic services offered by the university library. Table 4.5 shows responses on electronic services offered.

Table 4.5 Electronic Services Offered by University of Nairobi Library

(n=74)

Electronic Service	Frequency	Percentage
Online Public Access Catalog (OPAC)	24	32.4
Information updates via e-mail	8	10.8
Information portal (library website) accessible to remote users	5	6.8
e-journals & e-databases	1	1.3
Library webpage	0	.0
E-content delivery through virtual learning environments	0	.0
None of the above	5	6.8
Not sure	18	24.3
No response	13	17.6
Total	74	100

Findings indicate that majority of the respondents 24 (32.4%) identified the online public access catalogue (OPAC) as the main e-service offered by the university library. Very few indicated the other e-services from the options provided. A large proportion of respondents, 31 (41.9%) were not aware of the e-services offered.

The researcher interviewed the librarians to establish what e-resources the university library was offering for distance students and how they were made accessible to them. All respondents stated that the e-resources offered by the library for both full-time and distance students included the PERI resources, Open Access e-resources and Past

Examination papers. When asked to indicate how the e-resources were made available to full time and distance students respectively University Librarians and senior library staff stated that access to e-resources was via IP and user names and passwords for some resources.

The findings from the study indicate that the e-resources were posted on the library website. The mode of access was mainly via IP with some resources accessible via username and password. This meant that full time students could access all e-resources since they were within the campus but this was not the case for distance students who were off-campus. These findings concur with those of distance students where they indicated the OPAC as the main e-resource they had access to but not other e-resources like e-journals.

4.4.4 How Distance Students Access Library E-resources

Distance students were asked to indicate how they accessed the university library's e-resources from a list of options provided.

Table 4.6: How Distance Students Access Library e-resources at the University of Nairobi

(n=74)

How Students Access E-resources	Frequency	Percentage
Physically visiting the library	30	41.1
Remotely from a commercial cyber café	9	12.2
Remotely from home	4	5.4
Remotely from outside the library but within the university campus	3	4.1
Remotely from my workplace	3	4.1
Remotely from my study centre	0	0
Other	0	0
None of the above. I have no access	33	44.6
No response	1	1.4

(Multiple Responses)

Table 4.6 reveals that 33 (44.6%) respondents from the University of Nairobi had no access to e-resources, 30 (41.1%) accessed library e-resources by physically visiting the library, those who indicated other options were very few and 1(1.4%) did not respond to this question.

Face-to-face interviews were held with University Librarians and senior library staff respectively to establish whether distance students could access the library e-resources from wherever they were. Multiple responses were obtained as follows:

“yes” and “no”; Online Public Access Catalogue (OPAC) is accessible; other e-resources are accessible via IP and username and password; the facility is there but it is dependent on the connectivity on the ground; distance students have to be in a centre connected to the university system.

These responses concur with the findings from distance students which indicate that except for the OPAC, they gained access to e-resources mainly by physically visiting the library.

4.4.5 Extent of Use of E-Resources

Distance students were asked to indicate from a list of options provided the extent to which they used e-resources such as OPAC, electronic journals and e-databases. Their responses are as indicated in Figure 4-3.

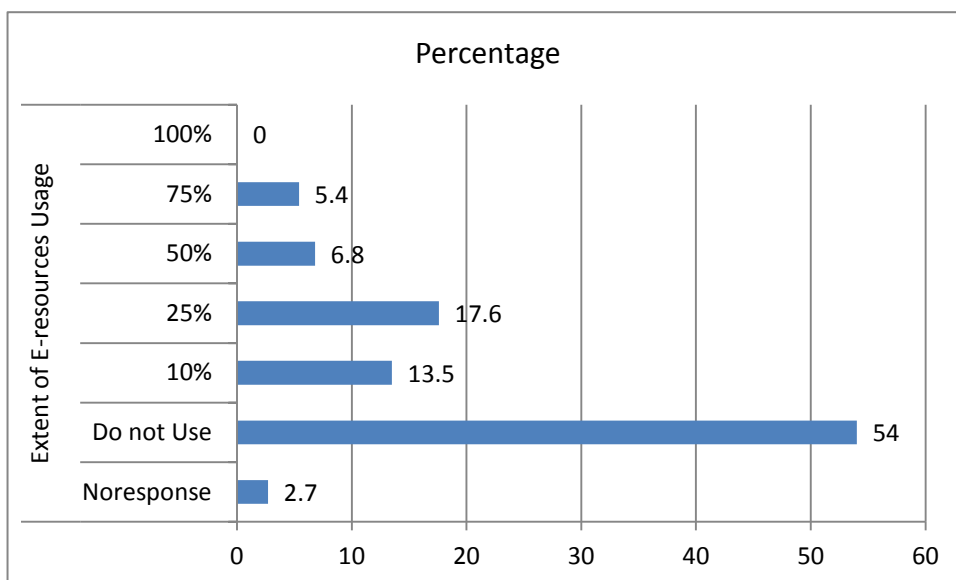


Figure 4-3: Extent of Use of e-resources at the University of Nairobi

Findings indicate that 40 (54%) respondents did not use e-resources. This represented the highest proportion of respondents. The findings confirm that distance students could not access the e-resources remotely. They could only do so while on campus but the extent of e-resources usage was insignificant as they did not have adequate time to use the library during the face-to-face sessions, hence the very low usage or no usage at all.

4.4.6 Frequency of Library Services Use

When asked to indicate the frequency of use of library services from a list of options provided, distance students provided the responses as shown in Table 4.7.

Table 4.7: Frequency of Library Services Use - University of Nairobi**(n=74)**

Library Service	Often (Weekly)	Sometimes (Monthly)	Once a year	Twice a year	Three times a year	Never
Books/Journals consultation in the library	5	9	1	0	47	11
Book loans in presence	5	7	0	0	46	15
Postal loans from home	0	0	0	0	1	71
Document delivery (e.g. photocopies)	1	2	0	0	0	70
Electronic resources accessed at the library	0	4	0	0	21	48
Electronic resources accessed remotely	1	19	0	0	3	50
Reference services/staff assistance	1	12	6	0	49	5

Table 4.7 indicates the responses from the University of Nairobi distance students. The findings from the study indicate that students mainly used library services when they went to campus, for example, 47 (63.5%) respondents indicated “Books/Journals consultation in the library” three times a year, 46 (62.2%) respondents indicated “Books loan in presence” three times a year, 21 (28.4%) respondents accessed electronic services at the library three times a year and 49 (66.2%) used reference services/staff assistance three times a year. Respondents who indicated that they never got postal loan services were 71 (95.5%), those who never got document delivery services were 70 (94.6%),

those who had never accessed electronic resources at the library were 48 (64.9%) and 50 (67.6%) had never accessed electronic resources remotely.

The finding was that distance students could get the library services only when they were on campus. These included mainly services like consultation of books/journals in the library, book loans in presence and reference services. They did not get services like postal loans services, document delivery and access to electronic resources.

The researcher held interviews with University Librarians and senior library staff to establish if the university libraries had services dedicated for distance students. When asked to state the information services offered to distance students, respondents provided their responses as follows:

all library services during residential sessions; enjoy all the facilities during residential sessions; no special arrangement for distance students; print information resources e.g. books; e-resources through the website; not well defined.

When asked if they provided adequate library services for distance students at the study centres, University Librarians stated that book loans were offered at the study centres. However, they were quick to add that library services were only available in some centres, e.g. Mombasa, Kisumu and Kakamega centres which were already networked were offering proper library services while other centres had to network with departments. In such cases, material was given to lecturers. Extra-Mural units were used to disseminate materials.

University Librarians and senior library staff were asked to indicate the usage of library services by distance students. Their responses were as follows:

main usage was at the centres; demand is there but limited by connectivity; usage confined to normal loans; not heavy borrowers because they are overburdened; active for the two weeks they are on campus; often ask for exam papers; postgraduate students use the services more than the undergraduates.

When asked to provide statistics of library services usage by distance students, respondents said that there was no way of tracking usage statistics for distance students. Libraries did not capture usage statistics by distance students at the time of the study.

Interviews with University Librarians and senior library staff reveal that the library services model provided in the selected university was that developed for residential students. There were no services dedicated for distance students and services at the study centres were inadequate. Distance students could only get library services when they went to campus. Even then, usage was confined to normal loans and they were not heavy borrowers because they were overburdened during the two weeks residential session. During such sessions, distance students often ask for exam papers. These findings corroborate the findings from distance students that they got library services only when they were on campus and their library use was confined to consultation of books/journals in the library and book loans in presence. The findings from librarians also indicate that demand for library services from distance students is there but limited by connectivity which concurs with findings from students that they did not use e-services from the university library.

4.4.7 Use of Other Sources of Information

Distance students were asked to indicate from a list of options provided their frequency of use of other sources of information. Table 4.8 show the responses obtained.

Table 4.8: Frequency of Use of Other Sources of Information – University of Nairobi

(n=74)

Information Source (UoN)	Often (Weekly)	Sometimes (Monthly)	Once or twice a year	Never
Study materials (Modules/Units)	68	3	0	1
Resources at the work place	4	20	0	48
Resources at the study centre	3	8	7	54
Other libraries	6	41	0	24
Lecturers	3	8	61	0
Other students	13	40	1	18
The web e.g. Google	7	34	1	28

Findings indicate that 68 (91.9%) respondents used modules often (weekly). Respondents also indicated that they used other libraries sometimes (monthly), 41 (55.4%) respondents; other students sometimes (monthly), 40 (54%) and Google sometimes (monthly), 34 (45.9%) respondents. The finding of the study is that distant learners were predominantly using modules as their main source of information. They also relied on other libraries, other students and Google to supplement the modules.

4.4.8 Current Awareness Service (CAS)

University Librarians and senior library staff were asked to state how current awareness was offered to distance students. The following responses were obtained:

there is no conscious effort to provide CAS to distance students; almost nil - no direct contact with distance students; through talks when they come to campus; physical displays; via the website; accession list and journal alerts sent; brochures and fliers to be done.

The finding of the study was that the current awareness services identified were targeted at the full time residential students and there was no conscious effort to provide CAS targeted at distance students.

4.4.9 Institutional Repositories

The study sought to establish what local content was captured from the academic staff by the University Library. University Librarians and senior library staff were asked to indicate what local content they captured from academic staff for uploading to the website. The responses indicated that the library was in the process of digitizing Past Examination papers and uploading these to the website. However, these were not downloadable outside the campus. Findings indicate that the library had not captured publications by the academic staff to build institutional repositories on their websites. In the case of examination papers which were being uploaded, they were only accessible within the university campus and therefore not accessible to distance students. However, it has been established that between the time of data collection and final completion of this study, the University of Nairobi Library had developed the institutional repository.

4.4.10 Library Staffing for Distance Students

The University Librarian was asked to indicate the highest qualification of the staff in charge of the library information systems. The staff in charge of the library information systems at the University of Nairobi had a Masters in Information Systems. When asked to state if they had library staff dedicated to offer services to distance students, the

respondent stated that there were no library staff dedicated for distance students. Due to inadequate staffing, library staff offered services to all students. The College Library in Kikuyu campus was initially dedicated to distance students, but with distance students being in all campuses, staff served both. The respondent also reported that Mombasa, Kisumu and Kakamega study centres had a room for library and books. The College Librarian liaises with the teaching staff in the selection of books, approval is made by Chairmen of Departments followed by the Dean. The selected books are purchased at the Main Campus. Cataloguing was done in Kikuyu where each copy was prefixed with location. The books were then circulated by the resident lecturers. Kisumu study centre had 2 staff members while Mombasa had 2 Library Assistants and 1 casual.

4.4.11 Library Budget

The University Librarian was asked to state how the library is funded and the annual budget allocated to the library. Responses indicated that the University of Nairobi Library was funded majorly from the parent organization, some donor funding and book donations. It had an annual budget of KSh.100 Million. When asked to indicate what proportion of the budget was allocated for distance learners' library services, the respondent revealed that there was no specific budget line for distance students and that they budgeted for all. The study also sought to establish the proportion of the library budget allocated to ICTs in the library. The response was that the proportion allocated to ICTs was 20% of the total library budget.

4.4.12 Strengths and Weaknesses of the University Library

The study sought to find out from distance students their perception of the benefits and weaknesses of the university library. The aim was to find out whether such perception would be a determinant to the use of ICTs in accessing information from the university library. Multiple responses on the key strengths of the university library were:

availability of reference materials; access to information; book loan service; photocopy service; staff assistance; reading space and enhancement of research.

Multiple responses on the key weaknesses of the university library were:

inaccessibility off campus, distance, scarcity of materials, limited book loan, lack of information literacy programmes, no properly organized services for distance students, no branch libraries, poor ICT infrastructure and limited space for large students numbers.

Findings indicate that distance students recognized the value of the university library in providing information for their study. However, the university library had major weaknesses which point at inadequate services for distance learners.

4.5 Information Literacy Skills of Distant Learners

One of the objectives of the study was to establish the adequacy of information literacy skills of distance learners. To address this objective, data was sourced from distance students, Deans and Chairmen of Departments, University Librarians and senior library staff.

4.5.1 Students Proficiency in Online Searching

Distance students were asked to indicate how proficient they were on online searching and retrieval. Figure 4-4 shows the responses obtained.

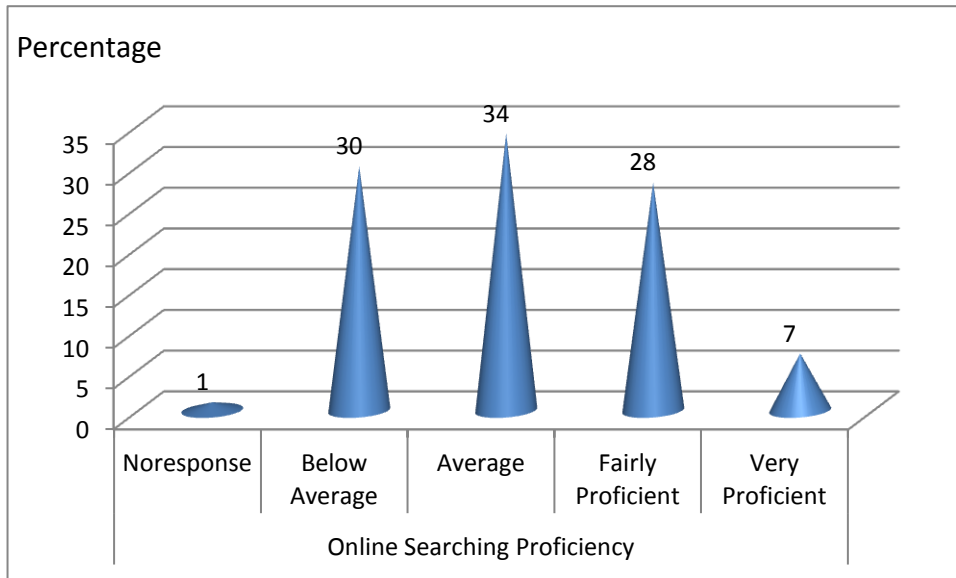


Figure 4-4: Online Searching Proficiency: University of Nairobi

Findings indicate that an insignificant number 26 (35%) of respondents at the University of Nairobi were proficient in online searching while 47 (64%) were average and below average in online searching proficiency. Interviews with Deans and Chairmen of Departments indicated that accessibility to ICTs in the university was good but not fully utilized due to computer illiteracy.

4.5.2 Competencies in ICT Skills

Distance students were asked to indicate how they learnt to use the internet. There was no response from 10 (13.5%) respondents. This represents the proportion of students who did not have ICT skills. Multiple responses were obtained from 64 (86.5%) respondents as shown in Table 4.9.

Table 4.9: Internet Use Training: University of Nairobi**(n=74)**

Internet Training	Frequency	Percentage
Through friends	36	56.3
Hands-on-practice (self-training)	17	26.6
Formal course	10	13.5
No response	10	13.5
University organized training	1	1.6

Table 4.9 shows that majority of respondents from the University of Nairobi learnt how to use the internet through friends, 36 (56.3%) and through hands-on-practice (self-training), 17 (26.6%).

The study also sought to establish the information literacy level of distance students from the librarians' perspective. Interviews were conducted with University Librarians and senior library staff. All respondents stated that the information literacy level for distance undergraduate students was very low. Information literacy among post-graduate students however, was good as they had previous exposure to using libraries. When asked to indicate whether the library organized orientation, induction and training for distance students, University Librarians and senior library staff provided the following responses:

distance students are disadvantaged in this respect; orientation is not structured; the university does not schedule for orientation of distance students; time is very short when they come for face-to-face sessions; distance students are not taught "Library Skills" like full time students; institutionally centralized talks by the University Librarian is inadequate; only occasional students are inducted.

The finding of the study was that the University Library did not have an information literacy programme for distance students. This finding corroborates the findings from distance students that they were not very proficient in online searching and that they learnt information searching skills mainly from friends or through self training.

4.6 Policies Supporting Provision of Information for Distance Learners

4.6.1 Distance Education Policies

One of the objectives of the study was to establish the policies that the selected case organization had put in place for supporting provision of information for distance learners. To address this objective, the researcher interviewed the Directorate of Distance Education, ICT Directorate and the University Librarian. These were selected on the basis that they were the categories of respondents which would be involved in the development of policies. The Directorate of Distance Education was asked to state what distance education policies were in place in the university. The findings indicate that distance education was included in policy development at the University of Nairobi. The policy in place was to run the dual mode of distance learning in which distance learning co-existed with face-to-face mode. The university was also developing the e-learning policy at the time of this study.

The University Librarian was asked to state if the university library had a strategic plan. The response from the respondent was a “yes” response. When probed further to indicate if the library had a policy for distance learners, the respondent gave a “no” response and stated that: “the library policy is silent about distance learners.” Asked how the library

management is involved in planning for distance education programmes, the respondent stated that:

the University Librarian is a member of various university committees such as Faculty Board, Post-graduates Board, Deans Committee and Senate. In addition, College Librarians from the University of Nairobi are members of the various committees which make decisions within the college.

4.6.2 ICT Policies

The researcher interviewed the Directorate of Distance Education to establish whether the University of Nairobi had ICT policies and strategy. The Directorate of Distance Education indicated that this was under the Directorate of ICT. The ICT Director was therefore interviewed on the same. The ICT Director indicated that the university had ICT policies in place as well as the Information Systems Steering Strategy. The respondent indicated that the ICT policy looks at enhancing ICT in the university and includes the number of computers, improvement of connectivity and band-width. The University Librarian was also asked whether the university library had ICT policies and strategy. The following were the responses:

the Library Strategic Plan has a big component on ICT. The ICT component of the Library Strategic Plan looks at the number of computers, improvement of connectivity and band-width, enhancing access to e-resources by increasing the number of resources and capacity building. The ICT Strategic Plan developed by the ICT Directorate has a component on the library.

When asked how the ICT strategic plan addressed the needs of information access by distance learners, the respondent indicated that:

the ICT policy looks at enhancing ICT as a whole and the issue of distance students is not separately addressed.

The findings of this study indicate that the University of Nairobi had developed ICT policies and strategies at the institutional level and at the University Library's level. However, the needs of distance students were not addressed in the ICT policies.

4.7 Challenges Experienced By Distance Students in Accessing Information through ICTs

One of the objectives of this study was to identify the challenges that distance learners experienced in accessing information through ICTs. To address this objective, data was sourced from distance students, Directorate of Distance Education, Deans, Chairmen of departments, University Librarians and senior library staff (Senior Librarians and Librarians).

Distance students were asked in an opinion question to indicate the degree to which they agreed or disagreed with the opinion expressed in the statements in Figure 4-5. Five categories of agreement/disagreement were used: 'strongly disagree, disagree, neutral, agree and strongly agree'. A significant number, 58 (78.4%) of the respondents agreed with the statement that 'they find it difficult to access library materials'.

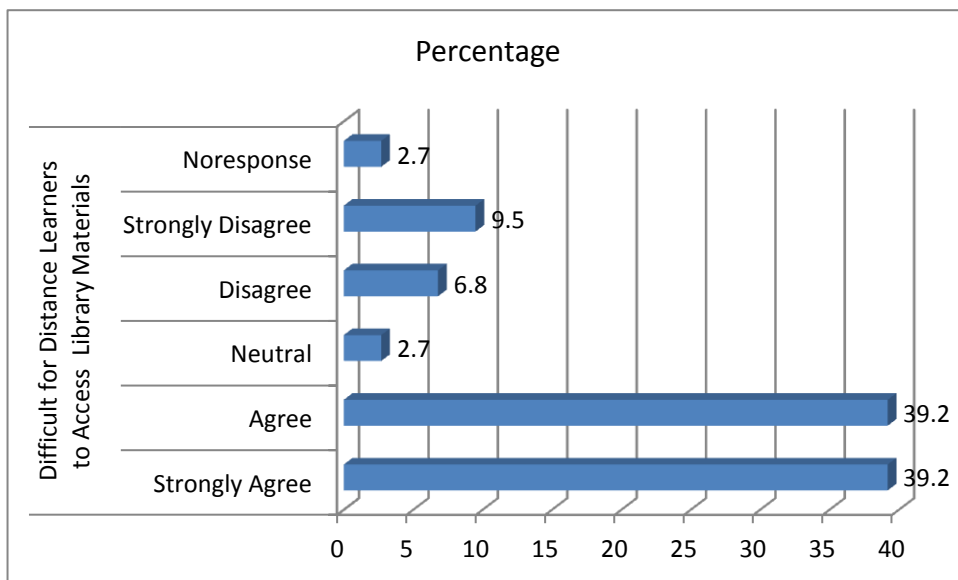


Figure 4-5: Students Perception on Access to Information: University of Nairobi

Through an open-ended question, distance students were asked to identify the challenges they experienced in accessing information through ICTs. In addition, interviews with the Directorate of Distance Education, Deans, Chairmen of departments, University Librarians and senior library staff (Senior Librarians and Librarians) elicited information on the challenges. The study identified a number of challenges that distance students experienced in accessing information through ICTs. These challenges are as discussed below.

Distance

Distance was one of the key barriers identified. Distance students were located in far places in the rural areas and had to travel long distances to get access to the university library or the nearest study centre. Inaccessibility of the library off-campus was a key hindrance to accessing information.

Time Limitation

Distance students have competing priorities. Normally they are in employment, have families and they have to allocate time for study. Consequently, they find themselves time constrained. As such, they find the book loan period too restrictive and therefore inadequate.

Use of the University Library

Although distance students have access to the university library during residential sessions, their time-table is normally packed leaving very little time for use of the library. In some cases, residential sessions were held in centres far from the university library and as such students could not visit the university library. At the time of this study, residential sessions at the University of Nairobi were being held at Nairobi School, Kenya Railways Training Institute and Kenya Water Institute which were too far from the main university library or the branch libraries for students to visit the library.

Cost

Findings show that cost of accessing information through ICTs was a challenge to distance students. Distance students used cyber cafés to access a computer and the internet. Online searching was expensive. In addition, travelling long distances to the university library or visiting other libraries was expensive due to transport costs. Apart from cost in terms of money, there was a cost in terms of time spent searching for information.

Lack of Awareness and Training

The study established that distance students were not aware of the online resources and services offered by the university library. There is no organized orientation and information literacy programme for distance students by the library. In addition, the students lacked basic computer skills and therefore found it difficult to locate relevant information from the internet. This resulted in time wastage in finding information.

Communication with the Library

The study established that communication between the university library and distance students was a challenge. Communication from the university to centres was poor. This was attributed to bureaucratic systems of the university. Distance students did not have close contact with librarians and no virtual services such as online help were provided for distance learners by the library. The use of e-mail and the mobile phone for communication with distance students had not been adopted by the library.

ICT Infrastructure

Findings show that ICT infrastructure was not well developed especially in rural areas where distance learners are located. There was poor connectivity from where distance students are located. Network delays due to low bandwidth were common. Lack of electricity in the rural areas was also a challenge. In addition, power interruptions had a negative effect on access to information.

Lack of Computers

Distance students did not have access to computers located in the university except limited access during residential sessions. Furthermore, the number of computers was inadequate for the large number of users. The number of computers at the centres was

also inadequate. Buying their own laptops was a challenge due to financial constraints. Distance students had therefore to visit cyber cafés to get access to a computer which was not convenient for them and was also expensive.

Access to e-resources

The findings show that distance students experienced challenges in accessing e-resources remotely. Access to the e-resources offered by the university library was limited as it was dependent on the connectivity on the ground. Distance students had to be in a centre connected to the university system. Furthermore, the mode of access to e-resources was by IP addresses and username and password for some resources. With the use of IP addresses, distance students needed to be at a university campus to access the e-resources. They could not access such e-resources from their computers at home or from a cyber café because these were outside the IP range. Another challenge on e-resources access was that some e-resources were not downloadable because the university library had no subscription to them.

E-Services

Distance students did not get e-services such as online book loans, online reference services and document delivery. They had to physically visit the library to get library services.

Inadequate Services at Study Centres

Findings also show that library services and resources at the study centres were inadequate. Regional centres lacked the facilities and resources and this posed a challenge to distance students in accessing information through ICTs.

Scarce Information Resources

Findings also show that there was competition for scarce information resources such as physical books. Distance students shared the same information resources with regular students which were inadequate for the large student numbers at the university. As such, distance students could only find outdated materials.

Library Assistance

The provision of library services for distance students was poorly coordinated. There were no library services dedicated for distance students. As a result, there was a general lack of assistance by the library. This resulted in students' reliance on former students for information and preference for Google and cut and paste. Although the Kikuyu Campus library was initially meant to serve distance education, these days it serves all users since distance learning is now offered in all campuses.

4.8 Suggested Ways of Improving Accessibility and Use of Information

The last objective of this study was to make recommendations for improving access and use of information through ICTs by distance learners in public university libraries. To address this objective, respondents were asked to make suggestions to address the issues identified and which affect access and use of ICTs in information access by distance learners. An analysis of the suggestions made revealed that there was a general consensus among the respondents on the need to strengthen certain areas among them the following:

Proper Planning and Management of Distance Education Programme

Respondents felt that proper planning of distance education programmes was not done during the initial launching. They note that most thinking was based on regular

programmes which led to low allocation of resources. In addition key stakeholders such as the librarians were excluded during the initial planning stages. Proper planning and management is necessary for the success of any programme. Distance education programmes should be planned for separately from the regular programmes and allocated adequate resources. All stakeholders should be involved during the planning for distance education programmes. Librarians should work in close consultations with lecturers, ICT and Distance Education departments. They should for example physically accompany lecturers when they meet students.

Formulation of Policies for Distance Education

Respondents suggested that there should be clear institutional policies on distance education. The ICT policy should address the needs of distance learners. Distance learners have unique challenges that such policies should address. University Libraries should have a clear policy on how best to serve distance learners.

Improve Communication with Distance Students

There is need to sensitize librarians on distance learners as a special category of users so that they can increase interaction with them. Librarians should communicate through e-mail and the mobile phone with distance students as this is the most convenient mode for them.

Expand Libraries to Regional Centres

It was suggested that the University library should be decentralized to the regional centres so as to reach distance learners. At the same time, the university should open more regional centres because the current centres are far from some of the students.

Relevant and adequate information resources and services should be provided at the centres. The University library should control centre libraries. It was further suggested that the central library system should be networked with regional centres electronically.

Improve ICT Infrastructure at Study Centres

A suggestion was made that all regional centres should be equipped with ICTs. The university should provide more computers at study centres and improve connectivity. The government should zero rate computers and improve rural electrification. The university should also encourage students to buy laptops and be connected from home.

Digitize the University Library

Another suggestion was to digitize the university library. Respondents pointed out that it was necessary to shift from a central physical library to a digital library. The library should use ICTs innovatively to make resources accessible. The book budget should, for example, be put into a more technical environment. The electronic library should be remotely accessible online to distance learners. The library should provide remote access to e-resources such as e-books and e-journals. The library should also provide e-library services such as document delivery via e-mail.

Train Distance Students in ICT and Information Searching skills

It was suggested that librarians should be more active in creating awareness to distance students on the resources and services available for them from the library. They should organize an orientation programme immediately the students enroll in the university. This should be followed by organized information literacy training to impart skills that the

students can use to exploit the resources offered to them. This can be achieved through organized meetings, workshops and seminars. Effort should also be made to provide information literacy via e-learning.

Capacity Building

A suggestion was made that all university staff including the library staff should be adequately trained in ICT skills to be able to assist distance students. They should also be trained in e-learning.

Library's Flexibility in Loan Services

It was suggested that the library should consider having flexible library rules for distance learners. The book loan system should not be so restrictive to distance learners as they have to travel long distances to return books to the library. For the same reason, the library should offer postal or courier loan delivery service.

Provide Mobile Library Services during Residential Sessions

Another suggestion was that the university library should provide mobile library services during residential sessions. As noted under challenges, some of the centres used for residential sessions are located far from the university library and as such students are unable to visit the library. A mobile library would address this problem.

Library Assistance

It was suggested that the library should have staff dedicated for distance learners. This would ensure that distance students get the library assistance they so deserve.

University Library should Partner with other Libraries

It was suggested that the university library should develop partnerships with other libraries. This would enable distance students to use the resources in other libraries nearest to them.

The University Library Should Play a Central Role

It was suggested that the university library should play a central role in e-learning. Indeed the library should act as the e-learning resource centre. It should integrate e-learning content with library e-resources so that distance students can access all resources from a central platform. All teaching departments should develop the e-content but this can be posted on the same platform with the e-resources.

4.9 Summary

This chapter has presented analyzed, interpreted and discussed data that was collected at Case Study Organization 1 – the University of Nairobi. It has examined a number of factors that affect access and use of ICTs for information provision for distance learners. Data collected related to factors deemed crucial to understanding the subject of the research including: characteristics of distance learners surveyed; range of ICTs and their application in support of Distance Education; e-readiness of University libraries for distance learners; information literacy skills of distance learners; policies supporting

provision of information for distance learners; challenges experienced by distance learners in finding information through ICTs and respondents' suggestions to address the issues identified. The study investigated how ICTs are utilized for information access by distance learners and in the process revealed gaps that need to be addressed so as to enhance access and use of ICTs in information provision for distance learners.

The study revealed that the University of Nairobi had put in place a range of ICTs such as computers, internet, student management system, computer labs. These were being used for functions such as e-mail, students' records administration, processing examination marks, word processing, internet access and presentations. However, the study revealed that there were still many areas that required to be addressed if distance students were to benefit from these ICTs. The number of computers was inadequate for the large number of students and staff and the computers were not accessible to distance students. Internet connectivity from where distance learners are located is poor. The e-learning policy was not fully developed. There was a lack of a defined policy on how to address distance students information needs by the university library. The needs of distance students were not addressed in the ICT policy. Data presented revealed that distance students had not used electronic services from the university library. Consequently, some suggestions from respondents' own perspective have been made which if implemented could help to enhance access to information through ICTs by distance learners.

CHAPTER 5

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

CASE STUDY ORGANIZATION 2

5.0 Introduction

This chapter presents data derived from questionnaires administered to distance learners and from interviews with the selected categories at Case Study Organization 2 – Kenyatta University. Data derived from questionnaires (See Appendix 1) was of a quantitative nature. It was analysed using SPSS and presented in graphical and tabular form. According to Neuman (2006), frequency tables and graphical representations are common methods of data presentation. Apart from the use of tables, figures were also used to vary the presentation of data. Percentages were rounded up to one decimal place. Data from interviews (see Appendices 2 – 5) was analysed thematically. The data was organized around themes and presented in a descriptive manner. In some cases, phrases and terms used by respondents are indicated.

5.1 Response Rate

Data from questionnaires and interviews addressing a particular research theme in relation to the study objectives are presented together. This approach enabled the researcher to collate research findings from questionnaires and interview schedules.

The sample size from Kenyatta University is as shown in Table 5.1. One hundred (100) questionnaires were distributed to distance students. 61 out of 100 or 61% of the distance

students surveyed completed and returned the questionnaire. The number of respondents interviewed is as shown in Table 5.1.

Table 5.1: Sample Size from Kenyatta University

Respondents	Numbers	Percentage
Distance Students (postgraduates and undergraduates)	61	61
Directorate of Distance Education	3	100
Deans and Chairmen of Departments	8	66.7
ICT Directors	1	100
University Librarians	1	100
Senior Library Staff (Senior Librarians and Librarians)	8	80
Total	81	63.8

Data is presented and organized according to the objectives of the study and the research questions (see Chapter One, Sections 1.3.1 and 1.4). The sequence of data presentation is as follows: characteristics of distance learners surveyed; range of ICTs available and extent of their use by distance learners; e-readiness of University Libraries for distance learners; information literacy skills of distance learners; policies for providing information for distance learners; challenges experienced by distance learners in finding information through ICTs and respondents' suggestions to address the issues identified and which affect access and use of ICTs in information access by distance learners.

5.2 Characteristics of Distance Learners

This section presents background information on characteristics of the distance learners surveyed. Understanding the background of the respondents would shed some light on the factors that influence the use or non-use of ICTs by the respondents. Gender and age

were found to be particularly important. The study sought to establish if these characteristics influenced the use or non-use of ICTs.

5.2.1. Distribution by Gender

The sample from Kenyatta University consisted of 42 (68.9%) male students and 19 (31.1%) female students, a ratio of 2 male students: 1 female student.

5.2.2 Distribution by Age

Figure 5-1 shows that the age distribution of the sample from Kenyatta University ranged from 20-55 years with the predominant age being between 26 and 30 years.

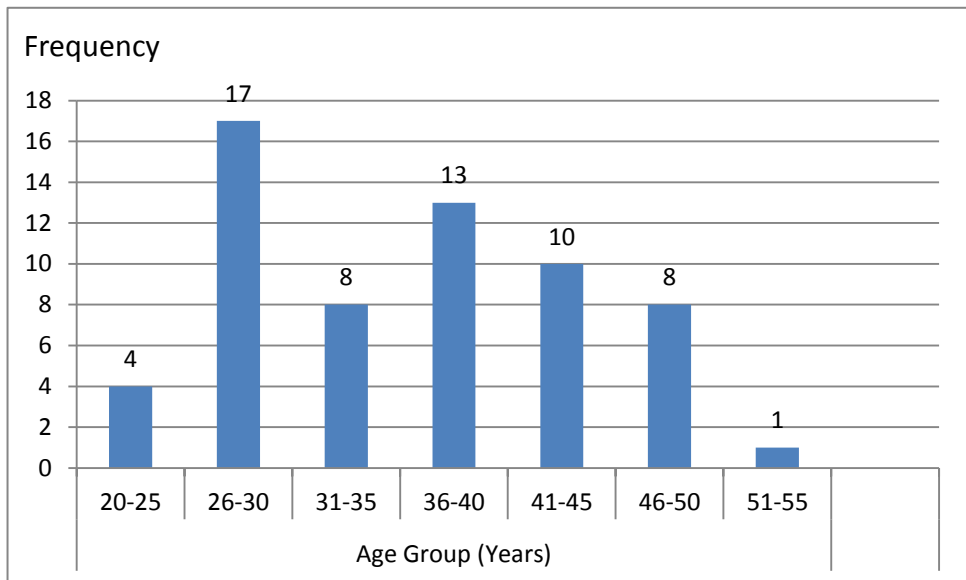


Figure 5-1: Distribution by Age at Kenyatta University

5.2.3 Distribution by Level of Study

The sample consisted of 24 (39.3%) postgraduate and 37 (60.3%) undergraduate students.

5.2.4 Distribution by Study Centres

Distance students surveyed came from various Study Centres as shown in Table 5.2.

Table 5.2: Distribution by Study Centre at Kenyatta University

(n=61)

Study Centre	Frequency	Percentage
Nairobi	31	50.8
Kisumu	15	24.6
Nyeri	4	6.5
Nakuru	3	4.9
Mombasa	3	4.9
Kakamega	2	3.3
Garissa	1	1.6
No response	2	3.3
Total	61	100

5.3 Range of ICTs Available and their Use by Distance Learners

The first objective of the study was to investigate the range of ICTs application at the selected case organization. Distance students were asked to indicate their access and use of ICTs through a number of questions. In addition, the researcher conducted interviews with four categories of university staff to establish the ICT infrastructure in the university. These included the Directorate of Distance Education, Deans, Chairmen of Departments, University Librarians and senior library staff (Senior Librarians and Librarians).

5.3.1 Access to ICTs by Distance Learners

The first question sought to establish the range of ICTs that distance students had access to. This was a multiple response question. The responses are as shown in Table 5.3.

**Table 5.3: Access to ICTs by Distance Learners at Kenyatta University
(n=61)**

Access to ICTs	Frequency	Percentage
Computer with Internet Facilities	48	78.7
Mobile Phone	48	78.7
DVD	38	62.3
Radio Cassette	28	45.9
Other	3	4.9

(Multiple Responses)

Findings indicate that access to the computer with internet facilities and the mobile phone were ranked highest. 48 (78.7%) respondents had access to the computer and to a mobile phone respectively. Other ICTs cited were the Television and LCD Projector.

5.3.2 Age Distribution in Computer Use at Kenyatta University

The study investigated whether there were age differences in access to and use of computers. Figure 4-2 shows the age frequency distribution in access and use of computer.

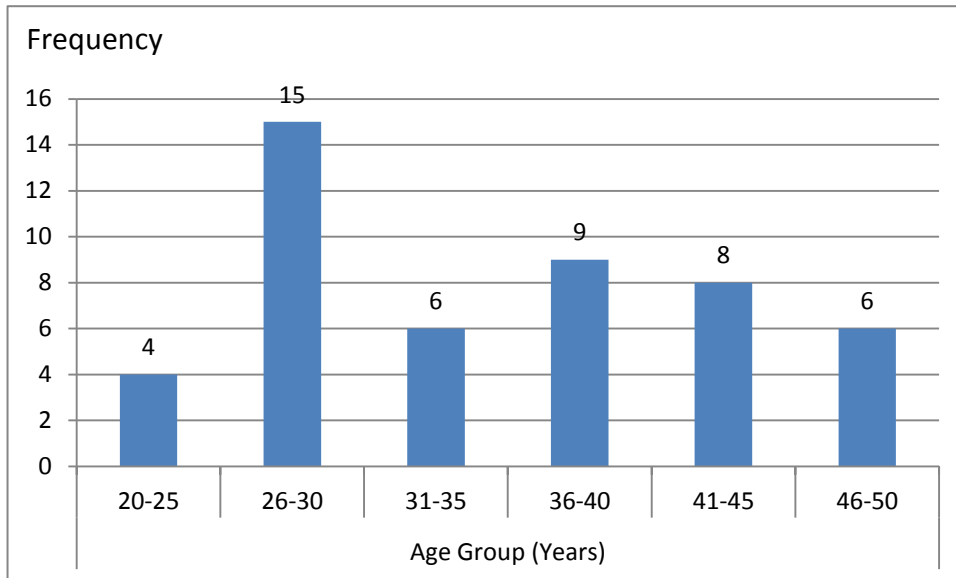


Figure 5-2: Age Distribution in Access to and Use of Computer

Figure 5-2 shows the age frequency distribution in access to and use of computer. There was no response from 13 respondents. The finding was that the predominant age group using computers was between 26-30 years.

5.3.3 Gender Distribution in Computer Use

The study investigated whether there were gender differences among distance students in access to computers. There were 31 out of 42 male (73.8%) and 17 out of 19 female (89.5%) respondents with access to a computer. The ratio of male: female ratio was 2:1. Considering that the male:female ratio in the sample was 2:1, the finding was that there were no gender differences in access to and use of computers.

5.3.4 Location of Use of Computer

The second question sought to establish the location from where distance students get access to a computer. This was a multiple response question. Responses are as shown in Table 5.4.

Table 5.4: Location of Use of Computer: Kenyatta University

(n=61)

Location	Frequency	Percentage
Work place	35	57.4
Commercial Cyber café	22	36.1
University Library	21	34.4
Personal laptop	17	27.9
Cyber café Within the University	16	26.2
Home	14	23.0
Study Centre	9	14.8
No Access to a Computer	6	9.8

(Multiple Responses)

Data obtained indicates that out-of a total of 61 respondents, 35 (57.4%) accessed and used computers from the work place, followed by 22 (36.1%), from a commercial cyber café, 21 (34.4%) from the university library, 17 (27.9%) had personal laptops, 16 (26.2%) from a cyber café within the university, 12 (23.0%) from home and 9 (14.8%) from the study centre. 6 (9.8%) respondents had no access to a computer.

Findings reveal that majority of distance students made use of computer outside the university library and the study centre.

5.3.5 ICT Infrastructure in the University

The study sought to establish what ICTs were available in the university. This was achieved through interviews with the Directorate of Distance Education, ICT Directors. The following multiple responses were obtained:

internet connectivity; computer labs connected to the internet; networked computers in offices; wireless network; Vsat at AVU; Study Centres on fibre link; laptops for Deans, Chairmen of Departments and Directors; Students Management System; students cyber cafés; e-learning blackboard; Broadcasting Studio; Audio Cassettes and mobile phones; the ratio of the computers in the labs to students is 5 computers for every 100 students; there is a loan facility for both students and staff to buy laptops.

Interviews were also conducted with the University Librarian, Senior Librarians and Librarians to establish what ICTs the university library had put in place. Their responses were as follows:

University library is fully automated on KOHA Integrated Library Management System; there are 500 computers of which 100 are allocated to staff at a ratio of 1:1 and 400 are for library users, a ratio of 7.5 computers for 100 students; these computers are allocated as follows: 5 computer labs with 40 computers each, 18 computers for OPAC, 5 computers in the Meeting/Instruction rooms, 47 computers in Study Carrels, 5 computers in the Group meeting room, computers in the Graduate Resource Centre; internet via fibre optic with good connectivity; wireless internet used with laptops; printers; library website that provides access to e-resources and other information; other information resources such as CD-ROMs, DVDs and audio-visual materials.

Findings indicate that a range of ICTs were available in various departments as well as in the University library.

5.3.6 Access to and Use of ICTs in the University

The researcher interviewed the Directorate of Distance Education, Deans and Chairmen of departments and the ICT Directors to establish the accessibility to ICTs. The Directorate of Distance Education and the ICT Director indicated that accessibility to

ICTs on campus was good but inadequate upcountry due to poor infrastructure. Deans and Chairmen of Departments indicated that accessibility was good but not fully utilized due to computer illiteracy.

When asked to describe the accessibility of ICTs to distance students, Chairmen of departments, multiple responses were obtained as follows:

accessibility of ICTs to distance students from the university is more or less non-existent; distance students can only access computers through the study centres; not sure about access at the study centres.

Further probing revealed that the ICTs put in place were accessible to full time students mainly. Distance students could only access them during residential sessions and even then the timetable was so tight that they rarely found time to use the computers. The researcher's experience in Kenyatta University also revealed that despite all the high numbers of computers available, these were still not adequate for the large numbers of students on campus.

These findings concur with findings of data collected from distance students which indicates that majority of distance students had accessed a computer mainly from the workplace and commercial cyber-café (see Tables 5.4 above).

The Directorate of Distance Education and Deans and Chairmen of Departments were also asked to indicate how they used the ICTs. Their responses were as follows:

ICTs are mainly used in e-mail communication; students' records administration; processing exam marks; word processing; internet access; for presentations; this accounts for 40% use of ICTs; access to library e-resources is still low.

The researcher also interviewed the Directorate of Distance Education, Deans and Chairmen of Departments to establish how content is delivered to distance students.

Responses were as follows:

The main medium for content delivery is the printed modules; other methods include face-to-face mode, audio cassettes and video conferencing.

Further probing revealed that the proportion of content delivered through printed modules was about 80%, through face-to-face 15% and the rest (5%) through Audio cassettes and other ICTs. The interviews also revealed that the university was in the process of converting to e-content on Moodle. The e-content was not accessible outside the campus at the time of this study.

The findings were that the main method of content delivery was largely through the printed modules, a little by face-to-face with delivery through ICTs being negligible. When asked if there was content which cannot be delivered through ICTs, majority of the respondents were not sure but those who responded identified Practicals and Teaching Practice as examples of content that cannot be delivered through ICTs.

5.4 E-readiness of University Libraries for Distance Students

One of the objectives of this study was to explore the level of e-readiness of the university libraries in providing information for distance learners. To address this objective, data was sourced from distance students, university librarians and senior library staff.

5.4.1 Distance Students Use of Email for Information Services

The researcher sought to establish whether students used e-mail to get information services from the university library. Findings indicate that 22 (36.1%) respondents used e-mail and 37 (60.6%) did not use e-mail to get information services from the library. 2 (3.3%) did not respond to the question.

5.4.2 Distance Students Use of Mobile Phone for Information Services

Distance students were asked to indicate whether they used the mobile phone to get information services from the university library. The findings were very similar to those of e-mail use. Findings reveal that 12 (19.7%) used the mobile phone and 46 (75.4%) did not use the mobile phone to get information services from the library. 3 (4.9%) did not respond to the question.

The researcher interviewed University Librarians and senior to establish how the library communicates with distance students. Multiple responses were obtained from respondents and included:

no communication; limited face-to-face communication during session; through the library e-mail; only happens at personal level; not official; no students contacts; telephone – distance students call the library; e-mail not embraced as official means of communication; students have to come to the centres; contact person among students is the students leader; mainly through writing.

It is clear from the responses that e-mail and telephone were not being used by the the University Library to communicate with distance students. This corroborates the findings from students that majority did not use e-mail and the mobile phone to get information services from the university library.

5.4.3 Electronic Services Offered By the University Library

Distance students were asked to indicate what electronic services were offered to them by the university library from a list of options that was provided. This was a multiple response question. Some students did not respond to this question.

Table 5.5: Electronic Services Offered By Kenyatta University Library

(n=61)

Electronic Service	Frequency	Percentage
Online Public Access Catalog (OPAC)	11	18.0
Library webpage	9	14.8
e-journals & e-databases	7	11.5
Information updates via e-mail	5	8.2
Information portal (library website) accessible to remote users	0	.0
E-content delivery through virtual learning environments	0	.0
None of the above	6	9.8
Not sure	0	.0
No response	23	37.7
Total	61	100

Findings indicate that 38 (62.3%) respondents responded to this question while 23 (37.7%) did not respond. This indicates that there was a general lack of awareness among distance students on the e-services offered by the university library. There were 11 (18%) respondents who identified the online public access catalogue (OPAC) as the main e-service offered by the university library. Very few indicated the other e-services. The finding of the study was that the OPAC was the main e-resource distance students had

access to. Other e-resources like e-journals, e-databases and information updates via e-mail were not accessible to distance students.

The researcher interviewed the University Librarian and senior librarians to establish what e-resources the university library was offering for distance students and how they were made accessible to them. All respondents stated that the e-resources offered by the library for both full-time and distance students included the PERI resources, Open Access e-resources and Past Examination papers. When asked to indicate how the e-resources were made available to full time and distance students respectively, the respondents stated that access to e-resources was via IP and user names and passwords for some resources.

The findings from the study indicate that the e-resources were posted on the library website. The mode of access was mainly via IP with some resources accessible via username and password. This meant that full time students could access all e-resources since they were within the campus but this was not the case for distance students who were off-campus. These findings concur with those of distance students where they indicated the OPAC as the main e-resource they had access to but not other e-resources like e-journals.

5.4.4 How Distance Students Access Library E-resources

Distance students were asked to indicate how they accessed the university library's e-resources from a list of options provided. Their responses are as shown in Table 5.6.

Table 5.6: How Distance Students Access Library e-resources: Kenyatta University (n=56)

How Students Access E-resources	Frequency	Percentage
Physically visiting the library	29	47.4
Remotely from a commercial cyber café	12	19.7
Remotely from my workplace	12	19.7
Remotely from my study centre	8	13.1
Remotely from outside the library but within the university campus	7	11.5
Remotely from home	4	6.6
Other	1	1.6
None of the above. I have no access	10	16.4
No response	5	8.2

(Multiple Responses)

Table 5.6 reveals that 29 (47.4%) respondents from Kenyatta University accessed library e-resources by physically visiting the library. Respondents who accessed library e-resources from a commercial cyber café were 12 (19.7%), those who accessed from the workplace 12 (19.7%), respondents who had no access to e-resources were 10 (16.4%) and 5 (8.2%) did not respond to this question. The finding of the study is that majority of distance students accessed library e-resources mainly by physically visiting the library.

Face-to-face interviews were held with University Librarians and senior library staff respectively to establish whether distance students could access the library e-resources from wherever they were. Multiple responses were obtained as follows:

“yes” and “no”; Online Public Access Catalogue (OPAC) is accessible; other e-resources are accessible via IP and username and password; the facility is there but it is dependent on the connectivity on the ground; distance students have to be in a centre connected to the university system.

These responses concur with the findings from distance students which indicate that except for the OPAC, they gained access to e-resources mainly by physically visiting the library.

5.4.5 Extent of Use of E-Resources

Distance students were asked to indicate from a list of options provided the extent to which they used e-resources such as OPAC, electronic journals and e-databases. Their responses are as indicated in Figure 5-3.

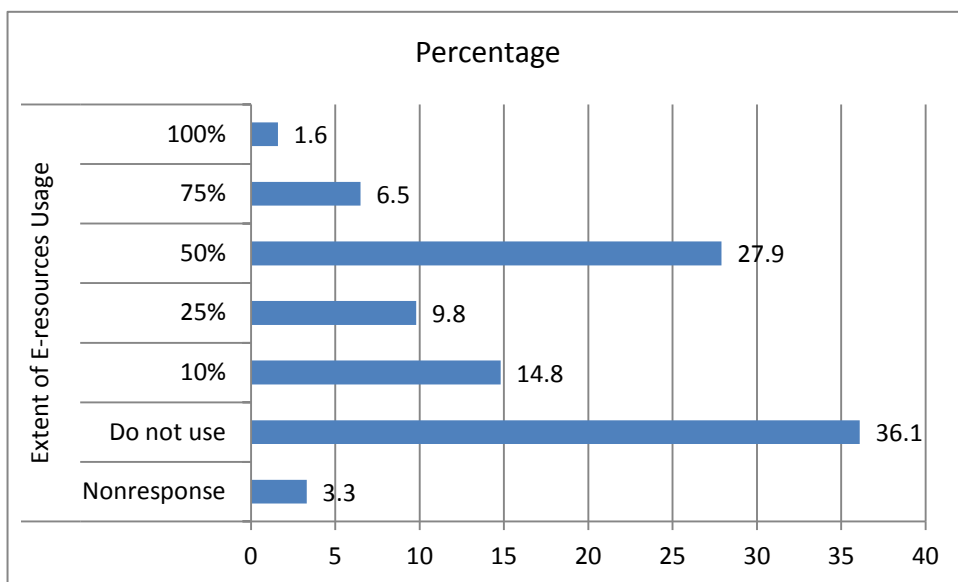


Figure 5-3: Extent of Use of e-resources: Kenyatta University

Findings indicate that 22 (36.1%) respondents from Kenyatta University did not use the e-resources, 17 (27.9%) indicated the extent of use as average and the rest indicated very low usage. The findings confirm that distance students could not access the e-resources remotely. They could only do so while on campus but the extent of e-resources usage was

insignificant as they did not have adequate time to use the library during the face-to-face sessions, hence the very low usage or no usage at all.

5.4.6 Frequency of Library Services Use

When asked to indicate the frequency of use of library services from a list of options provided, distance students provided the responses as shown in Table 5.7.

Table 5.7: Frequency of Library Services Use: Kenyatta University

(n=61)

Library Service	Often (Weekly)	Sometimes (Monthly)	Once a year	Twice a year	Three times a year	Never
Books/Journals consultation in the library	18	19	1	0	2	11
Book loans in presence	10	17	0	2	1	18
Postal loans from home	2	2	1	0	1	34
Document delivery (e.g. photocopies)	15	15	0	1	1	19
Electronic resources accessed at the library	5	25	0	2	1	18
Electronic resources accessed remotely	15	14	2	0	1	19
Reference services/staff assistance	10	24	0	4	1	10

Data in Table 5.7 indicates the responses from Kenyatta University distance students on their usage of library services. The findings from the study indicate that students mainly used library services when they went to campus, for example, a total of 37 (60.6%) respondents indicated “Books/Journals consultation in the library” often (weekly) and sometimes (monthly); a total of 27 (44.3%) respondents indicated “Books loan in

presence” often (weekly) and sometimes (monthly); 25 (41%) respondents accessed electronic services at the library sometimes (monthly) and a total of 34 (55.7%) used reference services/staff assistance often and sometimes. Respondents who indicated that they never got postal loan services were 34 (55.7%), those who never got document delivery services were 19 (31%), those who had never accessed electronic resources at the library were 18 (29%) and 19 (31%) had never accessed electronic resources remotely.

The finding was that distance students could get the library services only when they were on campus. These included mainly services like consultation of books/journals in the library, book loans in presence and reference services. They did not get services like postal loans services, document delivery and access to electronic resources.

The researcher held interviews with University Librarians and senior library staff to establish if the university libraries had services dedicated for distance students. When asked to state the information services offered to distance students, respondents provided their responses as follows:

all library services during residential sessions; enjoy all the facilities during residential sessions; no special arrangement for distance students; print information resources e.g. books; e-resources through the website; not well defined; extended borrowing (1 month); discretion on overdue; can borrow more books.

When asked if they provided adequate library services for distance students at the study centres, University Librarians stated that book loans were offered at the study centres. However, they were quick to add that library services were only available in some centres, e.g. Parklands, Ruiru, Mombasa and Kitui campus libraries.

University Librarians and senior library staff were asked to indicate the usage of library services by distance students. The following responses were obtained:

main usage was at the centres; demand is there but limited by connectivity; usage confined to normal loans; not heavy borrowers because they are overburdened; active for the two weeks they are on campus; often ask for exam papers; postgraduate students use the services more than the undergraduates.

When asked to provide statistics of library services usage by distance students, respondents said that there was no way of tracking usage statistics for distance students. Libraries did not capture usage statistics by distance students at the time of the study.

Interviews with University Librarians and senior library staff reveal that the library services model provided in the university was that developed for residential students. There were no services dedicated for distance students and services at the study centres were inadequate. Distance students could only get library services when they went to campus. Even then, usage was confined to normal loans and they were not heavy borrowers because they were overburdened during the two weeks residential session. During such sessions, distance students often ask for exam papers. These findings corroborate the findings from distance students that they got library services only when they were on campus and their library use was confined to consultation of books/journals in the library and book loans in presence. The findings from librarians also indicate that demand for library services from distance students is there but limited by connectivity which concurs with findings from students that they did not use e-services from the university library.

5.4.7 Use of Other Sources of Information

Distance students were asked to indicate from a list of options provided their frequency of use of other sources of information. Their responses are as shown in Table 5.8.

Table 5.8: Frequency of Use of Other Sources of Information: Kenyatta University (n=61)

Information Source (KU)	Often (Weekly)	Sometimes (Monthly)	Once or twice a year	Never
Study materials (Modules/Units)	52	5	3	1
Resources at the work place	41	15		3
Resources at the study centre	12	32	2	8
Other libraries	6	20	8	9
Lecturers	18	21	14	1
Other students	25	28	0	3
The web e.g. Google	23	17	1	8

Findings indicate that 52 (85.2%) respondents used modules often (weekly). Respondents also indicated that they used resources at the work place often (weekly), 41 (67.2%) respondents; other students often (weekly), 25 (41%) respondents and 28 (45.9%) respondents sometimes (monthly); Google often 23 (37.7%) respondents and 17 (27.9%) respondents sometimes (monthly). The finding of the study is that distant learners were predominantly using modules as their main source of information. They also relied on resources at the work place, other students and Google to supplement the modules.

5.4.8 Current Awareness Service (CAS)

University Librarians and senior library staff were asked to state how current awareness was offered to distance students. The following multiple responses were obtained:

no conscious effort to provide CAS to distance students; almost nil - no direct contact with distance students; through talks when they come to campus; physical displays; via the website; accession list and journal alerts sent; brochures and fliers to be done; the library is in the process of developing the electronic notice board and RSS feeds on OPAC on the library website.

The finding of the study was that the current awareness services identified were targeted at the full time residential students and there was no conscious effort to provide CAS targeted at distance students.

5.4.9 Institutional Repositories

The study sought to establish what local content was captured from the academic staff by the University Library. University Librarians and senior library staff were asked to indicate what local content they captured from academic staff for uploading to the website. The responses indicated that the library was in the process of digitizing Past Examination papers and uploading these to the website. However, these were not downloadable outside the campus. Findings indicate that the library had not captured publications by the academic staff to build institutional repositories on their websites. In the case of examination papers which were being uploaded, they were only accessible within the university campus and therefore not accessible to distance students. However, it has been established that between the time of data collection and final completion of this study, Kenyatta University Library had developed the institutional repository.

5.4.10 Library Staffing for Distance Students

The University Librarian was asked to indicate the highest qualification of the staff in charge of the library information systems. The staff in charge of the library information systems at Kenyatta University had a Masters in Library & Information Science plus specialization in ICT.

When asked to state if they had library staff dedicated to offer services to distance students, the respondent stated that there were no library staff dedicated for distance students. Due to inadequate staffing, library staff offered services to all students. One Senior Librarian was the Coordinator of Campus libraries namely Parklands, Ruiru, Mombasa and Kitui, which also give access to distance students. His role was to ensure that after the books were processed in the main campus library, they were distributed to the Branch libraries. Two library staff were seconded to Parklands and Ruiru branch libraries.

5.4.11 Library Budget

The University Librarian was asked to state how the library is funded and the annual budget allocated to the library. Responses indicated that the University Library was funded majorly from the parent organization, some donor funding and book donations. It had an annual budget of KSh.30 Million. When asked to indicate what proportion of the budget was allocated for distance students' library services, the respondent revealed that there was no specific budget line for distance students and that they budgeted for all. The study also sought to establish the proportion of the library budget allocated to ICTs in the library. The response was that the ICT budget was 33% of the total library budget.

5.4.12 Strengths and Weaknesses of the University Library

The study sought to find out from distance students their perception of the benefits and weaknesses of the university library. The aim was to find out whether such perception would be a determinant to use of ICTs in accessing information from the university library. Multiple responses obtained on the key strengths of the university library were:

availability of reference materials; access to information; book loan service; photocopy service; staff assistance; reading space and enhancement of research.

Multiple responses on the key weaknesses of the university library were:

inaccessibility off campus, distance, scarcity of materials, limited book loan, lack of information literacy programmes, no properly organized services for distance students, no branch libraries, poor ICT infrastructure and limited space for large students numbers.

Findings indicate that distance students recognized the value of the university library in providing information for their study. However, the university library had major weaknesses which point at inadequate services for distance learners.

5.5 Information Literacy Skills of Distance Learners

One of the objectives of the study was to establish the adequacy of information literacy skills of distance learners. To address this objective, data was sourced from distance students, Deans and Chairmen of Departments, University Librarians and senior library staff.

5.5.1 Students Proficiency in Online Searching

Distance students were asked to indicate how proficient they were on online searching and retrieval. Figure 5-4 shows the responses obtained.

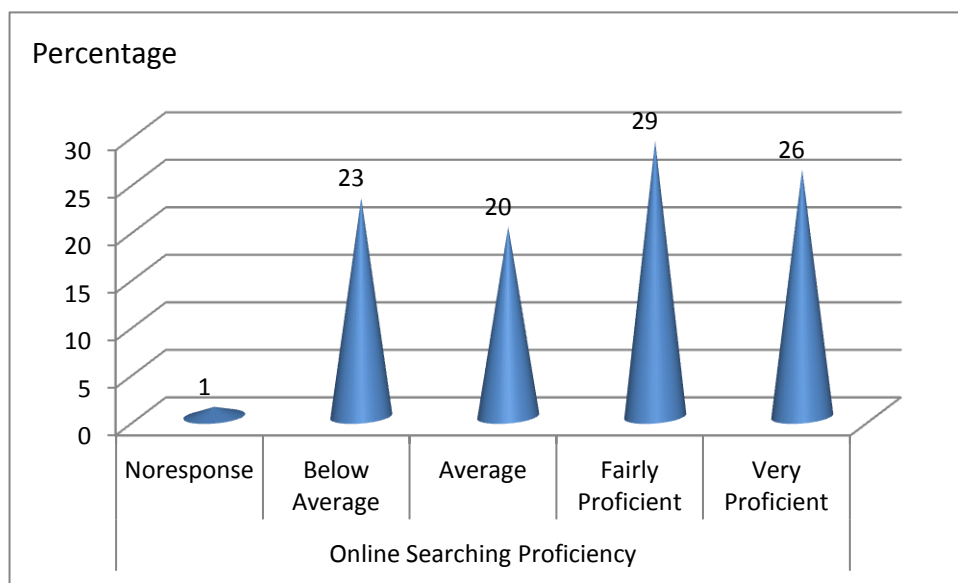


Figure 5-4: Online Searching Proficiency: Kenyatta University

Findings indicate that a total of 33 (55%) respondents were proficient in online searching while 26 (43%) were average and below average.

5.5.2 Competencies in ICT Skills

Respondents were asked to indicate how they learnt to use the internet. There was no response from 25 (40.9%) respondents. This represents the proportion of students who did not have ICT skills. Respondents who provided multiple responses were 36 (59%). Table 5.9 shows the responses obtained.

Table 5.9: Internet Use Training: Kenyatta University

(n=61)

Internet Training	Frequency	Percentage
No response	25	40.9
Hands-on-practice (self-training)	13	36.6
Formal Course	10	27.8
Through friends	8	22.2
University organized training	5	13.9

Table 5.9 shows that an insignificant number of 13 (36.6%) respondents had internet skills and they mainly learnt how to use the internet through hands-on-practice or self-training.

The study also sought to establish the information literacy level of distance students from the librarians' perspective. Interviews were conducted with University Librarians and senior library staff. All respondents stated that the information literacy level of distance undergraduate students was very low. Information literacy among post-graduate students however, was good as they had previous exposure to using libraries. When asked to indicate whether the library organized orientation, induction and training for distance students, University Librarians and senior library staff provided the following responses:

distance students are disadvantaged in this respect; orientation is not structured; the university does not schedule for orientation of distance students; time is very short when they come for face-to-face sessions; distance students are not taught "Library Skills" like full time students; institutionally centralized talks by the University Librarian is inadequate; only occasional students are inducted.

The finding of the study was that Kenyatta University Library did not have an information literacy programme for distance students. This finding corroborates the findings from distance students that they learnt information searching skills mainly through self training.

5.6 Policies Supporting Provision of Information for Distance Learners

5.6.1 Distance Education Policies

One of the objectives of this study was to establish the policies that the selected case organization had put in place for supporting provision of information for distance learners. To address this objective, the researcher interviewed the Directorate of Distance Education, the ICT Directorate and the University Librarian. These were selected on the basis that they were the categories of respondents which would be involved in the development of policies. The Directorate of Distance Education was asked to state what distance education policies were in place in the university.

The findings indicate that distance education was included in policy development at Kenyatta University. The policy in place was to run the dual mode of distance learning in which distance learning co-existed with face-to-face mode. The university was also developing the e-learning policy at the time of this study.

The University Librarian was asked to state if the university library had a strategic plan. The response was a “yes” response. When probed further to indicate if the library had a policy for distance learners, the respondent gave a “no” response and stated that the library policy was silent when it came to distance learners. Asked how the library management is involved in planning for distance education programmes, the respondent stated that the University Librarian was a member of various university committees such as Faculty Board, Post-graduates Board, Deans Committee and Senate.

5.6.2 ICT Policies

The researcher interviewed the Directorate of Distance Education to establish whether Kenyatta University had ICT policies and strategy. The Directorate of Distance Education indicated that this was under the Directorate of ICT. The ICT Directorate was therefore interviewed. The respondent indicated that the university had ICT policies in place as well as the Information Systems Steering Strategy. The ICT policy looks at enhancing ICT in the university and includes the number of computers, improvement of connectivity and band-width. The University Librarian was also asked whether the university library had ICT policies and strategy. The following were the responses:

the Library Strategic Plan has a big component on ICT. The ICT component of the Library Strategic Plan looks at the number of computers, improvement of connectivity and band-width, enhancing access to e-resources by increasing the number of resources and capacity building. The ICT Strategic Plan developed by the ICT Directorate has a component on the library.

When asked how the ICT strategic plan addressed the needs of information access by distance students, the respondent indicated that:

the ICT policy looks at enhancing ICT as a whole and the issue of distance students is not separately addressed.

The findings of this study indicate that Kenyatta University had developed ICT policies and strategies at the institutional level and at the University Library's level. However, the needs of distance students were not addressed in the ICT policies.

5.7 Challenges Experienced by Distance Students in Accessing Information through ICTs

One of the objectives of this study was to identify the challenges that distance learners experienced in accessing information through ICTs. To address this objective, data was sourced from distance students, Directorate of Distance Education, Deans, Chairmen of departments, University Librarians and senior library staff (Senior Librarians and Librarians). In order to first establish whether distance students experienced challenges in accessing information through ICTs, distance students were given an opinion question. In the opinion question, distance students were asked to indicate the degree to which they agreed or disagreed with the opinion expressed in the statements in Figure 5-5. Five categories of agreement/disagreement were used: 'strongly disagree, disagree, neutral, agree and strongly agree'. A significant number 37 (60.6%) of the respondents agreed with the statement that 'they find it difficult to access library materials' as shown in Figure 5-5.

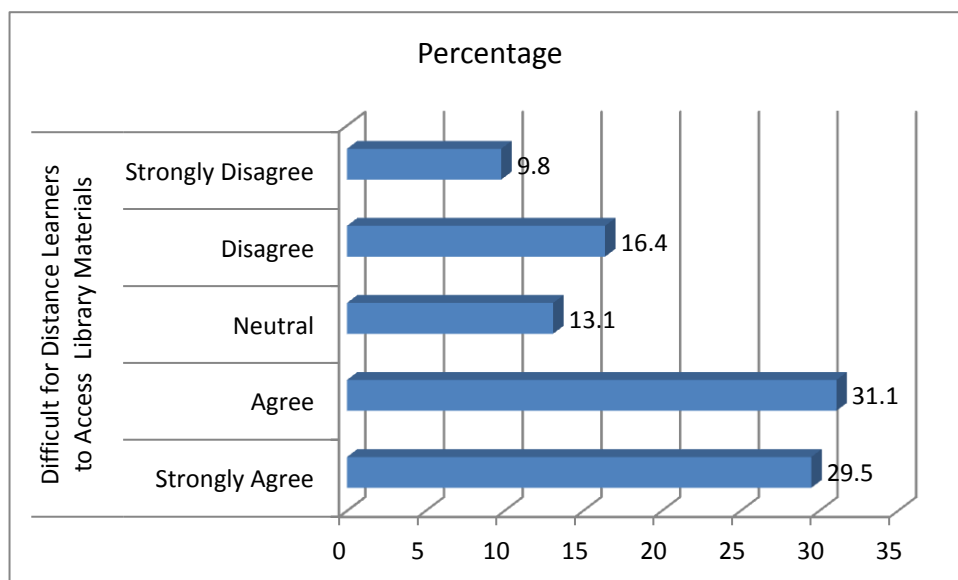


Figure 5-5: Students Opinion on Access to Information: Kenyatta University

The study identified a number of challenges that distance students experienced in accessing information through ICTs. These challenges are as discussed below.

Distance

Distance was one of the key barriers identified. Distance students were located in far places in the rural areas and had to travel long distances to get access to the university library or the nearest study centre. Inaccessibility of the library off-campus was a key hindrance to accessing information.

Time Limitation

Distance students have competing priorities. Normally they are in employment, have families and they have to allocate time for study. Consequently, they find themselves time constrained. As such, they find the book loan period too restrictive and therefore inadequate.

Use of the University Library

Although distance students have access to the university library during residential sessions, their time-table is normally packed leaving very little time for use of the library. In some cases, residential sessions were held in centres far from the university library and as such students could not visit the university library. At the time of this study, some residential sessions at Kenyatta University were being held at the Ruiru campus which is far from the main university library.

Cost

Findings show that cost of accessing information through ICTs was a challenge to distance students. Distance students used cyber cafés to access a computer and the internet. Online searching was expensive. In addition, travelling long distances to the university library or visiting other libraries was expensive due to transport costs. Apart from cost in terms of money, there was a cost in terms of time spent searching for information.

Lack of Awareness and Training

The study established that distance students were not aware of the online resources and services offered by the university library. There is no organized orientation and information literacy programme for distance students by the library. In addition, the students lacked basic computer skills and therefore found it difficult to locate relevant information from the internet. This resulted in time wastage in finding information.

Communication with the Library

The study established that communication between the university library and distance students was a challenge. Communication from the university to centres was poor. This

was attributed to bureaucratic systems of the university. Distance students did not have close contact with librarians and no virtual services such as online help were provided for distance learners by the library. The use of e-mail and the mobile phone for communication with distance students had not been adopted by the library.

ICT Infrastructure

Findings show that ICT infrastructure was not well developed especially in rural areas where distance learners are located. There was poor connectivity from where distance students are located. Network delays due to low bandwidth were common. Lack of electricity in the rural areas was also a challenge. In addition, power interruptions had a negative effect on access to information.

Lack of Computers

Distance students did not have access to computers located in the university except limited access during residential sessions. Furthermore, the number of computers was inadequate for the large number of users. The number of computers at the centres was also inadequate. Buying their own laptops was a challenge due to financial constraints. Distance students had therefore to visit cyber cafés to get access to a computer which was not convenient for them and was also expensive.

Access to e-resources

The findings show that distance students experienced challenges in accessing e-resources remotely. Access to the e-resources offered by the university library was limited as it was dependent on the connectivity on the ground. Distance students had to be in a centre connected to the university system. Furthermore, the mode of access to e-resources was by IP addresses and username and password for some resources. With the use of IP

addresses, distances students needed to be at a university campus to access the e-resources. They could not access such e-resources from their computers at home or from a cyber café because these were outside the IP range. Another challenge on e-resources access was that some e-resources were not downloadable because the university library had no subscription to them.

e-services

Distance students did not get e-services such as online book loans, online reference services and document delivery. They had to physically visit the library to get library services.

Inadequate Services at Study Centres

Findings also show that library services and resources at the study centres were inadequate. Regional centres lacked the facilities and resources and this posed a challenge to distance students in accessing information through ICTs.

Scarce Information Resources

Findings also show that there was competition for scarce information resources such as physical books. Distance students shared the same information resources with regular students which were inadequate for the large student numbers at the university. As such, distance students could only find outdated materials.

Library Assistance

The provision of library services for distance students was poorly coordinated. There were no library services dedicated for distance students. As a result, there was a general lack of assistance by the library. This resulted in students' reliance on former students for information and preference for Google and cut and paste.

5.8 Ways of Improving Access to and Use of Information

The last objective of this study was to make recommendations for improving access to and use of ICTs for information provision for distance learners in public universities. To address this objective, respondents were asked to make suggestions to address the issues identified and which affect access and use of ICTs in information access by distance learners. An analysis of the suggestions made revealed that there was a general consensus among the respondents on the need to strengthen certain areas among them the following:

Proper planning and management of distance education programme

Respondents felt that proper planning of distance education programmes was not done during the initial launching. They note that most thinking was based on regular programmes which led to low allocation of resources. In addition key stakeholders such as the librarians were excluded during the initial planning stages. Proper planning and management is necessary for the success of any programme. Distance education programmes should be planned for separately from the regular programmes and allocated adequate resources. All stakeholders should be involved during the planning for distance education programmes. Librarians should work in close consultations with lecturers, ICT and Distance Education departments. They should for example physically accompany lecturers when they meet students.

Policies for Distance Learners

Respondents suggested that there should be clear institutional policies on distance education. The ICT policy should address the needs of distance learners. Distance

learners have unique challenges that such policies should address. University Libraries should have a clear policy on how best to serve distance learners.

Improve Communication with Distance Students

There is need to sensitize librarians on distance learners as a special category of users so that they can increase interaction with them. Librarians should communicate through e-mail and the mobile phone with distance students as this is the most convenient mode for them.

Expand Libraries to Regional Centres

It was suggested that the University library should be decentralized to the regional centres so as to reach distance learners. At the same time, the university should open more regional centres because the current centres are far from some of the students. Relevant and adequate information resources and services should be provided at the centres. The University library should control centre libraries. It was further suggested that the central library system should be networked with regional centres electronically.

Improve ICT Infrastructure at Study Centres

A suggestion was made that all regional centres should be equipped with ICTs. The university should provide more computers at study centres and improve connectivity. The government should zero rate computers and improve rural electrification in the rural areas. The university should also encourage students to buy laptops and be connected from home.

Digitize the University Library

Another suggestion was to digitize the university library. Respondents pointed out that it was necessary to shift from a central physical library to a digital library. The library should use ICTs innovatively to make resources accessible. The book budget should, for example, be put into a more technical environment. The electronic library should be remotely accessible online to distance learners. The library should provide remote access to e-resources such as e-books and e-journals. The library should also provide e-library services such as document delivery via e-mail.

Train Distance Students in ICT and Information Searching skills

It was suggested that librarians should be more active in creating awareness to distance students on the resources and services are available for them from the library. They should organize an orientation programme immediately the students enroll in the university. This should be followed by organized information literacy training to impart skills that the students can use to exploit the resources offered to them. This can be achieved through organized meetings, workshops and seminars. Effort should also be made to provide information literacy via e-learning.

Capacity Building

A suggestion was made that all university staff including the library staff should be adequately trained in ICT skills to be able to assist distance students. They should also be trained in e-learning.

Library's Flexibility in Loan Services

It was suggested that the library should consider having flexible library rules for distance learners. The book loan system should not be so restrictive to distance learners as they have to travel long distances to return books to the library. For the same reason, the library should offer postal or courier loan delivery service.

Provide mobile library services during residential sessions

Another suggestion was that the university library should provide mobile library services during residential sessions. As noted under challenges, some of the centres used for residential sessions are located far from the university library and as such students are unable to visit the library. A mobile library would address this problem.

Library Assistance

It was suggested that the library should have staff dedicated for distance learners. This would ensure that distance students get the library assistance they so deserve.

University Library should Partner with other Libraries

It was suggested that the university library should develop partnerships with other libraries. This would enable distance students to use the resources in other libraries nearest to them.

The University Library Should Play a Central Role

It was suggested that the University Library should play a central role in e-learning. Indeed the library should act as the e-learning resource centre. It should integrate e-learning content with library e-resources so that distance students can access all resources

from a central platform. All teaching departments should develop the e-content but this can be posted on the same platform with the e-resources.

5.9 Summary

This chapter has presented analyzed, interpreted and discussed data that was collected at Case Study Organization 2 – Kenyatta University. It has examined a number of factors that affect access and use of ICTs for information access by distance learners. Data collected related to factors deemed crucial to understanding the subject of the research including: characteristics of distance learners surveyed; range of ICTs and their application in support of Distance Education; e-readiness of University Libraries for distance learners; information literacy competency skills of distance learners; policies supporting provision of information for distance learners; challenges experienced by distance learners in finding information through ICTs and respondents' suggestions to address the issues identified. The study investigated how ICTs are utilized for information access by distance learners and in the process revealed gaps that need to be addressed so as to enhance access and use of ICTs in information provision for distance learners.

The study revealed that Kenyatta University had put in place a range of ICTs such as computers, internet, student management system, computer labs. These were being used for functions such as e-mail, students' records administration, processing examination marks, word processing, internet access and presentations. However, the study revealed that there were still many areas that required to be addressed if distance students were to benefit from these ICTs. The number of computers was inadequate for the large number of students and staff and the computers were not accessible to distance students. The e-

learning policy was not fully developed. There was a lack of a defined policy on how to address distance students information needs by the university library. The needs of distance students were not addressed in the ICT policy. Data presented revealed that distance students had not used electronic services from the university library. Consequently, some suggestions from respondents' own perspective have been made which if implemented could help to enhance access to information through ICTs by distance learners.

CHAPTER SIX

DISCUSSION OF FINDINGS

6.0 Introduction

Chapter Four and Five presented, analysed and interpreted data collected from respondents of two case organizations, the University of Nairobi and Kenyatta University on a number of factors that were found critical in the access and use of ICTs for information by distance learners. Analysis revealed certain similarities and differences between the two case study organizations and these are the subject of discussion in this chapter. Chapter Six presents interpretations of the research findings. The purpose of the chapter is to search for the broader meaning of the research findings as well as relate the findings to the existing theories and empirical literature. This chapter discusses the findings based on the objectives of the study. The discussions are presented under the following sections: characteristics of distance learners surveyed; range of ICTs available and extent of their use by distance learners; e-readiness of University Libraries for distance learners; information literacy skills of distance learners; policies for providing information for distance learners; challenges experienced by distance learners in finding information through ICTs and respondents' suggestions to address the issues identified and which affect access and use of ICTs in information access by distance learners.

6.1 Characteristics of Respondents at the University of Nairobi and Kenyatta University

This study was informed by Roger's diffusion of innovation theory (1995). In this theory, the adopter, the individual, is an important component. The adopter makes a decision at

the individual level. Adoption is the individual's decision to use new technology while diffusion is the aggregate of adoption decisions. The rate of adoption is measured as the number of individuals who adopt an idea in a specific period. The characteristics of individuals that make them likely to adopt an innovation is one of the important elements in diffusion research. Characteristics of the distance learners were considered important in shedding light on the factors that influence the adoption of ICTs. The number of respondents from the two case organizations is as reflected in Table 6.1 below:

Table 6.1: Number of Respondents from the Two Case Organizations

Respondents	Number of Respondents	
	UoN (n=97)	KU (n=81)
Distance Students (postgraduates and undergraduates)	74	61
Directorate of Distance Education	5	3
Deans and Chairmen of Departments	8	8
ICT Directors	1	1
University Librarians	1	1
Senior Library Staff (Senior Librarians and Librarians)	8	8
Total	97	81

Though the initial sample had the same number of distance students, that is, 100 students for each study organization, the number of responses between the two organizations varied. The University of Nairobi response rate was higher with 74 (74%) respondents while that from Kenyatta University was lower with 61 (61%) respondents. The study revealed that both sets of distance students in the respective institutions had remarkably

similar characteristics. Apart from the Directorate of Distance Education, respondents in other strata numbered the same as the selection had been done purposively. The number of respondents from the Directorate of Distance Education at the University of Nairobi was higher (5) than that of Kenyatta University (3) because members of the Management team at Kikuyu Campus were more than those at Kenyatta University's ODEL. Nevertheless, between the two case organizations, similar strata had similar characteristics as they were purposively selected.

6.2 Characteristics of Distance Learners and Use of ICTs

The study revealed that age demographics among distance students were similar between the two case organizations. At the University of Nairobi, the range was between 20 and 50 with the predominant age between 31 and 35. At Kenyatta University, the range was between 20 and 55 with the predominant age between 26 and 30. Gender representation was also remarkably similar between the two case organizations. The study shows that the percentage of male students was double that of females at both universities. The sample consisted of both undergraduates and postgraduates in both universities. At the University of Nairobi the proportion of undergraduates was much higher, 70 (94.6%) while that of postgraduates was 4 (5.4%). At Kenyatta University, the proportion of undergraduates was 37 (60.7%) while that of postgraduates was 24 (39.3%).

This section will discuss the extent to which characteristics of respondents involved in this study could have influenced their access and use of ICTs. Nwagwu et. al. (2009) found that age and gender are among the factors that influence the use of the internet. Similarly, Blignaut (2009) found that demographic aspects such as age, gender, education and socio-economic status affect usage patterns and the gratification gained from internet

usage. Other studies had similar findings (Okiy and Ruteyan, 2003; Gilbert, Lee-Kelly and Barton, 2003; Sairrose and Mutula, 2004; Gurumurthy, 2006; Lera-Lopez, Billon and Gill, 2011 and Ndung'u et. al. 2012).

6.2.1 Age of Respondents and Extent of Use of ICTs

Age is one of the factors that may influence the use and non-use of ICTs. Findings indicate that majority of respondents were aged between 31-35 at the University of Nairobi and 26-30 at Kenyatta University. A closer analysis of the study indicates that age was a major factor in influencing the utilization of ICTs. The study revealed similar findings on the age variable in both case organizations. The study established that the predominant users of ICTs were younger students in the age bracket 31-35 years at the University of Nairobi and 26-30 years at Kenyatta University. These findings agree with the findings of a study by Adomi et. al. (2003), which established that the predominant regular users of the cybercafé in the Delta State, Nigeria were aged between 21-25 years. Similarly, the findings of a study by Alao and Folorunsho (2008) revealed that majority of cyber café users in Ilorin, Nigeria were students aged 21-25 years. In a study done in Gaborone, Botswana, Sirrose and Mutula (2004) established that users of cyber café were young with the dominant age being in the range of 21-30.

In another study, a household survey on the use of ICTs in Nairobi, Kenya, Ndung'u et. al. (2012) found that 80% and 81.4% of the respondents who were using internet and e-mail respectively were using the mobile phone to connect and were in the age bracket of 18-34 years. The study also established that those in the age group 25-34 were using most of the features of the internet. Apparently, e-learning was only used by this age group. This is corroborated by a study by Akande (2011) on the use of computer and internet

facilities in distance education in Nigeria which found that the predominant age of respondents was in the age bracket 26-30. These are the early adopters. They have greater rationality, have a more favourable attitude toward change and are more able to cope with uncertainty and risk than late adopters (Rogers, 1995).

6.2.2 Gender and Extent of Use of ICTs

The analysis on the gender variable revealed similar findings in both case organizations. The finding of the present study was that there were no gender differences in access to and use of ICTs by distance students in each university. While some studies have highlighted gender differences in the use of ICTs with majority of internet users being predominantly male, other studies have found no differences between the groups. For example, Gutierrez and Gamboa (2010) established that there was a gender gap in digitalization across three countries namely, Mexico, Peru and Columbia. Men had on average, a greater level of digitalization than women. Similarly, Griswold et. al. (2006) found that there was a gender gap in the use of cyber-café's in both Ghana and Nigeria with males out numbering females. A study conducted by Olatokun (2009) on socio-demographic differences in access and use of ICTs in Nigeria on a rural and urban community revealed that there was a gender divide in the two locations as well as rural-urban divide.

On the other hand, Thayer and Ray (2006) conducted a study on online communication preferences across age, gender and duration of internet use. Their findings were that there was no significant main effect for gender and online communication and relationship preferences. Similarly, in their study on internet use in Spain, Lera-Lopez et. al. (2011) found that there were no remarkable gender differences in the frequency of use of the

internet. The KENET project gender analysis of the ICT revealed that there was no significant difference between the male and female students of the universities (KENET, 2008). Similarly, Ndung'u et. al. (2012) found that gender did not have statistically significant influence on usage of the internet, e-mail and mobile phones. In another study on the dynamics of adoption and usage of ICTs in Kenya and Nigeria, Oyelaran-Oyeyinka and Adeya (2004) found no significant gender disparity in internet use among academics. These studies argue that gender alone does not influence use of ICTs. Other factors like education and socio-economic status influence the usage patterns among females and are the main cause of low usage where female users are concerned. According to Gurumuthy (2006), there have been gains for females in the usage of ICTs. Weiser (2000) also asserts that the gender gap in internet use is rapidly diminishing.

Gender differences in usage of ICTs have been attributed to inequalities in socio-economic status including education. Wasserman and Richmond-Abbot (2005) opine that socio-economic differences between men and women are related to the fact that men normally have had higher income levels and education than women. The differences may also be attributed to the fact that men have access to internet at work as they perform professional duties as well as technical expertise, a resource which women at home lack. If equal opportunities were available for all, then there would be no gender differences in access and use of ICTs. The finding of this study that there were no gender differences among distance students in access and use of ICTs in both case institutions can be attributed to the fact that both male and female students had similar education and socio-economic status.

6.3 Range of ICTs Available and Extent of their Use by Distance Learners

6.3.1 ICT Infrastructure in the University

The study established that the selected case study organizations, that is, the University of Nairobi and Kenyatta University had a similar range of ICTs. These included desk-top computers, laptops, internet, Wireless internet (Wi-Fi), student management system, computer labs., students' cyber cafés, e-learning blackboard, Broadcasting Studio, Audio Cassettes and Mobile phones. The study also established that with regards to computers, these were mainly networked desk-top computers located in offices, computer labs and students' cyber cafes in both universities. In Kenyatta University, some members of faculty namely Deans, Chairmen of Departments and Directors, had been given laptops by the university. When the number of computers was considered, the study revealed that Kenyatta University had more computers compared to the University of Nairobi. The study revealed that there was a difference in the PC ratio between the two institutions. The University of Nairobi had a PC ratio 3 PCs per 100 students whereas Kenyatta University had a PC ratio of 5 per 100 students. Kenyatta University therefore had a higher PC to students' ratio than the University of Nairobi.

Despite the fact that both institutions had the ICT infrastructure, there was a gap in that the number of computers in both universities was insufficient as their PC to students ratios were below the recommended average ratio of 10 PCs per 100 students. Furthermore, the regional centres at both institutions lacked proper ICT facilities and infrastructure such as electricity supply and Telecommunications. The findings concur with the findings of KENET (2008) e-readiness survey which established that for all 48 African universities surveyed, the PC ratios were all below the recommended average

ratio of 10 PCs per 100 students. In another study, CPS Research International (2012) established that even though Kenyan universities were leading in the use and accessibility of ICTs in education in East Africa, double intakes had reduced the ratio of students to ICTs especially in their main campuses.

The KENET study also established that universities were spending just about 0.3% of their annual budgets on internet bandwidth against the recommended 2%. The Task Force on the Re-Alignment of the Education Sector to the Constitution of Kenya (2010) identified one of the issues affecting distance education in Kenya as inadequate infrastructure and related support. ICT infrastructure is an important component in distance education specifically ICT-based distance education. Lecturers of distance students need to be facilitated with laptops to be able to communicate with distance students anytime, anywhere, at home or in the workplace. Holmberg (1989b) stated that availability of personal computers, modems and printers are a basic condition for distance education to speed up communication which is particularly important in distance education. Internet access is equally important in distance education. On the use of distance technology in the USA, Sherman and Beaty (2007) observed that the number of internet users had increased in the last decade and universities have adopted the use of distance technology for distance education. According to van Brakel and Chisenga (2003), there has been an increase in access to the internet in Africa since the late 1990s. The increase in staff and student populations in the selected universities means an increase in internet users which requires more investment in the band-width.

Another finding of the study was that the ICTs available in both case study institutions were being used for e-mail communication, students' records administration, processing

exams marks and word processing. The finding concurs with the findings by KENET (2008) which points out that the East African university community used computers largely for e-mail and word processing. Similarly, CPS Research International (2012) also points out that most of the lecturers in higher education institutions used ICTs to process and store data.

6.3.2 ICT Infrastructure in the University Library

The study revealed that both case organizations had similar ICT Infrastructure in the university library. Both university libraries had desk-top computers, internet (wired and wireless) as well as an Integrated Library Management System. Both the University of Nairobi and Kenyatta University libraries had automated all their front end and backend processes and provided web-based OPAC services. The University of Nairobi had installed Vubis while Kenyatta University had installed KOHA. This concurs with the findings of KENET e-readiness survey (2008). The survey established that although most university libraries surveyed were not automated and OPAC was not available off-campus, a few universities had achieved stage three and above in the ICT libraries indicator, which meant that they had automated all their front end and backend processes and provided off campus OPAC services. The two case study organizations in the present study were cited as examples.

When the number of computers was considered, the study revealed a difference between the selected cases. Kenyatta University Library had more computers (500 computers) than the University of Nairobi which had 200 computers. The PC: staff ratio at the University of Nairobi Library was 1 PC for 2 library staff and that of Kenyatta University Library was 1 PC for 1 library staff. The PC: students' ratio at the University of Nairobi

Library was 3 PCs for every 100 and 7.5 PCs for every 100 students at Kenyatta University Library. Findings indicate that the university library at Kenyatta University had a higher PC: students' ratio than the University of Nairobi Library. However, there was a gap in both university libraries in that the number of computers was insufficient as it fell below the recommended average of 10 PCs per 100 students. Furthermore the regional centres at both institutions lacked proper library facilities with ICTs. The findings of the present study are consistent with the findings of KENET (2008).

The study also established that both libraries had developed library websites/portals and posted e-resources on their websites. A library portal is a website that provides links to information and other websites. The content may be located anywhere – internal or external to the organization and may be in any format, physical or digital. Murray (2003) opines that implementing a portal brings the opportunity to develop e-library services as key learning support tool which makes it appealing and rewarding to use library services. The findings of the study indicate that the mode of access to e-resources was mainly via IP with some resources accessible via username and password in both institutions. This meant that on-campus students could access all e-resources but this was not the case for distance students who were located off-campus. The library should create a distance learners website from which a variety of resources and services can be accessed and give distance learners access to electronic resources (Maclean and Dew (2004).

6.3.3 Distance Students Access to and Use of ICTs

The findings of the study indicated that in each selected university, majority of distance students had access to a computer and a mobile phone. At the University of Nairobi, 65 (87.8%) respondents had access to a computer and to a mobile phone respectively. At

Kenyatta University, 48 (78.7%) had access to a computer and to a mobile phone respectively. On further investigation, however, the study established that distance students at both case study organizations did not access the computer from the university library or the study centre. Respondents from the University of Nairobi gained access to a computer mainly from a commercial cyber café, 43 (58.1%), while respondents from Kenyatta University gained access to a computer mainly from the work place, 35 (57.4%). Consequently, there was a gap in that distance students could not access the ICTs provided by the university library at both universities. This is because distance students could only access the ICTs provided by the university library during residential sessions but the timetable was so tight that they rarely found time to use the computers. This finding is consistent with the findings of Nwezeh (2010) on libraries and distance education in Nigeria who established that 247 (82.4%) respondents had never used the internet inside the library even if the facility was there.

The findings of this study are also consistent with the findings of KENET (2008) which established that over 50% of university students accessed computers in cyber cafés. Similarly, a study conducted by Akande (2011) on the use of computer and internet by sandwich students of University of Ado-Ekiti, Nigeria revealed that 149 (72.5%) respondents surveyed made use of computer and internet facilities outside the library and majority did so in cyber cafés. Oladokun and Aina (2011) found that majority of distance students in Botswana had access to the internet at work, on their own computer, followed by on their own machine and the cyber café. Another study conducted by Aguti and Fraser (2006) on integration of ICTs in the distance education Bachelor of Education programme, Makerere University Uganda, revealed that majority of distance students did

not have access to computer, 108 (58.7%) and internet, 140 (76.9%). Even in the case where students indicated they had access, only 3.4% had access to computer at home and 1.2% to internet at home. Other locations from where students accessed ICTs included the office, relative's home and friend's home.

The study revealed that access to ICTs was adequate on campus but inadequate upcountry for both institutions due to poor infrastructure such as electricity supply and Telecommunications. The study unveils a gap in access to ICTs by distance students located upcountry resulting in what Oladokun and Aina (2011) refer to as digital divide between locations. The finding by Oladokun and Aina (2011) in Botswana confirm the prevalence of internet accessibility in the city and town compared to the village. They posit that adequate arrangement should be made for the provision of ICT facilities like internet in strategic locations including the villages if distance learners working or living in such locations are to maximally benefit from ICTs.

On the use of the mobile phone, the study revealed similar findings in both institutions. A significant number of respondents, 87.8% at the University of Nairobi and 78.7% at Kenyatta University students had a mobile phone. The findings are consistent with mobile phone penetration trends in Kenya. According to the Economic Survey (2011), the mobile telephony market registered significant growth of 15.9% from the year 2009 to 2010. Similarly, the internet penetration recorded an impressive growth. Users more than doubled to stand at 7.8 million by June, 2010 compared to 3.6 million in June 2009. According to the Communications Commission of Kenya (2012), the market had 30.4 million mobile subscribers as at 30th September 2012 up from 29.7 million in the preceding quarter and an overall mobile penetration of 77.2%. Similarly, the uptake of

data/internet services continued to display an upward trend with 34.2% of the population accessing the internet mainly via mobile phone. In total, the estimated number of internet users stood at 13.53 million.

6.4 E-readiness of University Libraries for Distance Learners

E-readiness is the preparedness of the University Library to use ICTs to enhance information access to users thereby increasing the quality of learning, teaching and research. The concept of e-readiness was developed to provide a unified framework to evaluate the digital divide between more and less developed countries during the later part of the 1990s (Mutula, 2008). Thereafter, the academia, the private sector and development agencies developed several tools to assist in the measurement of the extent of digital divide. An example of such a tool is the Digital Opportunity Index (DOI) which measures and evaluates the opportunity, infrastructure and utilization of ICTs. Another example is the Information Society Index (ISI) which examines how nations are positioning themselves in the global information economy and the E-government Index (EGI) which focuses on digital governance and digital democracy.

KENET has been conducting e-readiness surveys of higher education institutions in Kenya and recently in Eastern Africa. According to KENET (2007), the main indicators used included: information infrastructure, internet availability, internet affordability, network speed and quality, developing ICT workforce, ICT in libraries, enhancing education with ICT, ICT research and innovation, people and organizations online, locally relevant content, ICT in everyday life, ICTs in the workplace, network environment, e-campus, ICT strategy, ICT financing and ICT human capacity. Since this study is concerned with e-readiness of university libraries for distance learners, the key

indicators that were considered crucial are the ICT infrastructure, electronic communication, electronic services, information literacy and local content. In addition, other factors such as budget and staffing for distance students were also considered important.

6.4.1 Electronic Communication with Distance Students

The rapid growth of the internet has placed great emphasis on computers as facilitators of communication, that is, computer mediated communication (CMC), allowing people to communicate across space and time. CMC media encompasses such technological tools as e-mail, intranets and social media sites (Kettinger and Grover, 2007).

This study required distance students to indicate their use of e-mail and the mobile phone for information services from the university library. The study revealed similar findings in both case study institutions indicating a gap in their use. Although majority of distance students had access to a mobile phone and internet, they did not use e-mail and mobile phone for information services from the university library. Findings indicate that 71 (96%) of the respondents from the University of Nairobi and 37 (60.6%) from Kenyatta University had not used e-mail to get information services from the University Library. Similarly, 73 (99%) from the University of Nairobi and 46 (75%) from Kenyatta University had not used the mobile phone to get information services from the University Library. These findings were corroborated by interview findings from the University Librarians and senior library staff. When asked how the library communicated with distance students, respondents from each university library provided the following responses:

no communication; limited face-to-face communication during session; telephone with residence lecturer; through residence lecturer's visit; e-mail residence lecturer; librarian given e-mail to distance students; through the library e-mail; students have to go to the centres; contact person among students is the students leader and mainly through writing.

The findings of the study were that library communication with distance students was limited and that both the University of Nairobi library and Kenyatta University library rarely used electronic communication to provide services to distance learners. The findings from the librarians corroborate the findings from distance students. These findings are consistent with the findings of Akinseinde and Adomi (2004) on e-mail usage by technical education students in Nigerian universities who found that students used e-mail mainly to communicate with relatives, friends and course mates. On mobile phones, Parsons (2010) conducted a study at Robert Gordon University (Aberdeen) on information provision for higher education distance learners using mobile devices. The study established that distance learners used the mobile phone mainly for communication with friends but very few students used it for educational purposes. A study to explore how the mobile phone could be used to enhance library operations in the SADC region, by Mutula (2002) observes that the only efforts being made in libraries is to dissuade users from using the mobile phone within libraries. Few efforts are geared towards exploring ways of using the mobile phone to enhance library operations.

University libraries should adopt e-communication with distance students if they are to provide them with services efficiently and effectively. Arunachalam (1999) asserts that ICTs have made the dissemination of information and knowledge possible in a rapid and widespread manner. Communication, as we knew it before the advent of the Information Age, has been revolutionized as physical presence is no longer a necessity for

communication to take place, instantaneously. Various studies have been conducted in the field of computer mediated communication (CMC), with focus being shed on the use of CMC in improving subsequent face to face communication (Uhler and Clark, 2001), trends and latest technologies in CMC (Herring, 2004), how CMC compares with face to face communication (Kim, et al., 2007) and factors influencing the uptake of various CMC media in organizations (Licoppe and Smoreda, 2005).

The use of the mobile phone for communication with distance students cannot be overemphasized. The biggest advantage of the mobile phone is that it is not dependent on telecommunication infrastructure like the fixed telephone system. In addition, the mobile phone uses wireless technology to access the internet and therefore provides a solution to the problems of connectivity especially in remote areas. Mutula (2002) opines that as the mobile phone technology continues to evolve and mature, it could have a significant impact on libraries. Indeed, if mobile phones were to be successfully deployed in libraries they would facilitate direct access to library information anywhere at any time. Similarly, a survey on internet access and use in 11 African countries (Kenya included) by Stork, Calandro and Gillwald (2013) established that internet access has increased significantly across all countries surveyed – an increase of 15.5% between 2007/2008 and 2011/2012. They observe that the mobile phone is the key entry point for internet use. They posit that mobile internet requires fewer ICT skills, less financial resources and does not rely on electricity at home, compared to computers or laptops. The present study is an agreement with this line of argument.

The other e-communication channels suitable for distance learners are the social media. Henderson and Bowley (2010) define social media as online applications and

technologies that allow participation, connectivity, user-generated content, information sharing and collaboration amongst a community. Examples of social media platforms include: Facebook, Twitter, LinkedIn, Blogs, Wikis, Discussion forums such as GoogleGroups and DGroups, Voice over IP/Instant Messaging (IM) applications, such as Skype, GoogleTalk, MSN Messenger, Yahoo Messenger, RSS feeds and other forms of many to many publishing. These are collectively referred to as Web 2.0 tools, (O'Reilly, 2005a). Web 2.0 generally refers to a second generation of services available on the World Wide Web that let people collaborate, and share information online. It is a new era of electronic, virtual, online tools and applications which move beyond static posting, managing and sharing of knowledge.

A study conducted by Chisenga and Chande-Mallya (2012) on the use of social media by information professionals in the SCECSAL region revealed that majority of the participants were using social media for social networking, followed by professional networking. Those who used social media for official work were very few. Similarly, the findings of a study conducted by Kwanya, Stilwell, and Underwood (2012) on the uptake of web 2.0 tools by Kenyan libraries indicated that private universities exhibited a higher uptake than their public counterparts. It also emerged that while some libraries had web 2.0 tool accounts, some of these were dormant. Also in some cases, the tools were not used for library purpose.

6.4.2 Use of Electronic Services by Distance Students

Distance students were asked to indicate what electronic services were offered to them by the university library. The study revealed similar findings in both case study organizations. The highest proportion which was a small number, (24) 32.4% respondents

from the University of Nairobi and 11 (18%) respondents from Kenyatta University indicated the OPAC. Responses on other e-resources such as e-journals, e-databases and information updates via e-mail were insignificant. A total of 31 (41.9%) from the University of Nairobi were either not sure or they did not respond and 23 (37.7%) from the Kenyatta University were not sure.

The study further investigated the extent to which distance students used e-resources such as OPAC, e-books, e-journals and e-databases. The study revealed a gap in access and use of e-resources by distance students in both case institutions. Findings indicate that 40 (54%) from the University of Nairobi and 22 (36.1%) from Kenyatta University did not use the e-resources. Similarly there were no respondents from the University of Nairobi who used the e-resources 100% and only an insignificant proportion, 2 (1.6%) who did so from Kenyatta University.

The study further investigated how distance students accessed the university library's e-resources. The findings indicated that a significant proportion of respondents in each case accessed the university library's e-resources by physically visiting the library e.g. 30 (41.1%) from the University of Nairobi and 29 (47%) from Kenyatta University. Remote access was insignificant. Findings also indicate that 33 (44.6%) from the University of Nairobi and 10 (16.4%) from Kenyatta University had no access to e-resources at all. The finding of the present study is that in both cases access to library e-resources by distance students was limited.

The study also sought to establish the frequency of use of library services by distance students, e-services included. The study established that the main services that distance

students at the University of Nairobi used were books/journals consultation in the library, used three times a year by 47 (63.5%) respondents and book loans in presence books/journals used by 46 (62.2%). Similar responses were elicited from distance students at Kenyatta University where a total of 37 (60.6%) used books/journals in the library and 27 (44.3%) obtained book loans in presence. When asked to indicate what other sources of information they used, the majority of respondents indicated that they mainly used the Study Modules/Units, other students and Google as their sources of information. This concurs with the findings of a study to investigate the information needs and information seeking behavior of distance learners at the Institute of Extra-Mural Studies in Lesotho (Boadi and Letsolo, 2004). The study established that the students' sources of information were colleagues, personal collections, co-workers and family members as they were unable to access on-campus library and information sources and services.

The findings from distance students were corroborated by interview responses obtained from the University Librarians and senior library staff. The study sought to establish the information services offered by the library for distance students from the librarian perspective. All the senior library staff interviewed from both universities revealed that there were no dedicated services for distance students. They stated that distance students enjoyed same library services and facilities as the full time students but only during residential sessions. Their library usage was confined to normal book loans and consultation of examination papers and even then, they were not heavy borrowers because they were overburdened. The study further investigated whether adequate library services were provided at the study centres. Respondents indicated that book loans were

offered at the study centres. However not all centres were offering proper library services. These were only available in a few centres which were networked which included Nairobi, Mombasa, Kisumu and Kakamega in the case of University of Nairobi and Parklands, Ruiru, Mombasa and Kitui campus libraries in the case of Kenyatta University. The findings of the present study were that distance students received library services mainly when they physically went to campus. The findings of the present study are consistent with the findings by Wachira and Onyancha (2012) who established that although remote users could identify whether or not items were available in the library through the OPAC, they have to personally present books at the issue counter at the University of Nairobi library for initial borrowing and renewal.

The study further investigated from librarians whether distance students could access the library e-resources from wherever they were. Respondents from both universities stated that the OPAC was accessible but for other e-resources, it was “yes” and “no”. Access was dependent on the connectivity on the ground. Distance students had to be in a centre connected to the university system. The mode of access to e-resources was by IP addresses and username and password for some resources. This meant that distance students could not have full text access to some e-resources remotely. There was a gap in distance students’ access to the e-resources provided by the university libraries in both cases. This is consistent with the findings by Wachira and Onyancha (2012) who found that access to e-resources by remote users from the University of Nairobi and Kenyatta University was via IPs and passwords and users could access the university library from the campuses that were interconnected with proxy server. This explains the general lack of use of e-resources by distance students and their dependence on the Study

Modules/Units and Google. As Nwezeh (2010) puts it, students should have remote access to catalogs, full text e-journals, e-books and electronic databases yet these facilities were lacking in the universities reviewed.

On document delivery service, 70 (94.6%) respondents from the University of Nairobi and 19 (31.1%) respondents indicated that they never used this service. The finding of the present study is that majority of distance students from the University of Nairobi never used this service. On the other hand, 30 (49.2%) respondents from Kenyatta University indicated that they had used document delivery service. Consequently, the finding of the study on document delivery is that the University of Nairobi library was not offering document delivery service to distance students. On the other hand, Kenyatta University library was offering document delivery service to some extent. This concurs with the finding by Wachira and Onyancha (2012) who established that document delivery through e-mail attachments were common at Kenyatta University. However, they were quick to add that all respondents from public universities said that users were encouraged to collect materials from the library by themselves.

The study further investigated how Current Awareness Services (CAS) was offered to distance students from the two cases. Responses from distance students indicated that majority were not really aware of the e-services offered by the university library. This can be attributed to lack of library orientation, information illiteracy as well as lack of such services for distance learners.

When asked to state how current awareness was offered to distance students, University of Nairobi Librarian and senior library staff provided the following responses:

no conscious effort to provide CAS to distance students; almost nil - no direct contact with distance students; through talks when they come to campus; physical displays; via the website; accession list and journal alerts sent, brochures and fliers.

Responses from Kenyatta University library staff were similar to those of the University of Nairobi but they also added that the library also provides current awareness via the electronic notice board and RSS feeds on OPAC on the library website.

The findings of the present study were that library e-services were inadequate for distance students in the selected universities. The findings concur with those of Abdelrahman (2012) whose investigation on the library and information services support available to distance learners in Sudan revealed that distance learners in Sudan have little available support to them. The Association of College and Research Libraries (2008) stipulates that distant learners are entitled to the same library services and resources as the regular students on campus. To achieve the goal of equity, it is necessary for librarians to provide more personalized services to distance students.

6.4.3 Content Delivery to Distance Students

The methods for content delivery to distance students as identified by faculty in each case included printed Modules, face-to-face, Audio Cassettes, Video Conferencing and e-content which was under development at the time of this study. The study finding was that content delivery through printed Modules remained the main method accounting for 80%, followed by face-to-face at 15% and the rest 5% through Audio Cassettes and other ICTs. Universities were in the process of converting modules to e-content. This concurs with the findings of an exploratory study conducted by Sherman and Beaty (2007) of how 49 higher education institutions in the USA utilized distance technology. Their findings

were that traditional face-to-face delivery was the most prevalent. However, many programs were beginning to utilize hybrid programs that combined face-to-face delivery and distance technology.

The study also sought to establish what local content was captured from the academic staff by university libraries from the two cases. University Librarians and senior library staff were asked to indicate what local content they captured from academic staff for uploading to the website. Findings indicate that the two university libraries had not captured publications by the academic staff to build institutional repositories on their websites. In the case of examination papers which were being uploaded, they were only accessible within the university campus and therefore not accessible to distance students. The findings concur with those of Gunga and Ricketts (2007) who observed that the three pillars of the ICT revolution namely connectivity, capacity and content are yet to be realized in Africa. Similarly, The National ICT policy for Kenya identifies content development as one of the challenges and has this to say:

“The main challenge is the underdevelopment of local content. ICT is a conveyor of information, providing opportunities for local people to interact with each other expressing their own ideas, knowledge, heritage and culture in their own languages. Improving local content will entail: developing content in local languages; rallying all stakeholders and development partners’ support in creating local content and identifying, selecting and capturing information and knowledge available in various formats”.

Institutional Repositories (IR) are digital collections capturing and preserving the intellectual output of an institution. The repository should be accessible to users both within the institution as well as to the public with no barriers to access. Such repositories enhance access to local publications. It is the memory of an institution. There is a

growing interest in institutional repositories which started from the north but moving far and wide supported by both world governments and non-governmental institutions such as UNESCO, IFLA, INASP, EIFL and PKP. In Kenya for example, KLISC has been conducting workshops with support from EIFL to sensitize institutions on Open Access and IR. Rotich and Musakali (2012) opine that Open Access institutional repositories are a must have for academic institutions. Similarly, Shafack (2012) emphasizes the need for Open Access institutional repositories in Cameroon.

6.4.4 Library Budget

The study sought to establish how the University Library is funded and the annual budget allocated to the library. The finding was that both university libraries were funded majorly from the parent organization and supplemented by some donor funding and book donations. University of Nairobi Library had an annual budget of KSh.100 Million while Kenyatta University Library's budget was KSh.30 Million. The finding was that this budget was inadequate as expressed by University Librarians from both universities. Extending the question of budget, the study further investigated to find out what proportion of the budget was allocated for distance students library services. The finding from both universities was that there was no specific budget line for distance students. One of the key elements identified by ACRL (2000) was that distance library services should be funded separately rather than drain from the regular funding of the library. Similarly, in a study on distance education library services in the University of Swaziland, Muswazi (2003) identifies budget allocation for distance education library service as key to the provision of quality library services for distance students.

The study also sought to establish the proportion of the library budget allocated to ICTs in the library. The response from the University of Nairobi was that the proportion allocated to ICTs was 20% of the total library budget whereas that of Kenyatta University was 33% of the total library budget. The finding was that Kenyatta University library had a higher budget allocation to ICTs than the University of Nairobi. Despite the allocation, the study established from the librarians that the allocation was inadequate in both cases. The findings are consistent with Kavulya (2004) who observed that inadequate funding in public universities was a major hindrance towards the provision of access and timely library services for distance learners. This is corroborated by the findings by Elisha (2006) who identified poor funding as the greatest challenge facing the application of ICT in Nigerian academic libraries. Poor funding manifests itself in areas such as poor ICT infrastructure and inadequate information resources.

6.4.5 Library Staffing for Distance Students

The study sought to establish whether the two university libraries had library staff dedicated to offer services to distance students. Interviews with the librarians reveal similar findings in both case organizations. There was a gap in both university libraries in that they did not have staff dedicated for distance students. Library staff offered services to all students. This was attributed to inadequate staffing. Though the College Library, University of Nairobi, Kikuyu campus was initially dedicated to distance students, the situation had changed with the admission of distance students in all campuses and staff served both on-campus and distance students. It was also established that only a few study centres had skeleton library staff e.g. in the case of University of Nairobi, Mombasa, Kisumu and Kakamega study centres had a room for library, books and

skeleton staff. In Kenyatta University, the branch campus libraries namely Parklands, Ruiru, Mombasa and Kitui were also accessed by distance students. The study revealed that limited staffing and low ICT literacy among library staff were among the challenges both university libraries encountered in the provision of library services. The findings concur with the findings of the study by Rosenberg (2005) that the lack of trained library staff was considered an equal challenge to that of lack of funding in university libraries in Africa. Similarly, in a study on distance education library services in Swaziland by Muswazi (2003), staffing issues were major challenge both in terms of numbers and skills. This was attributed to the fact that staffing levels and skills were originally planned for the traditional on-campus users. Staffing is vital for any library to provide services efficiently and effectively. For university libraries to provide a speedy and responsive service to distance learners there is need to increase the numbers of library staff as well as training them with skills which should include ICT skills as well as public relations and marketing skills. In addition, university libraries should allocate staff dedicated for distance learners and with the necessary skills.

6.5 Information Literacy Skills of Distance Learners

Information Literacy is the ability to identify what information is needed, understand how the information is organized, identify the best sources of information for a given need, locate those sources, evaluate the sources critically, and share that information. The goal of an information literacy programme is to instill information searching skills among the library users needed in the effective and efficient utilization of information resources. The study established that use of ICTs by distance students was curtailed by their lack of basic computer skills and information literacy skills at both institutions. When asked to

indicate how proficient they were in online searching, students from both universities indicated average and below average. In addition, students learnt how to use the internet either through friends at the University of Nairobi or self hands-on-practice (self-taught) at Kenyatta University.

The study further investigated the information literacy level of distance students from the librarians' perspectives. All respondents from both universities stated that the information literacy level for distance undergraduate students was very low. The study further investigated whether the library organized orientation, induction and training for distance students. The following were the main responses obtained:

distance students are disadvantaged in this respect; orientation is not structured; the university does not schedule orientation for distance students; time is very short when they come for face-to-face sessions; distance students are not taught "Library Skills" like full time students; institutionally centralized talks by the University Librarian is inadequate and only occasional students are inducted.

The study revealed similar findings in both case study organizations. The finding was that both university libraries did not have an information literacy programme for distance students. This finding corroborates the findings from distance students that majority of them from each case were not very proficient in online searching and that they learnt information searching skills mainly from friends or through self training. This finding concurs with the findings of Mabawonku (2004) on library use by distance undergraduate students in three Nigerian universities who established that no orientation or user education programme was provided for this category of students by at least two of the universities in the study. Similarly, Abdelrahman (2012) found that there was no library instruction or information literacy programmes for distance learners in Sudanese

universities. Roccas (2001) also noted that library instruction in research skills is often bypassed in distance education courses but letting students loose on a library web page is almost like letting them loose on the internet. Kavulya (2004) emphasized the need for providing information literacy instruction to distance education students and opines that this requires new methods of delivery such as videos, interactive web-based tools and video conferencing. A needs assessment study with distance students at the University of Illinois at Urbana-Champaign, USA, Kazmer (2002) established that students need to be trained to use library technologies. The training should be at a variety of levels from novice to expert and should include not just face-to-face but also asynchronous training through computer-based tutorials. These findings are corroborated by the findings by Mutula et.al. (2006). Their study on the implementation of an online information literacy module to first year students at the University of Botswana revealed that imparting information literacy skills through online module could improve students' competencies more than the face-to-face instruction mode.

6.4 Policies Supporting Provision of Information for Distance Learners

The success of any distance-learning programme requires appropriate curriculum development processes guided by a clear ICT policy (Nafukho, 2007). This discussion includes institutional policies on distance education, library policies on distance education as well as ICT policies.

The findings of the present study indicate that each selected University had included distance education in their policy development. The policy in place in each university was to run the dual mode of distance learning in which distance learning co-existed with face-to-face sessions. This finding concurs with the finding by Kavulya (2004) who

observed that at specified periods, students go to the centres for formal lectures and examination. Similarly, a study conducted by Nweze (2010) in four Nigerian Universities established that the face-to-face method was the main method of communication between the lecturers and students. Both case study institutions were in the process of developing the e-learning policy. The ICT policies in both cases were being developed by the ICT Directorate, whose main interest was the number of computers, connectivity and band width.

The study identified a gap in the development of ICT institutional policy in both universities. There was a general lack of a comprehensive ICT policy which includes distance learners and there was no clear policy on the integration of ICTs in the teaching process. This was perhaps a reflection of the scenario at the national level whereby the National ICT Policy had not yet been legislated and was still in the draft form. The draft policy basically aims at improving the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services (Kenya. Ministry of Information and Communications, 2006). The policy advocates the development of e-learning policy framework on e-learning and says that lack of such a policy has hampered its development and utilization. In an earlier study, Mutula (2001) underlines the importance of strategic plans in Kenyan public universities to address issues like the novelty of the technology in the university, training requirements, funding, modernizing the technology and staff motivation. Nwezeh (2010) posits that there is need to first create policies that address the library needs of distance learners and give guidelines on how the library services would be provided, as well as the necessary financial resources, personnel, and physical facilities.

On university library ICT policies, the study revealed that both university libraries lacked clear independent and comprehensive ICT policies. Findings indicate that each university library had a component on ICTs in their Strategic Plan and that the ICT Directorates had a component on the library. However, the libraries did not have clear independent ICT policies. The findings of the present study concur with the findings of a study conducted by Odero and Mutula (2007) which established that apart from Moi University, all other Kenyan university libraries did not have clear ICT policies and plans. Elsewhere in Nigeria, Elisha (2006) identified lack of a comprehensive ICT policy as one of the problems hindering the effective application of ICT in Nigerian academic libraries. Similarly, Nwezeh (2010) stated that:

there is need to first create policies that acknowledge the need for library services to distance learners and give guidelines on how these would be provided, as well as the necessary financial resources, personnel, and physical facilities.

These studies underscored the need for comprehensive ICT policies which would provide a blue print for ICT application and guidelines for implementation.

The study also established that both university libraries had a strategic plan. However, when asked to state if the library had a policy for distance learners, University Librarians stated that the library policy was silent when it came to distance learners. The findings of the present study were that there was no strategy to address the library needs of distance students in both universities. The findings concur with those of Kavulya (2004) whose findings indicated that there was a lack of institutional policies to guide the provision of information for distance learners in university libraries in Kenya. This was attributed to the ambivalent attitude among the planners of distance education programmes towards

the role of library services to the distance programmes. Similarly, Wachira and Onyancha (2012) conducted a focus group study to explore the support services and resources for remote library users in public universities in Kenya. The study established that the selected libraries which included the University of Nairobi, Kenyatta University, Moi University and Egerton University did not have policies for remote users.

The Association of College and Research Libraries (2008) states in the Standards that distance learners are entitled to the same library services and resources as the regular students on campus. Similarly, The Commission for University Education (CUE), (2012) Standards on distance learning library services state that the University shall provide adequate resources to support distance learning library services which should be the same as those of regular students. These standards can only be met if institutional policies are developed to guide the provision of information for distance learners.

6.5 Challenges Experienced By Distance Students in Accessing Information through ICTs

Distance students from both case organizations recognized the value of the university library in providing information for their study. They identified key strengths of the university library as: availability of reference materials; access to information book loan service; photocopy service; staff assistance; reading space and enhancement of research. However, the study revealed that majority of distance students from both the University of Nairobi and Kenyatta University had difficulty accessing library materials. For example, 58 (78.4%) respondents from the University of Nairobi and 37 (60.6%) from Kenyatta University indicated that they experienced difficulty accessing library materials. On the other hand, the main weaknesses identified by respondents were “distance” and

“inaccessibility off campus”. These findings concur with previous research conducted in Kenya by Aseey (2004) who found that access to library was a big problem as in most cases distance students came from far places some from remote areas where libraries were not available, hence they could not do their assignment well or get books for reference. Similarly, Abdelrahman (2012) found that distance students in Sudanese universities were underprivileged as far as library support services were concerned.

The study further investigated the specific challenges that distance students encountered in accessing information through ICTs. The study revealed similar challenges experienced by distance learners in both case organizations. The challenges identified were:

distance; limited time to use the library during face-to-face sessions; inaccessibility of the library resources off-campus; expensive; poor communication from the universities; limited number of computers at study centres; large students numbers competing for same resources; lack of computer skills; lack of information literacy skills; poor infrastructure in rural areas; bureaucratic systems; lack of information resources at regional centres; limited book loan; scarcity of materials; poor co-ordination of library services; lack of assistance from the library and reliance on former students to get information.

One of the key barriers to access and use of information by distance learners was distance. Distance learners are normally located in far places in the rural areas and have to travel long distances to get access to the university library or the nearest study centre. They are geographically isolated. Even when they go for residential sessions, some centres are far from the university library and as such students cannot visit the university library. Interviews with librarians confirmed that distance from students was a challenge. User studies carried out in sub-Saharan Africa have pointed out distance as a key barrier to information access by distance learners (Boadi and Letsolo, 2004; Muswazi, 2003).

Another challenge identified by distance students was time. Distance learners have competing priorities. Normally they are in employment and have families. With such responsibilities, they still have to allocate time for study. Consequently, they find themselves time constrained in their search for information. During residential sessions, their time-table is normally packed leaving little time for use of the ICTs provided by the university library. Boadi and Letsolo (2004) found that due to the difficulties they encountered such as distance and lack of time, distance learners look for information from other sources that are not necessarily the best such as friends and colleagues and other available library services.

The cost of accessing information through ICTs is a challenge to distance learners. Due to lack of ownership to computers or access at the study centres, distance learners use cyber cafés to access the internet. Online searching is expensive. The fact that distance learners lack information searching skills means that they use more time searching which translates to more cost. In addition, travelling long distances to the university library or visiting other libraries is expensive due to transport costs. Time and money spent hinders access and use of ICTs.

Another challenge is that distance students were not aware of the online resources and services offered by the university library. There is no organized orientation and information literacy programme for distance students. In addition, the students lacked basic computer skills and therefore found it difficult to locate relevant information from the internet. This resulted in time wastage in finding information. The lack of information literacy programmes for distance learners has been identified by other studies such as

Abdelrahman (2012), Mabawonku (2004) and Roccas (2001). Basic computer skills and information literacy skills are required in order for distance learners to fully utilize the ICTs. It is important for the university library to find ways of training distance learners with basic ICT skills and information literacy skills to enable them exploit the use of ICTs in accessing information. This requires new methods of delivery such as videos, interactive web-based tools and video conferencing as suggested by Kavulya (2004). Similarly, Mutula et. al. (2006) posit that imparting information literacy skills through online module could improve students' competencies more than the face-to-face instruction mode.

Another challenge is poor communication between the university library and distance students. Respondents indicated that distance students did not have close contact with librarians in both cases. E-mail and the mobile phone were not being used by the University Library to communicate with distance students and no virtual services such as online book loans, online help and online reference were provided for them. It was only in Kenyatta University where document delivery was being offered to some extent. Although majority of distance students had used the e-mail and the mobile phone, they did not use the ICTs for getting information services from the library. Other studies have also established that students used e-mail and the mobile phone mainly to communicate with relatives, friends and course mates but not for education purposes (Parsons, 2010; Akinseinde and Adomi, 2004). The use of e-mail, mobile phone and social media can remove barriers of distance and time and should be adopted in university libraries as means of communication with distance students. ICTs have revolutionized communication as physical presence is no longer a necessity for communication to take

place, instantaneously. Indeed, ICTs have made the dissemination of information and knowledge possible in a rapid and widespread manner (Arunachalam, 1999).

Access and use of ICTs by distance learners is also affected by poor ICT infrastructure in the rural areas. As it has already been mentioned, distance learners are scattered and some are located in the rural areas where connectivity is poor due to low band-width. This results in slow flow of information. In addition, lack of electricity in the rural areas is also a challenge since computers and mobile phones require electricity to function. Power interruptions also have a negative effect on access to information. A study by InfoDev (2008) shows that electricity is extremely relevant to internet and increasing national electrification is a pre-requisite to broadband development and geographical spread.

Another challenge encountered by distance students was inadequate computers. Although the computer to students ratio at Kenyatta University (5PCs per 100 students) was higher than at the University of Nairobi (3 PCs per 100 students), the study established that the number was insufficient in both cases. Their PC to students' ratios were below the recommended average ratio of 10 PCs per 100 students. Furthermore, distance students did not have access to computers located in the university campuses except for limited access during residential sessions. The number of computers at the centres was also inadequate. Buying their own laptops was a challenge due to financial constraints. Distance students had therefore to visit cyber cafés to get access and use a computer and internet which was not convenient for them and was also expensive. This challenge has been identified by various studies (Akande, 2011; Oladokun and Aina, 2011; KENET, 2008; Aguti and Fraser, 2006).

The findings show that distance students experienced challenges in accessing e-resources remotely. Access to the e-resources offered by the university library was limited as it was dependent on the connectivity on the ground. Distance students had to be in a centre connected to the university system. Furthermore, the mode of access to e-resources was by IP addresses and username and password for some resources. With the use of IP addresses, distance students needed to be at a university campus to access the e-resources. They could not access such e-resources from their computers at home or from a cyber café because these were outside the IP range. Another challenge on e-resources access was that some e-resources were not downloadable because the university library had no subscription to them. Other challenges mentioned included inadequate services at study centres, scarce information resources and lack of library support. A study conducted by Muswazi (2003) on distance education library services in Swaziland identified the major problems that faced distance students as long distances to the campus library, competition for limited relevant library resources with full-time students, limited financial resources, time, inadequate library resources, inadequate library support, lack of library skills, lack of computer skills, insufficient computer resources and no access to the internet.

6.6 Improvement to Information Access and Use

This study has shown that distance learners experience unique challenges in finding information through ICTs. Therefore there is need to find ways that can improve access to and use of information by distance learners. This section highlights the various ways for improving access and use of information for distance learners. Distance education

planners should recognize the central role the university library plays for the success of distance education and involve the library right from the start of the planning process.

In order to develop a model of services that address the information needs of distance learners, librarians should conduct needs assessment studies on distance students in order to establish their information needs. Dew (2001) recommends that in order to have a successful library program for off-campus students, librarians must understand who their students are and what they want. Based on the the needs assessment, university libraries should develop policies governing library services for distance learners. These should include guidelines on access to services and resources through ICTs, financial resources and staffing. Mwezeh (2010) recommended that libraries should have policies that give guidelines on how library services to distance learners would be provided as well as the necessary financial resources, personnel, and physical facilities. Additionally, each university should have a comprehensive ICT policy to provide guidelines in all aspects of ICT such as financing, use in course delivery and ICTs access by distance learners.

Use of ICTs by distance learners for access and use of information will address the challenge of distance and time. The selected universities should provide sufficient numbers of computers. They should double the number of computers in the labs and open the labs 24 hours. More computers should also be provided in the university libraries as well as at regional centres. In addition, universities should facilitate distance students to acquire laptops through an affordable loan facility. This will address the issue of use of cyber cafés thereby reducing the time and cost of accessing information. The use of mobile phones for information access would greatly improve access to information. The biggest advantage of the mobile phone is that it is not dependent on telecommunication

infrastructure like the fixed telephone system. In addition, the mobile phone uses wireless technology to access the internet and therefore provides a solution to the problems of connectivity especially in remote areas. The mobile internet requires fewer ICT skills, less financial resources and does not rely on electricity at home, compared to computers or laptops (Stork et. al., 2013).

Improvement of the ICT infrastructure will also improve access to information by distance learners. The Kenya government should improve the ICT infrastructure especially in the rural areas with a view to lowering internet costs. This should go hand in hand with rural electrification efforts. This will increase internet access by distance students.

Digital libraries or electronic libraries can offer solutions to information access problems experienced by distance learners. A digital library as defined by Arms (2005) is a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network. The main campus library system should be networked with regional centres electronically to enable distance students to access the library from the regional centre. A digital library can link e-learners to library catalogues, licensed journal databases, e-books, selected e-resources, electronic course reserves, tutorials and to forums for communication and interaction with others (Sharifabadi, 2006). The advantages of digital libraries in enhancing information access in the Sub-Saharan region has been discussed by a number of scholars such as Magara (2002), McDonald and Kebbell (2004), Mutula (2004), Rosenberg (2006) and Kavulya (2007). Some of the potential benefits of digital libraries include: the digital library brings information to the user's desk, computer power is used for searching and browsing, information can be shared, information is easier to keep current, the

information is always available even if the library is closed, new forms of information become possible e.g. databases and there is potential in digital libraries saving money. The digital library should have an information portal which is a platform which allows one-stop-shop access to information resources and services. Through the portal, distance students can have access to the library remotely. Some of the benefits for the student include: easy access to quality; approved resources; one interface to learn and one search across all resources or the federated search; link from a citation to full text and e-journal and easy sign in through familiar Athens passwords.

University libraries should provide e-services for distance students. Loan services such as online book reservations and online loan renewal can be made available through the web-based OPAC. The integrated library management system such as KOHA has features that can provide the e-services. Document delivery can be done via e-mail or posting the documents in a Wiki which is made accessible to distance students. Virtual reference service can be provided by an online librarian designated for distant learners. Librarians should adopt Web 2.0. Tools such as blogs, Facebook and Wikis in providing online reference services as these are interactive and make the experience more interesting.

The library website/portal is the best platform for online current awareness services. Adding electronic links from the OPAC to the library website would be the most effective method of capturing the attention of distance students. Libraries should make use of the electronic board to make announcements on the library website of new services and resources. They should provide RSS feeds which users can subscribe to so that they can receive alerts via e-mail whenever new items are posted on the library website.

University libraries should organize an initial face-to-face orientation of distance students followed by online asynchronous training through computer-based tutorials. Librarians should prepare Power Point presentations containing information on searching, finding and evaluating electronic information and post the presentations on the library website. Alternatively the instructions can be modified into a series of web pages and be presented on e-learning platforms such as Blackboard (Roccas, 2001). User studies conducted by a number of scholars indicate that off-campus students prefer electronic library services such as web and/or e-mail reference, remote access to full text databases and instructional resources (Kazmer, 2002; Moyo and Cahoy, 2003 and Wu and Liu, 2004).

University libraries should increase the number of relevant e-books. They can do so by allocating more of their book budgets to e-books. Libraries should provide seamless remote access to the full text of licensed e-resources. Content providers often use IP address as an authentication mechanism to control access to their products. To allow seamless remote access to the full text of licensed e-resources, the library should install EZProxy software. EZProxy doesn't require browser configuration and is designed for library use. It would allow library users to log in through the library's EZProxy sever and gain full text access to the licensed e-resources remotely from home or elsewhere. This would reduce the number of passwords and provide a more user-friendly experience. Instructions about authentication should be posted on the University Library portal. Wu and Liu (2004) assert that it is now possible for academic libraries to use technology and provide services that were not possible years back. Libraries should develop Institutional Repositories (IR) and make them available through the library portal.

The delivery of quality services requires adequate staff with the relevant skills to provide the services. The area of ICT changes very fast and library staff have to keep abreast with new technologies. University libraries should organize for the training of library staff in ICT skills. This can be achieved through short courses, workshops and seminars. In addition, asynchronous training through computer-based tutorials should be included.

6.7 Summary

Chapter Six presented an interpretation of the research findings in the light of empirical literature on use of ICTs by distance learners in accessing information. The interpretation involved searching for the broader meaning of the research findings as well as relating the findings to the literature reviewed and the objectives of the study. An attempt was made to show how the current research findings concur or differ from previous research of a similar nature. The interpretation of research findings covered all the specific objectives indicated in Chapter One, Section 1.3.1 except the last objective namely to make recommendations and propose a model of the use of ICTs in accessing information for distance education in public university libraries. This is covered in Chapter Seven.

Chapter Six has shown that there are certain shortcomings on access and use of ICTs for information by distance learners in both the University of Nairobi and Kenyatta University. Findings from the two cases were very similar. The range of ICTs available in both the University of Nairobi and Kenyatta University was inadequate for the large number of students and staff. Furthermore, the ICTs were not accessible to distance students except when they went to campus and even then they were constrained by time. Distance students from both universities gained access to a computer mainly from a Commercial Cyber Café, the work place and few had personal laptops. Access from the

university library and the study centre was negligible. This negatively affects distance students in their pursuit for information for their assignments and research.

The success of any distance-learning programme depends on clear institutional policies on distance education, library policies as well as ICT policy. Chapter Six has shown that the ICT policy in both cases was not clear both at the institutional level and at the University Library level. In addition there was no policy to address the library needs of distance students in both universities. This lack of policies had adverse effect on distance learners in that their needs were not considered during the planning process. For example, there was no library budget allocation to address the information needs of distance learners. This resulted in competition for the limited information resources between distance students and on-campus students.

Access to adequate library services and resources is essential for the attainment of superior academic goals. Chapter Six has shown that a gap exists in the provision of library services especially e-services to distance students by both cases. Distance students were not aware of the e-services offered by the university library due to lack of orientation and user education of this category of users. In addition, distance students experienced various challenges in finding information such as lack of access to e-resources off-campus, lack of computer skills, lack of information literacy skills and limited communication with the library. Due to the difficulties they encountered, distance students resulted to looking for information from other sources that were not necessarily the best such as friends and colleagues and other available library services.

The next chapter is a summary of findings, conclusion and recommendations. A model for improving access and use of information through ICTs by distance learners in public university libraries is proposed.

CHAPTER SEVEN

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

7.0 Introduction

Chapter Seven presents a summary of findings, conclusion and recommendations for improving accessibility and use of ICTs in the provision of information for distance learners. Major findings from each of the two case study organizations are summarized and compared under appropriate headings. This is done taking into consideration the objectives of the study and the research questions. A conclusion has been made based on the findings of the study. Recommendations have also been made based on the results of the study and the conclusion. The study's recommendations address the study objectives and research questions. The study finally suggests areas of further research.

The purpose of the study was to investigate accessibility and use of ICTs in the provision of information to distance learners by the University of Nairobi and Kenyatta University libraries and to propose a model for improvement.

The objectives of the study were to:

1. Investigate the range of ICTs at the University of Nairobi and Kenyatta University Libraries.
2. Explore the level of e-readiness of the University of Nairobi and Kenyatta University libraries in providing information for distance learners.
3. Establish the adequacy of information literacy skills of distance learners.

4. Establish the policies that the University of Nairobi and Kenyatta University Libraries have put in place for supporting provision of information for distance learners.
5. Identify the challenges experienced by distance learners in accessing information through ICTs.
6. Make recommendations and propose a model of improving access and use of ICTs for information provision for distance learners in public universities.

7.1 Summary of Research Findings

This section presents a summary of research findings based on the objectives of the study.

7.1.1 Characteristics of Distance Students

Age was found to have an influence on the access and use of ICTs in both case organizations. The main users of ICTs among distance students in both case organizations were generally the younger students in the age bracket 31-35 years at the University of Nairobi and 26-30 years at Kenyatta University. On the other hand, gender was not found to have an influence on the access and use of ICTs. At both case organizations, there was no apparent association between gender and use of ICTs. The study established that there were no gender differences in access and use of ICTs in each selected university. This can be attributed to the fact that both male and female students had similar education and socio-economic status. Since both male and female students had equal opportunities, there would be no gender differences in access and use of ICTs.

7.1.2 Range of ICTs Available and Extent of Their Use by Distance Learners

One of the objectives of the study was to investigate the range of ICTs application at the two case study organizations with the aim of finding out whether this had any effect on ICTs use by distance learners. Findings indicate that the two case study organizations had similar available ICT infrastructure. This was in form of networked desk-top computers located in offices, computer labs, the library and students' cyber cafés, fiber optic internet, Wireless internet (WiFi), laptops for Deans, Chairmen of Departments and Directors, personal mobile phones and some study centres were on fibre link. The libraries in both universities had also automated the library system on integrated library management system and had developed library websites. The only difference between the two case study organizations was in the PC: students' ratio. The University of Nairobi had a lower PC: students' ratio than Kenyatta University. However, the number of computers in both case study organizations was still insufficient as it fell below the recommended 10 PCs per 100 students. Unfortunately findings showed that these ICTs were not being utilized to support distance students in both case study organizations.

The study established that available ICTs were mainly being used for e-mail communication, students' records administration, processing exams marks and word processing. Moreover, physical access and use of ICTs in the institution was mainly for on-campus students. Distance students access to ICTs from the university library and the study centres was negligible. Findings show that majority of distance students at both case study organizations used a computer mainly from a commercial cyber café, the workplace and a few had personal laptops. On students' access to the mobile phone, the study revealed similar findings in both case study institutions. A significant number of

respondents, 65 (87.8%) at the University of Nairobi and 48 (78.7%) at Kenyatta University students had a mobile phone. However, findings show that distance students in both institutions did not use the mobile phone to access information – 73 (98.6%) from the University of Nairobi and 46 (75.4%) from Kenyatta University had not used the mobile phone to get information services from the University Library.

7.1.3 E-readiness of University Libraries for Distance Learners

The study revealed more similarities than differences between the case study organizations in the e-readiness of the university libraries for distance learners.

7.1.3.1 Electronic Communication with Distance Students

Findings show that communication between the librarians and distance students in both case study organizations was limited and that both university libraries rarely used electronic communication with distance learners. Librarians said that it was difficult to identify this category of users. Findings show that both the University of Nairobi library and Kenyatta University library rarely used electronic communication to provide services to distance learners. Distance students from both universities received library services such as book loans and reference and information services only when they physically visited the University Library. Even then, use of library services was limited by lack of time due to a packed time table.

Although majority of distance students in both case study organizations had a mobile phone and could access a computer from the cyber café, findings indicate that majority of distance students from each case did not use e-mail and the mobile phone for getting information services from the university library. Findings show that 71 (95.9% of

distance students from the University of Nairobi and 37 (60.6%) from Kenyatta University had not used e-mail for getting information services from the University Library. Similarly, 73 (98.6%) distance students from the University of Nairobi and 46 (75.4%) from Kenyatta University had not used the mobile phone for getting information services from the library.

7.1.3.2 Use of Electronic Services by Distance Students

The study established that both university libraries did not offer adequate e-services for distance students. Distance students at both case study institutions were not aware of the e-services offered by the university library apart from the OPAC which was identified by a small proportion of students, that is, 24 (32.4%) respondents from the University of Nairobi and 11 (18%) respondents from Kenyatta University. The study revealed a gap in access and use of e-resources by distance students at both case institutions. No respondents from the University of Nairobi indicated having used the e-resources a hundred percent and only an insignificant proportion, 2 (1.6%) who did so from Kenyatta University. Findings show that 30 (41.1%) of distance students from the University of Nairobi and 29 (47%) from Kenyatta University accessed the university library's e-resources by physically visiting the university library. Similarly, librarians indicated that apart from the OPAC, access to e-resources was dependent on the connectivity on the ground. Distance students had to be in a centre connected to the university system. The mode of access to e-resources was by IP addresses and username and password for some resources. In addition, distance students at the University of Nairobi indicated that the main services that they used were books/journals consultation in the library, used three times a year by a significant number, 47 (63.5%) respondents and book loans in presence

books/journals used by 46 (62.2%) respondents. Similar responses were elicited from distance students at Kenyatta University where 37 (60.6%) respondents used books/journals in the library and 27 (44.3%) respondents obtained book loans in presence. Furthermore, distance students from both universities relied heavily on other sources of information such as print books, study modules/Units, other students and Google. On local content, findings indicate that both university libraries had not captured publications by the academic staff to build institutional repositories on their websites. In the case of examination papers which were being uploaded, they were only accessible within the university campus and therefore not accessible to distance students.

Regarding document delivery service, the two case study organizations differed. Findings show that majority of distance students from the University of Nairobi 70 (94.6%) and 19 (31.1%) from Kenyatta University never used document delivery service. On the other hand 30 (49.2%) respondents from Kenyatta University indicated that they had used document delivery service. Although the number of respondents who had used document delivery service from Kenyatta University was not very large, it shows that Kenyatta University library was offering the service to some extent compared to the University of Nairobi library. It further emerged that current awareness services was not offered to distance students at both case organizations. This explains why distance students were not really aware of the e-services offered by the university library. This can be attributed to lack of library orientation, information illiteracy as well as lack of such services for distance learners.

The study further established that library services at the study centres in both case organizations were inadequate. Respondents indicated that book loans were offered at the

study centres. However not all centres were offering proper library services. These were only available in a few centres which were networked which included Nairobi, Mombasa, Kisumu and Kakamega in the case of University of Nairobi and Parklands, Ruiru, Mombasa and Kitui campus libraries in the case of Kenyatta University.

7.1.3.3 Resource Allocation

Similar findings on resource allocation were obtained from both case study organizations. The study established that both university libraries were funded majorly from the parent organization and supplemented by some donor funding and book donations. However there was no allocation for distance students. This was caused by a lack of recognition of distance students as a special category of users and therefore planning for resources for them. With regards to budget allocation for ICTs, both institutions were experiencing similar inadequacies. With regard to staff allocation, both university libraries did not have staff dedicated to offer services to distance students. Furthermore, both libraries had inadequate staffing and ICT literacy was low among library staff. These inadequacies impact negatively on the access and use of ICTs by distance students.

7.1.4 Information Literacy of Distance Students

The study established that use of ICTs by distance students at both case study institutions was curtailed by their lack of basic computer skills and information literacy skills. When asked to indicate how proficient they were in online searching, students from both universities indicated average and below average. In addition, distance students learnt how to use the internet either through friends at the University of Nairobi or self hands-on-practice (self-taught) at Kenyatta University. Furthermore, findings from librarians indicate that both university libraries did not have an information literacy programme for

distance students. The library orientation is provided on an *ad hoc* basis which does not provide adequate training for both computer and information skills.

7.1.5 Institutional ICT Policies, Information Access and Use of ICTs

The study established that both case study institutions had included distance education in their policy development. The policy in place in both institutions was to run the dual mode of distance learning in which distance learning co-existed with face-to-face sessions. Both case study institutions were in the process of developing the e-learning policy. The ICT policies in both cases were being developed by the ICT Directorate, whose main interest was the number of computers, connectivity and band width. The study identified a gap in the development of ICT institutional policy in both universities. There was a general lack of a comprehensive ICT policy which addresses distance learners and there was no clear policy on the integration of ICTs in the teaching process. On university library ICT policies, the study revealed that both university libraries lacked clear independent and comprehensive ICT policies. Findings indicate that both case study institutional libraries had a component on ICTs in their Strategic Plan and that the ICT Directorates had a component on the library. However, the libraries did not have clear independent ICT policies. The findings of the present study were that there was no strategy to address the library needs of distance students in both universities. The study also established that although both university libraries had a strategic plan, the strategy did not address the library needs of distance students. The findings of the present study concur with the findings of a study conducted by Odero and Mutula (2007) which established that apart from Moi University, all other Kenyan university libraries did not have clear ICT policies and plans. Lack of comprehensive ICT policies that address the

needs of distance learners adversely impacts on information access and use of ICTs by distance learners in that their needs were not considered during the planning process.

7.1.6 Challenges Experienced by Distance Students in Accessing Information through ICTs

The study results show that distance learners experience challenges in accessing information through ICTs. These challenges were similar in both case study organizations. One of the key challenges was distance. Distance learners are normally located in far places in the rural areas and have to travel long distances to get access to the university library or the nearest study centre. Lack of computers was a key challenge. Due to long distances, distance students did not have access to computers in the university except limited access during residential sessions. In addition, the number of computers at the study centres was inadequate. Consequently, students resulted to using cyber cafes.

The high cost of accessing information through ICTs is another barrier to access and use of ICTs by distance learners. Due to lack of ownership to computers or access at the study centres, distance learners resulted to the use of cyber cafés which are expensive. In addition, travelling long distances to the university library or visiting other libraries was expensive due to transport costs. Another challenge was time. Distance learners have competing priorities and find it difficult to allocate time between employment, family and study. Many of the distance students were not aware of the online resources and services offered by the university library. There was no organized orientation and information literacy programme for distance students. In addition, the students lacked basic computer skills and therefore found it difficult to locate relevant information from the internet. This

resulted in using more time in searching for information which translates to more cost. Accessibility and use of ICTs by distance learners was also affected by poor connectivity due to low band-width and lack of electricity in the rural areas. Lack of remote access to e-resources and other e-services was another challenge. The mode of access to e-resources was by IP addresses and username and password for some resources. Consequently, distance students could not have full text access to all e-resources remotely. There was competition for relevant library resources with on-campus students. Due to poor communication by the university library, distance students lacked library support. This can be attributed to a lack of defined policy on how to address distance students information needs.

7.1.7 How to Improve the Use of ICTs to Access Information

This study has shown that distance learners experience unique challenges in the use of ICTs to access information. The study sought ways of overcoming these challenges. Distance education planners should recognize the central role the university library plays for the success of distance education and involve the library right from the start of the planning process.

Librarians should conduct needs assessment studies on distance students in order to establish their information needs. Based on the the needs assessment, university libraries should develop policies governing library services for distant learners. These should include guidelines on access to services and resources through ICTs, financial resources and staffing. Additionally, each university should have a comprehensive ICT policy to provide guidelines in all aspects of ICT such as financing, use in course delivery and ICTs access by distant learners.

The selected universities should provide sufficient numbers of computers. They should double the number of computers in the labs and open the labs 24 hours. More computers should also be provided in the university libraries as well as at regional centres. In addition, universities should facilitate distance students to acquire laptops through an affordable loan facility arrangement. This will address the issue of use of cyber cafés thereby reducing the time and cost of accessing information. The Kenya government should zero rate computers. This would make the laptops more affordable to all citizens.

Distance students should use mobile phones for information access. The biggest advantage of the mobile phone is that it is not dependent on telecommunication infrastructure like the fixed telephone system. In addition, the mobile phone uses wireless technology to access the internet and therefore provides a solution to the problems of connectivity especially in remote areas. Improvement of the ICT infrastructure will also improve access to information by distance learners. The Kenya government should improve the ICT infrastructure especially in the rural areas with a view to lowering internet costs. This should go hand in hand with rural electrification efforts. This will increase internet access by distance students.

Universities should develop digital libraries or electronic libraries. The main campus library system should be networked with regional centres electronically to enable distance students to access the digital library from the regional centre. The digital library should have an information portal which is a platform which allows one-stop-shop access to information resources and services. Through the portal, distance students can have access to the library remotely. Some of the benefits for the student include: easy access to quality; approved resources; one interface to search across all resources or the federated

search; link from a citation to full text and e-journal and easy sign in through familiar Athens passwords. A digital library can link the distance learners to library catalogues, licensed journal databases, e-books, selected e-resources, electronic course reserves, tutorials and to forums for communication and interaction with others.

University libraries should provide e-services for distance students. Loan services such as online book reservations and online loan renewal can be made available through the web-based OPAC. The integrated library management system such as KOHA has features that can provide the e-services. Document delivery can be done via e-mail or posting the documents in a Wiki which is made accessible to distance students. Virtual reference service can be provided by an online librarian designated for distant learners. Librarians should adopt Web 2.0. Tools such as blogs, Facebook and Wikis in providing online reference services as these are interactive and make the experience more interesting. These can also be used for electronic communication.

The library website/portal is the best platform for online current awareness services. Adding electronic links from the OPAC to the library website would be the most effective method of capturing the attention of distance students. Libraries should make use of the electronic board on the library website to provide current awareness. They should provide RSS feeds which users can subscribe to so that they can receive alerts via e-mail whenever new items are posted on the library website.

University libraries should organize an initial face-to-face orientation of distance students followed by online asynchronous training through computer-based tutorials. Librarians should prepare Power Point presentations containing information on searching, finding

and evaluating electronic information and post the presentations on the library website. Alternatively the instructions can be modified into a series of web pages and be presented on e-learning platforms.

University libraries should increase the number of relevant e-books. They can do so by allocating more of their book budgets to e-books. Libraries should provide seamless remote access to the full text of licensed e-resources. Content providers often use IP address as an authentication mechanism to control access to their products. To allow seamless remote access to the full text of licensed e-resources, the library should install EZProxy software. EZProxy doesn't require browser configuration and is designed for library use. It would allow library users to log in through the library's EZProxy sever and gain full text access to the licensed e-resources remotely from home or elsewhere. This would reduce the number of passwords and provide a more user-friendly experience. Instructions about authentication should be posted on the University Library portal. Libraries should develop Institutional Repositories (IR) and make them available through the library portal.

The delivery of quality services requires adequate staff with the relevant skills to provide the services. The area of ICT changes very fast and library staff have to keep abreast with new technologies. University libraries should organize for the training of library staff in ICT skills. This can be achieved through short courses, workshops and seminars. In addition, asynchronous training through computer-based tutorials should be included.

7.2 Conclusion

The study set out to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries and to propose a model for improvement. The findings confirm the assumption that distance learners at the two case organizations encounter problems in access and use of ICTs for information. While there are benefits to be derived from the use of ICTs for information, data shows that distance students are not using these technologies to access information from the university libraries. There is need to improve the ICT infrastructure in the selected universities in order to provide access to distance students. There is also need for the government to improve the national infrastructure such as telecommunications and electricity to facilitate access to ICTs by distance students. There is need for Kenyan university libraries to provide sufficient ICT facilities and adequate connectivity. This requires policies to be developed that will provide guidelines on the development of e-libraries dedicated for distance students. University libraries will need to work in partnership with the faculty for distance education, ICT unit and closely consult with management on the issue of budgetary allocation for distance education resources. There is need for university libraries to develop information portals that are remotely accessible to distance students. There is also need for university libraries to offer electronic resources and services to distance students. University libraries should also increase ICT and information literacy for distance learners and create awareness of the services available for them. Despite the existence of these challenges, there is potential for increased use of ICTs in accessing information by distance learners.

Findings indicate that the main users of ICTs among distance students in both cases were generally the younger students. The younger students are quick to learn how to use ICT tools while the older students do not take the initiative to do so. The study concludes that age influences the use of ICTs as established by Akande (2011). This can be attributed to the fact that ICTs are a recent development and younger people have had the opportunity to be exposed to them in schools as opposed to older people who did not have such an opportunity. On the other hand, gender was found not to have an influence in access and use of ICTs among distance students in both universities. This can be attributed to the fact that both male and female students had similar education and socio-economic status. It can be concluded that gender differences in the use of ICTs only occur when male and female users do not have equal opportunities in education and socio-economic status. Gender differences in usage of ICTs have been attributed to inequalities in socio-economic status including education (Wasserman and Richmond-Abbot, 2005).

The study established the range of ICTs available and extent of their use by distance learners at each case organization. The study revealed that both case organizations had a similar available ICT infrastructure which included networked computers and internet. The study also established that majority of distance students owned mobile phones. A few regional centres at each case organization were networked. Both university libraries were fully automated and subscribed to e-resources. However, it was established that the number of computers in both institutions was inadequate for the large number of students and staff. Moreover, physical access and use of ICTs in the institution was mainly for on-campus students. Distance students could not access the computers available on campus due to distance and resulted to the use of cyber cafés, the workplace and personal laptops.

This is consistent with the findings of KENET (2008) which established that over 50% of university students accessed computers in cyber cafés. Access to and use of ICTs by distance learners was also affected by poor connectivity due to low band-width and inadequate electricity in the rural areas. It can be concluded that there was a gap in distance students' access to and use of ICTs provided by the university in both case organizations resulting in what Oladokun and Aina (2011) refer to as digital divide between locations. Universities should find ways of facilitating distance students' access to ICTs by improving the ICT infrastructure in the regional centres and at the same time encourage distance students to own laptops through an affordable loan facility arranged by the university. The Kenya government should zero rate computers to make them affordable and improve the ICT infrastructure in rural areas. Also, distance students should consider using mobile phones for information access as these do not rely on telecommunications and use very little electricity.

The study also identified a gap in the e-readiness for distance learners at both case organizations. Findings show that both university libraries rarely used electronic communication to provide services to distance learners. The study established that distance students at both universities could not access e-resources such as e-books and e-journals remotely off campus. Distance students from both universities relied heavily on other sources of information such as print books, study modules/Units, other students, colleagues and Google. It can safely be concluded that although both university libraries had posted e-resources on their websites, these were not accessible by distance learners. The findings of the present study are in agreement with the findings by Wachira and Onyantha (2012) which established that remote users could not access e-resources from

selected public universities. Lack of remote full text access to e-resources by distance learners is likely to hamper their search for information and negatively affect their study. It can also be concluded that both university libraries did not have e-services for distance students. Distance students are separated from the university library by long distances. Provision of e-services such as book reservation, online loan renewal, online reference service, online information delivery, current awareness services and access to e-resources would address this challenge and ensure that distance students get same services as their full-time colleagues.

Findings indicate that the proportion of the library budget allocated to ICTs at both Universities was insufficient. Due to the limited budget, it was difficult for university libraries to provide adequate resources, adequate ICTs and a specific budget line for distance students. Both university libraries did not have staff dedicated to offer services to distance students. University Librarians attributed this to inadequate staffing. It is safe to conclude that both university libraries lacked adequate financial resources to ensure e-readiness for distance learners' services. This is in agreement with the findings by Kavulya (2004).

The study identified a gap in the level of information literacy of distance learners. Lack of information literacy skills among distance students is one of the factors that contributed to low utilization of electronic information resources. It is safe to conclude that both university libraries did not have an information literacy programme for distance students. The library orientation was provided on an *ad hoc* basis which did not provide adequate training for both computer and information skills. This is in agreement with the findings of a study by Abdelrahman (2012) on distance learners in Sudanese universities.

Online asynchronous training through computer-based tutorials would be ideal form of training for distance learners. Lack of computer skills among library staff was a major hindrance to training students on both computer and information skills. To ensure the success of information literacy programme, there is need for capacity building for library staff. This can be achieved through workshops, seminars and short courses.

The study identified a gap in the development of ICT institutional policy at both case study organizations. There was a lack of a comprehensive ICT policy which addresses distance learners. The study revealed that both university libraries lacked clear independent and comprehensive ICT policies. It can safely be concluded that there was a gap in the ICT policy in both universities in addressing the issue of information access by distance learners. Lack of a well developed institutional ICT policy as well as library ICT policy for distance learners constituted a gap in the formulation of good programmes for supporting distance students access to information through ICTs. The aim of the ICT policy should be to bring about improved order in procurement, utilization and management of ICT resources and should include all users.

The study established that indeed distance learners experience challenges in access to and use of ICTs. These can be summarized as: distance; inadequate computers; high access costs; time; lack of awareness of available e-services and e-resources; inadequate computer skills; inadequate information literacy skills; poor connectivity from the ground due to low band-width and inadequate electricity; lack of remote access to e-resources, inadequate ICT facilities and information resources at the regional centres; competition for relevant information resources with on-campus students and inadequate library

support. This explains their preference for Google and cut-and-paste as well as their reliance on other students as their main source of information.

7.3 Recommendations

Based on the above summary of findings and conclusions, the study came up with the following recommendations to address the gaps identified and so improve access to and use of ICTs for information by distance learners. The recommendations are addressed to various stakeholders such as the government policy makers, university policy makers, librarians and distance learners.

7.3.1 Involve all Distance Education Stakeholders

Poor planning of distance education programmes in the selected universities was identified as a major issue that contributed to problems encountered by distance learners in accessing information. It was noted that librarians were excluded during the initial planning stages for distance education programmes at both universities. Elsewhere, Lebowitz (1997) observed that the library which should be the heart of the university is normally not incorporated into distance courses delivery and recommends that librarians should convince educators of the need to provide distance students with access to library services. Proper planning and management is necessary for the success of any programme. Course delivery is not the only component of a distance education programme. Other important components include the librarians, ICT team, administrators and students. To create a successful academic environment for a distance learner, various support services to students and faculty have to be included in the plan. The study recommends that University management should involve all stakeholders during the planning for any distance education programme. There should be close collaboration

between the faculty, Directorate of Distance Education, ICT staff and librarians. University librarians should be more proactive and ask for the library to be included in the planning for distance learning programmes. The role of librarians should change from being reactive providers to that of being integrated and contributing members of distance education development team. This will help them to plan, prepare and organize for information resources and services suitable for distance learners. It is also recommended that all staff be fully informed about developments in ICTs at all times. This will ensure that all staff will buy-in the adoption of new technologies.

7.3.2 Conduct Needs Assessment on Distance Learners

The study established that librarians at the selected universities had not identified distance students as a special category of users and interaction with them was limited. The existing library services model in both universities was meant for on-campus students and no services dedicated for distance students were offered. On the other hand, it emerged that distance learners encountered challenges in accessing information through ICTs. Research has shown that in order to have a successful library program for off-campus students, librarians must understand who their students are and what they want (Dew, 2001). This study recommends that librarians conduct needs assessment studies on distance learners in order to establish their information and communication needs. This will help librarians to develop a model of services that address the information needs of distance learners.

7.3.3 Improve the National ICT Infrastructure

The study established that access to and use of ICTs by distance learners was affected by poor connectivity due to low band-width and inadequate electricity in the rural areas. Also, internet access was very expensive due to high tariffs. The study recommends that the Kenya government, specifically the Communications Commission of Kenya (CCK) should improve the telecommunications infrastructure in the rural areas with a view to lowering internet costs. The situation is slowly changing with the laying of fibre optic cable country-wide by various providers. Also, the National Broadband Strategy, 2013 launched recently plans to deliver a broadband with a minimum speed of 5 mbps in rural areas. It also seeks to compel fibre-optic networks to share infrastructure rather than building competitive networks. The government is considering introduction of rebates and special tariffs on electricity. This is expected to lower costs and boost household usage from the current 6.3% to 35% by 2017 (Kenya. Ministry of Information, Communications and Technology, 2013). The government should step up the rural electrification programmes. According to a report by InfoDev (2008), electricity is extremely relevant to internet and broadband development. Increasing national electrification is a pre-condition for further internet and broadband development and geographical spread. The study also recommends the use of alternative sources of energy such as solar. Already there are solar chargers being sold by private companies. The government should intervene and make these chargers affordable to people in rural areas.

7.3.4 Zero tax ICTs

One of the challenges encountered by distance students was inadequate computers. The study established that majority of distance students gained access to a computer through a

cyber café and didn't own laptops due to the prohibitive cost. It also emerged that the selected universities did not have sufficient number of computers for use by both students and staff. The study recommends that the Kenya government should zero-rate taxation on computers and other ICTs including mobile phones so that they can be more affordable to majority of its citizens. If computer prices and internet costs reduce, distance learners can afford to acquire laptops and connect to internet from home. Price reduction for mobile phones would be more advantageous to the distance learner because the mobile phone is not dependent on telecommunication infrastructure like the fixed telephone system. The mobile phone uses wireless technology to access the internet and therefore provides a solution to the problems of connectivity in rural areas. Mobile telephone providers have been lowering their tariffs but they can lower them further. All mobile phones should be web enabled to allow subscribers to access the internet.

7.3.5 Improve the ICT Infrastructure in the University

The study established that the ICT infrastructure in the selected universities was inadequate. The study recommends that the ICT Directorate of each selected university should increase the number of computers to the recommended average of 10 PCs for every 100 students in the university as indicated by KENET (2008). The computer labs should be open for 24 hours to ensure access by all at any time. University librarians should provide more computers in the university library as well as at regional centres. With the increase in numbers of staff and students, the ICT Directorate should continuously monitor connectivity in the university with a view to increasing the bandwidth as well as extending the Wi-Fi cover to the entire campus including the halls of residence. The study recommends that the University management should provide

Lecturers of distance students with laptops to be able to communicate with distance students anytime, anywhere, at home or in the workplace. Similarly, distance students should also be facilitated with laptops. Universities should lobby with the government for laptops starting with all first year students including distance students. If it is not possible to get the laptops free of charge, the University management should partner with willing sponsors and banks and arrange for an affordable loan facility for distance students to acquire laptops.

Due to the high penetration rate of the mobile phone, universities should adopt innovative mobile learning technologies for teaching distance learners. It should be made mandatory for distance students to acquire internet enabled mobile phones which they can use to access library resources and services.

7.3.6 Improve the ICT Infrastructure and Library Services at Study Centres

The study established that the regional centres lacked adequate ICT facilities. The study recommends that the ICT Directorate should ensure that all regional centres have adequate computers and internet including Wi-Fi. They should also ensure that all regional centres are linked electronically via fibre link to the main university.

The study also revealed that library services and resources at the centres were inadequate in both institutions. Indeed, libraries were missing in some centres. The study recommends that University librarians should expand the library to the centres and ensure that adequate information resources are provided and the full range of library services are offered at the centres. They should also ensure that the central library system is networked with regional centres electronically to enable distance learners to access the

digital library from the regional centres. Each regional centre library should have a secure multimedia lab to be used for online searches by distance learners.

7.3.7 Formulation of ICT Policies

On the national scene, this study notes that the ICT Policy drafted in 2006 is still in the draft form. The Kenya government through the Ministry of Information, Communications and Technology should come up with strategies for the implementation of this policy to guide the utilization of ICTs in the country. There is need for a comprehensive policy, legal and regulatory framework to for example, support ICT development, investment and application and to ensure affordability and access to ICTs nationally.

At the institutional level, the study established that the ICT policies in both case organizations were not comprehensive. The success of any distance learning programme requires appropriate curriculum development processes guided by a clear ICT policy (Nafukho, 2007). It is recommended that the university management in both institutions should ensure that a comprehensive ICT policy is well developed in line with the vision and mission of the university. The ICT policy should include e-learning and m-learning or mobile learning. The ICT policy would be necessary to provide guidelines in all aspects of ICT such as financing, use in course delivery and ICTs access by distance learners. In addition, the ICT policy should address the provision of basic computer skills to staff as well as students, both residential and distance students. It is further recommended that University librarians in both institutions develop comprehensive ICT policies for the library that address the needs of distance learners. The study established that there was no strategy to address the library needs of distance students in both universities. The study recommends that university librarians of both institutions should

have written policies governing library services for distance learners. These should include guidelines on access to services and resources through ICTs, financial resources and staffing and physical facilities.

7.3.8 ICT Skills Development and Information Literacy Instruction

The study identified lack of basic computer skills among library staff and distance students as a challenge. The area of ICT changes very fast and both the information providers and users need continuing training in ICTs to keep abreast with new developments. It is recommended that the ICT departments of both universities should organize short courses in basic ICT skills for faculty, other university staff and residential as well as distance students. The academic calendar of each university should include time for ICT training for distance students at the start of the program during their first face-to-face session. In addition, asynchronous training through computer-based tutorials should be included. The ICT policy should also provide for the development of ICT workforce and professionals or human capital development. The university librarians also have a role to play. They should include ICT skills training in the library training policy and organize for such training to be given to library staff either through the ICT departments or by other trainers.

The study also established that both university libraries did not have an information literacy programme for distance students. This refers to searching, finding and evaluating electronic information in various subject areas. The lack of information literacy programmes for distance learners has been identified by other scholars such as Abdelrahman (2012), Mabawonku (2004) and Roccas (2001). This study recommends that University librarians should be more proactive and first, ensure that time is allocated

for distance students for face-to-face library orientation during the start of their programme. Secondly, they should offer online asynchronous training through computer-based tutorials on the library website. Librarians should prepare Power Point presentations containing information on searching, finding and evaluating electronic information and post the presentations on the library website. Alternatively the instructions can be modified into a series of web pages and be presented on e-learning platforms such as Blackboard (Roccas, 2001). According to Mutula et. al. (2006), imparting information literacy skills through online module could improve students' competencies more than the face-to-face instruction mode.

7.3.9 Develop Electronic Library Portals

It emerged from this study that distance students at both universities encountered problems in accessing e-resources and services from the university library remotely. The study recommends that Systems Librarians in both institutions should develop digital or electronic libraries and provide remote access to the digital library through the library portal in consultation with the ICT team. A portal is a website designed to carry links to pages the user is likely to want to access. It is a platform which allows one-stop-shop access/searching and discovery via a unified single-point interface to organized heterogeneous resources and enabling services to a pre-defined community (users). Library portals are important platforms for distance learners. Through the portal, distance learners can have access to the library remotely. The information resources that should be posted to the library portal should include: e-books, e-journals, e-references and bibliographic databases. The e-services should include the web-OPAC virtual reference, circulation, document delivery, online current awareness and online literacy programmes.

The study also recommends that librarians should develop a unified access interface for distance learners to access the digital library. One sign on interface should be created for distance learners to access the digital library. Some of the benefits of the library portal for the distance learner are: easy access to quality; approved resources; one interface to learn and one search across all resources; link from a citation to full text and e-journal; easy sign in through familiar Athens passwords; electronic library services such as web and/or e-mail reference and instructional resources. According to Murray (2003), implementing a portal brings the opportunity to develop e-library services as key learning support tool which makes it appealing and rewarding to use library services.

Seamless remote access to the full text of licensed e-resources should be allowed by installing EZProxy software. EZProxy doesn't require browser configuration and is designed for library use. It would allow library users to logon through the library's EZProxy sever and gain full text access to the licensed e-resources remotely from home or elsewhere. This would reduce the number of passwords and provide a more user-friendly experience. Instructions about authentication should be posted on the University Library portal. In addition, librarians should also develop an interface for a federated search for the e-resources. A federated search interface enables users to search across all resources from a single interface. This will minimize the time spent having to logon to different publishers' sites.

7.3.10 Offer e-services

The study established that both university libraries did not have e-services for distance students. It is recommended that the university librarians should ensure that e-services are provided for distance learners. Loan services such as online book reservations and online

loan renewal can be offered through the web-based OPAC. The integrated library management system such as KOHA has features that can provide the e-services. Document delivery can be done via e-mail or posting the documents in a Wiki which is made accessible to distance students. The study also recommends that university librarians should ensure that virtual reference service is provided for distant learners. They should create a help-desk that is managed by an online librarian designated for distance learners. In addition, troubleshooting guides should be posted on the library portal for reference. With the emergence of multipurpose ICTs such as smart phones and ipads, librarians need to be more innovative in the way they can provide e-services to distance learners more effectively. An example of a university library that has come up with such innovations is UNISA Library. This library has implemented a wireless catalogue named AirPAC which gives users access to users remotely via their mobile devices (UNISA, 2013).

The faculty can post the course outlines and reading lists on the university website. The librarians can then link the reading lists to e-books and full-text journal articles which may reside in the library's server or somewhere else (Wu and Liu, 2004).

7.3.11 Create Awareness of Services

The e-resources and services provided by the university library may go to waste if they are not used. Distance learners need to be made aware of these services for them to exploit them. The study recommends a combination of various methods with a bias on online awareness services so as to reach distance learners. The library portal is the best platform for online awareness services. Adding electronic links from the OPAC to the library website would be the most effective method of capturing the attention of distance

learners. Librarians should make use of the electronic board to make announcements of new services and resources. They should provide RSS feeds which users can subscribe to so that they can receive alerts via e-mail whenever new items are posted on the library website. Librarians should also adopt newer methods of communication tools by using web2.0 tools such as blogs, Facebook and Wikis. These are interactive and make the experience more interesting. The use of e-mail and the mobile phone in communicating with distance learners should also be encouraged.

7.3.12 Staffing

The delivery of quality services requires adequate staff with the relevant skills to provide the services. The present study recommends that both university libraries should have a professional librarian supported by a team of librarians for distance learner's services. The librarian should be endowed with the relevant ICT skills. This librarian should liaise with faculty, the Directorate of Distance Education and other departments of the university library. The librarian should ensure that the library acquires information resources as recommended by faculty and provide appropriate e-services to distance learners. The university library should have a team of well trained online librarians with the necessary ICT skills to offer e-services to distance learners. In addition, all regional centre libraries should have trained librarians to provide proper library services at the centres. Distance students should be provided with an online contact dedicated for them. All library staff should be sensitized about distance learners and the need to treat them as a special category of users.

7.3.13 Allocation of Adequate Financial Resources

In order to provide the ICT facilities, e- resources and services, budgetary allocation must be provided. Money is required for the purchase of appropriate hardware and other accessories, software, costs of installation, support and maintenance, purchase of e-resources and other information resources as well as for staff emoluments. The university management should ensure that the university library is allocated adequate budget which at the time of this research should not be below 20% of total institutional budget as stipulated by the Commission for University Education.

7.3.14 Develop Partnerships with other Libraries

It is recommended that the university library at both institutions should develop partnerships with other libraries such as the Kenya National Library Services (KNLS). The main purpose of KNLS is to ensure access to information and promote reading for knowledge, information and enjoyment to the public. So far, KNLS has 59 branches located in various parts of the country. Of these branches, 21 are located at county headquarters and 38 are community based libraries located in the rural areas (Kenya National Library Services, 2014). KNLS offers a wide variety of information resources which include not only the hard copy books but also electronic information resources such as e-books and e-journals suitable for researchers. University libraries should partner with KNLS to enable distance learners to use the facilities and resources in the KNLS branch libraries nearest to them.

7.4 Proposed Model for Improving Accessibility and use of ICTs for Information to Distance Learners in Kenyan Public University Libraries

One of the objectives of this study was to propose a framework or model for improving access and use of ICTs in the provision of information to distance learners in public university libraries in Kenya. The model will focus on the key findings of this study especially those relating to challenges experienced by distance learners in access to and use of ICTs. Figure 7.1 is a graphical presentation of the proposed Distance Education E-library (DEEL) Model. Research has shown that ICTs are important tools for distance learners in accessing information for their study. However, distance learners have challenges in getting access to ICTs as well as in using them to find information relevant for their study. The purpose of the model is to propose systems that can facilitate distant learners' access to information through ICTs so as to facilitate their study.

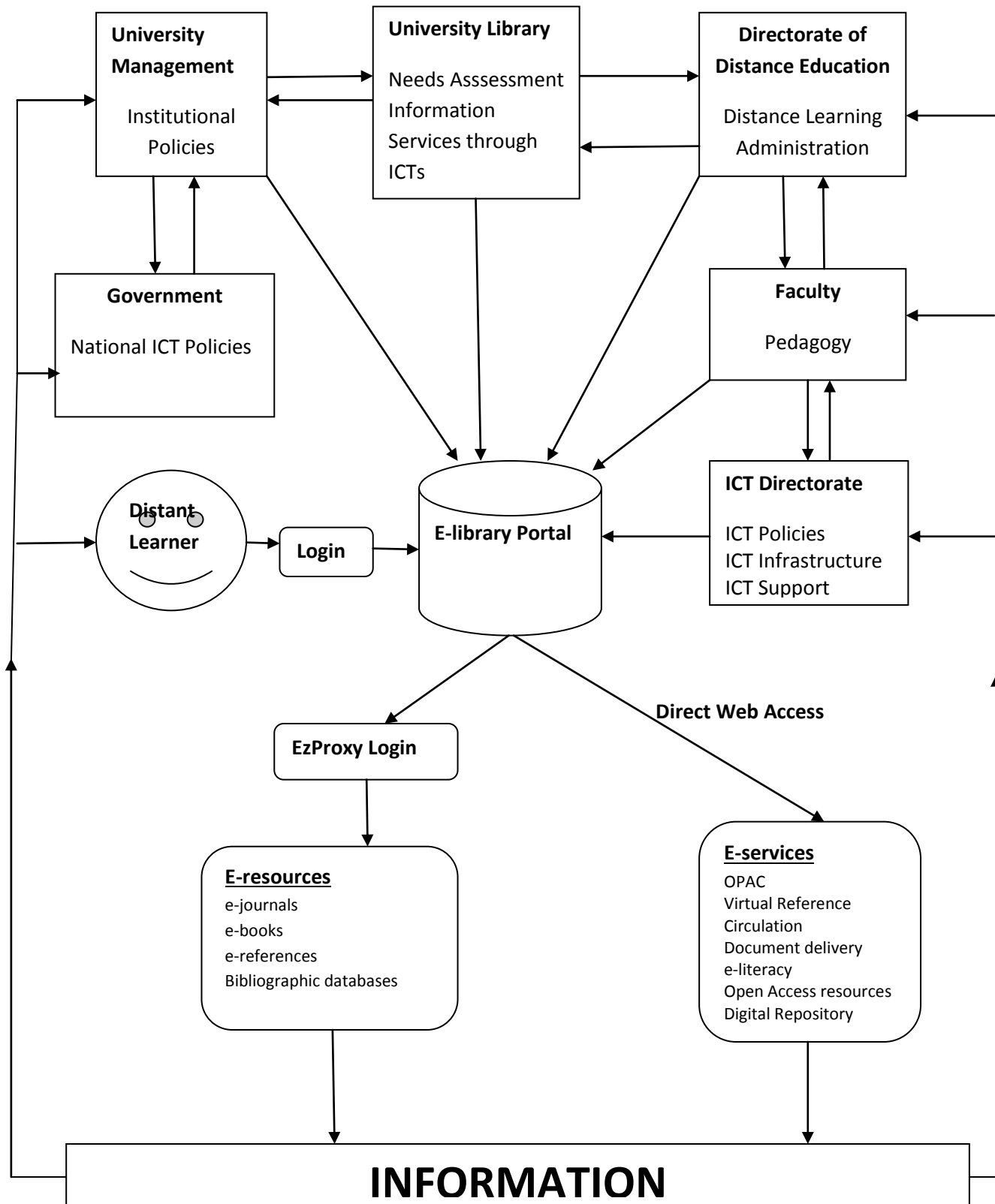


Figure 7-1: Proposed Distance Education E-library Model (DEEL)

Source: Author

This study established that access to ICTs by distance learners was inadequate upcountry for both case institutions due to poor infrastructure such as electricity supply and telecommunications. Some rural areas lack infrastructure such as telecommunications and electricity and this hinders access to ICTs by distance learners. Even where there is access through cybercafés, the cost of access is prohibitive. Improvement in ICTs access will start with the government providing the national ICT infrastructure in the rural areas. This requires formulation of ICT policies to guide in the development of the national ICT infrastructure. These policies will be concerned with ICT production, access and use. As Omwenga (2004) points out, effective policy formulation may see cybercafés lowering costs. The policy should also include tax exemption to ICTs. This will lower the cost of computers making laptops affordable both to institutions and to individual distance learners. Kenya has an ICT policy that recognizes the role of ICTs in the social and economic development of the nation. However, it does not focus on the rural areas. The ICT policy needs to focus more on the rural areas.

Another key component of this framework is the University Management. Poor planning of distance education programmes in the selected universities was identified as a major issue that contributed to problems encountered by distance learners in accessing information. Proper planning and management of distance education programme that is all inclusive is necessary for the success of the programme. The university management should involve all stakeholders during the planning for distance education and ensure adequate allocation of resources. This should include faculty, librarians, Directorate of Distance Education and ICT Directorate. All these components should work in partnership to create a successful academic environment for the distance learner.

The study established that the ICT infrastructure in the case institutions was inadequate. This includes the study centres some of which lack ICT infrastructure. The ICT Directorate is the component responsible for advising University Management in the formulation of institutional ICT policies. They advise Management on the institutional requirements of ICT Infrastructure should provide and continuously improve the ICT infrastructure in the institution. The ICT policies should address the needs of distance learners, for example, distance learners should be facilitated with laptops or tablets. All regional centres should be provided with adequate computers and internet including Wi-Fi. They should also be linked electronically via fibre link to the main university. This will ensure that distance learners can access the university system remotely. Also, distance students should consider using mobile phones for information access as these do not rely on telecommunications and use very little electricity.

The other important component is the University Library. The study established that the selected university libraries did not have policies for distance learners. Librarians should conduct needs assessment studies on distance learners in order to establish their information and communication needs. Distance learners should be the focus. Therefore their needs and wants and the environment where they are must be understood. Consequently, there should be interaction between the librarian and the distance learner. Based on the needs assessment, university librarians should develop policies governing library services for distance learners. These will include guidelines on access to services and resources through ICTs, financial resources and staffing.

The study established that the university libraries were not e-ready for distance learners. Distance students could not access the library e-resources remotely and there were no e-services for them. Furthermore, they experienced challenges in finding information due to lack of information literacy skills. The University Library should develop information products and services suitable for distant learners. The library will have an information portal which is a platform which will allow a one-stop-shop access to information e-resources and e-services. Through the portal, distance learners will have access to the library remotely. Some of the benefits for the distance learner will be: easy access to quality, approved resources; one interface to search across all resources or the federated search; link from a citation to full text and e-journal and easy sign in through familiar Athens passwords. Distance learners will be linked to library catalogues, licensed journal databases, e-books, selected e-resources, electronic course reserves, tutorials and to forums for communication and interaction with others.

University libraries will also provide e-services for distance learners. Loan services such as online book reservations and online loan renewal will be made available through the web-based OPAC. Document delivery will be done through e-mail or posting the documents in a Wiki which is made accessible to distance students. Virtual reference service will be provided by an online librarian designated for distance learners through Web 2.0. tools such as blogs, Facebook and Wikis. These are interactive and make the experience more interesting. Current awareness will be offered via the electronic board of the library portal. Users will be able subscribe to RSS feeds so that they can receive alerts via e-mail whenever new items are posted on the library portal.

Other components of the proposed model are the Faculty, the Directorate of Distance Education and the distance learner. The Faculty will play a pedagogical role which will motivate distant learners to search for information through ICTs. The Directorate of Distance Education will be dealing with the administration of distance education programmes. At the centre of the model is the distance learner who is the focus of all the other components. The model portrays the distance learner in context. It shows how the learner will access various e-resources and e-services through the e-library portal.

It is apparent from the model that access to and use of ICTs by distance learners in public universities in Kenya is influenced by various actors. The prerequisite for digital and virtual services for distance learners is the availability of national telecommunications and electricity which should be provided by the government. At the institutional level, distance learning administrators together with faculty and librarians should collaborate in improving access to and use of ICTs in the provision of information to distance learners. This will ensure that distance learners get the same privileges that their on-campus counterparts enjoy as far as information services are concerned and promote lifelong learning.

7.5 Suggestions for Further Research

The present study investigated accessibility and use of ICTs in information provision for distance learners at the University of Nairobi and Kenyatta University libraries. The study identified several issues which could be the subject of further research by other researchers in the field. The following discussion highlights areas that need further research in future.

The proposed qualitative model in this study does not demonstrate the relationship between use of ICTs for accessing information and actual use of information resources in a quantitative manner. Building on this model, further research may be conducted to establish quantifiable variables on the usage of e-resources by distant learners.

The current study covered two public universities namely the University of Nairobi and Kenyatta University. It is recommended that a similar study be conducted to include other higher education institutions.

Although the current study established the challenges that distance students in the selected universities experience in accessing information through ICTs, it is recommended that a comprehensive research be undertaken to establish the information needs and information seeking behaviour of distant learners. This is important for librarians in order to provide relevant information services to distant learners.

The current study established that distant learners at the selected universities experienced challenges in accessing e-resources. It is recommended that further research be conducted on the navigation of the library website by distance learners with a view to recommending changes to improve navigation.

The present study was based on distant learners on the hybrid mode of distance education where students studied at a distance with limited face-to-face sessions with lecturers. Universities in Kenya are gradually embracing e-learning. It is recommended that research be conducted on integrating e-library into the e-learning environment.

The study identified that the ICT infrastructure in rural areas in Kenya where most distant learners reside is inadequate. Further research should be conducted on the use of emerging technologies that do not depend on infrastructure in e-learning and e-library services.

The aim of the study was to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries and to propose a model for improvement. This has been achieved and areas for further research have been identified.

REFERENCES

- Abdelrahman, O.H. (2012). A basic hybrid library support model to distance learners in Sudan. *Journal of Librarianship and Information Science* 44 (1), 19-26. Retrieved November 14, 2012 from <http://lis.sagepub.com/content/44/1/19>
- Abdel-Wahab, A. (2008). Modeling students' intention to adopt e-learning: A case from Egypt. *Turkish Online Journal of Distance Education* 9 (1), 157-168. Retrieved January 30, 2009 from http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/3a/f2/e1.pdf
- Adams J.M. (2000). Distance learning at Fairleigh Dickinson University: Distance learning initiative. Inaugural Address September 27, 2000. Retrieved January 30, 2009 from <http://view.fdu.edu/default.aspx?id=6381>
- Adesoye, A.E. & Amusa, O.I. (2010). Investigating the information needs of sandwich and part-time students of two Public universities in Ogun State, Nigeria. *Jnl. Hum. & Soc. Sci.* 2 (2), 98-106.
- Adomi, E.E., Okiy, R.B. & Ruteyan, J.O. (2003). A survey of cybercafés in Delta State, Nigeria. *The Electronic Library*, 21 (5), 487-495. Retrieved July 1, 2013 from <http://www.emeraldinsight.com/0264-0473.htm>
- Access to Global Online Research in Agriculture (2007). Retrieved November 27, 2007 from www.aginternetwork.org
- Aguti, J.N. & Fraser, W.J. (2006). Integration of Information Communication Technologies (ICTs) in the Distance Education Bachelor of Education programme, Makerere University, Uganda. *Turkish Online Journal of Distance Education*, 7 (3), 89-104.
- Akande, S. O. (2011) Computer and internet facilities use in distance education: A survey of sandwich students of University of Ado-Ekiti, Nigeria. *Library Philosophy and Practice*. (January), 1-9. Retrieved May 4, 2013 from <http://unllib.unl.edu/LPP/lpp2011.htm>
- Akinseinde & Adomi (2004). E-mail usage by technical education students in Nigerian universities. *Library Hi Tech News*, (9), 15-20. Retrieved July 4, 2013) from <http://www.emeraldinsight.com/search.htm?st1=Akinseinde+&ct=jnl&ec=1&bf=1&go=Go>
- Alao, I.A. & Folorunsho, A.L. (2008). The use of cybercafés in Ilorin, Nigeria. *The Electronic Library*, 26 (2), 238-248. Retrieved July 2, 2013 from www.emeraldinsight.com/0264-0473.htm

- Aoki, K. and Pogroszewki, D. (1998) Virtual University Reference Model: A guide to delivering education and support services to the distance learner. *Online Journal of Distance Learning Administration* 1(3), Fall 1998. State University of West Georgia, Distance Education Centre. Retrieved November 30, 2012 from <http://www.westga.edu/~distance/ojdla/fall13/aoki13.pdf>
- Arms, W.Y. (2005) Digital libraries. New Delhi: Ane Books.
- Arunachalam, S. (1999). Information and knowledge in the age of electronic communication: a developing country perspective. *Journal of Information Science*, 25 (6), 465-476. Retrieved September 10, 2012 from Sage database
- Aseev, A.A. (2004) *An investigation into the process and management of distance education in Kenya: A case study of the Faculty of External Studies*. Unpublished M. Ed. Thesis. Nairobi: University of Nairobi.
- Association for the Development of Education in Africa (2002). DE and Open learning in Sub-Saharan Africa. Retrieved May 3, 2013 from <http://www.adeanet.org/adeaPortal/publications/docs/open%20learning%201.pdf>
- Association of College and Research Libraries (2008) Standards for distance learning library services. Retrieved November 14, 2012 from <http://www.ala.org/ala/mgrps/divs/acrl/standards/guidelinesdistancelearning.cfm>.
- Baker, J.D. (1999) Models of Distance Education. Retrieved January 30, 2009 from http://www.bakersguide.com/Articles/Articles/Models_of_Distance_Education/
- Blanche, M.T., Durrheim, K. and Painter, D. (2006). First steps in qualitative data analysis *In* Blanche, M.T., Durrheim, K. and Painter, D. (eds.) *Research in practice: applied methods for social sciences*. 2nd rev. ed. Cape Town: University of Cape Town.
- Blignaut, P. (2009). A bilateral perspective on the Digital Divide in South Africa. *Perspectives on Global Development and Technology*, 8, 581-601. From DOI: 10.1163/156915009X12583611836091. (Retrieved 1 July 2013).
- Boadi, B.Y & Letsolo, P. (2004). Information needs and information-seeking behavior of distance learners at the Institute of Extra-Mural Studies in Lesotho. *Information for Development*, 20(3): 189-199. Retrieved March 28, 2013 from <http://idv.sagepub.com/content/20/3/189>
- Boeije, H. (2010). *Analysis in qualitative research*. London: Sage.
- Budapest Open Access Initiative (2002). Retrieved October 18, 2012 from www.budapestopenaccessinitiative.org/

- Breetzke, G. (2008). The challenges of distance learning for GIS in South Africa. ESRI Education User Conference, San Diego, U.S.A. 2-5 August, 2008. *The British Computer Society glossary of ICT and computing terms* (2005). 11th ed. Harlow: Pearson.
- Bryne, S. and Bates, J. (2009). Use of the University Library, Elibray, VLE, and other information sources by distance learning students in University College Dublin: Implications for academic librarianship, *New Review of Academic Librarianship*, 15 (1), 120-141. Retrieved November 30, 2012 from <http://dx.doi.org/10.1080/13614530903143169>
- Chaputula, A.H. (2012). State, adoption and use of ICTs by students and academic staff at Mzuzu University, Malawi. *Program: Electronic Library and Information Systems*, 46 (4), 364-382. Retrieved July 4, 2013 from www.emeraldinsight.com/0033-0337.htm
- Chisenga, J., & Chande-Mallya, R. C. (2012). Social media and professional networking: a case study of information professionals in the SCECSAL region *In Information for sustainable development in a digital environment: Proceedings of the 2012 SCECSAL Conference, Nairobi: 4th – 8th June, 2012. Nairobi: Kenya Library Association, 340-352.*
- Coffman, S. (2001) Distance education and virtual reference: Where are we headed? *Computers in Libraries*, 21(4), 20-25. Retrieved November 30, 2012 from <http://www.infoday.com/cilmag/Apr01/coffman.htm>
- Commission for University Education (2012). *Standards and guidelines for university libraries in Kenya*. (Rev. ed.) Nairobi: Commission for University Education. Nairobi: CUE.
- Commonwealth of Learning (2015) Open and distance education: Key terms and definitions. Retrieved November 3, 2015 from <http://hdl.handle.net/11599/829>
- Communications Commission of Kenya (2012). Quarterly sector statistics report: First quarter of the Financial Year 2012/13 (July-September 2012). Retrieved February 28, 2013 from <http://www.cck.go.ke/resc/statcs.html>
- Communications Commission of Kenya (2013). The National Broadband Strategy for Kenya for the period 2013-2017 (draft). Retrieved July 31, 2013 from <http://www.cck.go.ke/>
- Cooper, J. L. (2000) A model for library support of distance education in the USA. *Interlending & Document Supply*, 28 (3), 123-131.
- Cooper, D.R. and Schindler, P.S. (2006) *Business research methods*. 9th ed. Boston: McGraw-Hill.

- Corbin, J. and Strauss, A. (2008) *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Los Angeles: Sage.
- Cox, A. (2003) Choosing a library portal system. *VINE: The Journal of Information Management Systems*, 33(1), 37-41.
- CPS Research International (2012) Top 100 East African Universities Survey. Nairobi: CPS International. Retrieved March 1, 2013 from www.cps-research.com
- Creswell, J.W. (1994) *Research design: Qualitative and quantitative approaches*. Thousand Oaks, CL: Sage.
- Creswell, J.W. (2003) *Research design: Qualitative, quantitative and mixed methods approaches*. 2nd ed. Thousand Oaks, CL: Sage.
- Cresswell, J.W. (2012) *Educational research: Planning, conducting and evaluating quantitative and qualitative research*. 4th ed. Boston: Pearson.
- Dempsey, L. (2003) The recombinant library: Portals and People. *Journal of Library Administration*, 39 (4), 103-136. Retrieved November 26, 2007 from http://www.tandfonline.com/doi/abs/10.1300/J111v39n04_10
- Dew, S. H. (2001) Knowing your users and what they want: surveying off-campus students about library services. *Journal of Library Administration*, 31(3/4), 177-198. Retrieved March 28, 2013 from http://www.tandfonline.com/doi/abs/10.1300/J111v31n03_15
- Distance education in Sub-Saharan Africa. Retrieved May 3, 2013 from http://www.adeanet.org/adeaPortal/includes/publications/PDF/enseignementdistance_06_en.pdf
- Durrheim, K. (2006) Research design *In* Blanche, M.T., Durrheim, K. and Painter, D. (eds.) *Research in practice: applied methods for social sciences*. 2nd rev. ed. Cape Town: University of Cape Town. pp. 33-59.
- Durrheim, K. and Painter, D. (2006). Collecting quantitative data: measuring and sampling *In* Blanche, M.T., Durrheim, K. and Painter, D. (eds.) *Research in practice: applied methods for social sciences*. 2nd rev. ed. Cape Town: University of Cape Town. pp. 132-159
- Economist Intelligence Unit (2003) The 2003 e-learning readiness rankings London: EIU. Retrieved November 26, 2007 from www.eiu.com
- Eke, H.N. (2010) The perspective of e-learning and libraries in Africa: Challenges and opportunities. *Library Review*, 59 (4), 274-290. Retrieved March 28, 2013) from www.emeraldinsight.com/0024-2535.htm

- Elisha, M.J. (2006). The application of information and Communication Technology (ICT) in Nigerian academic libraries: Prospects and problems. *The Information Manager*, 6 (1&2), 35-39.
- The European Library Automation Group (2002) Report of the Portal Workshop of the European Library Automation Group Meeting, Rome, Italy, 17-19 April 2002. Retrieved February 4, 2013 from www.ifnet.it/elag2002/workshop.html
- Farrell, G. and Shafika, I. (2007) *Survey of ICT and Education in Africa: A Summary Report, Based on 53 Country Surveys*. Washington, DC: infoDev / World Bank. Retrieved May 3, 2013 from <http://www.infodiv.org/en/Publication.353.html>
- Fayek, M.B. (2008). E-learning and its application in Egypt. A Presentation made at Aachen University of Technology, Germany.
- Frankfort-Nachmias, C. and Nachmias, D. (1996) *Research methods in the social sciences*. 5th ed. London: Arnold.
- Friedlander, B.P. (2002). Cornell University's distance-learning course makes global. Retrieved January 30, 2009 from <http://www.globalenvision.org/library/14/225>
- Galatanu, C.D., Ghica, V. and Ernu, E. (2008). The quality of open distance learning: The impact of the constructivism pedagogy. Retrieved December 10, 2008) from http://conference.iasi.roedu.net/site/conference/papers/GALATANU_C-The Quality of Open Distance Learning-the Impac..pdf
- Gilbert, D., Lee-Kelly, L. & Barton, M. (2003). Technophobia, gender influences and consumer decision-making for technology-related products. *European Journal of Innovation Management*, 6 (4), 253-263. Retrieved July 1, 2013 from www.emeraldinsight.com/1460-1060.htm
- Glennie, J. and Bialobrzeska, M. (2006). Overview of distance education in South Africa. South African Institute for Distance Education. Retrieved February 20, 2009) from <http://www.saide.org.za/resources/Distance%20Education/Overview%20of%20DE%20in%20SA%202006%20.doc>
- Gourley, D. (2003) Library portal roles in a Shibboleth Federation. Retrieved November 26, 2007 from <http://shibboleth.internet2.edu/docs/gourley-shibboleth-library-portals-200310.html>
- Grassian, E.S. and Kaplowitz, J.R. (2009) *Information literacy instruction: Theory and practice*. 2nd ed. New York: Neal-Schuman.
- Griswold, W., McDonnell, E.M. & McDonnell, T.E. (2006). Glamour and honor: Going online and reading in West African culture. *Information Technologies and International Development*, 3 (4): 37–52.

- Glossary of terms (2007). Retrieved November 27, 2007 from <http://www.physicalgeography.net/physgeoglos/s.html#anchor197057>
- Gueverra, J. (2007). Repositioning for a virtual culture. *On the Horizon*, 15 (3):139-144
- Gunga, S.O. and Ricketts, I.W. (2007) Facing the challenge of e-learning initiatives in African Universities. *British Journal of Education Technology*, 38 (5), 896-906. Retrieved January 30, 2009) from doi:10.1111/j.1467-8535.2006.00677.x
- Gurumurthy, A. (2006). Promoting gender equality? Some development-related uses of ICTs by women. *Development in Practice*, 16 (6), 611-616. Retrieved July 1, 2013) from <http://dx.doi.org/10.1080/09614520600958298>
- Gutiérrez, L.H. & Gamboa, L.F. (2010). Determinants of ICT Usage among Low-Income Groups in Colombia, Mexico, and Peru. *The Information Society*, 26, 346-363. Retrieved July 2, 2013 from DOI: 10.1080/01972243.2010.511559
- Haynes, A. (2002) Distance learning library services: Challenges and opportunities for an academic library system. *Indiana Libraries, Distance Learning*. Retrieved September 22, 2008) from <https://scholarworks.iupui.edu/bitstream/handle/1805/1247/Distance%20Learning%20Library%20Services.pdf>
- Haynes, A. & Mannan, S. (2006). Indiana's Statewide Distance Education Library Services Task Force: Past, present, and future. *Journal of Library Administration* 45 (1-2): 203-213. Retrieved May 25, 2013) from http://dx.doi.org/10.1300/J111v45n01_11.
- Health Internetwork Access to Research Initiative (2007). Retrieved November 27, 2007 from www.who.int/hinari
- Henderson, A., & Bowley, R. (2010). Authentic dialogue? The role of “friendship” in a social media recruitment campaign. *Journal of Communication Management*, 14 (3), 237-257. Retrieved September 29, 2012 from Emerald database
- Herring, S. C. (2004). Slouching toward the ordinary: Current trends in computer-mediated communication. *New Media & Society* 6 (1), 26-36. Retrieved March 22, 2013 from <http://nms.sagepub.com/content/6/1/26>
- Holmberg, B. (1989a) *Theory and practice of distance education*. London: Routledge.
- Holmberg, B. (1989b) Key issues in distance education. *European Journal of Education*, 24 (1), 11-23.
- Hung, D. (2001) Design principles for web-based learning: Implications for Vygotskian thought. *Educational Technology* 41 (3), 33-41. InfoDev (2008) ICT regulation tool kit: Electricity. Retrieved July 1, 2013 from <http://www.ictregulationtoolkit.org/4.1.6.3>

- International Telecommunication Union (2013). Statistics: Global ICT developments. Retrieved May 7, 2013 from <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>
- Jomo Kenyatta College of Agriculture and Technology (JKUAT). Retrieved February 12, 2009) from http://www.jkuat.ac.ke/index.php?option=com_content&view=article&id=22&Itemid=69
- Jones, M.F. (2003) Getting started: A guide for new distance learning librarians. Retrieved November 14, 2012 from http://caspian.switchinc.org/~distlearn/guidelines/getting_started.html
- Juma, M.N. (2004). The establishment of higher education open and distance learning knowledge base for decision makers in Kenya. Paper presented to UNESCO. Retrieved November 27, 2007 from http://www.unesco.org/education/studyingabroad/highlights/odl_kp/kenya.doc
- Kang'ethe, S., Karani, A., Onditi, E., Mangera, B. And Pemba, K. (2008). *How to write a winning thesis*. Eldoret, Kenya: Zapf Chancery.
- Kanwar, A. and Daniel, J. (2010) Distance education and open universities *In Higher education: Teaching and learning in higher education*. Vancouver: Elsevier.
- Karim, A.H. and Dih, B.L. (2009) Uniting e-libraries and e-learning. Retrieved May 2, 2013 from www.lib.usm.my/elmuequip/conference/Documents/ICOL%202005%20Paper%2005%20Awang%20Suhaimi%20&%20Lim%20Bann%20Dih.pdf
- Kazmer, M.M. (2002) Distance education students speak to the library: here is how you can help even more. Retrieved January 30, 2009 *Electronic Library*, 20 (5), 395-400. from <http://www.emeraldinsight.com/0264-0473.htm>
- Kavulya, J.M. (2004) Challenges in the provision of library services for distance education: A case study of selected universities in Kenya. *Afr. J. Lib. Arch. & Inf. Sc.* 14 (1), 15-28.
- Kavulya, J. J. (2007). Digital libraries and development in Sub-Saharan Africa: a review challenges and strategies. *The Electronic Library*, 25 (3), 299-315.
- Kaye, A. (1981). Origins and structures *In* Kaye, A. and Rumble, G. (eds.) *Distance teaching for higher and adult education*. London: The Open University. pp. 15-31.
- Keegan, D. J. (1988). On defining distance education *In* Stewart, D., Keegan, D. and Holmberg, B.J (eds.). *Distance education*. London: Routledge. pp. 6-33.

- Keegan , D. (1996) Foundations of distance education. 3rd ed. London: Routledge.
- Keegan, D. (2002) *The future of learning: From eLearning to mLearning*. Hagen: FernUniversität. 172p.
- Kelly, K. (2006) From encounter to text: Collecting data in qualitative research In Blanche, M.T., Durrheim, K. and Painter, D. (eds.) *Research in practice: applied methods for social sciences*. 2nd rev. ed. Cape Town: University of Cape Town. pp. 285-319.
- Kenya Education Network (2007). E-readiness survey of higher education institutions in Kenya. Retrieved September 9, 2008 from <http://www.kenet.or.ke/main.php?lang=en>
- Kenya Education Network (2008). East African Universities Accession Project (2008) Staging results and key findings: EA Accession Project Phase I, 2008. Retrieved November 22, 2012 From http://kenet.or.ke/eready/findings_results.php
- Kenya. Ministry of Information and Communication (2006). National information and communication technology (ICT) policy (Draft). Nairobi: Ministry of Information and Communication. Retrieved December 2, 2008 from <http://www.information.go.ke/docs/ICT%20Policy.pdf>
- Kenya. Ministry of Information, Communications and Technology. Retrieved December 18, 2013 from <http://www.information.go.ke/>
- Kenya. Ministry of Planning and National Development. Central Bureau of Statistics (2011). *Economic Survey 2011*. Nairobi: Government Printer.
- Kenya National Library Services. Retrieved March 21, 2014 from www.knls.ac.ke
- Kenyatta University. Retrieved September 10, 2011 from <http://www.ku.ac.ke/>
- Kenyatta University, Institute of Open Distance & e-Learning. Retrieved September 10, 2011 from <http://www.ku.ac.ke/images/stories/docs/ODEL-Students-Guide-Booklet-2010.pdf>
- Kenyatta University (2011) Kenyatta University Calendar 2011-2014. Nairobi: Kenyatta University.
- Kenyatta University launches e-learning (KUeL). (2005, 14 June). *Daily Nation* p. 26.
- Kenya. Ministry of Education. Task Force on the Re-Alignment of the Education Sector to the Constitution of Kenya 2010 (2012). Towards a globally competitive quality education for sustainable development: Report of the Task Force. Retrieved September 4, 2012 from http://www.vision2030.go.ke/cms/vds/Task_Force_Final_Report_Feb_20123.pdf

- Kettinger, W. J., & Grover, V. (2007). The use of computer-mediated communication in an interorganizational context. *Decision Sciences*, 28(3), 513-555. Retrieved September 29, 2012 from Wiley Online Library database.
- Khasseh, A., Moghaddam, H.S. & Jowkar, A. (2009). Distance education and the role of library services in Iran: A case study of Shiraz University distance learners. *Library High Tech News*, 26(7): 11-14. Retrieved September 10, 2012 from <http://www.emeraldinsight.com/index.htm>
- Kibuga, E. M. (1985). *Information provision in Kenya with particular reference to adult and distance learning programmes*. Unpublished MLib Dissertation. Loughborough: Loughborough University of Technology.
- Kiplang'at, J. and Ocholla, D.N. (2005). Diffusion of Information and Communication Technologies in communication of agricultural information among agricultural researchers and extension workers in Kenya *South African Journal of Library & Information Science* 71 (3): 234-246.
- Kim, H., Kim, G. J., Park, H. W., & Rice, R. E. (2007). Configurations of relationships in different media: FtF, email, instant messenger, mobile phone, and SMS. *Journal of Computer-Mediated Communication*, 12(4). Retrieved September 29, 2012 from Wiley Online Library database.
- Kombo, D.K and Tromp, D.L.A. (2006) *Proposal and thesis writing: An introduction*. Nairobi: Paulines.
- Kothari, C.R. (2004) *Research methodology: Methods and techniques*. 2nd rev. ed. New Delhi: New Age.
- Kwanya, T., Stilwell, C. and Underwood, P. (2012). The application of Web 2.0 tools by libraries in Kenya: A reality check. In *Information for sustainable development in a digital environment: Proceedings of the 2012 SCECSAL Conference, Nairobi, 4th – 8th June, 2012*. Nairobi: Kenya Library Association, 295-304.
- LaRocque, N. & Lathan, M. (2003) The promise of e-learning in Africa: The potential for public-private partnerships. Retrieved May 2, 2013 from <http://www.businessofgovernment.org/sites/default/files/ELearninginAfrica.pdf>
- Lebowitz, G. (1997) Library services to distant students: An equity issue. *The Journal of Academic Librarianship*, 23 (4), 303-307. Retrieved November 30, 2012 from <http://www.grossmont.edu/musgrave2/courses/journal.pdf>
- Leedy, P.D. and Ormrod, J. E. (2005). *Practical research: Planning and design*. 8th ed. New Jersey: Pearson.
- Lera-Lopez, F., Billon, M. & Gill, M. (2011). Determinants of internet use in Spain. *Economics of Innovation and New Technology*, 20 (2), 127-152. Retrieved July 1, 2013 from <http://dx.doi.org/10.1080/10438590903378017>

- Lephalala, M. and Piernaar, C. (2007). Writing centres: Promoting access in open distance learning. *Praxis: A writing Centre Journal* Fall 2007. Retrieved February 20, 2009) from <http://projects.uwc.utexas.edu/praxis/?q=node/171>
- Lindergger, G. (2006). Research methods in clinical research *In* Blanche, M.T., Durrheim, K. and Painter, D. (eds.) *Research in practice: Applied methods for social sciences*. 2nd rev. ed. Cape Town: University of Cape Town pp. 455-475.
- Licoppe, C., & Smoreda, Z. (2005). Are social networks technologically embedded?: How networks are changing today with changes in communication technology. *Social Networks*, 27, (4), 317-335. Retrieved September 29, 2012 from ScienceDirect database .
- Liu, X. and Errey, C. (2006). Socio-technical systems – there is more to performance than new technology. Retrieved September 25, 2008 from <http://www.ptg-global.com/papers/strategy/socio-technical-systems.cfm>
- Lwoga, E.T., Chimwaza, G., Aronson, B. and Vent, O. (2007). Building science information fluency in African universities: how libraries and researchers are benefiting from improved access to science scholarship. Paper presented at the World Library and Information Congress: 73rd IFLA General Conference and Council. Durban, South Africa. 19-23 August 2007. Retrieved February 25, 2008) from <http://www.ifla.org/IV/ifla73/index.htm>
- Mabawonku, I. (2004). Library use in distance learning: A survey of undergraduates in three Nigerian universities. *Afr. J. Arch. & Inf. Sc.* 14, (2), 151-165.
- Maclean, E. & Dew, S.H. (2004). Assessing the library needs and preferences of off-campus students. *Journal of Library Administration* 41(1-2), 265-302. Retrieved May 14, 2013 from http://dx.doi.org/10.1300/J111v41n01_20.
- Magara, E. (2002) Application of digital libraries and electronic technologies in developing countries: practical experiences in Uganda. *Library Review*, 51 (5), 241-255. Retrieved November 30, 2012 from www.emeraldinsight.com/0024-2535.htm
- Mason, R. (2006) The university: Current challenges and opportunities *In* D’Antoni, S. *The Virtual University models and messages: Lessons from case studies*. Paris: Unesco. 19p.
- McBurney, D.H. and White, T. L. (2007) *Research methods*. 7th ed. Belmont, CA: Thomson Wadsworth.
- Minishi-Majanja, M. K. and Kiplang’at, J. (2005). The diffusion of innovations theory as a theoretical framework in library and information science research. *South African Journal of Library & Information Science*, 71 (3), 211-224.

- Minishi-Majaja, M.K. and Ochola, D.N. (2004). Auditing of information and communication technologies in library and information science education in Kenya. *Education for Information*, 22: 187-221.
- Models of distance education and related delivery technologies. Retrieved January 30, 2009 from <http://www.ignou.ac.in/institute/handbook1/section%203.pdf>
- Mishra, S. (2002) A design framework for online learning environments. *British Journal of Educational Technology* 33 (4), 493-496.
- Moore, M. (1988). On a theory of independent study *In* Stewart, D., Keegan, D. and Holmberg, B.J (eds.). *Distance education*. London: Routledge. pp. 68-92.
- Moyo, M.L. and Cahoy, E.S. (2003) Meeting the needs of remote library users. *Library Management*, 24 (67), 281-290. Retrieved November 30, 2012 from <http://www.emeraldinsight.com/0143-5124.htm>
- Mugenda, O.M. and Mugenda, A. G. (2003) *Research methods: Quantitative and qualitative approaches*. Nairobi: Acts.
- Muhamudally, N. (2010) Use of mobile learning in education and training settings *In* Sukon, K.S. and James-Saar, N. (eds.). Trends in distance education and open learning: Policy papers, Paris: Association For the Development of Education in Africa. Retrieved May 4, 2013 from http://www.adeanet.org/adeaPortal/includes/publications/PDF/enseignementdistance_06_en.pdf
- Mumo, M. (2012) Internet capacity to double soon after fifth fibre optic cable lands (2012, 20 Nov). *Daily Nation* p. 28.
- Mungania P. (2006) Looking beyond challenges: distance education opportunities in Kenya. Retrieved November 26, 2007) from http://eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=ED492667&ERICExtSearch_SearchType_0=no&accno=ED492667
- Murray, R. (2003). Information portals: casting a new light on learning for universities. *Campus-Wide Information Systems*, 20 (4), 146-151.
- Muswazi, P. (2003). Distance education library services in Swaziland. *Information Development*, 19(3): 214-222. Retrieved November 16, 2012) from <http://idv.sagepub.com/content/19/3/214>
- Mutula (2001a). Internet access in East Africa: A future outlook. *Library Review* 50 (1), 28-33.

- Mutula (2001b) The IT environment in Kenya: implications for libraries in public universities. *Library Hi Tech*, 19 (2), 155-166. Retrieved January 30, 2009 from <http://www.emerald-library.com/ft>
- Mutula, S.M.(2002a) E-learning initiative at the University of Botswana: challenges and opportunities. *Campus-Wide Information Systems*,19 (3), 99-109. Retrieved January 30, 2009 from <http://www.emeraldinsight.com/1065-0741.htm>
- Mutula, S.M. (2002b) The cellular phone economy in the SADC region: implications for libraries. *Online Information Review*, 26 (20), 79-91. Retrieved January 30, 2009 from <http://www.emeraldinsight.com/1468-4527.htm>
- Mutula, S. (2004) IT diffusion in Sub-Saharan Africa: implications for developing and managing digital libraries. *New Library World*, 105 (1202/1203), 281-289. Retrieved January 30, 2009 from www.emeraldinsight.com/0307-4803.htm
- Mutula, S.M. (2008). Digital divide and economic development: case study of sub-Saharan Africa. *The Electronic Library*,26 (4), 468-489. (Retrieved June 27, 2013) from www.emeraldinsight.com/0264-0473.htm
- Mutula, S., Kulosopa, T., Moahi, K. & Wamukoya, J. (2006). Design and implementation of an online information literacy module: Experience of the Department of Library and Information Studies, University of Botswana. *Online Information Review*, 30 (2), 168-187. Retrieved March 14, 2013 from www.emeraldinsight.com/1468-4527.htm
- Mwanzia, T.M. (2013) The effectiveness of the Kenya Library and Information Services Consortium (KLISC) in the provision of electronic information resources in libraries in Kenya. Unpublished MPhil Thesis. Eldoret: Moi University.
- Nafukho, F.M. (2007) The place of e-learning in Africa's institutions of higher learning. *Higher Education Policy* 20, 19–43. Retrieved February 20, 2011 from www.palgrave-journals.com/hep
- Ndung'u, M.N., Waema, T.M. & Mitullah, W. (2012). Factors influencing usage of new technologies in low-income households in Kenya: the case of Nairobi. *Info*, 14 (4), 52-64. Retrieved July 1, 2013 from DOI 10.1108/14636691211240888
- Newton, R. (2007) Developing information literate off-campus learners: Pedagogical issues and current practice. *Libri*, 57, 140-164.
- Neuman, W.L. (2006) *Social methods: qualitative and quantitative approaches*. 6th ed. Boston: Pearson.

- Nwagwu, E.W., Adekannbi, J. and Bello, O. (2008). Factors influencing use of the internet: A questionnaire survey of the students of University of Ibadan, Nigeria. *The Electronic Library*, 27 (4), 718-734. Retrieved July 1, 2013) from www.emeraldinsight.com/0264-0473.htm
- Nwezeh, C.M.T (2010). Libraries and distance education in Nigerian universities: A revisit. *New Review of Academic Librarianship*, 16 (1), 102-115. Retrieved November 30, 2012 from <http://dx.doi.org/10.1080/13614530903584255>
- Online Access to Research on Environment (2011). Retrieved September, 2011 from www.oaresciences.org
- Odero, D.J.N. & Mutula, S.M. (2007). Internet access in Kenyan university libraries since 1990s. *Malaysian J. of Lib. & Info. Sci.* 12 (1), 65-81.
- Odero-Musakali, D. and Mutula, S.M. (2007). Internet adoption and assimilation in Kenyan university libraries. *Library Review*, 56 (6), 464-475. Retrieved January 30, 2009 from www.emeraldinsight.com/0024-2535.htm
- Ogula, P.A. (2010) *A guide to research proposal and report writing*. Nairobi: CUEA Press.
- O'Lawrence, H. (2007). An overview of influences of distance learning on adult learners. *Journal of Education and Human Development*, 1 (1), 1-9. Retrieved February 12, 2008 from <http://www.scientificjournals.org/journals2007/articles/1041.htm>
- Oladokun, O. and Aina, L. (2009) Library and information needs and barriers to the use of information sources by continuing education students at the University of Botswana. *Information Development*, 25 (1), 43-50. Retrieved May 14, 2013 from <http://idv.sagepub.com/content/25/1/43>
- Oladokun, O. and Aina, L. (2011) ODL and the impact of digital divide on information access in Botswana. *The International Review of Research in Open and Distance Learning*, 12 (6), 158-177.
- Olatokun, W.M. (2009) Analysing socio-demographic differences in access and use of ICTs in Nigeria using the capability approach. *Issues in Informing Science and Information Technology* 6, 480-496.
- Omwenga, E.I., Waema, T.M. and Wagacha, P.W. (2004) A model for introducing and implementing e-learning for delivery of educational content within the African context. *African Journal of Science and Technology (AJST)*, 5 (1), 34-46.

- O'Neill, K., Singh, G. and O'Donoghue, J. (2004) Implementing e-learning programmes for higher education: A review of the literature. *Journal of Information Technology Education*, 3: 313-323.
- Online Access to Research on Environment (2007). Retrieved November 27, 2007 from www.oaresciences.org
- O'Reilly, T. (2005a) What is Web 2.0: Design patterns and business models for the next generation of software. Retrieved January 30, 2009
From <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>
- Oyelaran-Oyeyinka, D. & Adeya, C.N. (2004).
Dynamics of adoption and usage of ICTs in African universities: A study of Kenya and Nigeria. *Technovation*, 24 (10), 841-851.
- Parsons, G. (2010) Information provision for HE distance learners using mobile devices. *The Electronic Library*, 28 (2), 231-244.
Retrieved September 10, 2012 from www.emeraldinsight.com/0264-0473.htm
- Patton, M.Q. (2002). *Qualitative research and evaluation methods*. 3rd ed. Thousand Oaks, CL: Sage.
- Perraton, H. (1994). National developments and international cooperation in distance education in Commonwealth Africa *In* Keith, H., John, M. and Keegan, D. (eds.) *Distance education: New perspectives*. London: Routledge. pp. 250-260.
- Pityana, N.B. (2009) Open distance learning in the developing world: Trends, progress and challenges. Keynote speech delivered on the occasion of M-2009 23rd ICDE World Conference on Open Learning and Distance Education. "Flexible Education for All: Open – Global – Innovative" 7-10 June 2009, Maastricht, the Netherlands. Retrieved October 22, 2009
from
<http://www.unisa.ac.za/contents/about/principle/docs/ICDEMAastricht250609.pdf>
- Prakash, S. (2003) The Africa Virtual University and growth in Africa: A knowledge and learning challenge. *Human Development*, 223. Retrieved May 4, 2013 from <http://www.worldbank.org/afr/findings>
- Programme for Enhancement of Research Information (2011). Retrieved September 10, 2011 from <http://www.inasp.info>
- Reddy, G. R. (1994). Open Universities: the new temples of learning *In* Keith, H., John, M. and Keegan, D. (eds.) *Distance education: New perspectives*. London: Routledge. pp. 236-249.

- Roccas, L.J. (2001) Distance learning and distance libraries: Where are they now? *Online Journal of Distance Learning Administration*, 4 (1), 1-7. Retrieved September 22, 2008 from <http://www.westga.edu/~distance/ojdla/fall43/roccos43.html>
- Rogers, E.M. (1983) *Diffusion of innovations*. 3rd ed. New York: The Free Press.
- Rogers, E.M. (1995) *Diffusion of innovations*. 4th ed. New York: The Free Press.
- Rogers, E.M. and Scott, K.L. (1997) The Diffusion of Innovations model and outreach from the National Network of Libraries of Medicine to Native American Communities. Retrieved September 25, 2008 from <http://nmlm.gov/archive/pnr/eval/rogers.html>
- Rosenberg, D. (2005). Toward the digital library: findings of an investigation to establish the current status of university libraries in Africa. International Network for the availability of scientific publications (INASP), Oxford. 30 p. Retrieved November 28, 2007 from <http://www.inasp.info>
- Rosenberg, D. (2006) Towards the digital library in Africa. *The Electronic Library*, 24 (3), 289-293. Retrieved January 30, 2009 from www.emeraldinsight.com/0264-0473.htm
- Rotich, D.C.& Musakali, J.J. (2012) Repositioning academic repositories for better management through open access *In Information for sustainable development in a digital environment: Proceedings of the SCECSAL 2012 Conference, Nairobi, 4th – 8th June, 2012. Nairobi: Kenya Library Association, pp. 117-125.*
- Saint, W. (1999) Tertiary Distance Education and Technology in Sub-Saharan Africa. Retrieved 3 May 2013) from http://www.adeanet.org/adeaPortal/publications/wghe/tert_disted_en.pdf
- Sairrose, T.M. & Mutula, S.M. (2004). Use of cybercafés: Study of Gaborone city, Botswana. *Program: Electronic Library and Information Systems*, 38 (1), 60-66. Retrieved July 1, 2013 from www.emeraldinsight.com/0033-0337.htm
- Senge, P.M. (1990) *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday.
- Shafack, R. (2012). Open access and institutional repositories as essential tools for the progress of science: a focus on central Africa with the example of Cameroon *In Information for sustainable development in a digital environment: Proceedings of the SCECSAL 2012 Conference, Nairobi, 4th – 8th June, 2012. Nairobi: Kenya Library Association, pp. 126-131.*
- Sharifabadi, S.R. (2006) How digital libraries can support e-learning. *Iranian Journal of Information Science and Technology*, 4 (1), 39-56.
- Sharma, B.M. (ed.) (2008) *Distance education*. New Delhi: Commonwealth.

- Sherman, W.H. and Beaty, D.N. (2007). The use of distance technology in educational leadership preparation programs. *Journal of Educational Administration*, 45 (5), 605-620. Retrieved January 30, 2009 from www.emeraldinsight.com/0957-8234.htm
- Sinha, C. 2005. Effect of mobile telephony on empowering rural communities in developing countries. Retrieved November 28, 2007 from http://www.irfd.org/events/wf2005/papers/sinha_chaitali.pdf
- Stork, C., Calandro, E. & Gillwald, A. (2013). Internet going mobile: Internet access and use in eleven African countries. *Info*, 15 (5), 34-51. Retrieved August 25, 2013 from DOI 10.1108/info-05-2013-0026
- Strauss, A. (1987). *Qualitative analysis for social scientists*. Cambridge: CUP.
- Sujatha, G. (2008) Digital library initiatives in India: A proposal for Open Distance Learning. Retrieved 30 November 30, 2012 from http://www.iatul.org/doclibrary/public/Conf_Proceedings/2008/SujathaGuram.pdf
- Sutton, M.J. (2003) Problem presentation, understanding, and learning transfer implications for technology education. *Journal of Industrial Teacher Education* 40 (4).
- Swan, K. (2005). A constructive model for thinking about learning online. In Bourne, J. and Moore, J.C. (eds.). *Elements of quality online education: Engaging communities*. Needham, MA: Sloan-C.
- Taha, A. (2007) Networked e-information services to support the e-learning process of UEA University. *The Electronic Library*, 25 (3), 349-362. Retrieved November 14, 2012 from www.emeraldinsight.com/0264-0473.htm
- Tatnall, A. (2005) Portals, portals everywhere In Tatnall, A. (ed.) *Web portals: The new gateways to internet information and services*. Hershey PA: Idea Group. pp 1-14.
- Taylor, J.C. 1995. New millennium distance education. Retrieved January 30, 2009 from http://www.usq.edu.au/users/taylorj/publications_presentations/2000IGNOU.doc
- Thayer, S.A. & Ray, S. (2006). Online communication preferences across age, gender, and duration of internet use. *Cyberpsychology & Behaviour* 9 (4), 432-440.
- Trei, L. (2007). Stanford expands distance learning across the globe. *Stanford Report*, September 12, 2007. Retrieved February 20, 2009 from <http://news-service.stanford.edu/news/2007/september12/iop-091207.html?view=print>

- Uhler, B.D., & Clark, C. B. (2001) The use of computer-mediated communication to enhance subsequent face-to-face discussions. *Computers in Human Behavior*, 17 (3), 269-283. Retrieved September 10, 2012 from Science Direct database.
- UNESCO (1998)
- World declaration on higher education for the twenty-first century: Vision and action and framework for priority action for change and development in higher education In World Conference on Higher Education in the Twenty First Century: Vision and action, Paris 5-9 Oct. 1998. Paris: UNESCO.
- UNISA, (2013). AirPAC puts the Unisa Library Catalogue in your hand. Retrieved July 5, 2013 from http://oasis.unisa.ac.za/screens/airpachelp_2013.pdf
- United Nations Millenium Development Goals (MDGs) .Retrieved November 28, 2007 from <http://www.un.org/millenniumgoals/goals.html>
- Unwin, T. (2008) Survey of e-learning in Africa Retrieved May 2, 2013 from http://www.elearning-africa.com/pdf/survey/elareport_timunwin.pdf
- The University of Nairobi Retrieved September 10, 2011 from <http://www.uonbi.ac.ke/>
- The University of Nairobi Admissions Supplement (2009, 8 May). *Daily Nation*, Advertising Feature I.
- The University of Nairobi (2011) University of Nairobi Calendar 2011-2012. Nairobi: University of Nairobi.
- University of Twente (2007). Retrieved November 27, 2007 from http://www.tcw.utwente.nl/theorieenoverzicht/Theory%20clusters/Communication%20Processes/System_Theory.doc
- Van Brakel, P. A. and Chisenga, J. (2003) Impact of ICT-based distance learning: the African story. *The Electronic Library*, 21 (5), 476-486. Retrieved 20 February 20, 2009 from <http://www.emeraldinsight.com/0264-0473.htm>
- Van der Riet, M. and Durrheim, K. (2006) Putting design into practice: writing and evaluating research proposals In Blanche, M.T., Durrheim, K. and Painter, D. (eds.) *Research in practice: applied methods for social sciences*. 2nd rev. ed. Cape Town: University of Cape Town. pp. 80-111.
- Varsity starts reforms and anti-graft war. (2013. 14 Aug). *Daily Nation* p. 5.
- Wachira, M.N.& Onyancha, O.B. (2012). Serving remote users in selected public university libraries in Kenya: Discussions with section heads. Paper Presented at the SCECSAL 2012 Conference organized by the Kenya Library Association, Nairobi, 4th – 8th June, 2012.

- Wang, M.Y. (2003) The strategic role of digital libraries: Issues in e-learning environments. *Library Review*, 52 (30), 111-116.
- Wang , C. and Liu, Z. (2003) Distance education basic resource guide. *Collection Building*, 22 (3), 120-130.
- Wasserman, I.M. and Richmond-Abbot, M. (2005) Gender and the internet: Causes of variation in access, level, and scope of use. *Social Science Quarterly*, 86 (1), 252-270.
- Welman, J.C. and Kruger, S.J. (2001). *Research methodology for business and administrative sciences*. 2nd ed. Oxford: OUP.
- White, B. (2000) *Dissertation skills for business and management students*. London: Thomson.
- World Bank (1999). *World Development Report 1998/99: Knowledge and Development*. Washington D.C.: OUP.
- Wu, Y.D. & Liu, M. (2004) Content management and the future of academic libraries. *The Electronic Library*, 19 (6), 432-439. Retrieved January 30, 2009) from <http://www.emerald-library.com/ft>
- Yieke, F.A. (2005). Towards alternatives in higher education: the benefits and challenges of e-learning in Africa. *CODESRIA Bulletin*, (3&4), 73-75.
- Yin, R.K. (1989) *Case study research: Design and methods*. London: Sage.
- Yin, R.K. (2009) *Case study research: Design and methods*. 4th ed. London: Sage.
- Yusuf, M.O. (2006) Problems and prospects of Open and Distance Education in Nigeria. *Turkish Online Journal of Distance Education*, 7 (1), 22-26.
- Zake (2008) Challenges to e-learning in developing communities in Africa. Retrieved May 2, 2013 from <http://digitallearning.eletsonline.com/2008/07/challenges-to-e-learning-in-developing-communities-of-africa/>

APPENDICES

Appendix 1: Questionnaire for Distance Students

Dear Sir/Madam,

Date...../...../.....

I am a student pursuing a PhD degree at Moi University in Library and Information Science. As part of the requirements for the degree, I am undertaking a research entitled:

“Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries.”

Distance education is increasingly becoming a popular means for accessing higher education due to its flexibility. Distance learners need access to up-to-date information resources as their full time colleagues. The purpose of the study is to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries. It is expected that the findings of this study will provide a framework for improving the application and use of ICTs in providing access to information to distance learners in public university libraries in Kenya.

Your assistance in answering this questionnaire will help to improve access to information for distance learners in your library. **Any information provided through the questionnaire will be treated with utmost confidentiality and will be used for academic purposes only.**

KINDLY RETURN THE COMPLETED QUESTIONNAIRE TO YOUR LECTURER BY FRIDAY 24TH APRIL, 2009 MORNING

Thank you in advance for your cooperation.

Yours faithfully,

Grace W. Kamau (Mrs.)

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Title:

Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries. (Phd. In Library & Information Studies Project, Moi University).

Definitions

ICTs stands for Information Communication Technologies. In this study, ICTs refers to computers, telecommunications and digital electronics.

E-resources refers to Electronic resources such as Online Public Access Catalogue (OPAC), electronic journals and electronic databases

Please answer all questions. Tick [] appropriately and write in the spaces provided.

A. General Information

Sample number

Date.....

1. Name of the university where you are registered for your course

University of Nairobi

Kenyatta University

2. Status of respondent

Postgraduate student

Undergraduate student

3. Please indicate:

Faculty.....

Department.....

Course.....

Year of study.....

4. What is your study centre? (e.g. Nairobi, Nyeri, Kisumu, Mombasa etc.)

.....

5. What subjects are you studying?

.....
.....
.....

6. Gender: Male Female

7. Age bracket:

20-25 years 26-30

31-35 36-40

41-45 46-50

51-55 56-60

Above 60

8. What is the format of distance learning offered by your university?

Correspondence

Broadcast

Teleconferencing

e-learning

Hybrid/blended (students spend most of their time off campus but are required on site for short periods once in a while e.g. for consultation with lecturers, exams etc.)

Other (Please specify)

.....
.....

B. Access to E-resources

9. What electronic services are offered to you by your university library?

(Tick all that apply)

Online Public Access Catalogue (OPAC)

e-journals and e-databases

Library Web page (Please give URL.....)

Information portal (library website) accessible to remote users

Information updates via e-mail to students and faculty

E-content delivery through virtual learning environments

None of the above

10. How do you access your university library's e-resources?

Visit the library and access the e-resources from the library computers

Remotely from outside the library but within the university campus

Remotely from my study centre

Remotely from a commercial cyber café outside the university

Remotely from home

Remotely from my work place

Other (Please specify).....

None of the above. I have no access to the university library's e-resources

11. How often do you use the following services from your university library ?

Library Service	Often (Weekly)	Sometimes (Monthly)	Once a Year	Twice a Year	Three times a Year	Never
Books/Journals Consultation in the library						
Book loans in presence						
Postal loans from home						
Document delivery (e.g. Photocopies)						
Electronic resources (e.g. OPAC, Electronic journals and databases) accessed at the library						
Electronic resources (e.g. OPAC, Electronic journals and databases) accessed remotely from the workplace or cyber café						
Reference services/staff assistance						

Comments:.....

12. To what extent do you use e-resources such as OPAC, electronic journals and e-databases offered by the university library ?

100%

75%

50%

25%

10%

I do not use

13. How much do you use other sources of information?

Information source	Often (Weekly)	Sometimes (Monthly)	Once or twice a year	Never
Study material (“Modules/Units”) provided by my lecturers				
The resources at my work place (e.g. library, school etc.)				
The resources at my study centre				
Other libraries (Please specify)				
My lecturers				
Other students (For exchange of information and documents)				
The web e.g. Google (not library sites) (Please specify).....				
Other (Please specify).....				

Comments.....
.....

C. Access to and use of ICTs

14. What ICTs do you have access to?

Computer with internet facilities

Mobile phone

Radio cassette

DVD

Others (Please specify).....

15. How do you get access to a computer?

Personal laptop

In the university library

Cyber café within the university

Commercial cyber café

Home

From my work place

From my Study Centre

Have no access to a computer

Other (please specify).....

16. Do you use e-mail to get information services from your university library?

.....

17. Do you use the mobile phone to get information services from your university library?

.....

.....

18. What type of website does your institution provide?

Information website

Interactive or Transaction website

None

I don't know

19. Please choose **one** of the responses below to give your opinion on the statements below:

1 = Strongly agree 2 = Agree 3 = Neutral 4 = Disagree

5 = Strongly disagree

	1	2	3	4	5
It is difficult for distance learners to access library materials					
Library portals (library websites) can enhance accessibility to information by distance learners					
Library portals can make distance education difficult for students					

20. How proficient are you on online searching and retrieval ?

Very proficient

Fairly proficient

Average

Below average

21. How did you learn to use the internet? (**Tick all that apply**)

Through university organized training

Hands-on-practice

Through a formal training course

Through friends

Others (please specify)

.....
.....

22. Does the library provide training on ICT skills?

Yes

No

I don't know

If yes, how did you know of the training?

.....
.....
.....

23. What is the duration of the

training?.....

24. What is the mode of training?

.....
.....

D. Challenges

25. What are the strengths of the university library services to the distance learners?

.....
.....
.....

26. What are the weaknesses of the university library services to the distance learners?

.....
.....
.....

27. What challenges do you face in finding information?

.....
.....
.....

28. What is the cause of these challenges?

.....
.....
.....

29. How should your university library address the above challenges?

.....
.....
.....

30. How should your university library participate in e-learning programmes of the university?

.....
.....
.....

31. What suggestions and recommendations can you make for improving access to information resources for distance students in your university?

.....
.....

Thank you for taking the time to share with us!

Appendix 2: Interview Schedule for the Directorate of Distance Education

Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries

A. General Information

1. Sample number.....
2. Date.....
3. Name of the institution.....
4. Department.....
5. Designation.....
6. Please indicate your highest qualifications.....
7. What are your main duties and responsibilities?
.....
.....
.....

B. Organization

8. Total number of staff teaching distance education programmes.....
9. What distance education policies are in place in your institution?
10. Does your institution have a Distance Education Strategic Plan? (Vision, Mission, Objectives and Strategies)
11. How does your policy on distance education address access to electronic information resources by the university library
12. What courses are offered through distance education?

13. Number of distance education students (Please indicate the number of students per course including the gender)

Postgraduates:

Undergraduates.....

14. What mode(s) of distant education is/are in use in your institution?

15. How is Distance Education in your university organized?

16. Do you have e-learning?.....

17. If yes to item 16 above, what courses are offered through e-learning?

18. If no, to item 16 above, do you have plans to offer e-learning?

19. Do you involve the University Librarian when planning for distance education programmes?

20. How are distance education programmes funded?

21. Do you have a budget allocated to library services for distance students?

C. ICT Infrastructure

22. How is content delivered to distance students?

23. How should your university library participate in distance education programmes of the university?

24. What ICT infrastructure is in place in your institution?

25. What ICT policies are in place in your institution?

26. What ICT strategies exist in your institution?

27. What type of website does your institution maintain? (e.g. Information, Interactive or Transactional website)
28. How do you use ICTs?
29. How would you describe the accessibility of ICTs in your institution?

D. Challenges

30. What challenges do you experience in managing distance education programmes? (Please include challenges related to access to information for distance learners if any)
31. What is the cause of the above challenges?
32. What are the benefits of library portals (library websites) in addressing information accessibility to distance learners?
33. Do you have experience with distance education from elsewhere that you would like to be replicated in your university?
34. What suggestions and recommendations can you make regarding access to information resources for distance education in your institution?

Thank you for taking the time to share with us!

Appendix 3: Interview schedule for Deans and Chairmen of Departments

Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries

A. General Information

1. Sample number.....
2. Date.....
3. Name of the institution.....
4. Department.....
5. Designation.....
6. Please indicate your highest qualifications.....
7. What are your main duties and responsibilities?
.....
.....
.....

B. Organization

8. Total number of staff teaching distance education programmes.....
9. Number of distance education students (Please indicate the number of students per course including the gender):
Postgraduate.....
Undergraduates.....
10. What courses are offered through distance learning?

11. What mode(s) of distant education is/are in use in your institution?
12. How is Distance Education in your university organized?
13. Do you have e-learning?
14. If yes to item 13 above, what courses are offered through e-learning?
15. If no to item 13 above, do you have plans to offer e-learning?

C. Information Resources

16. Is there a difference in the use of information resources for assignments between the regular and distance students?
17. Do you think that the study material (“Units”) given to students are sufficient for their assignments?
18. Is the necessity to use additional information sources stated in the unit outline?
19. Do you think that the university library resources are accessible to distance students?

D. ICT Infrastructure

20. How do you deliver content to distance learners?
21. What proportion of content is delivered through ICTs?
22. Is there content which cannot be delivered through ICTs? If yes,
 - (a) which ones?
 - (b) why?
23. What ICT infrastructure is in place in your institution?

24. Do the lecturers have institutionalized networked computers in their offices?
25. How do you use the ICTs in your institution?
26. What type of website does your institution maintain (e.g. Information website, Interactive or Transactional website etc.)?
27. How would you describe the accessibility of ICTs in your institution?
 - (a) To Lecturers?
 - (b) To distance students ?
28. How should your university library participate in distance education programmes of the university?

E. Challenges

29. What challenges do you experience in managing distance education programmes? (Please include challenges related to access to information for distance learners if any)
30. What are the causes of the above challenges?
31. What are the benefits of library portals (library websites) in addressing information accessibility to distance learners?
32. Do you have experience with distance education from elsewhere that you would like replicated in your university?
33. What suggestions and recommendations can you make regarding access to information resources for distance education in your institution?

Thank you for taking the time to share with us!

Appendix 4 : Interview Schedule for University Librarians

Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries

A. General Information

1. Sample number
2. Date.....
3. Name of the University.....
4. Name of the library
5. Age:
 31-35 36-40

 41-45 46-50

 51-55 56-60

 Above 60
6. Gender: Male Female
7. Please indicate your highest
qualifications.....
8. What are your main duties and responsibilities?

-
.....
9. Total number of library staff.....
- Professionals.....
- Paraprofessionals.....
- Non-professionals.....
10. Number of academic staff served by the library.....
11. Number of non-academic staff served by the library
12. Total number of students served by the library (Full-time and part-time).....
- Postgraduates.....
- Undergraduates.....
13. Total number of distance students served by the library
- Postgraduates.....
- Undergraduates.....
14. Number of branch libraries serving the wider university system
(faculties, schools, campuses etc. Please name them)

.....
.....

B. Policy issues

15. The University library organizational structure (Organogram)
16. Do you have library staff designated to offer library services to distance students?
17. How is the library funded?
18. What is the total annual budget of the library in KSh?
19. What proportion of the budget is for distance students' library services?
20. Does your library have a strategic plan?
21. Does your library have a policy on distance learners?
22. How is the University library management involved in the planning for distance education programmes?
23. How can your university library participate in e-learning programmes of the university?

C. Information Services

24. What information services does the University library offer to distance students?
25. Do you provide adequate library services at the Study Centres for distance students?
26. Can distance students access the library e-resources wherever they are?
27. How is the information literacy level of distance students in your university?

28. Does the library organize orientation, induction and training for distance students?
29. How is Current awareness offered to distance students?
30. How does the library communicate with distance students? (e.g. telephone, e-mail, Web guides to help instruct users)
31. How is the usage of library services by the distance students? (Please provide usage statistics)

D. ICT Infrastructure

32. What ICT strategic plan is in place in your library?
33. How does the ICT strategic plan address the use of ICTs in enhancing information access for distance students?
34. What portion of the total library budget is allocated to automation and ICT operations?
35. What is the highest qualification of the staff in charge of the library information systems?
36. What ICT infrastructure is in place in your library?
37. How would you describe the accessibility of ICTs in your library?
38. What is the state of automation in your library?
39. How many computers are available in the library?
40. How many are connected to the internet?
.....
41. (a)How many are allocated to library staff?
.....

(b) How many are allocated for library users?

.....

42. Where are the workstations for users located?

.....
.....
.....

43. How is the library connected to the internet? (e.g. dial-up, leased line, VSAT etc.)

.....
.....

44. How is the speed of connectivity?

.....

45. Does the library have a portal/website?.....

46. What electronic/digital resources are offered by the library?

(a) For full time students

(b) For distance students

47. How are these electronic resources made accessible to full time students?

48. How are these electronic resources made accessible to distance students?

49. What content do you capture from the academic staff for uploading into the websites for students?

E. Challenges

50. What challenges does the university library face in the provision of information services to:

(a) Full-time students

(b) Distance students?

51. What is the cause of the above challenges?

52. What suggestions and recommendations can you make regarding access to information resources for distance students in your library?

Thank you for taking the time to share with us!

Appendix 5 : Interview schedule for Senior Library Staff

Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries

A. General Information

1. Sample number
2. Date.....
3. Name of the University.....
4. Name of the library
5. Age:

<input type="checkbox"/> 31-35	<input type="checkbox"/> 36-40
<input type="checkbox"/> 41-45	<input type="checkbox"/> 46-50
<input type="checkbox"/> 51-55	<input type="checkbox"/> 56-60
<input type="checkbox"/> Above 60	
6. Gender: Male Female
7. Designation.....
8. Please indicate your highest qualifications.....
9. What are your main duties and responsibilities?

.....

.....

.....

B. Information Services

10. What information services do you provide to full time students?
11. What information services does the University library offer to distance students?
12. Can distance students access the library e-resources wherever they are?
13. How is the information literacy level of distance students in your university?
14. Does the library organize orientation, induction and training for distance students?
15. How is Current awareness offered to distance students?
16. How does the library communicate with distance students? (e.g. telephone, e-mail, Web guides to help instruct users)
17. How is the usage of library services by the distance students? (Please provide usage statistics)

C. ICT Infrastructure

18. What ICT infrastructure is in place in your library?
19. How would you describe the accessibility of ICTs in your institution?
20. What is the state of automation in your library?
21. How many computers are available in the library?
.....
22. How many are connected to the internet?
.....

23. How many are allocated to library staff?

.....

24. How many are allocated for library users?

.....

25. Where are the workstations for users located?

.....

26. How is the library connected to the internet? (e.g. dial-up, leased line,
VSAT etc.)

.....

27. How is the speed of connectivity?

28. Does the library have a portal/website?

.....

29. What electronic/digital resources are offered by the library?

30. How are these electronic resources made accessible to full-time students?

31. How are these electronic resources made accessible to distance students?

32. What content do you capture from the academic staff for uploading into
the websites for students?

D. Challenges

33. What challenges do you face in providing information services to:

(a) Full-time students?

(b) Distance students in particular?

34. What is the cause of the above challenges?
35. What do you perceive as the benefits of library portals/websites in addressing any of the above challenges?
36. How can your library participate effectively in e-learning programmes of the university?
37. What suggestions and recommendations can you make regarding access to information resources for distance education in your library?

Thank you for taking the time to share with us!

Appendix 6: Letter of Introduction

Dear Sir/Madam,

Date...../...../.....

RE: Phd in Library and Information Science Research: Interview

I am a student pursuing a PhD degree at Moi University in Library and Information Science. As part of the requirements for the degree, I am undertaking a research entitled:

“Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries.”

Distance education is increasingly becoming a popular means for accessing higher education due to its flexibility. Distance learners need access to up-to-date information resources as their full time colleagues. The purpose of the study is to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries. It is expected that the findings of this study will provide a framework for improving the application and use of ICTs in providing access to information to distance learners in public university libraries in Kenya.

Your participation in this interview will be highly appreciated. The interview will take about one hour and will be conducted with your consent. **Any information provided through the interview will be treated with utmost confidentiality and will be used for academic purposes only.**

Thank you in advance for your cooperation.

Yours faithfully,

Grace W. Kamau
 Head, Infocentre
 International Livestock Research Institute (ILRI)
 Old Naivasha Road
 P.O. Box 30709
 Nairobi 00100, Kenya
 Tel. +254-20-422 3000
 Dir +254-20-422 3032
 Fax: +254-20-422 3001

Cell Phone: 0722-674329

E-mail: g.kamau@cgiar.org

Website: www.ilri.org

Appendix 7: Pre-test Checklist for Distance Students and Staff

Title: Access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries. (Phd. Information Science Project, Moi University).

1. (a) Does the questionnaire have any typographical errors?

Yes []

No []

(b) If yes, please indicate them in the questionnaire

(c) Does the interview schedule have any typographical errors?

Yes []

No []

(d) If yes, please indicate them in the interview schedule

2. (a) Does the questionnaire have misspelt words?

Yes []

No []

(b) If yes, please indicate them in the questionnaire

(c) Does the interview schedule have misspelt words?

Yes []

No []

(d) If yes, please indicate them in the interview schedule

3. (a) Is the questionnaire font size sufficient for reading?

Yes [] No []

(b) If no, please provide suggestions

.....
.....

(c) Is the interview schedule font size sufficient for reading?

Yes [] No []

(d) If no, please provide suggestions

.....
.....

4. (a) Is the vocabulary used in the questionnaire appropriate for the respondents?

Yes [] No []

(b) If no, please provide suggestions

.....
.....

(c) Is the vocabulary used in the interview schedule appropriate for the respondents?

Yes []

No []

(d) If no, please provide suggestions

.....
.....

5. (a) Do the topics in the questionnaire adequately cover the study objectives?

Yes []

No []

(b) If no, please provide some suggestions

.....
.....

(c) Do the topics in the interview schedule adequately cover the study objectives?

Yes []

No []

(d) If no, please provide some suggestions

.....
.....

6. (a) Does the format of questions in the questionnaire flow?

Yes []

No []

(b) If no, please provide some suggestions

.....

(c) Does the format of questions in the interview schedule flow?

Yes [] No []

(d) If no, please provide some suggestions

.....
.....

7 (a) Are the questions in the questionnaire clear?

Yes [] No []

(b) If no, please provide suggestions for questions that are not clear

.....
.....

(c) Are the questions in the interview schedule clear?

Yes [] No []

(d) If no, please provide suggestions for questions that are not clear

.....
.....

8 (a) Are the instructions provided for filling the questionnaire clear?

Yes [] No []

(b) If no, please provide some suggestions

.....

(c) Are the instructions provided for filling the interview schedule clear?

Yes []

No []

(d) If no, please provide some suggestions

.....

.....

9. (a) Is the questionnaire layout clear?

Yes []

No []

(b) If no, please provide some suggestions

.....

.....

(c) Is the interview schedule layout clear?

Yes []

No []

(d) If no, please provide some suggestions

.....

.....

10. Kindly provide suggestions which will help improve the quality of the questionnaire

.....

.....

11. Kindly provide suggestions which will help improve the quality of the interview schedule

.....
.....

Thank you for your time in pre-testing the research instruments. Kindly let me have your feedback using the following e-mail address: g.kamau@cgiar.org

Appendix 8: University of Nairobi Colleges, Institutes and Campuses

Colleges

College of Agriculture and Veterinary Medicine (CAVS) – located at Upper Kabete

College of Architecture and Engineering (CAE) – located in the Main Campus

College of Biological and Physical Sciences (CBPS) – located at Chiromo Campus

College of Education and External Studies (CEES) – located at the Kikuyu Campus

College of Health Sciences (CHS) – located at Kenyatta National Hospital Campus

College of Humanities and Social Sciences (CHSS) – located at the Main Campus

Institutes

Institute of Anthropology, Gender and African Studies (At Museum Hill)

Institute for Development Studies (Main Campus, CHSS)

Institute of Diplomacy and International Studies (Main Campus, CHSS)

Institute of Nuclear Science and Technology (Main Campus, CAVS)

Population Studies and Research Institute (Main Campus, CHSS)

University of Nairobi Institute of Tropical and Infectious Diseases (At Kenyatta National

Campuses

- The Main Campus
 - College of Architecture and Engineering – comprising of :
School of The Built Environment, School of The Arts and Design and School of Engineering
 - College of Humanities and Social Sciences – One of the faculties – Faculty of Arts
 - School of Journalism and Mass Communication
 - A number of Institutes as indicated above
 - Central Administration

- Jomo Kenyatta Memorial Library
- The Chiromo Campus
 - The School of Biological Sciences
 - School of Computing and Informatics
 - School of Mathematics
 - School of Physical Sciences
 - Pre-clinical Medical and Veterinary Departments
- The Upper Kabete Campus
 - College of Agriculture and Veterinary Medicine
- The Lower Kabete Campus
 - School of Business
- The Kikuyu Campus
 - The College of Education and External Studies
- The Kenyatta National Hospital Campus
 - The College of Health Sciences
- The Parklands Campus
 - School of Law
- Kenya Science Campus
 - Campus of The College of Education and External Studies. It is located on Ngong Road

Appendix 9: Kenyatta University Campuses, Colleges and Institutes

Campuses and Colleges

Main Campus

Ruiru

Parklands

Nairobi City Centre

Nakuru

Migori

Nyeri

Mombasa

Kitui

KU/KIST

Schools

School of Agriculture & Enterprise Development

School of Applied Human Sciences

School of Business

School of Economics

School of Education

School of Engineering and Technology

School of Environmental Studies

School of Health Sciences

School of Public Health

School of Hospitality and Tourism

School of Humanities and Social Sciences

School of Law

School of Pure and Applied Sciences

School of Visual and Performing Arts

Graduate School

Institutes

Institute of Open Distance & e-Learning (ODEL)

- School of Applied Human Sciences
- School of Business
- School of Education
- School of Engineering and Technology
- School of Hospitality and Tourism
- School of Humanities and Social Sciences
- School of Pure and Applied Sciences
- School of Visual and Performing Arts
- School of Agriculture and Enterprise Development

Appendix 10: University of Nairobi Library Photos

Jomo Kenyatta Memorial Library



College of Education & External Studies Library



JKML OPAC



JKML Study Area



Appendix 11 – Kenyatta University Post Modern Library Photos

Kenyatta University Post Modern Library



A Computer Lab in KU Post Modern Library

