INTERNET USE AMONG UNIVERSITY STUDENTS IN KENYA: A CASE STUDY OF THE UNIVERSITY OF NAIROBI

by

MERCY WANGECHI WAITHAKA

Submitted in accordance with the requirements for the degree of

MASTER OF ARTS

in the subject

INFORMATION SCIENCE

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROF P NGULUBE

CO-SUPERVISOR: PROF OB ONYANCHA

SEPTEMBER 2013

DECLARATION

I declare that this study, **Internet use among university students in Kenya: A case study of the University of Nairobi**, is my original work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references. This dissertation does not incorporate, without acknowledgement, any material previously submitted for a degree at any other university.

Mercy Waithaka   September 2013

....   ……...................
Signature   Date

DEDICATION

This work is dedicated to my loving husband Dr Steve Waithaka (who believes it is never too late to learn) and to my two daughters Winnie (Peace lover) and Shalom (Peace) (who made positive contributions to this work through their understanding, patience and encouragement – even when I could not find time to attend to their various social needs).

ACKNOWLEDGEMENTS

To God be the glory, because He gives me strength to do all things.

From the formative stages to the final draft of this work, I owe immense gratitude to two men in my academic life: my supervisors, Professor Patrick Ngulube and Professor Onyancha Bosire. Their sound advice and careful guidance were invaluable.

I would like to thank all the people who agreed to participate in the research process in one way or another because without their time and co-operation, this work would not have been possible.

I extend special thanks to the research assistants who coordinated the collection of questionnaires in the different colleges of the University of Nairobi.

Esther Wanjau, I highly appreciate your efforts of putting this work into one continuous piece through your professional word-processing skills.

My husband, Dr Steve Waithaka, I salute you for your support – morally and financially. You have set the pace for studies as the family head and we cannot afford to sit back in our comfort zones.

Lastly and most importantly, I am grateful to UNISA for the financial assistance awarded me in the form of a bursary for the 2011 and 2013 academic years. UNISA is my university of choice.

To each of the above, I extend my deepest appreciation.

ABSTRACT

The researcher investigated internet usage among students at the University of Nairobi using a quantitative case study method. A questionnaire-based survey was done among 381 students and face-to-face interviews were conducted with the university's library staff. The research findings indicate that the students' level of awareness about the internet services offered at the university was high. The students had good basic computer and internet skills; however, they lacked more advanced skills and this negatively affected their use of internet resources. The students used the internet for various purposes, including to study, teach and do research; to communicate; and for social interaction. The major recommendations of the study include providing formal internet training and adequate facilities; implementing a better, inclusive policy on internet use; and better co-ordinated university efforts. Free internet access should be made available to all the university students, if not all members of the university community.

Key terms: internet use; university students; information needs; online databases; e-journals; social networking sites; computer-mediated communication; user studies; University of Nairobi

TABLE OF CONTENTS

LIST OF TABLES

xiii

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

AGORA	Access to Global Online Research in Agriculture
AIM	American Online (AOL) Instant Messenger
AJOL	African Journal Online
ARPANET	Advanced Research Projects Agency Network
CAVS	College of Agriculture and Veterinary Science
CAE	College of Architecture and Engineering
CBPS	College of Biological and Physical Sciences
CEES	College of Education and External Studies
CHS	College of Health Sciences
CHSS	College of Humanities and Social Sciences
CIDCM	Centre for International Development and Conflict Management
CMC	computer-mediated communication
e-KLR	electronic Kenya Law Reports
ERIC	Education Research Information Centre
FTP	file transfer protocol
GIF	graphics interchange format
HTML	hypertext mark-up language
HTTP	hypertext transfer protocol
ICT	information and communication technology
IM	instant messaging
INASP	International Network for the Availability of Scientific Publications
JPEG	Joint Photographic Experts Group
JSTOR	Journal Storage
LIS	Library and Information Services
MIDI	musical instrument digital interface
OPAC	Online Public Access Catalogue
PGD	postgraduate diploma
PhD	Doctor of Philosophy
RIA	rich internet applications

RSS	rich site summary
SBIGs	subject-based information gateways
SNS	social networking sites
SPSS	Statistical Package for Social Sciences
UNISA	University of South Africa
UON	University of Nairobi
WAIS	side-area information servers
WWW	World Wide Web

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1   CONCEPTUAL SETTING

The internet is a global network of linked computers that enables people to share and exchange information (Lebow 1995:36). Through the internet, services such as e-mail; the World Wide Web (WWW); mailing lists; Usenet; newsgroups; and social networking sites (SNS) like Facebook, MySpace, Friendster and others are accessible. Severin and Tankard (2001:32) point out that the most popular internet services are e-mail, the WWW, newsgroups and mailing lists. With more advances in technology, developments in social communications such as SNS are becoming increasingly popular, especially among college students (ComScore Inc 2007).

The internet is arguably one of the most significant technological developments of the late 20th century. It is a mechanism for information dissemination and a medium for collaborative interaction among individuals and between individuals and their computers without regard to the geographical limitations associated with space (Leiner, *et al* 2000). The internet developed from a United States Department of Defence project (Dawson 2005). During the Cold War there was concern that in the event of a nuclear attack, US communication systems could be knocked out by missiles hitting key communication centres. There was therefore a need to develop a distributed system that could withstand such destruction. In the late 1960s, the internet (under its original name Advanced Research Projects Agency Network – ARPANET) was designed to be used for military purposes only (Hinson & Amidu 2005: 315).

The internet has transformed all facets of human life since it became globally accessible to the public in the 1990s. This transformation is evidenced by the rising number of internet users globally. According to the Computer Industry Almanac (2009), the worldwide number of internet users surpassed one billion in 2005 (up from 45 million in 1995 and 420 million in 2000). It has become a powerful means of information transmission and has been embraced by academic institutions to enhance research and academic work. Luambano and Nawe (2004:16–19) confirm that the internet has become an important component of academic institutions as it

plays a pivotal role in meeting the information needs of these institutions. They sum up the importance and benefits of the internet as:

- It increases access to information all over the world.
- It provides scholars and academic institutions with an avenue to disseminate information to a wider audience worldwide.
- It enables scholars and students at different locations on the globe to exchange ideas on various fields of study.
- It has enabled the growth of distant learning, both within nations and across international borders.
- It provides students and lecturers with a communication system that they can use to communicate with each other irrespective of distance.

According to De Fleur and Dennis (2002:42), academics (including scientists and professors) use the internet extensively and this explains why educational institutions were early adopters of the internet. Dawson (2005) explains that the strengths of the internet for academic work include currency of online information sources, accessibility to multimedia resources, and information that is not limited by distance or time constraints. With improved internet connectivity, academic institutions in developing countries are tapping into the many opportunities offered modern information societies (INASP 2003). The increased use of the internet in academic institutions worldwide means that educational researchers recognise the significance of and understand how and why students use it. Studies on internet usage among university students are desirable as students are heavy internet users (compared to the general population) and using the internet is a matter of daily routine for them (Jones & Madden 2002). Kenya has experienced phenomenal growth with regard to internet usage and is ranked fifth among the top 10 countries in Africa in terms of internet users. It also leads in terms of the number of internet users in East Africa (Kenya ICT Strategy 2006; Internet World Stats 2009).

The internet is also regarded as a powerful communication medium due to its unique characteristics. According to Severin and Tankard (2001:37–43), its features include

interactivity, hypertextuality and multimediarity. These characteristics help users to be active and to exchange roles in their mutual discourse (Severin & Tankard 2001:46).

Interactivity is related to control: people can control what information they see, for how long, how many times and in what order. Roehm and Haugtvedt (1999) note that interactivity has two dimensions namely control and message. The control dimension refers to the entity that controls the nature of the interactivity. The message (which refers to the width of interactivity) has two elements, namely form-oriented interactivity and content-oriented interactivity (Roehm & Haugtvedt 1999).

Hypertextuality is an important feature of the internet. Severin and Tankard (2001:43) note that the WWW uses hyperlinks, which are points on the Web that a user can click on to be moved to some point in the same Web document, the same Website or other Websites.

Multimediarity is another important feature of the internet. Severin and Tankard (2001:54) say that multimedia is a "communication system that offers a mixture of texts, graphics, sound, video and animation". This feature is further enhanced by hyperlinks or hypertext, on which users can click to bring up a sound or video. As a multimedia medium, the internet integrates the characteristics of the television, print and radio into a single medium. Chou (2001:40) remarks that university and college students appreciate the interactivity, ease of use, availability and breadth of information accessed on the internet. This is acknowledged by Greenfield (1999) who asserts that the internet's accessibility, intensity of information that can be accessed online and the potency of its contents are unique characteristics which contribute to its popularity.

In order for students to make effective use of the internet, they must know the services and the resources that are available on the internet and what they are used for. These services include Computer Mediated Communications (CMC) which constitutes e-mail, chat rooms, instant messaging (IM), the World Wide Web (WWW), internet relay chat, File Transfer Protocol(FTP), Usenet Newsgroup, Listservs and Social Networking Sites (SNS) among others. Some of the material resources that are found on the internet are e-journals, e-books, e-newspapers and online databases.

1.2   CONTEXTUAL SETTING

The history of the University of Nairobi (UON) dates back to 1947 when the colonial government in Kenya drew up a plan for the establishment of a commercial institute in Nairobi. By 1949, the idea had developed into an East African concept aimed at providing higher technical education for all the territories of East Africa. In 1951, the institute received a Royal charter under the name Royal Technical College of East Africa. Later (in April 1952), with the help of the colonial government and welfare fund grants, the then governor Sir Philip Mitchell laid the foundation for the institution (University of Nairobi 2009) .The college opened its doors to a batch of students in April 1956. From this point on, the college's growth was tremendous – partly due to the help received from the Vice Chancellor of London. He suggested that the institution be developed into an inter-territorial university college for East Africa. The recommendation was accepted in June 1961. Through an Act of the East African High Commission, the Royal Technical College was transformed into a second university of Africa under the name Royal College Nairobi and in 1964 it was renamed University College of Nairobi. In 1970, it became a full-fledged university under the name "University of Nairobi". Since then, the University has grown to comprise the following colleges (University of Nairobi 2009):

- College of Biological and Physical Sciences
- College of Health Sciences
- College of Education and External Studies
- College of Agriculture and Veterinary Sciences
- College of Humanities and Social Sciences
- College of Architecture and Engineering

The university currently has a population of approximately 50 000 students in both regular and self-sponsored programmes. The main campus is located in the capital city of Nairobi. The UON library network comprises the main library (Jomo Kenyatta Memorial Library) and 11 branch libraries. The library was started in 1960 as the Gandhi Memorial Library by the Gandhi

Memorial Academic Society and its growth has been tremendous over the years (University of Nairobi 2009). Initially, the library was designed to accommodate only 500 students who were taking technical courses. At the time, the UON was only a technical college and 15% of the student population was Kenyans. By 1978, it had 5076 undergraduate students, 914 postgraduate students and a teaching staff of 883 full-time lecturers. The Gandhi Memorial Library could not cope with the huge growth in the number of students and this prompted the government to provide a grant of 80 million Kenya shillings to build a new library as a memorial to the Kenya's first president, the late Jomo Kenyatta. The new library was opened in 1988 and has sitting capacity of 3000 readers and a book stock of over 700 000 volumes, including books and bound periodicals (University of Nairobi Library 2009).

With the advent of information and communication technologies (ICTs), the library's resources and functions have been revolutionised. For instance, the library subscribes to licensed databases which the students access in the internet laboratory situated at the library. At present, the users are able to access over 20 000 e-journals and download articles of interest. The library is registered to access more than 30 databases which are listed alphabetically on the library's Website (http://library.uonlib.ac.ke). Among the licensed databases, the library subscribes to are (University of Nairobi Library 2009):

- African Journal Online (AJOL)
- Blackwell Synergy
- Access to Global Online Research in Agriculture (AGORA)
- Emerald
- Cengage Gale
- e-KLR
- EBSCO Host
- Google Scholar
- Hinari
- Journal Storage (JSTOR)
- Oxford University Press
- Mary Ann Liebert

1.3   BACKGROUND TO THE PROBLEM

Many academic institutions are rapidly adopting ICTs. This has gone a long way in facilitating the provision of internet services to students and university staff members. Jones and Madden (2002:23–28) point out that the internet has opened new academic opportunities for students. Firstly, online groups thrive on the internet. These study groups allow students to discuss class work with even though they may be living millions of miles apart, hand in assignments, communicate with lecturers and maintain contact easily. However, previous studies have shown that while students in Kenya use the internet extensively, it is rarely used to further their academic or educational goals as expected in the information technology age. For example, a study by Wambilyanga (2002:39) revealed that the youth in Nairobi did not consider the internet an academic hub and Kwanya (2005:36) found that most of the students who participated in the study did not visit Websites for academic purposes. Jones and Madden (2002:23) concur with these findings and say that it is not surprising that university students use the internet more as a medium for social communication than for academic purposes. Another development that has been promoted by tertiary institutions' adoption of ICTs is the provision of electronic resources or digital resources (e-resources). Academic libraries, and especially university libraries, subscribe to these resources as additional resources to their print resources. However, it is discouraging to note that e-resources are not adequately utilised.

In a study on college students' use of the internet in the library, Jones and Madden (2002) found that the majority of students' time was not spent on utilising e-resources. Students indicated that they used the internet for e-mail, IM and Web surfing. There are several reasons why students use the internet inadequately or ineffectively, but the major reason is lack of skills to use internet resources (Luambano & Nawe 2004:13–17). According to these authors, insufficient awareness of internet resources that could enhance learning and students' lack of motivation because lecturers do not encourage them to use internet resources but instead emphasise print resources are some of the reasons for minimal internet usage. Mutula (2001:36) also points out that in East Africa, users are not taught the necessary skills to use the internet effectively. Jones and Madden (2002:33) further observe that although academic resources are offered online, students may not yet have been taught or have not figured out how to locate these resources. It is also important to

note that many people still think of the internet as simply a tool for e-mail communication and not for other Web-based applications (CIDCM 1998).

It is therefore evident and disappointing to note that although there are increased efforts by universities to provide internet services and e-resources to students, few students use them to further their academic goals. This causes a lot of concern to university administrators. It also causes concern to those who are involved in designing e-learning Websites and other internet-based resources. As Kwanya (2005:38) says, if students do not fully utilise the internet and e-resources that are available in the libraries, the efforts invested in their development and provision will go to waste. The extensive use of the internet since the 1990s has made the study of the internet a focal point for many researchers. (A more detailed literature review is provided in chapter 2 of this dissertation.)

1.3.1   Problem statement

The UON has taken measures to ensure that it is not left behind in the information age. The diffusion, adoption and development of ICTs are emphasised to ensure that internet services are available to both students and staff of the university to enhance research, teaching and communication. However, little has been done in terms of research to evaluate how students use the internet resources provided through the university library. It is often assumed that once internet services are made available, the students will be ardent users of these services in order to enhance their academic work (Kamonde 2003). The challenges that academic libraries, and especially university libraries, face is how to provide for the information needs of their large number of students when they are supposed to read the same publications in their subject specialty. Printed sources are never enough due to the growing number of students. Students who search the internet for the specific subject specialty face a plethora of digital information that may not always be factually correct. Research indicates that although university students are technologically savvy, they may lack the information literacy skills of evaluating the authenticity of retrieved digital information (Valenza 2004:2).

Njiraine (2000) notes that although university students visit the internet laboratory at the UON Library, it is evident that they do not use the services for academic work but rather for social

communication and entertainment. This is confirmed by Kamonde (2003) who in his study on ICTs adoption in universities observed that the most used internet application is e-mail, which is used mostly for social communication. Although the UON Library subscribes to various licensed databases and online journals which are significant sources of information for students, it is not always clear whether the students use them optimally for academic work. In fact, it is possible that the students do not perceive these licensed databases and internet sources as significant resources for their academic work and research.

Most of the studies that have been done on students' internet usage were carried out before 2005 and focused largely on specific internet applications, such as e-mail. The internet is very dynamic and a lot of technological developments have taken place, such as Web 2.0 technologies and social networking platforms which include Facebook, MySpace and Friendster. No recent research has been done to evaluate how these new technological developments (internet applications) have been adopted by university students at the UON. Furthermore, no study has been conducted to examine the situation in Kenya as far as university students' use of the internet is concerned. Kenya is a developing country whose technological developments and advancements are different from those of the Western world and underdeveloped countries. This means that the level and capacity of internet usage among students differ greatly from that of students in the Western world or underdeveloped countries. This study addressed these issues and filled in the existing gaps.

1.3.2   Aim

The aim of the study was to examine internet usage among university students in Kenya with special reference to the UON.

1.3.3   Study objectives

The objectives of the study were:

1) to ascertain the level of students' awareness of the internet services offered by the UON
2) to assess students' skills in accessing the internet services

8

3) to determine the factors affecting students' effective use of the internet services

4) to examine the use of different types of internet applications (for example e-mail, social networking tools, the WWW and search engines)

5) to establish the kind of information students look for on the internet

6) to establish the problems students experience in their efforts to use the internet services

1.3.4 Research questions

The following research questions guided the study in order to fulfil the stated research objectives:

1) What is the level of students' awareness of the internet services offered by the UON?

2) What internet skills do students have?

3) Which internet applications do students use?

4) What factors affect students' effective use of the internet services offered at the UON?

5) What kind of information do students look for on the internet?

6) What problems do students experience when they use the university's internet laboratory?

Table 1.1: Objectives, research questions and possible sources of data

Research questions	Objectives	Possible sources of data
What is the level of students' awareness of the internet services offered by the UON?	To establish the level of students' awareness of the internet services offered by the UON	• Questionnaire • Interviews
What kind of information do students look for on the internet?	To establish the kind of information students look for on the internet	• Questionnaire • Interviews • Literature review
What are the factors that influence the effective use of the internet at the UON?	To establish the factors that influence the effective use of the internet at the UON	• Questionnaire • Focus group discussion • Interviews
What internet applications do students use?	To determine which different types of internet applications students use	• Questionnaire • Focus group discussion • Literature review
What problems do students encounter when they use the university's internet laboratory?	To establish the problems students encounter when they use the university's internet laboratory	• Questionnaire • Focus group discussion
What internet skills do the students have?	To establish students' internet skills	• Questionnaire

1.4   JUSTIFICATION OF THE STUDY

Within the discipline of information science, this study is situated in the sub-discipline of user studies. User studies are research studies in which members of a specific user community are identified and selected to determine their information needs, information seeking behaviour, information literacy, expectations of information services and how their information needs are satisfied (Moyer 2005:229). User studies tell us what users really want (information needs), including their opinions, attitudes, expectations and ways in which users search for information (their information seeking behaviour) (Tenopir 2003). User studies enable professionals in the field of library and information science to gain new insights into library user needs, user information seeking behaviour and user satisfaction with the existing information services, and to include library users in the planning of new or improved information services.

Although user studies often confirm what we already know, their significance is that they provide new insights into how libraries can better serve the library users in their communities (Tenopir 2003). The results of library user studies provide librarians with information on how users view the library, including the quality of library services and its strengths and weaknesses. The results may therefore help librarians to improve the information services and collections, to decide which information resources to purchase and to develop effective user instruction. Improved services could reinforce the library's mission to be a responsive institution in a changing information environment.

Since library users are as diverse as their information needs, it is often necessary that a study focuses on a specific aspect or phenomenon such as a specific type of service or user group. Therefore, this study focused on university students as an academic library user group when using the internet services provided by the UON Library for their academic work and research. This study can also be situated in a wider context, since university students' information literacy needs have pedagogical implications. This study could make a contribution to the knowledge, understanding and improvement of the information literacy needs of university students. Information literacy is especially relevant in the current era of digital information technology where students have access to multiple sources of digital information via the internet. University

11

students must have the ability to evaluate information in order to submit research work which is factually correct. The common assumption that university students are technologically "savvy" often leads to students' not being taught information literacy skills (Valenza 2004:2). A better understanding of university students' information literacy should lead to improved user instruction, which could lead to more effective use of internet services by university students and improved research and academic work. Research and teaching are the core functions and responsibilities of universities. Students at all levels are expected to spend most of their time learning and conducting research. They should be engaged in knowledge generation and transmission as full- time activities. Therefore, they are an excellent population for a study aimed at determining the diffusion and use of the internet. The internet is seen as the engine behind some of humankind's most ground-breaking discoveries and our students cannot compete on the world stage unless they embrace and use it fully.

1.5   SCOPE AND LIMITATIONS OF THE STUDY

In terms of population, the study was limited to the students of the UON; therefore, it excluded the other members of the university community (such as teaching and non-teaching staff). The study focused on the students from the six constituent colleges of the university who formed the units of analysis. This study is a case study whereby a survey-questionnaire and interviews were used to collect data. The meanings defined by the researcher may differ from those of the respondents. As such, the conclusions drawn from this study are those of the researcher and the findings from this study cannot be generalised to populations other than the one studied. When data is collected from respondents through a self-reported instrument as was the case with the current study, the question of accuracy is raised. Respondents are only as honest and forthright as they choose to be, and even then the degree of honesty is suspect due to subtle workings of the human subconscious. While it is assumed that the respondents in this study were honest and forthright, there is no guarantee that they actually were. Another limitation in this study is that the researcher did not look at how the diffusion, adoption and development of ICTs in the universities have impacted on the use the internet among the university students. As far as the subject scope is concerned, the study was restricted to the students' internet usage and therefore

did not cover their use of print resources which are also available in the UON Library. Geographically, the scope of the study was limited to the UON in Kenya.

1.6   LITERATURE REVIEW

The researcher reviewed literature that relates directly to the study's aims and objectives. The review provided a sound conceptual, theoretical and practical understanding of internet usage among university students. Neumann (2000:447) states that the purpose of a literature review is to provide a theoretical background to the study and to learn what others have done. Mouton (2006) summarises the reasons why literature reviews are important as follows:

- to ensure that one does not merely duplicate an existing study
- to find out the most recent and authoritative theories about the subject
- to find out what the most widely empirical findings in the study field are
- to find out the available instrumentation that has proven validity and reliability
- to find out what the most widely accepted definitions of key concepts in the field are

The literature was reviewed in order to highlight the following issues: the internet as an information resource, the benefits of the internet in education, students' awareness of internet services, internet skills, internet-based e-resources, and problems students experience when using the internet at the UON Library. Chapter 2 of this dissertation is devoted to a detailed literature review on these issues.

1.7   METHODOLOGY

This section concerns the research methodology that was used in this study. Chapter 3 of this dissertation is devoted to a detailed discussion of the research methodology. A quantitative case study method was used for the study. A case study is a research method which provides a detailed story of the study case (Hancock 2002; Johnson & Christensen 2004; Key 1997; Myers

2007; Tellis 1997). The case study, as mentioned in the contextual setting, was about the UON. The target population was the university students from all the colleges of the university. Stratified sampling was adopted to select the target population for the questionnaire survey, while the key informants for the interviews were identified through purposive sampling. The researcher applied methodological triangulation to collect the data. Methodological triangulation, also known as multiple methods, is a strategy whereby a researcher uses different types of methods to collect data. The researcher used a literature review, face-to-face interviews and a questionnaire survey to collect the data for this study.

1.8   ETHICAL ISSUES

Ngulube (2003:233) points out that ethics are key to developing moral standards that can be used in situations where actual harm or potential harm can be done to an individual or group. Cohen, Manion and Morrison (2000) stress that the question of access, harm, deception, secrecy and confidentiality are all issues that a researcher has to consider and resolve in any research context. In this study, the researcher ensured that the dignity and the welfare of the participants were at all times maintained. The respondents to the questionnaire and those who participated in the interviews were made aware of the purpose of the study. They were assured that all their responses would be treated anonymously and no individual would be identified. The research was approved by the University of South Africa's (UNISA) College Postgraduate Committee and cleared by the University Research Ethics Board before it was undertaken. This resonates with the UNISA Policy on Research Ethics (University of South Africa 2007) which specifies that researchers have to avoid undertaking secret or classified research, be competent and accountable, respect human participants, and be responsible while conducting research.

1.9   DEFINITIONS OF TERMS

The important terms that are used in this dissertation are defined below.

- *Digital resource.* Digital or e-resources are information resources that are accessed online via the internet and include licensed databases, digital libraries (also known as virtual libraries) and Web-published information retrieved through commercial search engines (Tenopir 2003:67).

- *E-mail* . Messages, usually text, sent from one person to another via computer; they can also be sent automatically to a large number of addresses (Matisse Enzer glossary of internet terms 2000–2008).

- *Internet.* A wide-area network connecting millions of computers globally for the purpose of allowing people to access information contact each other and share information resources (Matisse Enzer glossary of internet terms 2000–2008).

- *Internet service.* A generic term that encompasses e-mail, WWW, Usenet, newsgroups, file transfer protocol (FTP), IM, internet relay chat and list servers, and mailing lists (Matisse Enzer glossary of internet terms 2000-2008).

- *Information literacy.* Armstrong (2005:1) defines this concept as "Knowing when and why you need information, where to find it, how to evaluate, use and communicate it in an ethical manner".

- *Internet resource.* Any document that is available and accessible on the internet, for example e-journals, e-books and e-newspapers. "Internet resource" in this case is synonymous with e-resource or digital resource (Matisse Enzer glossary of internet terms 2000–2008).

- *Licensed databases.* These are information resources that are available online which require subscription by institutions in order to gain access to the organised digital information in the databases (also referred to as "subscription databases"). The digital information in the database is the intellectual property of the vendors; therefore the information is licensed and requires subscription in order to gain access to the information. The information in the licensed databases is verified, peer-reviewed and authenticated (Gunn 2002: 27).

- *Mailing list.* A system that allows people to send e-mail to one address, whereupon the message is copied to all other subscribers to the mailing list, enabling them to participate in a discussion (Matisse Enzer glossary of interment terms 2000–2008)

- *Search engines.* Search engines are services on the WWW that allows users to search large databases of Web pages (3 billion Web pages) by word, phrase or other criteria (Hock 2007:63).

- *Usenet.* This is a worldwide system of discussion groups, with comments passed among thousands of machines (Matisse Enzer glossary of internet terms 2000–2008).

- *Web 2.0 technologies.* "Web 2.0" refers to the ongoing development of WWW technology that has resulted in a set of new technologies and services. Its applications and services include the use of blogs, video sharing, social networking and podcasting – reflecting a more socially connected Web where people can contribute as much as they can consume (Anderson 2007).

- *World Wide Web (WWW or Web).* The whole constellation of resources that can be accessed using Gopher, FTP, hypertext transfer protocol (HTTP), Telnet, Usenet, wide-area information servers (WAIS) and other tools. It is the universe of hypertext servers that allows texts, graphics, sound files, etc to be mixed together (Matisse Enzer glossary of internet terms 2000–2008).

1.10   ORGANISATION OF THE DISSERTATION

This dissertation has six chapters which are organised as outlined below.

Chapter 1: Introduction and background to the study

This chapter covers the background information on the study. It contains an introduction on what the internet is and its origin, as well as the historical background of the UON (where the research was based). The purpose of the study, its aims and objectives, and the research questions are provided in this chapter. Significance, justification, scope and   the limitations of the study

and the definition of terms are also covered in this chapter. Lastly, the work plan and the organisation of the dissertation are provided in this chapter.

Chapter 2: Literature review

In this chapter the works of other researchers are critically evaluated. It is a review of the literature on the following issues: the internet as an information resource, benefits of the internet in education, students' awareness of internet services, internet skills, internet-based e-resources and the problems students experience when using the internet.

Chapter 3: Research methodology

In this chapter the research methodology that was used to conduct the research is discussed. The research design, research method, study area, target population and sampling procedures are covered. The data collection method and procedures as well as techniques of data analysis, the measuring instruments and their development, standardisation, reliability and validity are also discussed in this chapter.

Chapter 4: Analysis and presentation of the data

The data are analysed and presented in terms of the objectives of the research.

Chapter 5: Research findings

In this chapter the results of the data (presented in chapter 4) are discussed. A critical evaluation of the results is done in an attempt to ascertain their contribution to knowledge on the use of the internet.

Chapter 6: Summary, recommendations and conclusions

This is the last chapter of this dissertation and is intended as a summary of the research. Conclusions are drawn based on the findings and recommendations are made which can be adopted or implemented to solve problems that have been identified. Recommendations for further research are also provided.

1.11   SUMMARY

The primary purpose of this chapter was to set the scene for the study on internet usage among university students in Kenya. The conceptual setting of the study was explained and the origin and development of the internet were highlighted. The features and applications of the internet were discussed briefly. The contextual setting of the study (that is, the place where the study was conducted) was explained. The problem statement (consisting of the purpose, objectives and research questions that had to be answered) was also explained. The significance and justification of spending time and money on the research were established. The conceptual and geographical limitations of the study were set out. A brief explanation of the literature review and its importance in research was given, as well as a short summary of the methodology that was used for the study. Ethical issues that had to be observed were covered and definitions of the working terms were provided. The chapter concluded with an explanation of the structure of the dissertation. The next chapter of this dissertation is the literature review.

CHAPTER 2
LITERATURE REVIEW

2.1   INTRODUCTION

It is difficult to undertake research without referring to the work of other scholars. The aim of the research endeavour may be unclear and difficult to define at the beginning of the process. Reading up on the topic helps one to clarify issues pertaining to the area under investigation. While the aim of the literature review is to support one's argument, it also helps to summarise and synthesise the ideas other scholars have already put forward. Discovering gaps not yet covered by previous research helps the researcher to refine and shape the direction of the investigation (Wilkinson 2000). It puts into perspective the practicality of ideas that one has or comes across. Leedy and Ormrod (2005:64) confirm that a review of the literature allows one "to look again (re + view) at what others have done in areas that are similar though not necessarily identical to one's own area of investigation".

Neumann (2000:447) states that the purpose of the literature review is to provide a theoretical background to the study and to learn what others have done. As pointed out in chapter 1 of this dissertation, Mouton (2006:87) summarises the reasons why literature reviews are important as follows:

- to ensure that one does not merely duplicate an existing study
- to find out the most recent and authoritative theories about the subject
- to find out what the most widely empirical findings in the study field are
- to find out the available instrumentation to prove validity and reliability
- to find out what the most widely accepted definitions of key concepts in the field are

Literature reviewed in this chapter covered the following issues discussed below: importance of the internet in higher education, internet as an information resource ,benefits of the internet in

education, awareness of the internet services, skills in using the internet, internet-based electronic resources and services and finally the problems university students experience when using the internet.

2.2   IMPORTANCE OF THE INTERNET IN HIGHER EDUCATION

The internet is one of the most important and complex innovations of mankind. It is a powerful tool of communication, and is used for the dissemination and retrieval of information. The internet is also increasingly being used for educational course delivery (Sinha 2004).

The progressive increase in the use of ICTs has drastically changed research, teaching and learning. A great deal of research has proven the importance of ICTs in education. Among these ICTs, the internet has been a major force of change in higher education. Since 1991, and especially with the introduction of the WWW in 1993, the internet has gradually become the main vehicle of scholarly communication (Al-Ansari 2006). It is an educational tool with great potential. It may be used to replace traditional classroom lectures or to supplement traditional instructional methods. The internet enables students to communicate with other students (even abroad) and to share ideas, knowledge, experiences and cultural practices. It enhances the skills and capabilities of students, and assists them in their studies and professional lives (Khan, Khan & Bhatti 2011).

The internet plays a pivotal role in meeting the information and communication needs of academic institutions since it makes it possible to access a wide range of information, such as up-to-date reports, from anywhere in the world. It also enables scholars and academic institutions to disseminate information to a wider audience around the globe through websites and as a way to search for information and organise output (Luambano & Nawe 2004). The internet has many resources academics can harness for scholarly work (Badu & Markwei 2005).

The reasons for the emerging popularity of the internet in education include its impact on budgets, classroom space and personnel (Alkhezzi 2002). The ability to transmit information worldwide attracts students to take educational courses online. This has many positive effects, especially for students who are limited by time to attend classes at designated hours (Alkhezzi

2002). The delivery of educational courses over the internet is very important, especially for non-traditional students whose ability to attend regular classes is limited due to work, family responsibilities and/or distance. A number of higher education institutions use the internet to deliver courses (Al-Motrif 2000). Al-Motrif (2000) reports that in a 1998 survey of more than 1000 higher education institutions, more than two-thirds used the internet to deliver courses. Alkhezzi (2002) identifies five reasons why colleges and universities should invest in ICTs. They are:

1) competitive position
2) teaching
3) learning
4) curriculum enhancement
5) preparing students for the workforce

2.3   INTERNET AS AN INFORMATION RESOURCE

The emergence of the internet has meant that vast amounts of information resources that were previously mostly limited to libraries and bookstores can be made available to a much wider community. Restrictions created by distance, availability and access to information have to a large extent been removed. More information continues to become available in electronic format as this medium is embraced by publishers, museums and archives (Schmidt 2003:3). The internet is also considered a reservoir of information. On the internet, users are able to access e-resources freely or at a fee. Some of the material resources found on the internet are e-books, e-newspapers, e-databases, e-journals and online encyclopaedias.

2.3.1   Impact of the internet

Through the Pew Internet and American Life Project, significant research has been conducted on the impact of the internet on families, communities, the work place, children, teenagers, students, schools, health care and the political environment (Pew Research Centre 2008). The project is an initiative of the Pew Research Centre, an unbiased "fact tank" that provides information on

issues and trends in the United States and the rest of the world. So far, the project has produced four reports that are relevant to this study on the influence of the internet on society.

According to Jones & Madden (2002), the first Pew internet project was conducted in 2000 and it found that 64% of the students who participated in the study used the internet as an essential aid outside the classroom to browse the WWW. The second Pew Internet Project, which was conducted in 2002, showed that 78% of the students who participated in the study did online searches for their research and homework (Levin, Arateh, Lenhart & Rainie 2002:1). They also communicated via the internet with other students to share information. The third Pew Internet Project was conducted in 2006. Horrigan (2006:1–10) found that the internet had indeed become a primary information resource for students and that students were increasingly using the internet for research. The fourth Pew Internet Project, whose research results were released at the end of 2007 (Estabrook, Witt & Rainie 2007:18–22), was conducted among mostly college students. The study found that the students aged 18 to 20 years used libraries due to the availability of computers where they could access high-speed internet and wireless services to find help in solving problems and to satisfy learning outcomes in terms of obtaining information.

Tenopir (2003) undertook a project for the US Council of Library and Information Resources (CLIR) and analysed over 200 studies about the users of online information resources. She concluded that college and university students use the internet more than the library.

In a 2006 study, Jansen and Spink (2006:248–263) analysed the transaction logs of nine search engines over a lengthy period and confirmed that the internet is now the primary source of information for most students. They found that 38% of all online queries contained only one search term and the average time spent per session was 15 minutes. Geck (2006:19–23) confirmed these findings and added that students rapidly concluded that retrieved results at the top of a Web page are usually more relevant than the results found at the bottom of the page.

According to Leibenluft (2007), the most popular internet Website used for educational and reference purposes is the online encyclopaedia Wikipedia. Wikipedia is an online, free and open Web-based encyclopaedia that was designed in 1995 by software researcher Ward Cunningham.

Wikipedia was founded as a non-profit organisation with more than one million entries in at least 10 languages (Boutin 2005). It is the biggest multilingual free-content encyclopaedia on the internet and provides Web-published information to which internet users may contribute and which is not always authenticated.

In an article on the quality of information, Tenopir (2007:26) refers to the ongoing debate about the lack of quality of Wikipedia entries (both intentional and unintentional) and the falsified credentials of some Wikipedia editors. The use of Wikipedia as a reference tool is discouraged by many tutors because of the (sometimes) doubtful accuracy of its information and the inability to critically evaluate information sources and author credentials. Harris (2007:26) states that many schools and colleges have instructed students not to cite Wikipedia as a source in research assignments. Wikipedia agrees that it is not a valid resource for scholarly research, but rather a good starting point for research, and recommends that students check facts they find on Wikipedia against other information resources (Harris 2007:26; Barrack 2005:300).

Yahoo! Answers is another popular Website that has achieved huge success among internet users (Leibenluft 2007). On this Website any user of the Yahoo search engine can post a question or an answer to a question. The site has 120 million users worldwide and has 400 million searchable answers in its archives. According to a Web-tracking company, Yahoo! Answers is the most visited internet education and reference Website after Wikipedia (Leibenluft 2007).

As explained by Harris (2007), open internet-based information resources are not always authentic. Thus librarians prefer to provide access to authenticated information resources, most of which are found on licensed databases.

2.3.2   Use of online databases and other internet-based resources

A number of studies have been conducted to assess the use of internet-based databases by students. Licensed databases are provided by metadata aggregators and contain scholarly journal articles and reference works that provide authentic peer-reviewed information. These databases

are licensed by metadata aggregators such as EBSCO Host and Cengage Gale, mainly because the licensed databases are the intellectual property of the owners of digital information services. Further reasons for licensing databases include enhanced value by adding, grouping, editing and reviewing data from available resources and building digital libraries for various communities.

Access to these databases is restricted to institutional subscribers that are licensed to make the services available to authorised users in accordance with the terms and conditions of the license agreement. Typically, use is subject to copyright (including fair use) and protection and non-commercial use restrictions. The database owners also prohibit the content being made available on publicly available Websites that can be indexed, for instance Google. However, remote access is permissible to authorised users via a protected password that changes regularly and allows downloading and printing limited copies of citations, abstracts or full text (or portions thereof) from the database for personal use. Licensees may not post the passwords to the licensed databases or any publicly indexed Website (Kuzyk 2007)

Licensed databases have increased rapidly in number, size and use in recent years and their services are continuously revised and improved in order to keep up with competitors in the field. Improvements include enhanced search ability and navigation of interfaces, more customisation and the continued provision of multiple formats (Kuzyk 2007:8).

Most digital libraries and licensed databases today have customised user interface that can accommodate the unique information needs of the user. A customised interface could be used by students to get to the correct information faster if the information is aptly categorised, or even faster with capabilities such as full-text search, federated search, spelling suggestions and relevance turning (Ultraseek 2006:2).

Scholarly, academic digital libraries and licensed databases provide authentic, peer–reviewed published information to users that can be gathered from a wide field of reliable sources. Information seekers who access commercial search engines often have to deal with information overload and low relevancy results. Digital libraries and licensed databases provide relevant, reliable information to users and are less likely to provide information overload. Frequent digital

library use may lead to an increase in information literacy skills (Schmidt 2003:12 -13). Digital libraries and licensed databases are constructed environments, designed with the needs of the user community they serve in mind. The way digital libraries are constructed influences the way they will be used and to what extent they will be used (Gunn 2002:30). Licensed databases form the bulk of the digital reference resources to which academic libraries (university libraries included) subscribe.

Several studies have been done on how and why university students use e-resources. A study by Shuling (2006) revealed that students at Shaanxi University in China used e-resources for various reasons, including writing dissertations, preparing homework and consulting material about subjects. Shuling (2006) also reported that 60% of the respondents studied used the databases which the university library subscribed to. Another study conducted by Moghaddam and Talawar (2008) indicated that all the respondents who participated in the study (397) used e-journals, with research students accounting for the highest percentage (53%). The students used e-resources mostly for research, education and current information; and least for recreation and to win awards. The study further revealed that e-journals were considered the most important part of scientific communication.

Levin-Clark (2006) conducted a survey among all the students, faculty and other staff at the University of Denver in 2005 to determine the library users' awareness of e-books, how they used them and their level of satisfaction with the format. The results of the survey (with 2067 respondents) showed that e-books were used by about a half of the university community. Anuradha and Usha (2006) surveyed all the students and staff of the Indian Institute of Science in 2004. The results of their study indicated that the students tended to use e-books more often than the faculty members and staff. The students who used e-books mostly used reference books and technical materials. The main aim of the study by Anuradha and Usha (2006) was to measure faculty members' attitudes towards e-books. Among the important findings was that half of the faculty members said they preferred using online resources, with 89% reporting that they used educational, government and professional Websites for research, class preparation and/or instruction.

2.4 BENEFITS OF USING THE INTERNET IN EDUCATION

The development of the internet has been referred to as "the most transforming technological event since the capture of fire" (Barlow *et al* 1995:35). Whether or not this is true, it is clear that the internet certainly has had a major impact on universities worldwide. As part of the PEW Internet Life Project, Jones, Johnson-Yale, Perez and Schuler (2007) surveyed a random representative sample of 7421 undergraduates from 40 college campuses across the United States to determine students' activities and attitudes about the use of the internet for academic purposes. The general finding was that all the students used the internet for academic purposes and that most of them (84%) believed that the internet had positively impacted their academic lives.

A major academic benefit of the internet is free, easy and immediate access to large amounts of information on almost any topic. Luambano and Nawe (2004) recognise that the internet has become an important component in academic institutions as it plays a pivotal role in meeting the information and communication needs of the institutions. They (Luambano & Nawe 2004:13-17) point out that the internet:

- increases access to information all over the world
- provides scholars and academic institutions with an avenue to disseminate information to a wider audience worldwide
- enables students and scholars at different locations on the globe to exchange ideas on various study fields
- has enabled the growth of distance learning within nations and across international borders
- provides students and lecturers with a communication system to communicate irrespective of distance
- helps students to achieve their academic goals

The internet has widened distant learning through what is referred to as e-learning. Okuogo (2006) points out those e-learning offers less expensive, more convenient and a richer way of

becoming educated, as well as having contact with more diverse groups of fellow students than ever before. Ngulube, Shezi and Leach (2009) concur with that the internet offers these educational benefits.

The Web 2.0 platform also has educational benefits (Duffy 2008). The new Web 2.0 technologies and Websites such as blogs, wikis and YouTube make new demands on learning and they provide new learning support even as they dismantle some of the learning support upon which education depended in the past. Some of the benefits of using blogs in education are (Richardson 2006):

- It promotes critical and analytical thinking.
- It promotes creative, intuitive and associational thinking.
- It promotes analogical thinking.
- It offers potential for increased access and exposure to quality information.
- It provides a combination of solitary communication and social interaction.

YouTube has educational benefits in that video can be a powerful educational and motivational tool. Video in itself is not an end but a means to achieving learning goals and objectives. Specific examples of incorporating YouTube into teaching and learning are:

- YouTube can be used to create a learning community where everyone has a voice and anyone can contribute; the value lies equally in the creation of the content and the network of students which form around content that is discovered and shared (Educause Learning Initiative 2006).
- YouTube can be applied by allowing students to create a short video as part of an assessment instead of the traditional essay. Being involved in making a video improves the students' visual literacy, which is an important skill in today's electronic culture (Educause Learning Initiative 2006).
- YouTube allows the student to experiment with new media to convey information and knowledge. Many educators believe that the act of creating content in virtually any form is a valuable learning exercise (Educause Learning Initiative 2006).

- Within higher education, Jenkins (2007) describes a "Youniversity" and suggests an intellectual network where students interact not only with professors but also with industry and community.
- YouTube can be used as a virtual library.

The use of wikis in education is also becoming popular and is of great benefit in education. A wiki is a group of Web pages that allow users to add content, similar to a group discussion forum or blog, but also permits others to edit the content (Arregiun 2004). Wikis provide an online space for collaborative authorship and writing. They are available online for all Web users or members of specific communities and include version control tools that allow authors to track the history of specific pages and the history of their personal contributions (Duffy 2008). By using wikis, students can easily create simple Websites – without prior programming knowledge or skills – in hypertext mark-up language (HTML) or use current software for Website authoring. Wikis also enable them to interact with an evolving document over time. They allow teachers and students to interact in the evolution of a written task and to continually comment on it instead of commenting only on the final draft.

2.5   AWARENESS OF INTERNET SERVICES

According to the *Collins English dictionary* (2009), "awareness" means having knowledge of the existence of something. It follows then that awareness of internet services means having knowledge of the services and resources that are available on the internet and being conversant with what institutions offer in terms of these services. When the user is aware of a resource or a service, it will lead to more use of the service or resource (Asemi & Riyahiniya 2007).

College students use the internet more than any other population group (Jones *et al* 2007). Consequently, much of the research on the use of the internet has focused on college students (Byuns, Reffini, Mills, Douglas, Niang & Stepchenkova 2009). According to Hinson and Amidu's (2005) study on internet adoption amongst final-year students at Ghana's oldest business school, the level of awareness of internet and its various applications was low – with only 42% of the respondents responding positively. Most of the students reported that they had

been introduced to the internet by friends or family members, while others had learned about it through self-initiative.

Another study conducted by Moghaddam and Talawar (2008) on the use of scholarly e-journals at the Indian Institute of Science showed a high level of internet awareness, with 98% of the respondents being positive about awareness. Reporting on a study of the reasons for the use and non-use of e-journals and databases, Talja and Maula (2003) cite lack of knowledge on what is available (awareness) on the internet as one of the reasons why these resources are not fully utilised.

Another study on the use and impact of e-journals at the Indian Institute of Technology that was conducted by Kuar and Verma (2009) revealed that awareness of internet resources was not a big problem since 85% of the population investigated acknowledged being aware of the internet services and resources that were available in the institute's library.

Badu and Markwei (2005) studied the awareness and use of the internet at the University of Ghana. This study revealed that the awareness of internet services among the respondents was universal, with 99,2% of the respondents indicating that they were well aware of the internet. The results of the study also showed that e-mail was the most well-known service among the staff and students, followed by the WWW, discussion groups, UseNet News and FTP in descending order. Telnet, Gopher and WAIS were not well known among the respondents.

Parameshwar and Patil (2009) studied the use of the internet by faculty and research scholars at Gulbarga University's library in India. The study showed that the faculty members had longer experience of using the internet than the research scholars. The use of technical reports and electronic theses and dissertations was limited due to a lack of awareness by research scholars and students. Despite the fact that all the respondents indicated that they were aware of the internet services, the results revealed that not all were aware of the different resources that are available on the internet nor of the internet techniques and related applications of the internet.

Kanaujia and Satyanarayana (2003) conducted a study among the science and technology community of the city of Lucknow in India to assess the level of awareness and demand of the Web-based learning environment among science and technology information seekers. The major findings of the study were that all the respondents were aware of the internet, with 49% reporting that they browsed the Web for two to four hours daily. From the sample studied, 14% browsed the Web for more than five hours and 40% reported using the internet to consult technical reports.

A study conducted by Sinha (2008) on ICT and internet awareness among college and university lecturers in India revealed that internet awareness among the refresher course participants was very poor. From the 46 participants, only 36% was internet literate and 63% was internet illiterate. The study further revealed that those who were internet illiterate were also unaware of internet services and resources.

The literature review on internet awareness revealed gaps that this study intends to fill. Most of the research was done more than five years ago. The internet is dynamic and a lot of innovations and discoveries (such as Web 2.0 technologies and social media) are available today. This means that the current situation and how these new innovations have been adopted by university students are not known, especially in Kenya. The earlier studies concentrated on the Western world and limited studies focused on the African nations. Although the above studies do not reveal a big problem of awareness of internet services and resources among university students, it is clear that these studies were carried out in universities outside Kenya. This study concentrated on the situation in Kenya.

2.6   SKILLS IN USING THE INTERNET

One cannot access internet-based resources without adequate internet skills (Okello-Obura & Magara 2008). Tella, Tella and Ayeni (2007) argue that students' ability to find and retrieve information effectively is a transferable skill that will also be useful in their future lives; it also enables the positive and successful use of e-resources while they are at school. These authors

note that in this digital era, any student at a higher level of education who intends to achieve should have the ability to explore the digital environment. Students are increasingly expected to use electronic information at university. In order to make use of the growing range of internet resources, students must acquire and practice the skills that are necessary to exploit them (Okello-Obura & Magara 2008). These skills include:

- knowledge of the structure of the databases
- knowledge of the instructions they must enter into the computer
- understanding the ways in which these instructions are linked to one another

Acquiring these skills is essential in a technology-driven environment and they can be enhanced tremendously through initiative learning strategies (Dawson 2005).

In addition to having internet skills, students should be network literate. Network literacy has been defined as the ability to participate as a peer in the emerging knowledge networks on the internet and to have as deep an understanding of the logic or protocols of these networks as we do of print. This means that students should understand how to participate on the Web by writing and connecting in the public sphere (Eziani 2011). Network literacy for students consists of two important elements:

1) knowledge of network information
2) skills to locate, select, evaluate and use the network information

Knowledge of network information includes (Enziani 2011):

- recognising the range and uses of global network information resources and services
- understanding the role and use of network information in problem solving and performing basic life activities
- knowing the system whereby network information is created, managed and made available Network skills include (Enziani 2011):

31

- identifying information that is needed for a specific purpose
- locating the needed information from networks through efficient information retrieval methods, skills and tools
- selecting and evaluating network information on a given topic
- manipulating and organising network information with other resources to enhance its value
- using, analysing and presenting network information for problem solving and lifelong learning

To acquire network literacy, users should first have basic literacy (know how to read and write), computer literacy (know how to operate computers, which are the interfaces between network information and end users), media literacy (understand the different media for storing network information and know how to use them) and information literacy (know how to locate, evaluate and use information effectively) (Okello-Obura & Magara 2008).

Several studies have been done on students' skills in using the internet. According to Muniandy (2010), a study on the academic use of the internet among undergraduate students at a Malaysian university revealed that their level of internet usage skills was fair: 70% of the respondents reported that their skills were fair, only 2% reported a very high level of internet usage skills and 27% reported a high level of internet usage skills.

Hinson and Amidu's study (2005) showed that lack of electronic literacy skills among final-year students at Ghana's oldest business school was a great obstacle in using internet resources, with a total of 48% of the respondents indicating that they lacked the necessary skills to access internet resources. This paints a gloomy picture of low levels of internet skills and literacy because the natural assumption is that final-year university students should be at the forefront of development and be skilled in how to use the internet, given that the information forms an integral part of their research and learning.

Ngulube *et al's* study (2009) which explored network literacy among students of the St Joseph Theological Institute in South Africa found that there was limited use of the internet due to the students' poor level of network literacy. Savolainen (2002) describes network literacy as

- knowledge of the information resources available on the internet
- skilful use of ICT tools to access network resources
- judging the relevance of information, and
- using CMC tools

Shuling (2006) investigated and analysed the use of e-resources in university libraries. The study revealed that the students' ability to use e-resources was lacking, with 55% of the respondents only knowing the "keyword" search method and only 16% using high-level search methods. This shows that a considerable amount of the students had not really mastered the information search techniques and their techniques and skills need to be improved.

2.7   INTERNET-BASED ELECTRONIC RESOURCES AND SERVICES

The term "internet-based e-resources" can be broadly defined to include sources that are available via the Web, FTP, Gopher, Telnet, mailing lists, e-mail, and other network tools or protocols (including self-publications and e-journal articles) (Zang 2001). Text resources that are available on the internet include dictionaries, encyclopaedias, thesauruses, glossaries and other reference works. These resources range in quality from low to very high. While some of them are free, for example Encyclopaedia Britannica (http://www.britannica.com), many of the best resources on the Web require subscriptions (Perry & Schneider 1999). Electronic information is available in different formats or file types. A format is the arrangement of data within a document file that typically permits the document to be ready or written by a certain application (*Microsoft Press computer users' dictionary* 1998:149). ASCII format is the plain text or text only file. Web documents are presented in HTML. Images on the Web are available as GIF or PEG GIF (graphics interchange format), which allows for compressing small or medium-sized files and can store up to 256 colours. JPEG (Joint Photographic Experts Group) is a newer format that stores more than 16 million colours. The MIDI format (musical instrument digital

interface) is used in controlling devices that create and read musical information. Streaming transmission is a new technique that is used to transmit both sound and video files. Audio files are transmitted using the WAVE format (Perry & Schneider 1999).

2.7.1 Internet services

The internet provides a variety of services that enable communication and access to electronic information for many different purposes.

(a)   Telnet

Telnet is an internet service that allows users to connect from their system to a remote electronic system (Diaz 1994:7). Once connected, one's computer becomes a terminal in that system. It also allows users to log in to their accounts from remote locations. Services that available via Telnet include remote databases, information servers and online public access catalogues (OPACs, for example the Library of Congress Catalogue). Telnet connections or logins present problems when the remote server is down because then one cannot connect to the server. The advent of the WWW has led to a reduction in the usage of some of the services.

(b)   File transfer protocol

FTP is one of several services built into and supported by internet suite protocols. It is a program to transfer files from one computer that is connected to the internet to another computer that is connected to the internet (Gauntlet 2000). FTP allows for the transfer of large documents, software and multimedia information sources like images, maps and sound.

(c)   Gopher

This is an internet system that was developed at the University of Minnesota which allows a site to create an invisible tunnel from itself to other sights (Diaz 1994:10). It is a menu-based system which allows the user to do a search on a specific topic and presents the results in a hierarchical menu. Gopher does not provide graphics or pictures, which might be its major weakness since modem documents or information sources now contain such features. Before the WWW, Gopher services were popular but like the Telnet services, its popularity is declining.

2.7.2 World Wide Web

The World Wide Web (abbreviated as WWW or W3) is an important and major application of the internet that became prominent in 1990 (Ebersole 1999:3). The WWW is a multimedia, hypertextual collection of information and entertainment resources that is available to users who are connected to the internet. The concept of the WWW was conceived in the late 1980s by Tim Berners-Lee at the European Organisation for Nuclear Research (CERN) (Poulter 2003). It was constructed using HTML and HTTP as the building blocks. The WWW has an application (called a browser) which allows the user to access the Web by means of "point and click" navigation through the hypertext links and icons. This is known as "surfing the Web". The first internet browser was called Mosaic and later became Netscape Navigator, which was followed in 1999 by Microsoft Internet Explorer (Hock 2007:5). The content of the WWW is what of significance to students. The diverse content meets the needs of users searching the Web on multiple fronts for information, education and social interaction (Ebersole 1999:7; Jansen & Spink 2006:256).

Today the trend of internet applications is towards rich, dynamic, user-friendly, process relevant and personalised applications. Rich internet applications (RIA) now deliver desktop-software-like functions on the Web to enable new kinds of engagement and highly interactive applications (Noda & Helwig 2005:1–8; Xin 2006:1–3). These applications and sharing among users are called the second generation of the Web or Web 2.0.

(a)   Searching the World Wide Web

The internet is an enabler, in other words it is infrastructure that gives users access to information content that is unfiltered, unprocessed and enormous in quantity. To get the available content, the user can attempt to search for it manually by typing in various Web addresses (uniform/universal resource locators or URLs), using available search software or choosing to rely on the expertise of others (Lorenzen 2002:3). The tools that are used most often to explore the web can be categorised as general directories, specialised directories and Web search engines (Hock 2007:8)

(b)   Internet browsers

One needs a browser to access the internet. As explained above, a browser is an application that allows the user to access the WWW by employing "point and click" navigation to move through hypertext links and icons. The first internet browser became available in 1994 and was called Mosaic. This was later called Netscape Navigator, which was followed by Microsoft Internet Explorer in 1999 (Hock 2007:5). Today, other browsers like Mozilla are in use and have become popular with many students.

(c)   Internet search tools

Web search tools include search engines, metasearch engines, directories and subject-based information gateways (SBIGs).

(d)   Internet search engines

Web pages become searchable by means of a Web search engine service according to a four-step process which corresponds to search engine "parts": (1) the crawlers, (2) indexing program and index, (3) search engine program and (4) HTML interface (Hock 2007:63). Crawlers or spiders scan the internet to gather information from Websites and feed this information to the search engine's indexing mechanism. The indexing program indexes virtually every word and links the URL, metatag and image file name on every new page found by the crawlers. The search engine program then matches these to the user's search criteria and delivers the retrieved results in a ranking order determined by the relevance-ranking algorithm used by the search engine.

Major search engines such as Google and Yahoo! have advanced search features that include Boolean operators (AND, OR, NOT), with some automatic stemming and prefixes such as "intitle," "allintitle" and "inurl". Information can also be searched by type of media and the popular search engines usually also include formats such as images, audio and video streaming (Hock 2007:129).

(e)   *Directories*

A directory is a listing of hyperlinks to Web page that is organised into hierarchical categories (Hock 2007). The difference between directories and search engines is that while search engines are machine indexed, directories are indexed by people who select pages or links to include in the directory. Directories vary in terms of size and their approaches to organising information resources, and they provide much smaller search output than major search engines (Chowdhury & Chowdhury 2001).

(f)   *Subject-based information gateways*

These are subject entrances (clearing houses) to quality assessed internet resources. They are a catalogue of records that describe internet resources and offer links to the resources (Begum & Jean 1999). SBIGs are also known as virtual libraries, gateways, digital collections and cyber libraries (Chowdhury & Chowdhury 2001). They are quality controlled and are often constructed by information specialists or librarians.

The review of the literature reveals that researchers have identified different aspects of Web usage by students in terms of their background and experience with computers and the Web, their domain knowledge, their cognitive abilities, information strategies, the nature of the search task, query formulation, system capabilities, demographics, environment, etc. All these factors contribute to the way users search the Web.

Hsieh-Yee (2001) shares the view that many studies in the published literature did not analyse Web usage directly but sought to understand who searched the Web, what tasks they performed, what their perception was of Web search tools and how they searched. She conducted a study in 2001 that shows the trends of research on the phenomenon of Web search behaviour from 1995 to 2000. Hsieh-Yee mentions that according to the Search Engine Index, the internet users ranked searching as their most important activity, giving it a 9,1 on a 10-point scale rating. The index also indicated that 57% of the internet users searched the Web each day and they identified searching as the second most popular activity, after e-mail.

In an informative review on Web search studies, Jansen and Pooch (2001) compared the search characteristics of Web users with those of users of traditional information retrieval systems. They found differences in the behaviour of the two categories of searchers in terms of using terms per query, searching session length, and use of Boolean operators or advance search features.

One of the most comprehensive attempts to understand Web usage was made by Jansen and Spink (2004) who analysed the query logs of the search engines of Excite, Alta Vista, Ask Jeeves and AlltheWeb.com from 1997 to 2003. They discussed the changes and explored how people search the Web by analysing the trends of Web searches in terms of the length and format of search queries, reformulation of a query, use of advance search and search session length.

A study of Web usage in 16 selected libraries in Ahmedabad and Gandhinagar in India that was conducted by means of a survey revealed the satisfaction levels of the library and information services (LIS) professionals with the type of information sought through search engines. The findings indicate the LIS professionals' dependence on search engines and their familiarity with the advanced search options of the search engines (Batthini & Madhani 2003).

Apart from general studies on Web users, a number of studies have focused on students. Today the Web and ICT are embedded in students' lives. They use the Web daily for communication, entertainment, socialising, shopping and learning (Lenhart, Madden & Hitlin 2005). Many studies have been conducted to investigate the Web search behaviour of university students. Aitken (2007) is of the view that the role of the Web and ICT in tertiary education and research is expanding and changing.

Chang and Perng (2001) carried out a research on the information search habits of graduate students at Tatung University". The purpose of their study was to investigate the information requirements and search habits of graduate students at Tatung University in Taipei (Taiwan). They reported the extensive use of the internet by the students in the recent past, mostly the use of Web-based databases, e-journals and search engines.

Ebersole (1999) reviewed the research conducted in 1998/1999 to examine students' perceptions and uses of the Web for academic purposes. The results of the content analysis of sites visited by students suggest that students believe the Web to be an important and valuable resource.

Navarro-Prieto, Scaife and Rogers (1999) sought to develop an empirically-based model of Web searches and 23 students were recruited from the School of Cognitive and Computer Science at the University of Sussex. From their research, they were able to identify three different general patterns of Web searches: (1) a top-down strategy, (2) a bottom-up strategy and (3) mixed strategies. They compared Web searchers' high and low experiences and concluded that expert searchers plan their searches ahead based on their knowledge about the Web, while novice searchers hardly plan at all. Hölscher and Strube (2000) acknowledged that searching for relevant information on the Web is often a laborious and frustrating task for inexperienced users.

Cmor and Lippold (2001) noted a number of observations students made while searching the Web. Their findings can be summarised as follows: (1) students use the Web for everything, (2) they may spend hours on searching or just a few minutes, and (3) students searching skills vary.

Zhang, Anghelescu and Yuan (2005) conducted an exploratory study on engineering and science students to see how domain knowledge affects users' Web searches and search effectiveness. They concluded that the level of domain knowledge seems to have an effect on Web searches (that is, as this level increases, the user tends to do more searches and to use more terms in queries) but not on search effectiveness.

These studies indicate that a large body of literature focuses on how users search the Web and sheds light on several factors relating to the use of the Web.

2.7.3   Web 2.0 technologies

Web 2.0 technologies are Web applications that facilitate interactive information sharing, user-centred designs and collaboration on the internet (Selwyn 2008; Safran, Helic & Gutl 2007; Greenhow, Robelia &Hughes 2009; McGee & Diaz 2007).

The most common applications of Web 2.0 technologies are user applied tags, zooming in and out on maps, and instant windows opening when the cursor is moved over the Web page (Hock 2007:7). The benefits of these technologies to students are the combination of multiple sources of related information that they can use to gain a more holistic view on a topic. Unlike the Web 1.0 sites that are static, the Web 2.0 sites are collaborative and emphasise sharing among users. The latest generation of Web 2.0 technologies (such as blogs, wikis and rich site summary [RSS]) are quickly becoming ubiquitous, offering unique and powerful information sharing and collaboration. Once the students use the Web 2.0 technologies, they discover its worth in education and enjoy its benefits. As Hargadon (2008) say: "Web 2.0 is the future of education." Web 2.0 technologies allow students to collaborate, to actively get involved in creating content and sharing or exchanging online information (Grosseck 2008:478–482).

Specific Web 2.0 technologies that contribute to higher education include blogs, micro blogs, wikis, syndication of content through RSS, YouTube, Podcasts, streaming media, SNS and other social software artefacts (Alexander & Levine 2008). These are briefly described below.

(a)   Blogs

The word "blog" is a contraction of the words "web" and "log". Blogs are Web dialogues that provide a threaded record of a conversation between groups of people. This is very similar to discussion boards since both are threaded discussions. The difference between the two is that a blog will start with a question or theme and then become conversational in writing style, whereas a discussion board will have a theme and remain generally within that theme and will be more scholarly in writing style. This tool helps to create a sense of belonging among students and a conversational tone in their interactions (Woods & Baker 2004).

(b)   Wikis

The word "wiki" originates from the Hawaiian words "*wiki wiki*", which mean superfast. Wikis are collaborative sites that allow for content to be added or edited instantaneously. This tool helps to build a sense of community in an online classroom, because students have equal

ownership in its creation. Students actively interact with one another to create content (Woods & Baker 2004). This interaction is two-way communication from student to student that promotes collaborative knowledge construction (Ouzts 2006).

(c)   Podcasting/Vodcasting

Podcasting can be defined as the process whereby digital audio files are distributed over the internet either by using feeds or by other distribution media. Vodcasting is the video format of the same service. Mostly, the media casting (which includes both audio and video) is done either through "media on demand" or through subscription services. These services allow the users to have a higher level of control over what media they want as it works on the demand and supply chain of activity.

(d)   YouTube

YouTube is a popular video-sharing website where users can upload, view and share video clips. It has become an enormously popular form of Web 2.0 new media. According to a recent article in *Wired Cites*, an average of 65 000 uploads and 100 million videos are viewed per day on YouTube (Godwin-Jones 2008).

A typical YouTube Webpage is characterised by the following (Duffy 2008):

- It has a wide variety of video content (including movie and TV clips, music videos and amateur content such as video blogging and short original videos).
- Unregistered users can watch most of the videos on the site; registered users can upload an unlimited number of videos.
- Flag is the ability to indicate when a video has inappropriate content.
- Title, which is the main title of the video.
- Tags are keywords specified by the person who uploaded the video.
- Channels relate to groupings of content.
- Related videos (determined by the title and tags) appear to the right of the video.

- Registered users can subscribe to content feeds for a particular user or users.
- Comments are often not monitored and can be provided by any registered user about a video that has been uploaded.
- Views are the number of times a video has been watched.
- Videos can be rated by registered users.

According to Bruns and Humphreys (2005), using wikis in an educational set-up is beneficial to students since they acquire collaborative skills and are able to do collective authoring through critical reading and responsible writing. Wikis are also tools for knowledge creation and they promote writing as a process and knowledge sharing over time.

Blogs, according to a study by Grosseck (2008), are important tools for students since they use them for real-world writing experiences, pull class blogs together into one area for easy tracking, use peer networks to develop their own knowledge and update new information (such as homework and assignments). Comments on blogs can encourage students to help each other with their writing and to get responses to a question without the answers being repeated.

Web 2.0, as it relates to the classroom, is an exciting phenomenon. Students are no longer limited but rather enhanced by technology. Tapscott (2008) identifies eight differentiating characteristics of Generation Net that pertain to learning and Web 2.0. Students want autonomy in their choices and expression; they want to personalise things; they want entertainment, play and social interaction; they want real-time communication and high-speed access, and the opportunity and platform to be innovative (Tapscott 2008:34–36; West &West 2009:24 - 25). With this new generation of students and their specialised needs, pedagogical approaches have to be adapted. With the help of Web 2.0 tools, students are now able to participate directly in the creation, refinement and distribution of shared content in contrast to being merely passive receivers of information (Selwyn 2008:15). The role of students in the Web 2.0-enhanced classroom has been transformed to enable them to become information evaluators as opposed to passive students who merely reflect their instructor's knowledge (McGee & Diaz 2007:9). As evaluators, students begin to think critically about the information and actively engage in the production and

evaluation of it through these technologies. Tapscott (2008:98) delineates the transition that students who use Web 2.0 tools have made from passive to active learning:

> "Instead of just numbly receiving information, they are gathering it from around the globe with lightening speed. Instead of just trusting a TV announcer to tell us the truth, they are assessing and scrutinizing the jumble of facts that are often contradictory or ambiguous. When they write toothier blog, contribute a video, they have an opportunity to synthesize and come up with a new formulation, which leads to a giant opportunity for them. The Net Generation has been given the opportunity to fulfil their inherent human intellectual potential as no other generation".

These technologies provide students with limitless opportunities to expand their knowledge and the knowledge of others, and they require dynamic and active involvement by the student. Blake (2008:42) states that Web 2.0 tools allow students to transform from passive consumers of authentic source materials to active author/owners of the material; they synthesise the material and contribute to the evolution of knowledge. This ownership of knowledge pushes students to think about and create authentic source content at a much higher and more critical level. Active engagement with authentic source content is the basis and premise of Web 2.0 technologies. Based on the literature published on Web 2.0 and learning since 2006, the concepts of active participation and collaborative learning continually emerge as major pedagogical attributes of Web 2.0 technologies (Selwyn 2008; Safran et al 2007; Greenhow et al 2009; McGee & Diaz 2007; Purushotma 2006; Cormode & Krishnamurthy 2008; Ullrich, *et al* 2008; Kreamer 2008; Dooly 2007). Ullrich et al (2008) point out that this stimulation of active participation distinguishes Web 2.0-based learning from traditional Web 1.0 learning where users read Web pages and solve exercises but cannot contribute. With active student involvement, the Architecture of Participation model of O'Reilly (2003) becomes apparent and begins to construct itself within the learning process. Ullrich et al (2008) agree that Web 2.0 involves an essence of architecture to which the students contribute information that is assumed valid and improves the overall quality of the platform, thus building on itself.

The concept of the long tail in the Web 2.0 context, which was first used by Anderson (2004), is other common characteristic researchers have identified in describing the change in Web architecture. In terms of learning, the long tail phenomenon implies that students have significantly increased access to produce, publish, receive and give feedback on content they produce themselves by using Web 2.0 technologies because of the virtually limitless amount of

space, storage and accessibility of the internet. These freedoms mean that students have knowledge and the world at their fingertips.

When utilised in the classroom, Web 2.0 technologies also change the dynamic between teacher and student. However, while students seem to have readily adjusted to advances in technology through Web 2.0 technologies, educators may not be adjusting accordingly. After surveying 3000 public school students, Levin et al (2002) recognised a "digital disconnect" between students and their teachers, with students reporting that their teachers had not yet adjusted their teaching to respond to the new methods students use to communicate and to use the Web beyond the classroom. The classroom environment and students have changed and as a result, the role of the teacher has also changed. Lee (2008) sees the role of teachers as facilitators in learning environments which integrate technology. No longer is the teacher the sole source of knowledge. Web 2.0 technologies make knowledge decentralised, accessible and co-constructed by and among a broad base of users (Greenhow et al 2009:247). While the constructivist classroom may have collaborative benefits based on the Web 2.0 tools that are used, Ullrich *et al* (2008) and Angeli (2008) offer important considerations to consider before making the transition to an entirely Web 2.0-based classroom. Based on the analysis from a study on micro-blogging Ullrich et al (2008) conducted, it is clear that although students may encourage one another to participate, unconstrained active participation results in distractions. These researchers suggest that although Web 2.0 technologies are successful in stimulating participation, the teacher must still maintain an active role as the discourse mediator (Ullrich , *et al* 2008:712). As shown by the micro-blogging study, active participation and collaboration can have negative educational effects when teachers do not maintain their roles as discourse mediators. The technologies require educators to be diligent, reflective practitioners.

Educators should recognise "collaboration as the take and exchange of information and collaboration as productive exchange and construction of ideas leading to learning gains" (Angeli 2008:274).

Some researchers argue that Web 2.0 tools lead to new and innovative pedagogical approaches to reach the new generation of students, while others insist that these are old approaches in a new

package with the same underlying goal. McGee and Diaz (2007) suggest that Web 2.0 technologies afford students similar educational benefits as student-centred, pedagogically-driven instruction. These researchers state that emerging technologies are designed to assist students to become active, engaged students and to interact more with other students, further building and constructing each other's knowledge; the co-construction of knowledge is the same underlying goal of Web 2.0 tools, even though the approach can arguably be different and new. These new technological tools have impacted e-learning by creating a modern learning process which has collaborative aspects and where active contributions to learning content are made (Safran, *et al* 2007). A paradigm shift has occurred in e-learning and the focus is no longer on the student's interaction with the computer but rather on the student's interactions with other people via the computer (Dooly 2007:64). This shift requires a better understanding of how the communicative aspect of Web 2.0 technologies intersects with student achievement and learning. Anderson (2007), Ullrich, *et al* (2008), and Rollett, *et al* (2007) delineate common attributes of Web 2.0 technologies and their implications on pedagogy. Web 2.0 tools utilise technology that affords users or students the opportunity to express themselves individually (blogs) or collaboratively (wikis), and visually (video-casts) or aurally (podcasts) on a user-friendly platform that emphasises organisation and effectiveness (Rollett, *et al* 2007).

2.7.4   Social networking sites

According to (Boyd & Ellison 2007), the extraordinary increase in the popularity of SNS over the past few years has encouraged scholars from various disciplines to study the use of SNS from multiple perspectives. Boyd and Ellison (2007) define SNS as "Web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system".

The cornerstone of almost every SNS is the personal profile page, which displays a list of the names of friends who are also users of the site. The friends list, which usually includes links to friends' pages, is typically visible to anyone who has access to the profile page. Most SNS

encourage users to connect with, or to "befriend", each other by providing directories of relevant user populations and/or recommender systems (Coyle & Vaugh 2008). The large majority of SNS require bi-directional confirmation in order for two users to become friends; however, some allow one-directional connections (Boyd & Ellison 2007). Most SNS also provide a way to leave messages or comments on friends' profile pages. These messages can be public or private, depending on the users' privacy settings. SNS are different from other social Websites in that participants primarily use them to connect with people who are already part of their offline extended social network (Ellison, Steinfield & Lampe 2007). There are currently hundreds of SNS on the WWW (Boyd & Ellison 2007). However, Facebook is the most popular among teenagers, college students and adults in the United States (Lenhart, Purcell, Smith & Zickuhr 2010).

Research on the prevalence of the use of SNS among college students indicates that a large majority of undergraduates have at least one SNS account, which they check multiple times per day (Peluchette & Karl 2008; Raacke & Bonds-Raacke 2008; Salaway & Caruso 2008). In their study on college students' use of SNS in which they surveyed 116 undergraduate students, Raacke and Bonds-Raacke (2008) found that 83, 2% of the students had MySpace accounts, 90, 1% had Facebook accounts and 74, 3% had accounts on both sites. On average, the participants checked their accounts 4, 19 times per day, spending 1, 46 hours on their own sites and 1, 10 hours on friends' sites. The most popular uses of both MySpace and Facebook included keeping in touch with old friends (96, 0%), keeping in touch with new friends (91, 1%), posting/looking at pictures (57, 4%), making new friends (54, 0%) and locating old friends (54, 4%). While there were no significant gender differences in terms of the most popular uses of SNS, men were more likely than women to use SNS for dating (16,3% versus 0,0%) and learning about events (44,9% versus 23,1%). In a similar study, Peluchette and Karl (2008) surveyed 433 college students and found that 80% had at least one SNS account (Facebook was the most popular) and more than 50% checked their account(s) at least once a day.

Salaway and Caruso (2008), on behalf of the Educause Centre for Applied Research, conducted a study on undergraduate students' use of SNS in 2007. Survey responses of the participants ($N =$ 27 317) from 90 four-year and eight two-year institutions indicated that just over 85% of the

college students had at least one SNS account and almost 90% of the SNS users had an account on Facebook, which was also the most commonly used SNS. The focus group data show that students spent a lot of time on SNS when they "should [have been] studying or doing other things" (Salaway & Caruso 2008). Salaway and Caruso had expected students to spend more hours on SNS than were reported. Instead, the majority of users (55, 8%) reported spending only five hours or less per week on SNS, 26, and 9% spent between six and 10 hours on the sites and the remaining 17, 3% spent 11 hours or more on it. The participants primarily used SNS to stay in touch with friends (96, 8%); share photos, videos and other content (67, 7%); and learn more about people (51, 6%). Interestingly, almost half of the students (49, 7%) reported that they had used the sites to communicate with classmates for academic reasons – a finding which has not been reported in other studies on the use of SNS. All in all, the results of research studies on students' use of SNS indicate that most students had a Facebook account, which they used frequently to connect with people and share photos and other personal content (Peluchette & Karl 2008; Raacke & Bonds-Raacke 2008; Salaway & Caruso 2008).

2.7.5   Computer-mediated communication

CMC has been defined as synchronous or asynchronous electronic communication and computer conferencing whereby a sender encodes text messages that are relayed from the sender's computer to the receiver's computer (Gaunlett 2000). CMC includes e-mail, IM, online chat rooms, bulletin boards and Listservs.

(a)   E-mail

E-mail is a mediated communication technology that enables users to send messages in the form of electronic letters to other users in asynchronous time. The Pew Internet and American Life Project indicated that e-mail is the most frequently used internet communication tool among college students (Jones & Madden 2002). Of the students who participated in the study, 62% reported using e-mail as their primary medium of communication on the internet; 72% of the

students checked their e-mail at least once a day, which points to e-mail usage being part of their daily routines (Jones & Madden 2002). E-mail may be short text messages that are sent between individuals, but it is also used to define the electronic distribution of complete documents composed of text, data, images and other forms of information (Gauntlett 2000). E-mail messages are generally delivered in a matter of seconds, regardless of the geographical location of the receiver. An e-mail message can be sent to an individual or to many e-mail addresses/individuals simultaneously. The history of e-mail can be traced back to 1972, when an ARPANET researcher Ray Tomlinson wrote the first program that could send and receive messages over the internet (Perry & Schneider 1999). Today e-mail is used to communicate in business and across diverse fields, and is the most popular feature of the internet.

E-mail is one of the internet services that is heavily used by the general public and students in particular. Sairosse and Mutula (2004) concur with this and say that the majority of users visit cyber cafés for e-mail communication. Adomi, Okiy and Ruteyan (2003) adds that teenagers and young adults, most of whom are students, usually use e-mail to communicate with their friends and relatives.

Aiken, Vanjano, Ray and Martin (2003) note that college students spend a large amount of time sending and receiving e-mails. This is in agreement with the findings of the PEW Internet and American Life Project study reported by Jones and Madden (2002), which indicated that e-mail is the most frequently used internet communication tool among college students. Another survey, done by Laite (2000), involving 406 graduate and undergraduate students at Shippensburg University (US) indicated that all the students used e-mail.

Due to the one-on-one nature of e-mail, its use has made lecturer–student interaction easy. When students and lecturers are geographically separated, they can still communicate with each other (Bailey & Cotler 1994). From the lecturer's point of view, e-mail can be used in a variety of ways, such as giving quizzes, providing updates and answering student's questions (Poling 1994).

(b)   Instant messaging

IM is a form of mediated communication technology that enables users to communicate with other users in real time. A user sends a message and it appears on the receiver's computer screen. The receiver then responds by sending a message back. A synchronous conversation can then occur. Many different instant messaging programs are available, such as America Online (AOL) Instant Messenger (AIM), ICQ ("I seek you"), Yahoo Messenger and Google Talk. IM has taken hold in the college student population; they are twice as likely as the average internet user to use it (Jones & Madden 2002). The Pew Internet and American Life Project found that 29% of students who were surveyed reported that IM is their primary internet tool and that on any day, 26% of college students use IM (Jones & Madden 2002). Leung (2001) found that for many Chinese college students, using ICQ was a daily activity, with 32% of respondents indicating that they chatted on ICQ daily. In another study conducted for the Pew Internet and American Life Project, the researchers found that IM was primarily a young person's activity (Rainie 2000). They found that 59% of the survey participants 18 to 24 years old engaged used IM (Rainie 2000).

Flanagin (2005) said that people of typical college age constitute a considerable and important population of instant messaging users .The research that has been done seems to indicate that IM is widely used by young people. Teenagers use it to ask each other out, to break up and to make plans with friends (Lenhart, Rainie & Lewis 2001). Hard af Segerstad and Ljungstrand (2002) found that college students use Webwho, a Web-based IM program, to collaborate on assignments and coordinate social activities .This suggests that IM is used for both tasks and social activities, and has instrumental and ritual uses.

(c)   Online chat rooms

Using online chat rooms is another activity in which many young adult internet users participate. Online chat rooms are a form of mediated communication technology, like IM, whereby users can communicate in real time; a user can have a conversation with many people instead of just one person. Users enter a chat room which may be for people with a specific interest (such as knitting) or for people of a certain age (such as those who are 50 years or older). Once in the chat room, users are able to have a conversation. 53% of internet users aged 18 to 24 years have

participated in online chat rooms at some point and 8% have engaged in it as a daily activity (Rainie 2000). Rumbough (2001) found that 37% of the college students he surveyed had at some point joined a chat room to interact with other people, with 5,8% of them doing so daily. While the number of college students who used online chat rooms as a daily activity was not as high as those who used e-mail and IM daily, the percentage was still large.

Research on online chat rooms indicates that users use it to have conversations and to initiate relationships with others (Peris, Gimeno, Pinazo, Ortet, Carrero, Sanchiz & Ibanez 2002). Some people used chat rooms for emotional support (Whitty 2002), while others used it as a way of coping with trauma (Stone and Pennebaker 2002).

(d)   Listservs

Listserv lists are electronic discussion lists that are supported by a special software application called Listserv. It facilitates one-to-many communication and is also a general purpose file server (Gauntlet 2000). Listservs have been formed on a wide variety of special topics which users subscribe to, for example there are Listservs for those who are interested in music, those who are interested in specific software programmes such as INNOPAC and CDS-ISIS and those who are simply cataloguers sharing their experiences on the internet.

(e)   Newsgroups

The newsgroup feature is like a huge bulletin board on which people post messages and comments others can react to and add further bits of information and insight (Gauntlet 2000). Although it is similar to a Listserv, the major difference between the two is that when one joins or subscribes to a newsgroup, e-mail messages are not automatically deposited into one's account. One has to go to the newsgroup to read the messages.

Much research has been done about people's use of CMC and internet technologies in general. Rumbough (2001) found that 37% of the respondents in his study had used the internet to meet

someone. McKenna (2002) also found that people use the internet to form new relationships online in addition to maintaining relationships with their family and friends. People also use the internet as a way of maintaining relationships with friends and family whom they know offline (McKenna 2002). In particular, mediated communication seems to play a role in the maintenance of one type of relationship: long distance relationships (Dainton & Aylor 2002). Although the telephone is still a popular means of long distance communication, CMC has become a way for many people to maintain relationships across a distance. One explanation that Dainton and Aylor (2002) propose for people's choice to use CMC in long distance relationships is the relative inexpensiveness and convenience of the medium. Papacharissi and Rubin (2000). found that interpersonal utility and convenience were two of the reasons why people use the computer to communication, along with information seeking, entertainment and to pass time. Flanagin and Metzger (2001) found 10 motive clusters for people's internet usage: information, learning, playing, leisure, persuasion, social bonding, relationship maintenance, problem solving, status and insight. These researchers found that mediated interpersonal technologies (including both CMC and the telephone) were used mainly for social bonding, relationship maintenance, problem solving and persuasion (Flanagin & Metzger 2001). The above research were general in nature and were not done in an educational setting, therefore they did not reflect results on the use of CMC among university students.

2.8   PROBLEMS UNIVERSITY STUDENTS EXPERIENCE WHEN USING THE INTERNET

The literature review on factors affecting students' internet usage and the challenges they faced seemed to intertwine and hence they were combined.

As some researchers have reported, several challenges militate against university students' use of the internet. A study conducted by Oyadonghan and Eke (2011) on factors affecting students' use of information technology in Nigeria showed that the availability of resources and materials, management and administration, and students' attitudes and dispositions were but a few of these challenges. Womboh (2008) points out that harsh economic conditions and government apathy about library services further militate against the use of ICTs in developing African countries.

Oyadonghan and Eke (2011) list the inhibitors of students' use of the internet as insufficient availability of IT resources, inadequate training on how to use the internet, the uncooperative attitude of staff, time constraints, cost of utilisation, obsolete equipment, space constraints, irregular power supply and systems failure.

Okello-Obura and Magara's study (2008), which they conducted in East Africa, revealed several problems students faced when using the internet at Makarere University in Uganda. These included lack of network skills, slow internet connection, inadequate network computers, inadequate opening hours of the computer laboratory, library staff's unwillingness to help, lack of access to printers in the library at low cost and few computers in the internet laboratory. This is in agreement with the study Luambano and Nawe (2004) carried out at the University of Dar es Salaam which indicated points of internet access were few, the speed of connection was low, a shortage of time, and lack of awareness and inadequate skills as inhibitors to students' successful utilisation of internet services. This was further complicated by inability to afford the access fee.

Another study, which was conducted by Talja and Maula (2003) at the University of Tampere in Finland, reported findings similar to the above studies on problems students faced when using the internet. The findings included lack of access, lack of knowledge of what is available, conservative attitudes and lack of computer skills as hindrances. This is in agreement with Hinson and Amidu (2005) who reported access limitations and lack of skills as problems for final year students at Ghana's Oldest Business School. Moghaddam and Talawar (2008) reported lack of long-term access and incomplete e-resources, network dependency, reading from a monitor and loss of certain attributes of the paper version as some of the challenges for students at the Indian Institute of Science. Parameshwar and Patil (2009) reported downloading problems, irrelevant information, finding relevant information and information overload as the major challenges for faculty members and research scholars at Gulbarga University's library in India.

Malaney (2005) investigated internet usage among college students and problems related to students' online behaviours by administering surveys to randomly-selected samples in 2000 (N = 593) and 2003 (N = 606). The students were asked to answer questions about their online activities over the preceding seven days. The study revealed problems such as the possibility of

becoming addicted to using the internet; poor academic grades due to wasting study time on the internet; and missing classes, work or appointments due to an inability to control online behaviour.

Academic problems related to internet usage have been documented in several other key articles. Kubey, Lavin and Barrows (2001) conducted one of the studies which specifically focused on internet usage and academic performance. The purpose of their research was to determine if there was evidence to support the prevalence of internet dependency among college students and to ascertain whether internet dependency was associated with self-reported academic problems. The study was conducted among students (N = 572) at Rutgers University who completed a 43-item questionnaire about their internet use, study habits, academic performance and personality. 53 students (9%) reported that they might have become "a little psychologically dependent on the Internet" and could be considered internet dependent; 80 students (14%) reported that their "schoolwork had been hurt" because of time spent online and could be regarded as experiencing internet-related academic problems.

According to the results of the study, internet-dependent students were more likely to experience internet-related academic problems than students who were not dependent on the internet (r = 0,563, p < 0,01). In addition, internet-dependent students reported spending significantly more time online compared to students who were not internet-dependent (M = 11,18 hours per week versus M = 3,84 hours per week) and students with internet-related academic problems reported spending significantly more time online compared to the total sample (M = 11,08 hours per week [SD = 8,75] versus M = 4,67 hours per week [SD = 5,44]). Furthermore, students with academic problems reported that they stayed up late, felt tired the next day and missed class due to their use of the internet. While female students accounted for two-thirds of the sample, male participants made up almost half (49%) of the internet-dependent group. This finding was consistent with other studies on college students' internet dependence which found that male students were more likely than female students to be internet-dependent (Anderson 2004; Morahan-Martin & Schumacher 2000).

The literature reviewed on the problems students experienced in terms of using the internet revealed a big gap since very little studies have been done in East Africa and especially Kenya. Most of the researchers concentrated on the West. Since the pace of technological development is different in different parts of the world, it means that the problems also vary – depending on developments. Kenya, being a developing country, has its own unique problems as far as internet usage is concerned and thus the researcher carried out the research in Kenya.

2.9   SUMMARY

The researcher reviewed literature directly related to the study. The review provided the researcher with a sound conceptual, theoretical and practical understanding of internet usage among university students. The literature was reviewed to cast light on the following issues: the importance of the internet in higher education, the internet as an information resource, benefits of using the internet in education, students' awareness of internet services, students' internet skills, internet-based resources and services, and the problems students experienced when using the internet. In the next chapter the methodology employed in carrying out the research is set out.

CHAPTER 3
RESEARCH METHODOLOGY

3.1   INTRODUCTION

The methodology that was adopted for the study is set out in this chapter. The research method and its virtues and applicability to the research are explained. The target population comprised university students and library staff, and both stratified and purposive sampling were used. The sample size, and how the sample was selected, is also explained.

The data collection methods and instrumentation, which included interviews and questionnaires, are discussed. Their advantages and disadvantages, and their suitability in different kinds of studies, are also discussed. The chapter continues with the data analysis process, in other words how both the qualitative data and the quantitative data were analysed. Ethical considerations, including how the participants were not exposed to any harm, are covered. Finally, the problems that the researcher encountered during the research process are discussed.

3.2   RESEARCH PARADIGMS

There are three research paradigms, namely qualitative, quantitative and mixed method research. Qualitative and quantitative research are the major approaches used by social sciences researchers. Creswell and Plano Clark (2007:28), agree with Leedy and Ormrod (2005) in saying that "no single study perfectly fits all of the elements of either a qualitative or quantitative study". Johnson and Onwuegbuzie (2004:14) identify a third research paradigm and assert that "if one prefers to think categorically, mixed method research sits in a new third chair, with qualitative research sitting on the left side and quantitative research sitting on the right side".

Besides reiterating the same point, Johnson, Onwuegbuzie and Turner (2007) highlight the importance of using a mixed method approach to find the answers to one's research questions.

3.2.1 Qualitative research

According to Leedy & Ormrod (2005:94), qualitative research is typically used to answer questions about the complex nature of a phenomenon, often with the purpose of describing and understanding the phenomena from the participant's point of view. They describe quantitative research as research that are used to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena (Leedy & Ormrod 2005:94).

Qualitative research is used often in the humanities because it strives to capture the human meanings of social life as it is lived, experienced and understood by the participants. It has also been applied in disciplines such as medicine. Taylor (2000:64) explains that qualitative research begins with observing the phenomenon, and this is followed by recording and classifying the data. This means doing a detailed examination of the phenomena prior to analysis. Another distinguishing characteristic of qualitative research is that data are collected in their natural context and statements are analysed in the context of an extended answer or the total course of the interview (Flick 2004:8; Taylor 2000:90).

According to Creswell (2003), qualitative research has the following demerits:

- The knowledge produced may not be generalised to other people or other settings.
- It is more difficult to test hypotheses and theories.
- It may have lower credibility with some administrators and commissioners of programmes.
- It generally takes more time to collect data compared to quantitative research.
- Data analysis is often more time consuming.
- The results are more easily influenced by the researcher's biases.

3.2.2 Quantitative research

The main aim of quantitative research is to give valid and objective descriptions of phenomenon (Taylor 2000:69). The researcher tries to maintain objectivity by not allowing his or her personal bias to influence the analysis and interpretation of the data. Quantitative research may be classified as descriptive, analytical or experimental. A descriptive quantitative research method was adopted for this study. The descriptive survey enabled the researcher to learn about a large population (thousands of university students) by means of a descriptive survey.

Leedy and Ormond (2005:179) state that descriptive quantitative research examines a situation as it is, and it involves either identifying the characteristics of an observed phenomenon or exploring possible correlations among two or more phenomena. It neither changes nor modifies the situation under investigation, nor determines cause–effect relationships. This study is a user study in the field of Information Science that describes the opinions, attitudes, expectations and search behaviour of university students when they use the internet.

A quantitative approach enables the researcher to manipulate variables and control natural phenomena. Hypotheses are constructed and tested against the hard facts of reality. Quantitative research relies, for its comparative statistical evaluation, on standardisation in data collection. This means that the order of the questions in a questionnaire, and the possible responses to them, are strictly prescribed in advance and the conditions under which the questions are answered should be held constant for all the participants in the study (Flick 2004:9).

The following are some of the characteristics of quantitative research (Patton 2002:40).

- *Data*: Objective data are collected by means of questionnaires from respondents, and the number of respondents who answered counts.
- *Sample*: Usually a large number of subjects are chosen randomly to represent the whole population.
- *Reality*: The focus is concise and narrow.

- *Measurable*: What it assumes to be a static reality is measured in the hope of developing universal laws.
- *Reasoning*: The reasoning is logical and deductive.
- *Generalisation*: The researcher strives for generalisation.
- *Autonomy*: The researcher is not part of the process; the respondents fill in the questionnaires alone in their own time.
- *Analysis*: The report is based on a statistical analysis and the basic element of analysis is numbers.
- *Setting*: It is done in a highly controlled setting (as opposed to the natural setting of qualitative research).

Creswell (2003) highlights the demerits of quantitative research as follows:

- The categories the researcher uses may not reflect local constituencies' understandings.
- The theories the researcher uses may not reflect local constituencies' understandings.
- The researcher may miss out on phenomenon that occur because of the focus on theory or hypothesis testing rather than on theory or hypothesis generation.
- The knowledge that is produced may be too abstract and general for direct application to specific local situations, contexts and individuals.

However, combining the two approaches (qualitative and quantitative) could yield more credible results (Creswell, Fetters & Ivankova 2004). Combining the two approaches suited this study best in order to use different methods for the data collection, interpretation and presentation of the research findings (Creswell 2003). The researcher therefore applied a quantitative method in surveying the student population, while qualitative research was applied in the interviews with the library staff.

3.2.3 Mixed method research

As explained above, when mixed method research is used, the researcher mixes or combines qualitative and quantitative research techniques/methods/approaches, concepts and/or languages

in a single study. It is the "third wave" or third research movement (Johnson & Onwuegbuzie 2004). It is an approach where the researcher tends to base knowledge claims on pragmatic grounds (for example, consequence-oriented, problem-centred and pluralistic). Strategies of enquiry are used that involves collecting data – either simultaneously or sequentially – to best understand the research problem. The data collection involves gathering both numeric information (for example, on instruments) and text information (for example, in interviews, so that the final database contains both quantitative and qualitative information). However, mixed method research has its merits and demerits (Creswell & Plano-Clark 2007).

The merits of mixed method research are:

- Words, pictures and narratives can be used to add meaning to numbers.
- Numbers can be used to add precision to words, pictures and narratives.
- Research can test and generate a grounded theory.
- The researcher can answer a broader and more complete range of research questions because he or she is not confined to a single method/approach.
- Stronger evidence for a conclusion can be provided through the convergence and corroboration of findings.
- The generalisation of the results can be increased.
- Qualitative and quantitative research are used together to produce more complete knowledge to inform theory and practice.

The demerits of mixed method research are:

- It can be difficult for a single researcher to carry out, especially if two or more approaches are used concurrently.
- It is more expensive than other research methods.
- It is more time consuming than other research methods.

3.3   RESEARCH METHOD

The researcher used a case study research design for this study whereby both quantitative and qualitative methods were used to obtain data.

A case study research method provides a detailed story of a case/problem (Hancock 2002; Johnson & Christensen 2004:46; Myers 2007). There has been a notable increase in case study research (Bachor 2000; Myers 2007; Rowley 2002) which can be attributed to the fact that it allows for in-depth investigation of a problem (Flyvbjerg 2003; Hancock 2002). Bachor (2000:76) contends that the rationale behind undertaking case study research is the fact that it is a convenient and meaningful technique which provides face value credibility as it is seen as providing evidence or illustrations some readers can readily identify with.

Bachor (2000) stresses that the key features of a case study are its scientific credentials and its evidence base for professional applications. For Rowley (2002), the wide usage of case study research is mainly due to its capacity to offer insights that might not be achieved with other approaches. To sum up the fundamental nature of the case study research approach, Yin (2008) stresses that the goal of the method is to give as accurately as possible the fullest most complete description of the case.

In the light of the above, the use of the case study approach has been advocated. For instance, Rowley (2002) notes that case study research usually emerges as an obvious option for students and new researchers who undertake research on their workplace or a comparison between a limited number of organisations. Hancock (2002), Rowley (2002) and Soy (2006) point out the following as some of the virtues associated with case study research:

- It offers information with richness and depth.
- It is a highly versatile research method and any and all methods of data collection are used, from testing to interviewing.
- It enables the researcher to understand a complex issue or object.

- It can extend experience or add strength to what is already known through previous research.
- Context is emphasised, which can help to bridge the gap between abstract research and concrete practice by allowing researchers to compare their first-hand observations with the quantitative results obtained through other research methods.

Although case study research has been commended for its virtues, it also has shortcomings. For instance, Hancock (2002) and Soy (2006) indicate that case study research often produce biased research findings, mainly because of the exposure of studied cases and the small number of studied cases is difficult to generalise. Soy (2006) contends that researchers in various disciplines successfully carry out case study research based on carefully planned and crafted studies of real-life situations, issues or problems. Selecting this research method for the current study was mainly because the researcher investigated UON as an institution.

Table 3.1: Key characteristics of case study research and its application to this study

Key characteristics of the case study	Application to this research
A phenomenon is studied in a natural setting.	Students were surveyed at the UON.
Data is collected by multiple means.	The data was collected by means of questionnaires and interviews.
One or a few entities (person, group or organisation) are examined	The research was concerned with students' perceptions of UON library staff.
The complexity of the unit is studied intensively.	The focus was on the UON as the unit of study.
The results that are derived depend heavily on the integrative power of the investigator.	The results were drawn from the responses to the questionnaire and interviews.
Case study research is useful to study the "why" and "how".	The type of data that was collected was on the "how" and "why".
Data collection methods include questionnaires, document analysis and interviews.	The researcher used questionnaires, interviews and document analysis to collect data.

(Source: Benbasat, Goldstein & Mead 1987)

3.4 TARGET POPULATION

Mugenda and Mugenda (2012:245) define "population" as the set of all the elements, units, objects or subjects in the universe of interest for a particular study. It refers to the entire group of individuals, objects, items, cases, articles or things with some common attributes or characteristics. When the population is clearly defined, it is referred to as the target population.

The target population of this study comprised students and library staff of the UON. The UON had a population of over 50 000 students at the time of the study (University of Nairobi 2009). The choice of students as the main respondents was based on the fact that students are heavy users of the internet compared to other university members such as academic and non-academic staff; the use of the internet among students is a daily routine and the internet has always been part of their world (Jones & Madden 2002). The students who were selected for the study were from all six colleges of the UON.

The library staff members were included in the study mainly because the internet services at the UON are accessed through the library system and these staff members could provide important information about internet service provision. The UON library system at the time of the study had 152 members of staff, both professionals and non-professionals. Out of 152 staff members, 89 were library and information science professionals and it is from this population that the participants were drawn. To narrow down the sample, only the staff members who were involved in internet service provision in one way or another were asked to participate in the study. The researcher therefore selected this group of staff members because they were deemed to have the necessary information about internet service provision.

3.4.1 Sample frame

The sample frame is a listing of the individuals in the population from which a sample is drawn. The quantitative samples for the survey were extracted from the sample frame. To determine

who would participate in the quantitative study, the lists of students in the different colleges that were available in the library database were used as a frame. Onwuegbuzie and Collins (2007) suggest that the sample size should be informed by the research objectives, research questions and research design. According to Kumar (2005), the sample size is determined by three factors: (1) the level of confidence with which the researcher wants to test the results, (2) the degree of accuracy the researcher requires to estimate the population parameters and (3) the estimated level of variation with respect to the main variable being studied. Creswell and Plano-Clark (2007:113) suggest that, "if the quantitative research design is an experiment, investigators turn to power analysis formulas; if the study is a survey, sampling error formulas can help identify the appropriate size for the sample".

In this study, the use of a questionnaire required survey-type sample-size calculations, which meant that a sample error formula was used rather than power analysis formulae.

Usually social science researchers assume that if the population is large, the sample also has to be large – but this is not necessarily accurate (Ngulube 2005; O'Sullivan, Rassel & Berner 2008). Researchers such as Leedy and Ormrod (2005) propose a sample size of 50% of the population. Thus, perspectives on the exact sample size do vary. O'Sullivan, Rassel and Berner (2008:155) point out: "One misconception about sample size is that a sample must include some minimum proportion of the population. This implies that if the size of the population is larger, the sample size must be increased by a corresponding amount. This is not the case. In fact the main factors that determine the sample size are the desired degree of accuracy and the confidence level."

Accordingly, a common rule of thumb is a 95% confidence level so that the results are accurate to within approximately 3%. A sampling error of 3% and a 95% confidence level mean that we can be 95% confident that the population resembles the sample – approximately a 3% sampling error (Ngulube 2005:135).

However, when there is a defined sample size and to increase accuracy without increasing the sample size, one has to settle for a lower confidence level; conversely, to increase confidence

level and keep the same sample size, some accuracy must be sacrificed (O'Sullivan, Rassel & Berner 2008).

The study had two sample frames. The first sample frame, which was the same as the study population for the survey, comprised UON students from all the six colleges. The list of registered students from the library database was used. The second sample frame was made up of the library staff from whom the qualitative data was collected through face-to-face interviews. The UON staff list was obtained from the library's administration office. The list consisted of the names of the staff members, their designations, and the sections or locations where they were stationed.

3.4.2   Sample size

The sample was determined in two phases. In the first phase the sample size of 381 participants was determined from the entire target population of 5000 using the sample size calculation table suggested by Krejcie and Morgan (1970). The second phase of the sampling involved drawing samples representing   each college.

Powel and Connaway (2004:100) suggest that in selecting a stratified random sample, one must first divide the entire population into groups or categories and then draw independent samples. The participants were selected from each college of the UON. Using these strata (colleges), the names of the students in the database were copied and pasted on a Microsoft Excel spreadsheet. The function = r (which is Excel's method of putting a random number between 0 and 1 in the cells) was inserted next to each name in the column.

Selecting both the list of names and the random numbers and then clicking on the SORT command in the DATA tab resulted in the rearrangement of the lists in random order from the lowest to the highest number. This was based on the fact that if numbers were randomly allocated to the students' names, the chances of the individuals to be included in the study were equal (Leedy & Ormrod 2005). The researcher randomly picked the names of the participants

from the student lists of the colleges until the desired number of participants from every college was reached. This process enabled the researcher to select a sample which would be considered representative of the population. Tables 3.2 and 3.3 show the targeted population and samples representing the colleges respectively.

Table 3.2: Study population

Strata (Colleges)	N	Percentage
College of Humanities and Social Science	17 000	34
College of Biological and Physical Sciences	8 500	17
College of Agriculture and Veterinary Sciences	4 500	8
College of Education and External Studies	15 000	30
College of Architecture and Engineering	3 500	7
College of Health Sciences	2 000	4
Total	**50 000**	**100**

Table 3.3: Study sample

Strata (Colleges)	N	Percentage
College of Humanities and Social Science	130	34
College of Biological and Physical Sciences	65	17
College of Agriculture and Veterinary Sciences	30	8
College of Education and External Studies	114	30
College of Architecture and Engineering	27	7
College of Health Sciences	14	4
Total	**381**	**100**

3.5   SAMPLING PROCEDURES AND METHODS

It is not practical or possible to study an entire population if it is too large and therefore it is necessary to make general findings based on a study of a subset of the population. A subset of a population is known as a sample (Melville & Goddard 2001:34). Sampling procedures involve

defining the sampling techniques, the population, and the instrumentation and procedures used to obtain the data (Powell & Connaway 2004). According to Leedy and Ormrod (2005), sampling is done to create a small group from a population that is as similar to the population as possible. It should be a small group that is similar to the big group because the degree of resemblance and representativeness is very important (Teddlie & Yu 2007). Ngulube (2005:132) explains that "by studying the sample, it is possible to draw valid conclusions about the larger group".

There are two kinds of sampling techniques, namely probability sampling and non-probability sampling. Probability sampling occurs when the people who constitute a sample are chosen because the researcher has some notion of the probability that they will be a representative cross-section of the whole population being studied. Non-probability sampling is conducted without such knowledge about the sample being representative of the overall population.

The most commonly used probability sampling techniques include simple random sampling, stratified random sampling, systematic sampling and cluster sampling. Non-probability sampling is less desirable than probability sampling, especially if the objective of the research is to generalise the findings. Among the non-probability techniques are convenient or accidental sampling, quota sampling, purposive or judgmental sampling, and snowballing. Teddlie and Yu (2007:77) suggest that probability sampling techniques are primarily used in quantitative studies while non-probability techniques are used in qualitative studies.

When sampling, it is important to keep in mind that errors can arise on account of the sampling process, the measurement used for the sample or even non-sampling. The problem of precision (that is, the range within which the population parameters will lie in accordance with the reliability specified in the confidence level) is also important (Powell & Connaway 2004). The confidence level is the "level of certainty that the characteristics of the sample represented the target population" (Ngulube 2005:135). In other words, sample size is determined by how large a sampling error an investigator is willing to accept and the variability within the population from which the sample is drawn (O'Sullivan, Rassel & Berner 2008).

Stratified random sampling was used in this study to identify the participants for the survey as it gave everyone in the population an equal chance to be selected as part of the sample that was ultimately used. Purposive sampling was used to identify the library staff for the study based on the researcher's knowledge of the population and the objectives of the research.

Stratified random sampling is a technique whereby a population is divided into mutually exclusive groups called strata and then a simple random or systematic sample is selected from each group or stratum (Johnson & Christensen 2004:207). The target population of the study comprised all the students in the six colleges of the UON. The total population of the students at the time of the study was 50 000. The colleges of the university were the strata from which different sample sizes were drawn. Stratified random sampling was appropriate for this study since the UON has six colleges (strata). The significant advantage of stratified random sampling is that the researcher has some control over the selection of the sample to guarantee that the crucial people are covered and in the proportion that they exist in the wider population.

3.5.1 Purposive sampling

Purposive sampling, according to Kumar (2005:179), is determined by "the judgment of the researcher as to who can provide the best information to achieve the objectives of the study". Leedy and Ormrod (2005:2010) and O'Sullivan, Rassel and Berner (2008) opine that sampling depends on the researcher's judgment regarding who to include in a sample. Apart from the stratified random sampling that was used to identify the participants for the survey, the participants for the interviews were identified through a non-probability sampling technique called purposive sampling. Purposive sampling is most stressed as the rationale for undertaking case study research (Creswell 2003:185). The researcher identified potential participants who had characteristics deemed suitable for providing the required information (Johnson & Christensen 2004:215). The researcher conducted interviews with the following library staff:

- the e-resources librarian
- ICT staff
- two senior library assistants in charge of the internet/e-resources laboratory

- an internet laboratory attendant
- systems librarian

The above individuals had diverse roles in the provision of internet services at the UON. Conducting interviews with the above participants was a crucial part of the study as they brought a different dimension to the data that were collected.

3.6   DATA COLLECTION PROCEDURES AND METHODS

Kothari (2004:96) states that a number of different methods can be used to collect survey data, including interviews, focus group discussions, observation and questionnaires.

3.6.1   Interviews

One way of collecting qualitative data is by conducting interviews. "An interview involves one-on-one verbal interaction between the researcher and the respondent" (Melville & Goddard 2001:49). There must be an interviewer (whose role is to ask questions) and the interviewee (whose role is to respond to the questions). It involves presenting oral-verbal stimuli and replying with oral-verbal responses. Interviews can be done face to face or, if possible, by telephone (Kothari 2004:97). They can be conducted with individual respondents or with a group of respondents. Interviews are preferred for data collection because of the following advantages (Kothari 2004:98):

- More in-depth information can be obtained. This is facilitated by the fact that there is personal contact and the interviewer can probe for more information.
- A personal interview can help the researcher to measure what someone knows (knowledge) or what he or she likes and dislikes (values and preferences).
- Clarity of questions can be achieved; since this involves dialogue between the interviewer and the interviewee, any unclear questions may be clarified and explained.
- An interview can be conducted with both literate and illiterate respondents, hence the researcher has a chance to get data from a big sample – which will produce more reliable results.

69

- Samples can be controlled more effectively as there is no problem of missing returns. The non-response rate generally remains very low.
- The interviewer can control the interview and can select the persons who will answer the questions. He or she may also choose to conduct a focus group discussion.

However, the following are demerits of interviews as a data collection method (Kothari 2004:99).

- Interviewing might proof to be a very expensive method of data collection, especially where a large and widely spread geographical sample is chosen.
- The interviewing method is prone to bias, either on the part of the interviewer or of the respondent.
- Certain classes of people (such as executives and important officials) may not be easy to approach through this method and this may interfere with the adequacy of the data.
- An effective interview presupposes proper rapport with the respondents to facilitate free and frank responses. This is often very difficult to achieve.

The researcher used face-to-face interviews to collect the qualitative data for the study. The structured interview protocol (see appendix C) with open-ended questions was used in this study. The interview participants were six library staff members and the researcher was the interviewer.

3.6.2   Questionnaires

A questionnaire is a document that contains instructions, questions and statements which are compiled to obtain answers from respondents. The questions are presented with exactly the same wording and in the same order to all the respondents (Kothari 2004:101). Questionnaires may be online or postal questionnaires.

Questionnaires and surveys are sometimes perceived as having the same meaning. According to Powell and Connaway (2004:83), a "survey is a group of research methods commonly used to determine the present status of a given phenomenon". However, a questionnaire is a data

collection tool (Powell & Connaway 2004). In other words, while a survey is used to closely consider something in a general or very broad way (or is a statistical study of a sample population where questions about age, income, opinions and other aspects of people's lives are asked), a questionnaire is a set of questions that is used to gather information during a survey. The researcher used a questionnaire in this study. Leedy and Ormrod (2005:191) summarise the guidelines for questionnaire construction as follows:

> Keep it short; use simple, clear, unambiguous language; check for unwarranted assumptions implicit in your questions; word your questions in ways that do not give clues about preferred or more desirable results; check for consistency; determine in advance how you will code the responses; keep the *respondents'* task simple; provide clear instruction; give a rationale for any items whose purpose may be unclear; make the questionnaire attractive and professional looking; conduct a pilot test; scrutinize the almost-final product carefully to make sure it addresses your needs.

There are advantages and disadvantages to using questionnaires. Powell and Connaway (2004) explain that online questionnaires facilitates gathering data because it is relatively easy to collect and analyse data in a short time. They are also inexpensive to administer (Fowler 2002; Powell & Connaway 2004). Powell (1997) suggests that the fixed format of the questionnaire eliminates variation in the questioning process, even when respondents may interpret the same questions differently.

Powell and Connaway (2004) also mention disadvantages such as the absence of explanations to ambiguous questions, and a degree of non-responsiveness of respondents. They also voice their concerns about questionnaire design as a possible hindrance to the effectiveness of questionnaires due to complicated questions or questions that are excessively long. They also say that sometimes questionnaires "are so poorly conceived and executed that participation not only wastes the time of the respondent, but contributes to the production of inaccurate and misleading research" (Powell & Connaway 2004).

The self-administered questionnaire was selected as the primary instrument to collect data in this study. The questionnaire was considered appropriate because it enabled the respondents (the university students) to complete them at a convenient time before the stipulated deadline. The major attraction of using the questionnaire was the ability to collect large amounts of data in a relatively short time (Kothari 2004:103). The questionnaire method, however, has serious limitations when it comes to the response rate. Furthermore, when the content of the questions is considered to be threatening, the truthfulness of the self-report is compromised. In this case, there was concern that the respondents would not report accurately for fear of exposing themselves to criticism on the use of the internet and its applications. To minimise the effect of these limitations, the researcher adopted a strategy of distributing the questionnaire in person. The researcher also emphasised that the information obtained by the study could be used as a basis for improving internet services at the UON. This seemed to create interest among the participants. Cooperation was sought from the library management in encouraging the selected participants to respond.

The questionnaire was constructed with the objectives of the study in mind and covered the following study questions:

- What is the level of students' awareness of the internet services?
- What computer and internet skills do students have?
- What internet applications do students use?
- What kind of information do students seek on the internet?
- What factors influence the effective use of the internet by students?
- What problems do students experience while using internet?

The questionnaire consisted of both open-ended and closed-ended questions. For the close-ended questions, the students were provided with a list of alternative responses to choose from in order to facilitate consistent answers to questions; instructions were given on how to respond to the questions. The researcher obtained some of the questions of the questionnaire from previous studies that had been done on internet usage.

The questionnaire package consisted of a copy of the introductory letter from the researcher's supervisor, the researcher's own introductory letter explaining the purpose of the questionnaire and the questionnaire itself. The researcher, with the help of research assistants, distributed the copies of the questionnaires to all the respondents in their respective colleges.

The respondents were asked to complete the questionnaires and to return them to the issue desk of their respective college libraries. The research assistants helped to collect the completed questionnaires. Care was taken not to allow too long a time for completing the questionnaire in order to discourage delays and to minimise questionnaire losses.

3.7   DATA ANALYSIS AND PRESENTATION

Data collection is followed by data analysis. Data analysis refers to the process of generating value from the raw data (Johnson & Christensen 2004:500). Since both questionnaires and interviews were used in this study, the data were analysed using appropriate data analysis techniques. There are a number of data analysis techniques that can be used to analyse qualitative and quantitative data. According to Lewins and Gibbs (2005), qualitative data analysis is "the range of processes and procedures whereby we move from qualitative data that have been collected into some form of explanation, understanding or interpretation of the people and situations we are investigating". Byrne (2001) explains that qualitative studies are unique and unique data analysis strategies are often used. Taylor-Powell and Renner (2003) express similar sentiments when they indicate that "there is no single or best way" of achieving order and understanding when analysing and interpreting qualitative data, but it requires creativity, discipline and a systematic approach. Nevertheless, Byrne (2001) states that qualitative data analysis consists of identifying, coding and categorising patterns found in the data. The analysis process consists of the following steps (Taylor-Powell & Renner 2003:76):

1)   Get to know your data.
2)   Focus the analysis.
3)   Categorise the information.

4) Identify patterns and connection within and between categories.

5) Interpretation – bring it together.

Although it is agreed that a systematic approach (as outlined above) is necessary for data analysis, Taylor-Powell and Renner (2003) indicate that the choice of either analysing qualitative data manually or using a computer program such as a word processing program, relational database management program (for example Access) or special qualitative data analysis program depends on the size of the data set, the available resources, preferences, and the level of analysis needed or warranted.

Quantitative data analysis involves analysing quantifiable data. Because quantitative data is usually voluminous, using computer software that aids the analysis process has been in use for a long time. Common software that is used includes the Statistical Package for Social Science (SPSS) (Jones 2007). While it is agreed that specialised qualitative data analysis software enhances the analysis of large volumes of data (Byrne 2001; Pope, Ziebland & Mays 2000), researchers are urged to be mindful of the fact that qualitative studies are not undertaken with a view to generalise findings and that the responsibility of interpreting the data by a process of analysis is entirely their jurisdiction (Byrne 2001; Pope, Ziebland & Mays 2000).

3.7.1   Analysis of the data collected from the survey

The first step of the data analysis involved coding the responses in the coding sheet by transcribing the data from the questionnaire through assigning characters (numerical codes). This was followed by screening and cleaning the data to make sure that there were no errors. The data was then analysed based on the objectives of the research or to respond to research questions of the study, which were:

- What is the level of students' awareness of the internet services at the UON?
- What skills do students have to access the internet?
- Which internet applications do students use?

74

- What kind of information do students seek on the internet?
- What factors affect the effective use of internet services at the UON?
- What problems do students experience when using the internet at the university's internet laboratory?

The coding provided a platform for identifying similar patterns from the answers to the questionnaire on which themes were developed. Groups were formed from the identified themes and the various responses were categorised into them (Taylor-Powell & Renner 2003). Each theme was assigned a numerical code (Byrne 2001) which was then entered onto the computer using the SPSS software. Each code represented a theme – a tag assigned to related views by a group of respondents on a given question. The data analysis was carried out after the data entry of all the questions was complete. Descriptive statistics formed the basis for presenting the data collected. Frequency and percentage distributions indicating the number of occurrences of each category were used to reveal the patterns and thus to facilitate interpretation. The descriptive statistics were generated using SPSS 17 for Windows.

3.7.2 Analysis of the data collected from the interviews

The researcher used Microsoft Word to transcribe the responses. A content analysis was then done, where the researcher read all the responses in order to identify themes (Hancock 2002). Hancock (2002) explains that "[t]he process of content analysis involves continually revisiting the data and reviewing the categorization of the data until the researcher is sure that the themes and categories used to summarize and describe the findings are a truthful and accurate reflection of the data".

After the content analysis, Microsoft Word made it easier to group similar themes together by simply copying and pasting related themes so that the researcher could then analyse the data.

3.8   ETHICAL CONSIDERATIONS

In most LIS research, ethical standards are focused on maintaining the confidentiality of participants. In an educational institution, the Board of Postgraduate Studies usually has to be

made aware of the research so that they can help to ensure that the anonymity, respect and consent of the participants are safeguarded. In the current study, permission to contact the participants was sought from, and subsequently granted by, the UON library management. In addition, the research was approved by the Postgraduate Committee and cleared by the Research Ethics Board of UNISA before it was undertaken. This is in line with the UNISA Policy on Research Ethics (2007) which specifies that researchers have to avoid undertaking secret or classified research, be competent and accountable, respect human participants, and be responsible when doing their research.

When conducting research that involves people, it is important to inform them about the purpose of the research and what it will entail so that they do not feel exploited. It is also important to assure them of confidentiality issues. Onwuegbuzie and Collins (2007:306) suggest that an ethical research design is one that "adheres to the ethical guidelines stipulated by organizations such as Institutional Research Boards in order for the integrity of the research to be maintained throughout and that all sample members are protected". According to Carlin (2003:4), an ethical research design focuses on ensuring individuals' anonymity, maintaining confidentiality, gaining access to settings for research purposes and informed consent, protecting individuals from harm caused by participating in and presenting the research, and examining the relation between the researcher and the researched.

In order to adhere to the UNISA Policy on Research Ethics (2007), it was important to notify the identified sample population, before they were requested to participate, about the aims, methods and anticipated benefits of the research; their right to abstain from participating in the research and their right to terminate their participation at any time during the research; the confidential nature of their responses and their right to privacy and autonomy.

According to Bradburn, Sudman and Wansink (2004:14), informed consent "implies that potential respondents should be given sufficient information about what they are actually being asked and how their responses will be used". This is done to get their consent without pressurising them; it has to be clear to the respondents that their decision to participate should be voluntary. Carlin (2003:15) mentions the importance of researchers adhering to the codes of

ethics set by their professional associations. A code of ethics is a "formal statement of the profession's values regarding ethical behaviours which focuses on principles and values that govern the behaviour of a person or group with respect to what is right or wrong'' (Shachaf 2005:514).

It was important to ensure the integrity of the research for this study so that the data obtained could be used for comparison and to extrapolate conclusions. This is reiterated by Carlin (2003), who suggests effectively using primary sources to avoid unwittingly reproducing errors of logic as these may be perpetuated by subsequent researchers who use the work someone has completed with errors. Shenton (2005) highlights the importance of avoiding plagiarism and respecting copyright in LIS research. The UNISA Policy on Research Ethics (2007:4) clearly states that "researchers may not commit plagiarism, piracy, falsification or the fabrication of results at any stage of the research".

3.9   PROBLEMS ENCOUNTERED

Any research undertaking has its own challenges and this study was no exception. A number of difficulties were encountered during the research process. The main problem was the travel constraints. The population of the study was located in different locations within and around Nairobi. Some colleges are as far as 20 km from the city centre. The researcher therefore had to carefully plan travel in terms of time and cost. Another challenge was the response rate to the survey. Ngulube (2005) notes that the response rate is a concern for most surveys. Some questionnaires were not filled in at all while only half of others were completed. Some participants got completely lost while filling in the questionnaire. The researcher, a full-time employee at a busy academic institution, could not get study leave because she was not a full-time student and thus had very limited time for fieldwork. During the data collection phase, the UON was closed unexpectedly for one week due to the election process. The students could not be reached so that the questionnaires could be collected and this slowed down the research process, which took longer than planned.

3.10   SUMMARY

This chapter contains an explanation of how the research was conducted. The study followed a case study quantitative design, using both questionnaires and interviews as data collection instruments. This design was considered appropriate for this study because of the nature of the study, which involved a single case (UON), and the data that had to be collected. The study focused on students in the UON's six colleges: the College of Humanities and Social Sciences (CHSS), the College of Health Sciences (CHS), the College of Education and External Studies (CEES), the College of Architecture and Engineering (CAE), the College of Biological and Physical Sciences (CBPS), and the College of Agriculture and Veterinary Sciences (CAVS).

The population of the study comprised all the students of the UON, which totalled 50 000 at the time of the study, and staff members of the UON Library. Sampling was necessary since the researcher could not study the whole population. Stratified sampling was used for the survey participants and purposive sampling for the participants in the interviews. The sample size for the survey was 381 participants, who were picked using the existing sample size determination table.

The data collection methods and instruments consisted of a questionnaire and face-to-face interviews. The questionnaire was administered to the survey participants, while the interviews were conducted with the library staff members. The data analysis was done using appropriate data analysis techniques for different types of data.

The quantitative data analysis was done using the SPSS software for data analysis, while the qualitative data analysis was done mainly using the Microsoft Word processing program. Ethical considerations were attended to and the researcher adhered to the rules and practices of ethical research. The research was done purely for academic purposes and the participants were fully aware of what it entailed, their participation was voluntary and they were free to withdraw at any time. Confidentiality and anonymity were guaranteed.

The researcher encountered several challenges during the research process. These included time constraints, financial constraints and the questionnaire response rate to the survey.

CHAPTER 4

ANALYSIS AND PRESENTATION OF THE DATA

4.1   INTRODUCTION

The purpose of this chapter is to present and analyse the data collected with the questionnaire the students completed and in the personal interviews with the library staff. The first part of the questionnaire concerned the bio-data of the respondents and the rest of the questionnaire dealt with areas that covered the major research questions. The questionnaire was constructed around the research objectives and questions.

The following research questions guided the study:

- What is the level of students' awareness of internet services at the UON?

- What skills do students have to access the internet?

- Which internet applications do students use?

- What kind of information do students seek on the internet?

- What factors affect the effective use of internet services at the UON?

- What problems do students experience when using the internet at the university's internet laboratory?

4.2   STUDENT RESPONSES

The researcher distributed a number of questionnaires to each college. The responses were as follows: the College of Education and External Studies had the highest response rate at 78, 9%; the College of Humanities and Social Studies followed with a 71, 5% response rate; the College of Biological and Physical Sciences came third with 64, 6%; the College of Health Sciences had a response rate of 64, 3%; the College of Agriculture and Veterinary Sciences had 60% and the

College of Architecture and Engineering had 44, 4%. Out of the targeted sample of 381 participants, 264 (69%) responded. The response rate of the study is summarised in table 4.1.

Table 4.1: Response rate per college

Colleges	Number of questionnaires administered	Number of responses received	Percentage
CEES	114	90	78,9
CHSS	130	93	71,5
CBPS	65	42	64,6
CHS	14	9	64,3
CAVS	30	18	60,0
CAE	27	12	44,4
Overall	**381**	**264**	**69,3**

4.3   BIO-DATA OF THE RESPONDENTS

4.3.1   Academic status and level of study of the respondents

The respondents were asked to indicate their status in terms of their level of study (for postgraduate students) and year of study (for the undergraduate students). Out of the 264 respondents, 68 (26%) were postgraduate students and 196 (74%) were undergraduate students. Among the 68 postgraduate students, 11 (16, 2%) were Doctor of Philosophy (PhD) students, 37 (54, 4%) were pursuing master's degrees and 20 (29, 4%) were postgraduate diploma students. In the undergraduate category, 10, 2% was first-year students, 28, 6% was in their second year of study, 31, 6% was in their third year of study and 29.6% was fourth-year students.

4.3.2 Gender of the respondents

The gender distribution of the respondents is shown in figure 4.2. Out of the 264 respondents, 184 (69, 7%) were male, 72 (27, 3%) were female and eight (3%) did not specify their gender.
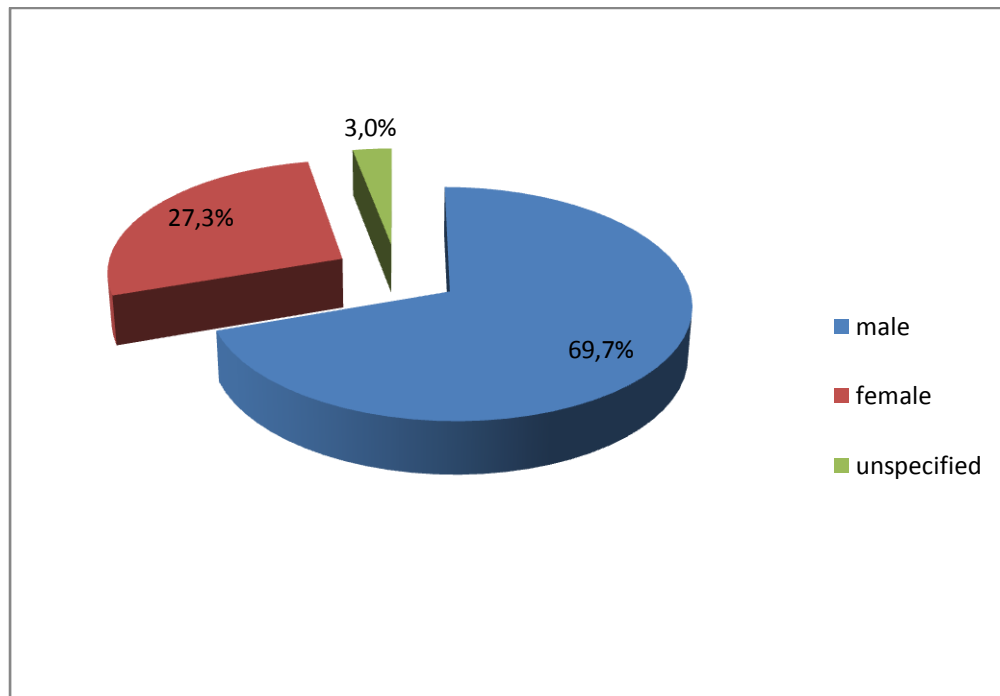
Figure 4.1: Gender distribution

4.3.3 Age of the respondents

The respondents were asked to indicate the age category to which they belonged. This was to help determine whether age was one of the factors affecting internet usage among university students. From the sample studied, 122 (46, 2%) of the respondents were 16 to 20 years old, 78 (29, 5%) were 21 to 25 years old, 48 (18, 1%) were 26 to 30 years old, 12 (4, 5%) were 31 to 35 years old, and four (1, 5%) were 36 years and older. These findings are summarised in table 4.2.

Table 4.2: Age distribution

Age group (years)	Frequency	Percentage
16–20	122	46,2
21–25	78	29,5
26–30	48	18,1
31–35	12	4,5
36 and older	4	1,5
Total	**264**	**100**

4.4   AWARENESS/KNOWLEDGE OF INTERNET SERVICES

The respondents were asked to indicate whether they were aware of the internet services. All 264 respondents answered in the affirmative. They were also asked to indicate the various ways in which they had become aware of the internet service. The respondents who indicated that they had learned about the services through fellow students were 55 (20, 8%), 105 (39, 8%) had become aware of it through the library orientation programme, 60 (22, 7%) through library staff and 44 (16, 7%) through the notice board. This is summarised in table 4.3.

Table 4.3: Various ways in which the respondents learned about the internet services

Method	Frequency	Percentage
Fellow students	55	20,8
Library orientation programme	105	39,8
Library staff	60	22,7
Notice board	44	16,7
Total	**264**	**100**

4.4.1 Competence/skill in using the computer and internet

This section concerned students' competence in using the computer and the internet. The respondents had to indicate their competence on a five-point scale ranging from "very good" to "very poor".

(a) Competence/skill in using the computer

From the sample studied, 129 (48, 9%) respondents indicated their computer skills were very good, 63 (23, 9%) indicated it was good, 41 (15, 5%) were not sure about their skills, 24 (9, 1%) indicated their skills were poor and seven (2, 7%) indicated their skills were very poor. The results are summarised in table 4.4.

Table 4.4: Respondents' rating of their competence/skill in using the computer

Computer skills rating	Frequency	Percentage
Very good	129	48,9
Good	63	23,9
Not sure	41	15,5
Poor	24	9,1
Very poor	7	2,7
Total	**264**	**100**

(b) Competence/skill in using the internet

The respondents were asked to indicate their perceived level of internet skills on a scale ranging from "very good" to "very poor". The purpose of this question was to gauge the students' levels of network literacy. From the sample studied, 121 (45, 8%) respondents indicated their skills were very good, 58 (22%) indicated it was good, 37 (14%) were not sure, 29 (11%) indicated it was poor and 19 (7, 2%) indicated it was very poor. The findings are summarised in table 4.5.

Table 4.5: Respondents' rating of their competence/skill in using the internet

Internet skills rating	Frequency	Percentage
Very good	121	45,8
Good	58	22,0
Not sure	37	14,0
Poor	29	11,0
Very poor	19	7,2
Total	**264**	**100**

4.4.2 Ways in which respondents learned how to use the computer and the internet

The respondents were also asked to indicate the ways in which they had learned how to use the internet. They were given various options from which to choose. The results indicated that 22 (8, 3%) had acquired their skills by attending the in-house course offered by the university, 62 (23, 5%) had received in-house training organised by the library, 112 (42, 4%) had taught themselves and 68 (25, 8%) had learned from colleagues. The results are given in table 4.6.

Table 4.6: Various methods of learning computer and internet skills

Method	Frequency	Percentage
In-house course offered by the university	22	8,3
In-house training by the library	62	23,5
Self-taught	112	42,4
Colleagues	68	25,8
Total	**264**	**100**

4.4.3 Competence in performing various internet and computer tasks

The respondents were asked to indicate their competence in handling various computer and internet tasks on a scale ranging from "poor" to "good". For basic computer skills, 42 (15, 9%)

respondents indicated their competence was poor, 70 (26, 5%) considered themselves average and 152 (57, 6%) indicated that their competence was good. As far as using search engines was concerned, 136 (51, 5%) respondents indicated their skills were poor, 55 (20, 8%) were average and 73 (27, 7%) had good skills. From the 264 respondents, 178 (67, 4%) had poor skills in using subject information gateways, 48 (18, 2%) were average and only 38 (14, 4%) had good skills. In terms of evaluating information on the internet, 134 (50, 8%) had poor skills, 78 (29, 5%) had average skills and 52 (19, 7%) had good skills. In terms of Web design, 134 (50, 8%) considered their skills poor, 52 (19, 7%) indicated their skills were average and 78 (29, 5%) had good skills. 18 (6, 8%) of the respondents indicated their competence in downloading and saving information was poor, 40 (15, 2%) thought they were average and 206 (78%) indicated their competence was good. As far as printing information was concerned, most of the respondents were good (182 or 69%), 50 (18, 9%) were average and only 32 (12, 1%) were poor. Most of the respondents reported poor search skills and strategies (180 or 68, 2%), 50 (18, 9%) indicated they had average skills while only 34 (12, 9%) thought they had good skills. Most of the respondents did not think they had adequate skills to use databases, with only 36 (13, 6%) indicating they had average skills 68 (25, 8%) and the majority (160 or 60, 6%) indicating they had poor skills. The findings are summarised in table 4.7.

Table 4.7: Competence in handling internet and other computer tasks

Skills	Poor	Average	Good
Basic computer skills	42 (15, 9%)	70 (26, 5%)	152 (57, 6%)
Using internet search engines	136 (51, 5%)	55 (20, 8%)	73 (27, 7%)
Using subject information gateways	178 (67, 4%)	48 (18, 2%)	38 (14, 4%)
Information evaluation	134 (50, 8%)	78 (29, 5%)	52 (19, 7%)
Web design	134 (50, 8%)	52 (19, 7%)	78 (29, 5%)
Downloading and saving information	18 (6, 8%)	40 (15, 2%)	206 (78, 0%)
Printing information	32 (12, 1%)	50 (18, 9%)	182 (69, 0%)
Search skills and strategies	180 (68, 2%)	50 (18, 9%)	34 (12, 9%)
Use of databases	160 (60, 6%)	68 (25, 8%)	36 (13, 6%)

4.4.4 Desired areas of training

The respondents were asked whether they felt that the UON had an obligation to train students on how to use the internet. All 264 respondents answered in the affirmative. They were asked to indicate the areas in which they desired to be trained. Search skills and strategies were indicated as the most desired area of training, with 180 respondents (68, 2%) choosing this area. This was followed closely by the use of subject information gateways, which 178 respondents (67, 4%) indicated. Using databases came third, with 160 respondents (60, 6%). This was followed by the use of search engines, with 136 respondents (51, 5%). 134 respondents (50, 8%) indicated they would like to be trained in evaluating internet information (50, 8%), while 124 (47%) required training on Web design. The findings are shown in figure 4.2.
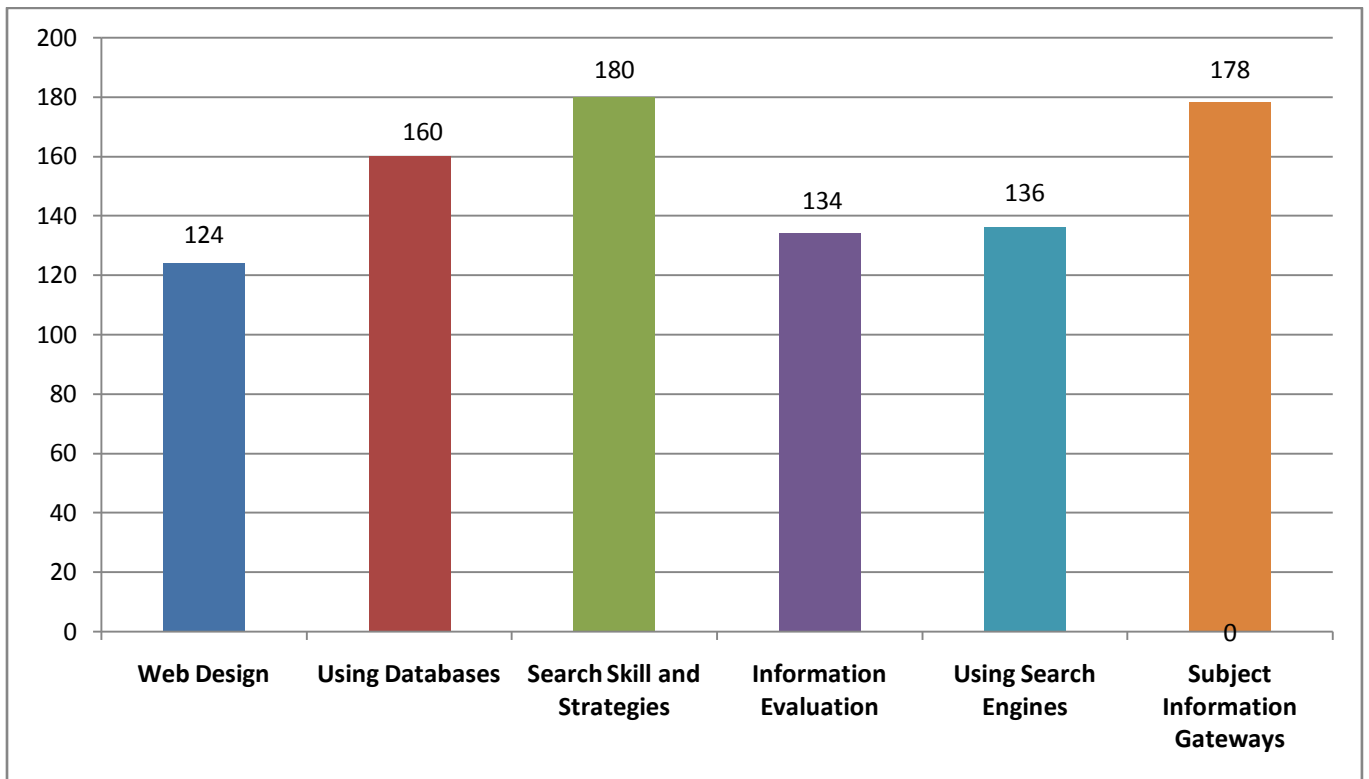
Figure 4.2: Desired areas of training

4.5   ACCESS TO AND UTILISATION OF INTERNET SERVICES

The researcher set out to determine the accessibility and utilisation of the internet services in terms of the venues used for internet access, technological devices used to access the internet, length of time spent using the internet, duration of internet access per day from different venues, required internet access time for academic searches, cost per month of internet access at a cyber café, purpose of using the internet, frequency of using the internet, use of search engines, search options, percentage of information needs satisfied through internet resources, preference for internet resources, impact of the internet on academic work and reliability of internet resources.

4.5.1   Access to the internet

The respondents accessed the internet from different venues. Those who accessed the internet from a personal office were 26 (9, 8%), 78 (29, 5%) accessed it from a departmental office, 122 (46, 2%) from the library, 258 (97, 7%) from a cyber café, eight (3%) from home and 10 (3, 8%) during laboratory workshops. The findings are summarised in table 4.8.

Table 4.8: Venues for internet access

Access point	Frequency	Percentage
Personal office	26	9,8
Departmental office	78	29,5
Library	122	46,2
Cyber café	258	97,7
Home	8	3,0
Laboratories/Workshops	10	3,8

NB: Multiple responses were possible.

4.5.2 Technological devices used to access the internet

The students were asked to identify which technological devices they used to access the internet. From the sample studied, 106 respondents (40, 2%) indicated they accessed the internet using desktop computers, 83 (30, 1%) used laptops, 65 (24, 6%) used mobile phones and 10 (3, 8%) used iPads. The various technological devices the students used to access the internet are listed in table 4.9.

Table 4.9: Technological devices used to access the internet

Device	Frequency	Percentage
Desktop computer	106	40,2
Laptop	83	31,4
Mobile/Cell phone	65	24,6
iPod	10	3,8
Total	**264**	**100**

4.5.3 Length of time spent using the internet

The researcher sought to determine how long the respondents had used the internet. Those who had used the internet for one to two years were 17 (6, 4%), 33 (12, 5%) had used it two to three years, 100 (37, 9%) had used it three to four years and 114 (43, 3%) had used it four to five years. This is summarised in table 4.10.

Table 4.10: Period of internet use

Time (in years)	Frequency	Percentage
1–2	17	6,4
2–3	33	12,5
3–4	100	37,9
4–5	114	43,2
Total	**264**	**100**

4.5.4 Duration of internet access per day from different venues

The respondents were asked how much time per day they had access to the internet from various venues. The findings are as summarised in table 4.11.

Table 4.11: Duration of internet access per day from different venues

Venue	1 hour	2 hours	3 hours	4 hours	5 hours
Home	15 (5, 7%)	2 (0, 76%)	2 (0, 76%)	1 (0, 38%)	-
Library	10 (3, 8%)	148 (56, 1%)	62 (23, 5%)	2 (0, 76%)	1 (0, 38%)
Cyber café	4 (1, 5%)	100 (37, 9%)	52 (19, 7%)	2 (0, 76%)	1 (0, 38%)
Office	172 (65, 2%)	8 (3, 0%)	12 (4, 5%)	9 (3, 4%)	2 (0, 76%)

4.5.5 Required internet access time for academic searches

The respondents were asked to indicate the time (in hours) they needed to access the internet to do academic searches adequately. Most of the respondents indicated they required three hours (113 or 42, 8%); 97 respondents (36, 7%) indicated they required four hours and the remaining 54 (20, 4%) indicated they required one, two or five hours. The results are summarised in table 4.12.

Table 4.12: Required internet access time for academic searches

Time (in hours)	Frequency	Percentage
1	3	1,1
2	16	6,1
3	113	42,8
4	97	36,7
5	35	13,3
Total	**264**	**100**

4.5.6   Cost of internet access from a cyber café

The respondents were asked to indicate the amount of money they spent on internet per month if they used a cyber café. Out of the 264 respondents, eight failed to give information about the cost of using the internet from a cyber café. More than 82% of the respondents spent 401 shillings and more on getting internet access at a cyber café, while only 17% used up to 400 shillings per month on getting internet access at a cyber café. The results are summarised in table 4.13.

Table 4.13: Cost of internet access from a cyber café (per month)

Cost (in Kenyan shilling)	Frequency	Percentage
Less than 100	9	3,4
101–200	15	5,7
201–300	10	3,8
301–400	8	3,0
401–500	51	19,3
More than 500	165	62,5
Total	**258**	**97,7**

4.5.7   Purpose of using the internet

The respondents were asked to indicate the purpose for which they used the internet. Six options were given: teaching, research, communication, recreation, learning and reading Web pages. Communication emerged as the most popular purpose, with 134 respondents (50, 8%) indicating this option. This was followed by research and teaching with 48, 5% and 38, 6% respectively. Recreation and learning were indicated by 16, 7% and 15, 9% of the respondents respectively; reading Web pages came last, with 11% of the respondents indicating this purpose. The summary of the findings is given in table 4.14.

Table 4.14: Purpose of using the internet

Purpose	Frequency	Percentage
Teaching	102	38,6
Research	128	48,5
Communication	134	50,8
Recreation	44	16,7
Learning	42	15,9
Reading Web pages	28	10,6

NB: Multiple responses were possible.

4.5.8   Frequency of using internet services

This question required respondents to indicate how often they used the internet services. A list of various internet services was provided on which the respondents had to indicate the frequency with which they used the services. The frequency ranged from daily use (5) to never (1). E-mail was the most used service, with 214 respondents (81%) indicating that they used it daily. Second was "own library OPACs", with 202 respondents (76,5%) indicating that they used it daily. The WWW was third in terms of daily used services (with 178 or 67, 4%), while e-journals and e-books came fourth with 152 (57, 6%) respondents. The least used services in the daily use category were online databases, with 45 (17%) respondents; 28 respondents (10, 6%) indicated discussion groups and eight (3%) indicated downloading software. A significant number of the respondents indicated that they used different services weekly, monthly or sometimes. However, the results showed that apart from e-mail, the WWW, own library OPACs and e-journals/e-books, other services were not used as frequently. The findings are summarised in table 4.15.

Table 4.15: Frequency of using internet tools and resources

Tools/Resources	Daily	Weekly	Monthly	Sometimes	Never
WWW	178 (67, 4%)	32 (12, 1%)	28 (10, 6%)	24 (9, 1%)	-
E-mail	214 (81, 1%)	23 (8, 7%)	18 (6, 8%)	9 (3, 4%)	-
Discussion groups	28 (10, 6%)	44 (16, 7%)	22 (8, 3%)	42 (15, 9%)	128 (48, 5%)
Own library OPACs	202 (76, 5%)	28 (10, 6%)	21 (8, 0%)	13 (4, 9%)	-
Other library OPACs	-	12 (4, 5%)	14 (5, 3%)	58 (22, 0%)	180 (68, 2%)
Online databases	45 (17, 0%)	55 (20, 8%)	48 (18, 2%)	52 (19, 7%)	64 (24, 2%)
E-journals/E-books	152 (57, 6%)	98 (37,1%)	7 (2, 7%)	4 (1, 5%)	-
Subject Information Gateways(SBIGs)	-	-	-	-	264 (100, 0%)
Downloading software	8 (3, 0%)	21 (8, 0%)	18 (6, 8%)	24 (9, 1%)	193 (73, 01%)

4.5.9   Use of search engines

The respondents were asked to indicate whether they were using search engines. All 264 respondents answered in the affirmative. They also had to indicate the frequency with which they used different search engines. Google was the most used search engine, with 215 (81, 4%) respondents indicating that they always used it. This was followed by Yahoo, with 195 (73, 5%) respondents indicating that they always used it. The frequencies of using the rest of the search engines were minimal. The findings are summarised in table 4.16.

Table 4.16: Frequency of using search engines

Frequency of use	Google	Yahoo	Alta Vista	Excite	Info Seek	Lycos
Always	215 (81, 4%)	195 (73,9)	10 (3, 8%)	6 (2, 3%)	3 (1, 1%)	7 (2, 7%)
Sometimes	42 (15, 9%)	41 (15, 5%)	3 (1,1)	2 (0, 8%)	4 (1, 5%)	2 (0, 8%)
Never	3 (1, 1%)	28 (10, 6%)	251 (95, 1%)	250 (94, 7%)	257 (97, 3%)	223 (84, 5%)
Missing	4 (1, 5%)	-	-	6 (2, 3%)	-	32 (12, 1%)
Total	**264 (100%)**	**264 (100%)**	**264 (100%)**	**264 (100%)**	**264 (100%)**	**264 (100%)**

4.5.10 Respondents' internet search options

The question required the respondents to indicate which search options they used for searches. The advanced search option usually indicates that the user is more familiar with doing internet searches, while the simple search option shows the contrary. The majority of the respondents (176 or 66, 7%) indicated that they used the simple search option, 42 respondents (15, 9%) used the advanced search option and 46 (17, 4%) used both the simple and the advanced search options. The results are shown in table 4.17.

Table 4.17: Respondents' internet search options

Search options	Frequency	Percentage
Simple search	176	66,7
Advanced search	42	15,9

Simple search and advanced search	46	17,4
Total	**264**	**100**

4.5. 11 Academic information needs satisfied through the internet

To gauge the use and the value of the internet, the respondents were asked to indicate the percentage of information needs that were satisfied through the internet. From the 264 respondents, 122 (46, 2%) had 11 to 50% of their needs satisfied through the internet, 94 (36, 5%) had over 50% and only 48 (18, 2%) had less than 10% of their needs satisfied. The results are shown in table 4.18.

Table 4.18: Percentages of academic information needs satisfied through the internet

Academic information needs	Frequency	Percentage
Less than 10%	48	18,2
11 to 50%	122	46,2
More than 50%	94	35,6
Total	**264**	**100**

4.5.12 Preference for internet resources over print resources

The respondents were asked to indicate their preference for internet resources over print resources on a scale of "strongly agree" to "strongly disagree". 147 respondents (55, 6%) strongly agreed, 73 (27, 7%) agreed, 18 (6, 8%) were neutral, 14 (5, 3%) disagreed and 12 (4, 5%) strongly disagreed. The results are summarised in table 4.19.

Table 4.19: Preference for internet resources over print resources

Rating	Frequency	Percentage
Strongly agree	147	55,7
Agree	73	27,7
Neutral	18	6,8

Disagree	14	5,0
Strongly disagree	12	4,5
Total	**264**	**100**

4.5.13 Impact of the internet on academic work

The researcher asked the respondents to indicate whether the internet had improved their academic work. All 264 respondents answered in the affirmative. They also had to indicate the areas in which the internet had improved their academic work. Access to quality and up-to-date information had the highest rate of responses, with 209 respondents (79, 1%) indicating this area. This was followed by information sharing, which attracted 184 (69, 7%) respondents. Handing in and receiving assignments came third, with 128 respondents (48, 5%); communicating with lecturers attracted 107 (40, 5%) respondents. This is shown in table 4.20.

Table 4.20: Areas in which the internet has helped respondents' to improve their academic work

Area	**Frequency**	**Percentage**
Communication with lecturers	107	40,5
Hand in/Receive assignments	128	48,5
Access to quality and up-to-date information	209	79,2
Information sharing	184	69,7

NB: Multiple responses were possible.

4.5.14 Reliability of internet resources

The researcher sought to determine how reliable the respondents found internet resources. The respondents had to rate internet resources on a scale ranging from "very reliable" to "very unreliable". From the sample studied, 96 (36, 4%) found internet resources very reliable, 92 (34, 8%) found it reliable, 26 (9, 8%) were not sure and 32 (12, 1%) indicated they are unreliable. The results are shown in table 4.21.

Table 4.21: Reliability of internet resources

Rating	Frequency	Percentage
Very reliable	96	36,4
Reliable	92	34,8
Not sure	26	9,8
Unreliable	32	12,1
Very unreliable	18	6,8
Total	**264**	**100**

4.6 USE OF LICENSED DATABASES AND ONLINE JOURNALS

The researcher sought to determine the degree to which the respondents used licensed databases and online journals.

4.6.1 Awareness of licensed databases and online journals

The respondents had to indicate whether they were aware of the online databases and journals that were available at the UON. All 264 respondents answered in the affirmative. They also had to indicate how they became aware of these services. Several options were provided and the respondents could indicate all that applied. Those who learned through the library staff were 98 (37, 1%), 28 (10, 6%) became aware of the services because of fliers, 198 (75%) learned through the library orientation programme, 102 (38, 6%) became aware through the library notice board and 94 (35, 6%) learned about it from colleagues. The findings are summarised in table 4.22.

Table 4.22: Awareness of licensed databases and online journals

Method of awareness	Frequency	Percentage
Library staff	98	37,1
Fliers	28	10,6

Library orientation programme	198	75,0
Library notice board	102	38,6
Colleagues	94	35,6

NB: Multiple responses were possible.

4.6.2 Use of databases and online journals

The researcher wanted to determine which databases the respondents used. The respondents could choose from various databases and their choice was not among the given options, they were free to add to it. Google Scholar emerged as the most popular database, with 213 respondents (80, 7%) choosing it. This was followed by EBSCO Host which attracted 186 (70, 4%) respondents. Emerald came third with 174 (65, 9%) respondents, while Project Muse came fourth with 164 (62, 1%) respondents. JSTOR was fifth with 156 (59, 1%) respondents and Sage came sixth by attracting 132 (53, 8%) respondents. Mary Ann Liebert attracted 132 respondents (52%) and was seventh in popularity. The rest of the databases were not very popular with the respondents, although they were also used. The results are shown in table 4.23.

Table 4.23: Popularity of databases and online journals

Database	Frequency	Percentage
EBSCO Host	186	70,5
Emerald	174	65,9
ERIC	78	29,5
HINARI	9	3,4
AGORA	15	5,7
Cengage Gale	102	38,6
JSTOR	156	59,1
Google Scholar	213	80,7
Blackwell	68	25,8
Oxford	56	21,2
Mary Ann Liebert	132	50,0
Sage	142	53,8

| Taylor and Francis | 118 | 44,7 |
| Project Muse | 164 | 62,1 |

4.6.3 Venues for accessing online journals

The respondents were asked to indicate the venues from which they accessed online journals. They were given five venues and they could indicate as many as applied to them. Out of the 264 participants, 38 (14, 4%) accessed e-journals from their personal offices, 188 (71, 2%) accessed it from the library, 82 (31, 0%) accessed it from departmental offices and none of the respondents accessed it from cyber cafés. The findings are summarised in table 4.24.

Table 4.24: Venues for accessing online journals

Venue	Frequency	Percentage
Personal office	38	14,4
Library	188	71,2
Departmental office	82	31,1
Home	8	3,0
Cyber café	-	-

4.6.4 Duration **of** using **online journals**

The researcher sought to find out how long the respondents had used the online journals. There were five time ranges to choose from. 22 respondents (8, 3%) had used the service for one to two years, 89 (33, 7%) had used it for two to three years, 85 (32, 2%) for three to four years and 56 (21, 2%) for four to five years. Those who had used the service for more than five years were 12 (4, 5%). The results are shown in table 4.25.

Table 4.25: Duration of using online journals

Time (in years)	Frequency	Percentage
1–2	22	8,3
2–3	89	33,7
3–4	85	32,2
4–5	56	21,2
More than 5	12	4,5
Total	**264**	**100**

4.6.5 Frequency of using online journals

The respondents had to indicate how frequently they used the online journals on a scale ranging from "never" to "very frequently". Out of the 264 respondents, 34 (12, 9%) used the journals occasionally, 112 (42, 4%) used it frequently and 118 (44, 7%) used it very frequently. The results are summarised in table 4.26.

Table 4.26: Frequency of using online journals

Rating	Frequency	Percentage
Never	-	-
Occasionally	34	12,9
Frequently	112	42,4
Very frequently	118	44,7
Total	**264**	**100**

4.6.6   Hours of access to online journals

The researcher sought to find out how much time the respondents had access to online journals in one day. The respondents were therefore asked to indicate the time (in hours) when they had access to online journals. From the sample studied, 18 respondents (6, 8%) accessed journals for one hour, 152 (57, 6%) for two hours, 28 (10, 6%) for three hours, 62 (23, 5%) for four hours and four (1, 5%) for more than five hours. The results are summarised in table 4.27.

Table 4.27: Hours of access to online journals per day

Hours	Frequency	Percentage
1	18	6,8
2	152	57,6
3	28	10,6
4	62	23,5
5	4	1,5
More than 5	-	-
Total	**264**	**100**

4.6.7   Satisfaction rate of using the online journals service

The respondents were asked to rate how satisfied they were with various aspects of the online journals service on a scale of very dissatisfied or dissatisfied (collapsed into dissatisfied), neutral, or very satisfied or satisfied (collapsed into satisfied). The responses indicate that the respondents were most dissatisfied with the availability of computers. This aspect was indicated by 147 (55, 7%) respondents. The physical location of the service was the second aspect the respondents were most dissatisfied with (110 or 41, 7%). The hours of access was third in the line of dissatisfaction and attracted 109 (41, 3%) respondents. However, 176 respondents (66, 7%) were satisfied with the communication by the staff members in charge of the service. The findings are summarised in table 4.28.

Table 4.28: Satisfaction with the online journals service

Aspect of service	Dissatisfied	Neutral	Satisfied
Retrieving and downloading relevant articles	102 (38, 6%)	78 (29, 5%)	84 (31, 8%)
Ordering articles	98 (37, 1%)	86 (32, 6%)	66 (25, 0%)
Training on use	108 (40, 9%)	88 (33, 3%)	68 (25, 8%)
Availability of computers	147 (55, 7%)	68 (25, 8%)	67 (25, 4%)
Physical location of service	110 (41, 7%)	66 (25, 0%)	88 (33, 3%)
Hours access	109 (41, 3%)	89 (33, 7%)	66 (25, 0%)
Communication by staff in charge	58 (22, 0%)	90 (34, 1%)	176 (66, 7%)

NB: Multiple responses were possible.

4.7   USE OF COMPUTER-MEDIATED COMMUNICATION

The researcher sought to investigate the use of CMC among the university students. The respondents were made aware of what CMC meant in the context of this research, namely e-mail, IM, online faxes and chat rooms.

4.7.1   Frequency of using computer-mediated communication for different purposes

The respondents were asked to indicate whether they used CMC. All 264 respondents answered in the affirmative. They were also asked to indicate how often they used CMC for different purposes. The respondents used CMC most frequently to receive and submit continuous assessment tests (198 or 75%). They also used CMC frequently to maintain social and personal contacts (178 or 67, 4%). Exchange of research results followed, with 112 respondents (42, 4%) indicating this purpose. The respondents used CMC occasionally to exchange research results, communicate with lecturers and for official communication. Discussion groups were not popular with the respondents and 150 (56, 8%) never used CMC for this purpose. The results are summarised in table 4.29.

Table 4.29: Frequency of using CMC for different purposes

Purpose	Never	Occasionally	Frequently
Maintain social and personal contacts	18 (6, 8%)	68 (25, 8%)	178 (67, 4%)
Exchange research results	16 (6, 1%)	136 (51, 5%)	112 (42, 4%)
Communication with lecturers	88 (33, 3%)	108 (40, 9%)	68 (25, 8%)
Official communication	68 (25, 8%)	108 (40, 9%)	88 (33, 3%)
Discussion groups	150 (56, 8%)	82 (31, 1%)	32 (12, 1%)
Receive and submit continuous assessment tests	18 (6, 8%)	48 (18, 2%)	198 (75, 0%)

NB: Multiple responses were possible.

4.7.2   Time spent on computer-mediated communication per day

The respondents were asked to indicate the amount of time they spent using CMC per day. From the sample studied, 131 (49, 6%) respondents spent one hour on it, 93 (35, 2%) spent two hours on it and 40 (15%) spent three hours on it. This is summarised in table 4.30.

Table 4.30: Time respondents spent on CMC per day

Time (in hours)	Frequency	Percentage
1	131	49,6
2	93	35,2
3	40	15,1
Total	**264**	**100**

4.7.3   Comparison of computer-mediated communication with other communication methods

The researcher sought to find out the effectiveness of CMC as a means of communication compared to other more traditional means of communication. Compared to postal letters, 214 respondents (81%) indicated that CMC was more effective, 22 (8, 3%) said that it was equally

effective and 28 (10, 6%) felt CMC was less effective. 116 respondents (43, 9%) indicated that CMC was a more effective means of communication than the telephone and 52 (19, 7%) indicated it was equally effective; the remaining 96 respondents (36, 4%) said that CMC was less effective than telephone. Compared to physical travel, 188 respondents (71, 2%) indicated that CMC was more effective and 24 (9, 1%) felt it was equally effective; 52 respondents (19, 7%) indicated that CMC was less effective than physical travel. In comparison to faxes, 144 respondents (54%) felt that CMC was more effective, 58 (22%) indicated they thought it was equally effective and 62 (23%) said it was less effective. This is shown in table 4.31.

Table 4.31: Comparison of CMC with other communication methods

Method	Less effective	Equally effective	More effective
Postal letters	28 (10, 6%)	22 (8, 3%)	214 (81, 0%)
Telephone	96 (36, 4%)	52 (19, 7%)	116 (43, 9%)
Physical travel	52 (19, 7%)	24 (9, 1%)	188 (71, 2%)
Faxes	62 (23, 0%)	58 (22, 0%)	144 (54, 0%)

4.8   USE OF SOCIAL NETWORKING SITES

This section of the questionnaire was aimed at obtaining information about the use of SNS among the university students by determining the number of holders of SNS accounts on Facebook, MySpace, Twitter, Flicker, Friendster, LinkedIn and Hi5. The students were free to indicate any other option that was not provided. They were also asked to rank the SNS in order of preference and to indicate their frequency of use, the purpose for which they used it and their perceptions of it.

4.8.1   Social networking site account holders

The respondents were required to indicate which SNS they had accounts with. Facebook attracted 232 (87, 9%) respondents, Twitter 103 (39%), LinkedIn 73 (27, 7%), Flicker 18 (6, 8%), MySpace 11 (4, 2%), Friendster five (1, 9%) and Hi5 four (1, 5%). About 182 respondents

had more than one account. The option "other" did not attract any response. The findings are summarised in table 4.32.

Table 4.32: SNS account holders

Site	Frequency	Percentage
Facebook	232	87,9
Friendster	5	1,9
MySpace	11	4,2
LinkedIn	73	27,7
Twitter	103	39,0
Hi5	4	1,5
Flicker	18	6,8
Other	-	-

NB: Multiple responses were possible.

4.8.2 Ranking of social networking sites

The respondents were asked to rank the SNS in order of preference. Facebook emerged as the most popular (232 or 87, 9%), followed by Twitter (103 or 39%). LinkedIn came third, with 73 respondents (27, 7%); Flicker and MySpace were fourth and fifth with 6, 8% and 4, 2 % respectively. The results are summarised in table 4.33.

Table 4.33: Ranking of SNS

Social networking site	Ranking	Frequency	Percentage
Facebook	1	232	87,9
Twitter	2	103	39,0
LinkedIn	3	73	27,7
Flicker	4	18	6,8
MySpace	5	11	4,2
Other	-	-	-

4.8.3 Frequency of using social networking sites

The researcher sought to determine how frequently the respondents used SNS. The findings indicated that 148 (56%) respondents visited SNS four times per day, 84 (31, 8%) respondents visited it three times per day, 22 (8, 3%) visited it twice per day, seven (2, 7%) visited it once per day and three (1, 1%) used SNS once a week. The findings are shown in table 4.34.

Table 4.34: Frequency of using SNS

Frequency	Responses	Percentage
Once a week	3	1,1
Once a day	7	2,7
Two times per day	22	8,3
Three times per day	84	31,8
Four times per day	148	56,1
Total	**264**	**100**

4.8.4 Purpose of using social networking sites

The respondents were asked to indicate the purpose for which they used the SNS. Various options were provided. Writing comments on one's own profile attracted 108 (40.9%) respondents and writing comments on friends' profiles had 62 (23,5) respondents; 73 respondents (27,7%) indicated they used SNS to share photographs and 131 (49,6%) used it to send messages to friends; 82 (31,1%) respondents used SNS to search for new friends; 42 (15,9%) looked at other peoples' profiles; 26 (9,8%) used it for events/parties and inviting friends, while 112 (42,4%) used it to create and join groups. The findings are summarised in table 4.35.

Table 4.35: Purpose of using SNS

Purpose	Frequency	Percentage
Writing comments on your own profile	108	40,9
Writing comments on your friends' profiles	62	23,5
Sharing photos	73	27,7
Sending messages to friends	131	49,6
Searching for new friends	82	31,1
Looking at profiles of other people	42	15,9
Having events/parties and inviting people	26	9,8
Creating and joining groups	112	42,4

NB: Multiple responses were possible.

4.8.5   Respondents' perceptions of their use of social networking sites

The researcher also looked at how the respondents perceived their SNS usage in relation to their studies. The respondents were asked to indicate whether they strongly disagreed with, disagreed with, were neutral on, agreed with or strongly agreed with the statements provided. The majority of the students agreed or strongly agreed that they lost track of time when they used SNS. More than half of the respondents (175, which accounted for 70%) agreed or strongly agreed that using SNS distracted them from their studies and that the time they spent on SNS ate away at their study time. The majority of the students (212 or 80, 3%) believed that using SNS did not affect their academic performance. The results are summarised in table 4.36.

Table 4.36: Respondents' perceptions of their use of SNS

Survey question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Sometimes I visit SNS when I am in class.	58 (22,0%)	63 (23,9%)	18 (6, 8%)	77 (29,0%)	49 (18,6%)
My grades are suffering because of my use of SNS.	98 (37,1%)	114 (43,2%)	44 (16,7%)	8 (3, 0%)	-
My use of SNS distracts me from studying.	8 (3, 0%)	24 (9, 1%)	47 (17,8%)	116 (43,9%)	69 (26,1%)
I think I am addicted to SNS.	37 (14,0%)	71 (26,9%)	66 (25,0%)	55 (20,8%)	37 (14,0%)
The time I spend on SNS means I have less study time.	5 (1, 9%)	37 (14,0%)	45 (17,0%)	108 (40,9%)	66 (25,0%)
I have missed class because of being on SNS.	230 (87,1%)	32 (12,0 %)	-	2 (0, 76%)	-
I am able to control my use of SNS so that it does not interfere with my studies.	5 (1, 9%)	18 (6, 8%)	77 (29,2%)	111 (42,0%)	53 (20,1%)
I use SNS to communicate with my class mates about course-related issues.	2 (0, 76%)	2 (0, 76%)	11 (4, 2%)	79 (29,9%)	172 (65,2%)

4.9   PROBLEMS RESPONDENTS EXPERIENCED WHEN USING THE INTERNET AT THE UNIVERSITY OF NAIROBI

The respondents were required to indicate the issues they considered to be impediments to effectively using the internet at the UON. Inadequate points of use was identified as the greatest problem, with 88,6% of the respondents indicating this as a problem; lack of adequate skills and difficulties in finding relevant information were second and third, with 82,6% and 80,7% of the respondents indicating them as problems. Information overload and the location of the internet

laboratory were cited by more than half of the respondents (69, 7% and 55, 3% of the respondents respectively) as problem areas. The limited hours of operation of the internet laboratory was indicated as a problem by 78, 0% of the respondents, while 196 respondents (74, 2%) thought temptation of addiction was a problem. The rest of the problems listed were each indicated by less than half of the respondents. The results are shown in table 4.37.

Table 4.37: Problems experienced while using the internet at the UON

Problem	Frequency	Percentage
Slow connection	122	46,2
Lack of adequate skills	218	82,6
Insufficient awareness	56	21,2
Difficulties in finding relevant information	213	80,7
Information overload	184	69,7
Lack of motivation from lecturers	92	34,8
Limited access to the internet laboratory	102	38,6
Inadequate points of use	234	88,6
Physical location of the internet laboratory	146	55,3
Limited hours of operation of the internet laboratory	206	78,0
Temptation of addiction	196	74,2

NB: Multiple responses were possible.

4.10 FINDINGS FROM THE PERSONAL INTERVIEWS

Personal interviews were conducted with the UON Library's six staff members. In this the data obtained from the interviews held with the e-resources librarian, the systems librarian, the two library assistants in the internet laboratory, the library ICT staff and the internet laboratory attendant are presented. The purpose of the interviews was to gather more information about internet usage at the university that could not be collected from the students. The library staff were asked 13 questions, which generated the following responses.

(1)   The participants were asked to indicate whether the students were aware of the internet services offered by the library. The entire sample answered in the affirmative that the students were aware of the internet services offered by the UON Library.

(2)   The participants were asked how they conducted the awareness programmes.

- Participants A, B and C said that awareness was created through library open days, library orientation programmes and the library staff.

- Participants D, E and F indicated that posters, library services user guides and fliers were

   Placed at strategic places where users could easily get them. They also said an electronic banner had been placed at the main entrance of the library to highlight the services offered by the library.

(3)   The interviewees were asked whether the students were competent enough to use the internet services.

- Participants A, E and F indicated that most of the students had hands-on experience in using basic computer packages but had poor network literacy skills.

- Participants B, C and D said the students were not competent enough to use the services.

(4)   The participants were asked if the students had adequate skills to fully exploit internet resources.

- Participant A responded that most students did not have the required internet skills.

- Participants B and C indicated that the students had limited skills in using the internet.

- Participant D said that most students just browsed the Web blindly and by luck got what

they were looking for.

- Participants E and F indicated that most students lacked the necessary network skills to fully exploit internet resources, especially with regard to search skills and strategies, using search engines and other technical aspects of internet usage.

(5) The interviewees were asked whether there was any network literacy training programmes for the users.

- Participants A, D and F responded that there was training for users in terms of user education.

- Participant C said that the training offered did not cover internet usage in detail.

- Participant B and E indicated that there was no network literacy programme for users and the training offered was far from what may be referred to as network literacy training.

(6) The participants were asked to indicate which internet services were offered at the UON Library.

All six participants indicated the following services:

- e-mail

- e-journals

- e-books

- e-learning portals

- social media

- e-newspapers

111

- WWW

- online databases

- OPACs

(7)   The participants were asked to indicate the internet services the users used most.

- Participants A, B and E indicated that e- mail and the WWW were used most.

- Participants C and F indicated that e-journals, OPAC and online databases were used most.

- Participant D indicated that SNS were used most.

(8)   The participants were asked what kind of information users searched for on the internet.

- Participants A and D said users looked for research material.

- Participants C and B said they looked for communication tools.

- Participants E and F said users looked for academic resources.

(9)   The participants were asked to indicate the purposes for which users used the internet services.

- Participants A, C, E and F said that the users used the internet for research, teaching and

    academic purposes.

- Participants B and D said the internet was used for communication and to maintain social

    and personal contacts.

(10)   The participants were asked what factors affected the effective use of internet services at the UON Library.

- Participants A, D and F said that the users did not have the necessary skills and the facilities were inadequate.

- Participants B, C and E said that the internet connection was slow, there was no inclusive internet use policy and there was inadequate time for internet access.

(11)   The participants were asked to indicate whether they thought the internet services were used optimally. The sample agreed unanimously that internet resources were not optimally utilized.

(12)   The interviewees were asked what problems they encountered when offering internet services at the UON Library.

- Participants A, B and C said there was a shortage of staff, inadequate facilities and low bandwidth which resulted in a slow connection.

- Participants D, E and F said the cost of e-resources was high; the demand was higher than the supply because there were too students for the limited facilities. They also said that the policy on internet usage was ambiguous and did not provide clear guidelines.

(13)   The participants were asked for recommendations on providing effective internet services at the UON Library.

- Participants A and B said more facilities (more computers connected to the internet and printing services) were needed.

- Participant C said that the time of internet access had to be reviewed.

- Participants D and E said there was a need for comprehensive network literacy training for internet users and more funding was needed to improve the bandwidth.

- Participant D said the internet services had to be provided at college level and all the colleges of the UON had to have internet laboratories. The internet services had to be promoted and marketed vigorously since library services were products just like any other products on the market.

4.11   SUMMARY

In this chapter the data collected from the student survey and interviews with the library staff were presented and analysed.

A descriptive analysis was done and the data were presented in frequency and percentage tables. The bio-data of the respondents to the survey, their awareness of the internet services, and their competence in using the computer and internet were shown. An analysis of their access to and utilisation of internet services and resources, use of licensed databases and online journals, and use of CMC and SNS was also done. The researcher also looked at the problems students experienced when using the internet.

The chapter concluded with the presentation of the data collected during the face-to-face interviews conducted with the library staff.

The major findings of the research are as follows:

- The students were aware of the internet services offered at the UON.
- Although the students had good computer and internet skills, these were only basic; advanced network skills were needed.
- the WWW and e-mail were the internet tools students used most.
- The students used the internet to do research, for academic purposes, for communication and for social interaction.
- The major problems made effective and efficient use of the internet services at the UON difficult were limited internet access and lack of adequate computer and internet skills.

114

CHAPTER 5

DISCUSSION OF RESEARCH FINDINGS

5.1   INTRODUCTION

In this chapter the findings from chapter 4, which were based on the responses from the students and the library staff, are discussed. The first section concerns the personal details of the respondents and the second section is a discussion on the research questions.

5.2   PERSONAL DETAILS OF THE RESPONDENTS

The questionnaires were distributed to the survey population which was composed of students of the UON. They provided information about their college affiliation, level of study, gender and age. All the colleges of the UON were represented and a total of 381 respondents were contacted to participate in the study. From this sample, 264 (69%) responded. This response rate can be attributed to the cooperation of the respondents.

Regarding the academic status and level of study of students, all the categories were represented (both undergraduate and postgraduate students). From the 264 respondents, 68 (26%) were postgraduate students and 196 (74%) were undergraduate students. It is common knowledge that in most institutions of higher learning, students who are pursing higher degrees are always less in number than the undergraduate students and this explains the bigger percentage of undergraduate students who participated in the study. In the postgraduate category, 11 respondents (16, 2%) were pursuing doctoral degrees, 37 (54, 4%) were following a master's programme and 20 (29, 6%) were postgraduate diploma students. Once again, it is common in institutions that the number of students who are pursuing doctoral degrees is not very big compared to students who are pursuing other programmes. In the undergraduate category, 10, 2% of the students were in their first year of study, 28, 6% was in their second year of study, 31, 6% was in their third year of study and 29, 6% was in their fourth year of study. The small percentage of first-year students who used the internet (10%) can be explained by the fact that they were still trying to settle down

and because they were not very familiar with the internet services, they did not yet gain confidence. The rest of the students (second-year, third-year and fourth-year students) were settled and familiar with the university routine; they therefore knew what was where and how to use it. The findings were summarised in tables 4.2 and 4.3 in chapter 4 of this dissertation.

In terms of the gender composition of the 264 respondents, 184 (70%) were male, 72 (27%) were female and eight (3%) did not specify their gender. This indicates that there were more male internet users than female users in the sample studied.

Recchiutti (2003) remarks that age is an important demographic variable in studies on the internet use. From the data gathered, it was clear that the ages of the respondents ranged from 16 to 36+ years. The age group distribution of the respondents was shown in table 4.4 of chapter 4. According to the data, the majority of the respondents (75, 7%) were in the age group 16 to 25 years. The rest of the respondents were aged 26 to 36+ years (24, 3%).

5.3   MAJOR RESEARCH QUESTIONS

The part of the questionnaire which was aimed at obtaining information to fulfil the research objectives was considered the most crucial part of the questionnaire. The research questions, as derived from the research objectives, were:

- What is the level of students' awareness of the internet services offered by the UON?
- What internet skills do students have?
- Which internet applications do students use?
- What kind of information do students look for on the internet?
- What factors affect students' effective use of the internet services offered at the UON?
- What problems do students experience when they use the university's internet laboratory?

5.3.1 Awareness/knowledge of internet service

The researcher found that all 264 respondents were aware of the internet services offered at the UON. This was in agreement with the data from the interviews held with the library staff who indicated that the users were aware of the internet services.

The respondents indicated various ways in which they had learned about the internet services. Most of them learned about the services through library orientation programme and library staff. Therefore, the library can be considered as fulfilling its role of creating awareness. The small number of students who learned about the services by other means can only be explained by the possibility that they joined the university late and were not able to attend the orientation programme conducted for first-year students on their entry to the university. The high rate of awareness of the internet services among students is in agreement with other studies that were carried out by researchers such as Kuar and Verma (2008) and Moghaddam and Talawar (2008). However, Hinson and Amidu (2005) and Sinha (2008) found a low level of internet awareness among students in Ghana and India respectively. Asemi and Riyahiniya (2007) contend that when a user is aware of the resource or service, this will lead to more use of the service or resource.

The library staff who were interviewed agreed that the library raised awareness of and promoted the internet services in the form of library open days, orientation programmes, digital banners and posters.

5.3.2 Computer and internet skills

The results in tables 4.4 and 4.5 of chapter 4 indicate that most of the respondents (72, 8%) had good or very good computer skills. The same trend occurs for internet skills, with 67, 8% of the respondents having either good or very good internet skills. It is clear that those who had good computer skills also had good internet skills. According to Okello-Obura and Magara (2008), in order for users to use internet services optimally, network literacy is very important. The data from the interviews revealed that the students lacked most of the network skills that are necessary for them to fully exploit the internet resources. Unlike the studies conducted by Ngulube et al (2009) and Hinson and Amidu (2005) which found a low level of network literacy among the respondents, this study showed that there was an improved level of network literacy among the UON students. This study is therefore in agreement with Muniandy's study (2010) which found a fair level of internet skills among the respondents.

However, according to the findings of this study that are summarised in table 4.6 in chapter 4, most of the respondents were either self-taught or learned these skills from colleagues. This trend is supported by studies carried out by Al-Ansari (2006) and Ngulube et al (2009) which also found the participants were self-taught. The respondents in the current study who were either self-taught or taught by colleagues amounted to 68, 2%. The rest of the respondents (31, 8%) were trained in-house in courses organised by the university or by the library. It is evident that self-training or other colleagues' assistance was the mainstay for learning how to use the internet and formal training played a minor role. It could be that formal training programmes were not properly marketed or their scheduled times may not have been convenient for the students. Self-taught methods had their limitations since the students were not exposed to various aspects of network literacy and only learned basic skills that helped them to surf the internet in a limited manner.

5.3.3   Competence in performing various internet and computer tasks

Concerning the respondents' competence in handling various tasks on the internet and computer, most respondents had good in basic computer skills and were good at downloading, saving and printing information. As these are tasks that do not require a lot of technical training and can be self-taught, this could be the reason why most of the respondents were good at handling them. This resonates what the interview participants said about the competence of the users. Earlier studies by Kamonde (2003) and Njiraine (2000) found the same trend. However, in areas such as search skills and strategies, using information gateways, using search engines, evaluating information and Web design, most respondents indicated that they were not confident in using them. This shows that perhaps the training offered had been too basic or the time allocated for training had been too short to cover these areas in detail to enable the respondents to acquire competent skills. Table 4.7 (chapter 4) shows the respondents' competence in handling the various tasks.

5.3.4   Desired areas of training

As far as training was concerned, all the respondents felt that the university had an obligation to provide training on how to use the internet. The desired areas of training which the respondents indicated proved to be the areas in which they lacked competence. Figure 4.7 shows that search skills and strategies was the area in which most of the respondents (180 or 68%) needed training. This was followed by the use of subject information gateways, with 178 (67%); the use of databases came third with 160 (61%); the use of search engines followed with 136 (52%); the evaluation of information on the internet had 134 (51%); and 124 respondents (47%) indicated they needed training on Web design. These findings are in agreement with the findings of Kamonde (2003) and Al-Ansari (2006) where the respondents indicated almost similar deficiencies. This is a clear indication that the network training programmes did not adequately meet the needs of the internet users. These findings explain why the respondents tended to use only the less-structured search engines search such as Google and Yahoo, since they are easy to use and require less or no training. The respondents used subject information gateways less

because most of them did not have the skills to use it. The respondents needed these skills to use the internet services to the maximum.

5.4 ACCESS TO AND UTILISATION OF INTERNET SERVICES

This part of the study was very important because internet use is determined by internet access.

5.4.1 Venues for internet access

The results in chapter 4 show that all the respondents had some level of access to the internet. Some of them accessed the internet from personal offices (26 or 9, 8%), others from departmental offices (78 or 29, 5%), 122 (46, 2%) from the library, 258 (97, 7%) from cyber cafés, eight (3%) from home and 10 (3, 8%) during laboratory workshops. From the results, it is clear that only 122 respondents (46, 2%) accessed the internet from the library, while 258 (97, 7%) accessed it from a cyber café. This indicates that there were students who accessed the internet from both the library and a cyber café. This could be due to the access time in the library which was limited to two hours per session. It is evident from the results that after the two hours, some students moved to a cyber café where the only limitation they had was the cost (and not time). This could also be caused by the limited points of access and equipment (as revealed during the interviews with the library staff). It is clear from the data of the interviews with the library staff that the computers were few and the space was too small to accommodate the number of students which the internet laboratory was supposed to serve. This could therefore be a reason why most of the respondents turned to using cyber cafés. The fact that only a few respondents accessed the internet at home speaks volumes about the economic status of most of them. Therefore, library and cyber cafés were the only two places of choice for internet access for most of the respondents. The respondents who had access to the internet in a personal office can be explained by the fact that the respondents were students as well as employees or workers and they could therefore access the internet from their personal or department offices. These findings are consistent with those of Luambano and Nawe (2004), Okello-Obura and Magara (2008) and Kamonde (2003). This shows that the problems that negatively affected internet usage in developing countries in the early years of the 21st century still persist.

5.4.2 Technological devices used to access the internet

Most of the respondents used desktop computers and laptops (as shown in table 4.9). This was largely due to the fact that the internet laboratory only had desktop computers. The respondents who reported that they were using laptops (31, 4%) used them to access the internet through the few data points provided in the library and through remote access if their laptops had been configured to the setting of the UON proxy. The respondents who accessed the internet from their mobile phones amounted to 24,6%. This low percentage could be explained by the cost factor since the students had to buy data bundles to access the internet from their mobile phones. Only 3, 8% of the respondents used iPads. Once again, this figure speaks volumes about the economic status of most of the respondents, who could not afford iPads. A summary of the technological devices the respondents used to access the internet appear in table 4.11 in chapter 4.

5.4.3 Length of time using the internet

The researcher sought to determine how long the respondents had been using the internet. Most of the respondents (80, 1%) had used the internet for a period of three to five years; the rest (19, 9%) had used the internet for a period of one to three years. Kamonde (2003) found that most of the respondents in his study had used the internet for only two years since the internet was still a myth for most people at the time. However, the results of the current study show the contrary in that using the internet has become routine for most students and they have known the internet for quite some time. The internet is no longer a mystery as it was in the early 1990s and the information age has revolutionised the use of the internet. Table 4.10 contains the results which indicate that the majority of the respondents had used the internet for a long time and the internet was no longer new to them.

5.4.4 Daily internet access from different venues

As far as daily access to the internet from different venues was concerned, the results show that most respondents (148 or 56, 1%) had two hours' access from the library. This may be explained

by the fact that respondents had limited access from the library (two hours per person per session) and most of them used the entire two hours. The respondents who had two hours' daily access from a cyber café amounted to 37, 5%. This may be explained by the fact that most respondents turned to accessing the internet from a cyber café due to the limited points of access in the library. It may also be argued that the respondents could afford the cost of two hours' access at a cyber café. The fact that 172 (65, 2%) respondents had one hour's access from an office may be attributed to the respondents being workers who could use the internet there during their free time. It is evident from the results that the respondents tried to diversify their access by using different venues since one venue could not meet their internet demands. Those who indicated they had more than two hours' access to the internet from the library probably visited the laboratory more than once a day to access the internet for more than the two designated hours per session.

5.4.5   Required internet access time for academic searches

Searching for information on the internet is tedious and sometimes leads to frustration due to information overload or a slow connection. In view of this, the researcher sought to find out how much internet access time the respondents required to adequately perform academic searches. The results in table 4.14 reveal that most of the respondents needed at least three hours of internet access to do a meaningful academic search: 42,8% of the respondents indicated they needed three hours, while 13,3% indicated they needed five hours. This shows that the two hours' limit offered by the library for internet access per session is far from enough for an academic search. Only 6, 1% of the respondents indicated that they needed two hours, while 1% indicated that one hour was enough. This need for more hours to do an academic search may be attributed to the fact that most of the respondents did not have search strategies that could help them to quick their searches. Many of them also did not know how to use subject information gateways, which means they were not able to narrow down their searches subject-wise and therefore suffered from information overload.

5.4.6   Cost of internet access from a cyber café per month

Since the facilities at the UON internet laboratory were inadequate, the respondents sometimes used commercial cyber cafés for internet access. The researcher sought to investigate how much money the respondents spent on internet access per month in cyber cafés. More than 62% of the respondents spent over 500 Kenyan shillings on internet per month and the rest (more than 35%) spent between 100 and 500 shillings per month. This indicates that cyber cafés were preferred places for internet access to the respondents, which could be due to the inadequacy of facilities at the UON Library's internet laboratory. The respondents' expenses for internet access per month are shown in table 4.13. This cost can be alleviated if the facilities at the UON are improved to cater for the larger student population. Another reason why the respondents used cyber cafés could be because the cafés had printing facilities, unlike in the UON Library where they could only download their work and save it on diskettes and flash disks to print elsewhere. Still another reason could be because there was no time limit in the cyber cafés as long as one was able to meet the cost.

5.4.7   Purpose of using the internet

Communication was the purpose for which most respondents (50, 8%) used the internet. Research was second, followed by teaching. These findings were consistent with what was revealed during the interviews with the library staff members. However, there were also multiple responses which indicated respondents used the internet for teaching, learning and research. The reason why many respondents indicated research and learning may be that the internet provides more current resources, including research results which others may want to build on. Most of these resources may not be readily available in print. The results on this item are summarised in table 4.16. These findings are consistent with those of Kamonde (2003), Al-Ansari (2006) and Kuar and Manhas (2008).

5.4.8   Frequency of using internet services

The data on the respondents' use of internet tools and services are presented in table 4.15. Email, the WWW, own library OPAC and e-journals were the services most used on a daily basis. The least used services were discussion groups, online databases and downloading software. This low use could be attributed to lack of skills. Studies by Adika (2003), Nasir Uddin (2003) and Nyamboga, Ongonda and Raymond (2004) also showed that e-mail and the WWW were the most used services .The data collected from the interviews collaborated this trend on the frequency of using internet services.

5.4.9   Search engines used

Web pages are searched by means of a search engine service in a four-step process which corresponds to the following search engine "parts": the crawler, the indexing program and index, the search engine program and the HTML interface (Hock 2007:63).

The frequencies with which the respondents used various search engines are shown in table 4.16. The most popular search engines were Google and Yahoo. Burns (2007) and Hock (2007) mention several reasons for Google's phenomenal popularity and success. Google is the largest of all the commercial search engines, with more than eight million searchable Web pages which result in more retrieved results per search. In conjunction with this, the internal algorithm for the relevance ranking of retrieved results is based on the popularity of previous use. The user-friendly, uncluttered simplicity of Google's interface also contributes to its popularity. The respondents used the other search engines much less and this can be explained by their lack of skills and awareness of how the search engines work. The high usage rate of Google and Yahoo could therefore be attributed to their simple and user-friendly interfaces. The results of this study were contrary to those of Al-Ansari's study (2006) which found that Yahoo was more popular than Google. Studies conducted outside Africa show that Google was the most used search engine (Asemi 2005; Kuar & Manhas 2008).

5.4.10   Internet search options

Most of the respondents (66, 7%) reported that they used the simple search option; 15, 9% reported that they used the advanced search option and 17, 4% of the respondents used both the simple and the advanced search options (as indicated in table 4.17). The fact that most of the respondents did a simple search was an indication that they did not have the skill to use the advanced search option, which could yield more specific results for searches. This means that most of the respondents searched for information using one word or two words, which limited the results. This was echoed by the staff who indicated during the interviews that most students did not have advanced search skills and were unfamiliar with Boolean search techniques that could enable them to combine terms to either narrow or widen their searches. Furthermore, this explains why the respondents cited getting relevant information from the internet as one of their challenges. Simple searches may also yield too much information, which may explain why the students also cited information overload as a challenge of using the internet.

5.4.11   Dependence on information on the internet

In order to gauge the uses and value of the internet, the researcher asked the respondents to indicate the percentage of their information needs that was satisfied through the internet. The findings were as follows (see table 4.18): 18,2% of the respondents indicated that less than 10% of their information needs were met through the internet, 46,2% indicated 11 to 50% of their information needs were met through the internet and 35,6% indicated that over 50% of their information needs were met through the internet. It is certainly encouraging to see that the internet has become a real alternative to traditional print sources for students. This is an indication that if more access to the internet is provided, more students would use it to satisfy their information needs since this is a self-sustaining technology for multiple information needs.

In terms of satisfaction levels, the researcher sought to find out whether the respondents strongly agreed or strongly disagreed with the statement that they preferred internet resources to print resources. The results are summarised in table 4.19. Most of the respondents (84%) agreed or

strongly agreed that they preferred using internet resources rather than print resources. This may be explained by the fact that the students had discovered the power of the internet and therefore preferred using it first to complete their assignments before moving on to other sources. A very small percentage of the respondents (14%) disagreed or strongly disagreed with the statement.

5.4.12   Impact of internet use on academic work

The impact of the respondents' internet use on their academic work is presented in table 4.20. The internet appears to have had a very positive impact on the respondents' academic work. From the respondents, 79,1% indicated that using the internet helped them to access quality and up-to-date information, 48,5% indicated it speeded up completing and receiving assignments, 40,5% indicated that the internet had improved their communication with lecturers and 69,7% indicated the internet had helped them to share information. These findings show that the internet has become a very important component of learning in the lives of students. The library and the university management should consider ways of improving internet accessibility, skills and infrastructure since this will help students to compete in a world that is largely defined by the use of information technology.

5.4.13   Reliability of internet resources

How reliable did the respondents find the information from the internet compared to other sources? The findings appear in table 4.21. While 71, 2% of the respondents reported that they found internet resources reliable or very reliable, 28, 8% were either not sure or that it was unreliable or very unreliable. This suggests that internet users are purposeful users who know what they want and can report or verbalise their information needs.

5.5   LICENSED DATABASE AND ONLINE JOURNALS SERVICE

The researcher sought to establish the degree to which the respondents used the various licensed databases and online journals that the UON Library subscribes to.

5.5.1 Awareness of databases and online journals service

This part of the study was aimed at determining whether the respondents were aware of the online databases and e-journals service supplied by the UON Library. All the respondents agreed that they were aware of this service. This agrees with the data from the interviews: the library staff indicated that the users were well aware of the internet services (which means they have promoted enough awareness of the service). The researcher also wanted to establish how the respondents got to know about the service. Most of the respondents (75, 0%) got to know about the service through the library orientation programme. This is very encouraging and means that the library staff fulfilled their role of creating awareness of the service. The respondents also learned about the service through the library notice board (38, 6%), from library staff members (37, 1%) and from colleagues (35, 6%). Those who learnt about the service through fliers accounted for (10, 6%). These findings (see table 4.22) show that most of the respondents learned about the service through the efforts of the library and this is encouraging to note. During the interviews the library staff indicated that the library services are products like any other products on the market and the library is in the business of providing these services. Therefore, awareness (through all available promotional means) should be generated to maximise the use of these services.

5.5.2 Use of databases and online journals service

The researcher wanted to establish how well this service was diffused in the academic community by establishing which databases and online journals were used. Studies by Kuzyk (2007) and Ultraseek (2006) have indicated that use of online databases and journals is becoming popular among university students. Google Scholar emerged as the most used database, with 80% of the respondents indicating that they used it. As pointed out earlier, this can be attributed to the simple and user-friendly interface of the search engine. It provides a simple way to conduct information searches for scholarly literature. On the internet the words below Google Scholar search box reads "stand on the shoulders of giants" in recognition of the academic scholars upon whose work Google Scholar is based (http://scholar.google.com). EBSCO Host

came second, with 70% of the respondents indicating that they used it. EBSCO Host is a consortium of publishers who makes available their works online. It provides tools for users to print or e-mail the research results for later use, which could explain its popularity with users. Emerald was used by 66% of the respondents, while JSTOR was used by 59% and Project Muse was used by 62% of the respondents. It is clear from the data that the databases that provide full-text journals were used most. The data in table 4.23 show the degree to which the respondents used the databases. It is encouraging and worth noting that the respondents used multiple databases. This shows a growing trend of using e-resources among university students.

The researcher probed further to ascertain where the respondents accessed the online databases. Many online journals can be accessed freely through the internet. However, INASP/PERI online journals are only available through institutional servers.

The data show that 71% of the respondents accessed the service through the library. This explained why the library vigorously promoted awareness of the service. The fact that some of the respondents accessed the service from a personal or departmental office or from home meant that their offices or homes were within reach of the university network since the service can only be accessed through institutional servers and must have remote access connections. Cyber cafés are not an option for access due to this restriction. The results appear in table 4.24.

The duration of using the online journals service varied from one year to more than five years (as summarised in table 4.25). The service was not new to most of the respondents and 87% had used it for a period ranging from two to five years. Only a small percentage (4%) of the respondents had used the service for more than five years and these could be students who were pursuing higher degrees. The 9% of the respondents who had used the service for one to two years could be first-year students who were not so familiar with the service. The length of using the service also depended on the respondents' exposure to the service.

How frequently a service is used depends on the frequency of the need and accessibility to the service when needed. As summarised in table 4.26, 87% of the respondents used the online journals service frequently or very frequently. Only 12% used the service occasionally and there

were no respondents who had never used the service. This indicated that the respondents used the service to a large extent; they had discovered this service as a good source for academic searches and were relying on it more than on print sources.

The research results on the number of hours of daily access to the online journals service indicate that 57,6% of the respondents had access to the service two hours daily, 23,5% had access for four hours, 10,6% had access for three hours and 6,8% had access for one hour (see table 4.27). This suggests that those who had access to the service used it to the maximum. They used the two hours per session to which they were limited in the library fully and it did not seem to be enough for the respondents.

The research on the online journals service would not be complete without an assessment of how satisfied the respondents were with various aspects of the service. The researcher therefore asked the respondents to indicate whether they were dissatisfied, neutral or satisfied with the service. The data on how the respondents evaluated the various aspects of the online journals service are summarised in table 4.28. Most of the respondents (56%) were dissatisfied about the availability of computers with an internet connection, 42% was dissatisfied with the physical locations of the service and 41% was dissatisfied with the hours of access. In general, the respondents were dissatisfied with most of the aspects of the service. However, effective communication by the staff in charge came out tops as the most satisfactory aspect of the service, with 66% of the respondents indicating their satisfaction.

5.6   USE OF COMPUTER-MEDIATED COMMUNICATION

CMC are made possible by CMC tools and systems that facilitate human communication across time and distance (Meskill & Anthony 2008). A number of these tools are available freely on the internet. The technologies include asynchronous tools (such as e-mails, discussion boards, Web blogs and shared network group folders) and synchronous tools (such as computer conferencing, video conferencing, text and voice IM, and chat) (Olaniran 2006). Yahoo messenger is an example of an instant messenger. It is possible to detect when friends are logged on when using

this tool. Many of the applications and techniques (such as e-mail, IM, chats, blogging and video sharing) facilitate students' collaborative and communication activities. In the study the researcher sought to determine how frequently the respondents used CMC for different purposes.

From the data in table 4.29, it is clear that most of the respondents (75%) frequently used CMC to receive and submit assignments, while 67% used CMC frequently to maintain social and personal contacts. Another 42% used CMC frequently to exchange research results. The data also show that quite a number of the students (57%) never used CMC for discussion groups and this is an area of concern as it might mean that the respondents did not have the skills to participate in discussion groups. However, the general observation is that most of the respondents were familiar with CMC tools and used them positively in their studies.

The researcher also sought information on the time the respondents spent on CMC per day. The majority of the respondents (50%) spent one hour on CMC per day, 35% spent two hours on CMC per day and 15% spent three hours on CMC per day. The fact that most of the respondents spent only one hour on CMC could be an indication that they only used it for specific purposes and hence there was no need to waste time on CMC. The results are summarised in table 4.30.

To conclude the study on the use of CMC, the researcher sought to obtain information on how much more effective the respondents found CMC in comparison to traditional communication methods. The data obtained is summarised in table 4.31. The categories of responses were collapsed into "less effective", "equally effective" and "more effective". Most of the respondents (214 or 81%) indicated CMC was more effective than traditional means of communication. The picture that emerged confirmed the researcher's suspicion that CMC is replacing traditional methods of communication. CMC has all but replaced postal letters since even job applications are now done via e-mail and some interviews are conducted through video conferencing. This is definitely due to the advantage of speed with which delivery is made – which is almost instantaneous. "Travelling" through cyberspace is fast and secure. Physical travelling to pass on messages has almost disappeared completely since the advent of CMC. It is therefore hardly surprising that physical travel would be seen as ineffective compared to CMC. The respondents who saw CMC as less effective than communicating by telephone amounted to 36%. The reason

for this might be that CMC offers much greater anonymity than the telephone and it is not connection based. However, the telephone is much more interactive and communication can be modified as it progresses. It is a closer person-to-person means of communication (which is ideally the most effective) and with the advent of mobile phones, the telephone is still a favoured method of communication. The main disadvantage of using the telephone is cost. CMC is very cheap (almost free), very fast and can be accessed virtually anywhere where there is an internet connection.

Few people use fax machines and it has remained a communication method for business rather than individuals. Fax machines send facsimiles of documents across distances electronically. They are favoured when original documents cannot be sent.

5.7 USE OF SOCIAL NETWORKING SITES

SNS offer users unique opportunities to express themselves and connect with others. As a result, the popularity of these sites has increased significantly (ComScore Inc 2007).

The researcher investigated which SNS respondents had accounts with. The data in table 4.32 show that 88% of the respondents had accounts on Facebook, 39% on Twitter, 28% on LinkedIn, and 2% had accounts on Friendster and Hi5 each. As might be expected, SNS are the most common type of social media Websites the students used and Facebook was by far the most popular, with 88% of the total sample having accounts on it. In studies on the prevalence of SNS usage among undergraduate students Raacke and Bonds-Raacke (2008) and Salaway and Caruso (2008) indicated that approximately 90% of the participants had Facebook accounts.

In ranking the SNS for the current study, Facebook was first, followed by Twitter; LinkedIn was third; Flicker was fourth and MySpace was fifth (see table 4.33). Once again, Facebook emerged as the most popular SNS among the respondents. The data also showed that 56% of the respondents visited SNS four times daily, 32% visited the sites three times daily, 8% of the respondents visited it twice daily, and 4% visited the SNS either once daily or once a week (as summarised in table 4.34). The findings indicate that whenever the respondents used the internet,

131

most of them visited SNS. The fact that most of respondents visited SNS four times daily shows that social networking is becoming a way of life for students.

As far as the purpose for which the respondents used SNS is concerned, the data show that most of them used SNS to send messages to friends, join groups and write comments on their own profiles. This means that SNS were a popular means of communication for the students. These findings are summarised in table 4.35.

With regard to the respondents' perceptions of their use of SNS, the researcher found that the majority of the respondents thought they lost track of time when they were on SNS. More than half of the respondents agreed or strongly agreed that using SNS distracted them from their studies, in other words the time they spent on SNS eroded their study time. However, the majority of the students did not believe using SNS interfered with their studies, doing academic work or affect their academic performance. The data also indicated that most of the respondents could control their SNS usage so that it did not interfere with their studies. It is worth noting that the majority of the respondents used SNS to communicate with their classmates about course-related issues. These findings are summarised in table 4.36.

5.8   PROBLEMS AFFECTING INTERNET USERS

The results of Saeed, Asghar, Anwar and Ramzan (2000), Ngulube et al (2009), Talja and Maula (2003) and Oyadonghan and Eke (2011) in their studies on internet use among students bear similarities with those of the current study, especially with regard to the problems the respondents encountered. This could be because of the level of economic development in Third World countries. From the data in table 4.37, it is clear that the problem of access was the greatest. The respondents had limited access to the internet laboratory due to its physical location, limited hours of operation and inadequate points of use. All these hindered the students' effective use of and access to the internet services, and most of the respondents cited access as a big challenge in using the internet. Most of the respondents (80%) also indicated they encountered difficulties in finding relevant information. This could be linked to their lack of skills in terms of search techniques and strategies, which was cited by 82% of the respondents as

a challenge in using the internet. Information overload was cited as a problem by 70% of the respondents. This happens when the retrieved information is too much for the user to determine if it is relevant for his or her purpose (what he or she is searching for). Another problem the respondents indicated was slow connection, which was caused by too many users being online at the same time. This problem was also found by Njiraine (2000), Kamonde (2003), Okello- Obura and Magara (2008), and Luambano and Nawe (2004) in their studies on internet usage. In the current study this problem resulted from the university's bandwidth capacity. Most of the respondents (74%) indicated the possibility of addiction as a problem in using the internetThis was especially true when using some internet applications such as Web 2.0 technologies which include SNS like Facebook on which students tend to spend a lot of time. From the interviews with the library staff, it emerged that the library also experienced challenges in providing the internet services. These included lack of personnel, limited funding to increase bandwidth capacity and the cost of e-resources.

5.9   SUMMARY

In this chapter the findings were discussed based on the responses from the students and the library staff. The respondents' personal details showed that all the colleges of the UON were represented in the sample, all levels of study, and both female and male students were represented. Furthermore, most of the age groups were represented.

Most of the respondents had good internet and computer skills, although these were only basic skills. The respondents lacked more advanced network skills. The study showed that most of the respondents accessed the internet from different venues ranging from their personal offices to their homes, with many resorting to cyber cafés due to the limited access they had in the UON Library.

It emerged from the study that most of the respondents used the internet for research, study, teaching and social interaction. The use of e-mail emerged as the most used service on a daily

basis. However, other internet resources such as online database and journals, CMC and SNS were also among the internet applications and resources the respondents used.

The chapter ended with a section on the problems the respondents encountered when using the internet at the UON Library. The next chapter contains the summary, recommendations and conclusions of the study.

CHAPTER 6

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

6.1   INTRODUCTION

This chapter contains a summary of the study, and recommendations and conclusions drawn from the findings. The aim of this study was to investigate the use of internet usage among university students in Kenya, with particular reference to the UON. The following objectives were pursued:

- to establish the level of students' awareness about the internet services offered at the UON
- to assess students' internet skills
- to determine students' use of different types of internet applications and resources
- to establish what kind of information students searched for on the internet
- to establish which factors affected students' use of the internet
- to establish the problems students faced when using the internet

6.2   SUMMARY

The researcher largely achieved the key objectives of the study by establishing that the level of internet awareness among the students of the UON was high and commendable. Although their basic internet and computer skills were at a high level, more training was required to enable them to explore the internet resources at a deeper level. Furthermore, inadequate facilities militated against the full utilisation of internet resources. The key areas on which the respondents were surveyed included their general internet usage, use of electronic databases and journals, use of CMC and use of SNS. Factors that influenced their effective use of the internet and the problems they experienced when using the internet were also explored. The study found vigorous use of the internet among the respondents and this, according to the respondents, has impacted their

academic work positively – especially in terms of exchanging research information and student–lecturer communication.

The efforts made to further internet usage among the students are commendable but more needs to be done, especially in the areas of training, providing functional facilities and intensive publicity of existing services. This will certainly enhance students' use of the internet, which should be a way of life in an academic community.

6.3   RECOMMENDATIONS

The study was aimed at investigating the factors affecting students' usage of and access to the internet at the UON. The recommendations below are based on the findings of the study and the literature.

6.3.1   Access

Access to the internet is paramount for students' effective use of the internet and related resources, and should be considered a priority at the UON. This could be achieved by ensuring that there are sufficient computers that are connected to the internet. Besides the main internet laboratory which the university already has, more internet laboratories should be established through decentralisation and individual initiatives by the colleges should be encouraged. It is worth noting that by the time of the completion of this study, efforts were already underway and college libraries like those of the College of Health Sciences, the College of Education and External Studies, and the College of Agriculture and Veterinary Science had set up e-resources laboratories; this had gone a long way in easing congestion at the Jomo Kenyatta Memorial Library's e-resources laboratory.

6.3.2   Training

Skills training in the use of both the computer and the internet should be extended to students at all levels. The libraries should cast their nets wider to reach the majority of the students. However, such programmes should not be left to the library alone but should be extended to the departments. Skills training could be embedded in the curriculum, making it compulsory to all first-year students for a set period of time (for example one semester) and assessing it as contributing towards term marks. Refresher training could be extended to students when they start preparing for their major projects. Due to the complexity of the information available on the internet, all users should be taught evaluation skills. To ensure continued skills development, students should be encouraged as much as possible to use the computer to complete and submit their assignments and projects. Self-guided tutorials could be made available on the university's Web pages. A noteworthy effort by the library staff is that they have posted a "pocket guide" on the library's Website which gives students step-by-step instructions and guidance on how to access the e-resources and how to search the OPAC.

6.3.3   Frequency of internet access

While the internet should be promoted as a resource for research and teaching, it should not be seen as replacing all traditional print resources. It is therefore crucial that users understand that the internet should be used in conjunction with other resources. Libraries should continue to purchase hard copies of core textbooks, journals and reference books, therefore funding for these resources should continue.

6.3.4   Inventory of available electronic resources

An inventory of the e-resources that are available in the UON Library should be made available to the users in a simple format that is easy to follow, for example by subject. Internet resources can be very migratory in nature and the URLs should be updated continuously to ensure that they

lead to the resources mentioned. Librarians could spearhead this and contribute towards building inventories.

6.3.5   Marketing

Marketing e-resources should be intensified in all the colleges of the UON. This can be done by means of organised workshops, the open days of the library and in conjunction with the ICT department through faculty and department meetings where library activities are included in the agenda. Library committees, which usually have representatives from each department, could be used as vehicles for communicating strategies.

6.3.6   Regulatory policy

Regulatory mechanisms should be put in place and where these already exist, they should be enforced so that computers and the internet are used for academic purposes as much as possible. This applies especially when it comes to the use of CMC and SNS. Some control measures should be put in place since most users tend to spend too much time on SNS and e-mail. This could go a long way in helping the users not to become addicted to the internet and in promoting responsible use of the internet.

6.3.7   Technical support

Trained personnel should be available at all times when the internet laboratories are open so that they can assist users with their computer and internet usage, and any problems that may occur while they are using the internet. Currently, the UON Library has few ICT staff who travel to all the colleges to solve problems that arise. Sometimes they are away for days traversing campuses like that in Kisumu and Mombasa in an effort to attend to internet connection issues.

6.3.8   Online journals service

The online journals service should be promoted as a major resource. At the time of the study, the number of users was low, considering the investment made in it. Publicity and training done by

the library staff should be done in a more organised and sustainable manner. The staff involved should receive frequent training in order to help users benefit from the service. The respondents were not satisfied with most of the aspects of the service. The university management should explore ways of expanding the internet laboratory and relocating it to a more visible location. Hours of operation should also be extended to be in line with other library services that are offered to 22h00. Funding this service should also be continued.

6.3.9 Role of academic libraries

The role of the academic libraries has to change to incorporate the current generation of users' digital information-seeking behaviour and preference for cutting-edge digital technologies into library planning, training, promotion and services in order to remain relevant to this generation in their quest for information. University libraries should provide digital assistance, support and training to internet users in order to promote their use of e-resources and to help them to develop into lifelong students, critical thinkers and effective users of these resources.

6.4 RECOMMENDATIONS FOR FURTHER STUDY

The following recommendations are made for further study:

- From a national perspective, a comprehensive study should be carried out about the internet and its implications on higher education and institutions of higher learning.
- A study on the use of Web 2.0 technologies in higher education should be carried out.
- A comprehensive study on the use of licensed databases among university students should be carried out.
- A study to evaluate the effectiveness of network literacy training programs that are currently offered at the UON is necessary in order to improve the training.

6.5   CONCLUSIONS

The study focused on investigating the use of the internet among university students in Kenya, with particular reference to the UON. The conclusions were guided by the research questions that the researcher sought to answer. Most of the students who participated in the study were aware of the internet services offered by the UON. Most of them had taught themselves to use the internet or learned from colleagues. Formal training did not play a big role in developing network skills. The respondents' skills in the use of ICT tools to access the information in a networked environment were limited. Many applications (such as blogging, video sharing and discussion groups) which may facilitate students' collaborative and communicative activities were not widely used. The study found that Google and Yahoo were the most commonly used search engines. This led to the conclusion that the students were unfamiliar with more structured search engines, hence they did not use them. This study also led to the conclusion that university students use the internet for various reasons that include research, academic work, communication and social interaction. The findings of this study highlight the fact that the information age has brought about change which has had an impact on university students' use of the internet. Network skills and digital information literacy have become critical skills for university students who need to be discriminative readers and competent information evaluators in order to succeed in their academic and research activities. Academic libraries, especially university libraries, may have to be reinvented and redesigned to remain competitive and relevant to the next generation. Professional librarians' skills will be tested in cyberspace, where the digital information needs of the next generation of library users will become increasingly demanding.

REFERENCES

Adika, G. 2003. Internet use among faculty members of the University of Ghana. *Library Review* 52(1):29–37.

Adomi, EE, Okiy, RB & Ruteyan, JO. 2003. A survey of cyber cafes in Delta State, Nigeria. *Electronic Library* 21(5):487–495.

Aiken, M, Vanjani, M, Ray, B & Martin, J. 2003. College students' internet use. *Campus-wide Information Systems* 20(5):182–185.

Aitken, W. 2007. Use of Web in tertiary research and education. *Webology* 4(2). Available: http://www.webology.ir/2007/v4n2/a42.html (accessed on 4 November 2011).

Al-Ansari, H. 2006. Internet use by the faculty members of Kuwait University. *The Electronic Library* 24(6):791–806.

Alexander, B & Levin, A. 2008. Web 2.0 story telling. Emergence of a new genre. *Educause Review* 43(6):40–56. Available: http://net.educause.ed/ir/library/pdf (accessed on 4 November 2011).

Alkhezzzi, FA. 2002. Internet use of graduate and undergraduate students in the college of education at Kuwait University. PhD dissertation, University of Colorado.

Al-Motrif, A. 2000. The results of college students' education level and gender on the use of the internet. PhD dissertation, Ohio University.

Anderson, C. 2004. The long tail. *Wired Magazine* 12(10). Available: http:/www.wire.com/wired/archive/12.10/tail.html (accessed on 14 April 2012).

Anderson, P. 2007. What is Web 2.0? Ideas, technologies and implications for education. *JISC Technology and Standards Watch*. Available: http://www.jisc.ac.uk/media/documents/technwatch/tsw.0701b.pdf (accessed on 25 February 2011).

Angeli, C. 2008. Distributed cognition: A framework for understanding the role of computers in classroom teaching and learning. *Journal of Research on Technology in Education* 40(3):271–279.

Anuradha, KT & Usha, HS. 2006. Use of e-books in an academic environment: Case study from the Indian Institute of Science Program. *Electronic Library and Information Systems* 40(1):48–62.

Armstrong, C. 2005. Chartered Institute of Library Information Professionals (CLIP) defines information literacy for the UK. Available: http://www.informationliteracy.org.uk (accessed on 25 February 2011).

Arregiun, C. 2004. Wikis. Encyclopedia of education technology. Available http//coe.sdsu.edu/eet/Articles/wikis/start/htm (accessed on 4 November 2011).

Asemi, A. 2005. Information searching habits of Internet users: A case study on the Medical Sciences University of Isfahan, Iran. *Webology*, 2(1), Article 10. Available at: http://www.webology.org/2005/v2n1/a10.html (accessed 5 May 2013).

Asemi, A & Riyahiniya, N. 2007. Awareness and use of digital resources in the library of the University of Medical Science, Iran. *The Electronic Library* 25(3):316–327.

Babbie, ER. 2001. *The basics of social research*. 2nd edition. London: Wadsworth.

Bachor, D. 2000. Reformatting reporting methods for case studies. Available: http://www.aare.ed.au/00 pap/bac00287.htm (accessed on 16 June 2012).

Badu, EE & Markwei, ED. 2005. Internet awareness and use in the University of Ghana. *SAGE Journal Online* 21(4):260–268.

Bailey, E & Cotler, M. 1994. Teaching via the internet. *Communication Education* 43:184–193.

Balas, JL. 2006. Information literacy and technology – They work best when they work together. *Computers in Libraries* 26(5):26–28.

Barlow, JP, Birkets, S, Kelly, K & Slouka, M. 1995. What are we doing online? *Harpers* 29(1):35–47.

Barrack, L. 2005. Weary of Wikipedia. *School Library Journal* 51(10):30.

Batthini, G & Madhani, A. 2003. Web search behavior of LIS professionals of selected libraries of Ahmedabad and Gandhinagar: A study. Available: http://irInflibnet.ac.in:8080/jspui/bitstream/1944/217/1/cali-48.pdf (accessed on 28 April 2012).

Begum, R, Jean, W.S. 1999. Internet use in libraries in South Asia with special reference to the role of the Universiti Sains Malaysia Library in promoting the use of the internet for teaching and learning. Available:http://www.ifla.org/iv/ifla65/papers/020-129e.htm (accessed 1 January 2011).

142

Benbasat, I, Goldstein, D & Mead, M. 1987. The case research strategy in studies of information systems. *MIS Quarterly* 11(3):369–386.

Blake, R. 2008. *Brave new digital classroom: Technology and foreign language learning*. Washington DC: Georgetown University Press.

Boutin, P. 2005. Inside the internet. Wikipedia is a real-life hitchhiker's guide. Available: http://www.slate.com/id/2117942/ (accessed on 12 October 2011).

Boyd, D & Ellison, N 2007. Social network sites: Definitions, history and scholarship. *Journal of computer-mediated communication* 13(1):210–230.

Bradburn, N, Sudman, S & Wansink, B. 2004. *Asking questions: The definitive guide to questionnaire design for market research, political polls, and social and health questionnaires.* Hoboken, NJ: Jossey-Bass.

Bruns, A & Humphreys, S. 2005. Wikis in teaching and assessment: The M/Cyclopedia Project. Paper presented at the 2005 International Symposium on Wikis, 16–18 October, San Diego. Available: http://snurb.info/files/wikis%20in%20Teaching%20 and % Assessment.pdf (accessed on 5 November 2011).

Burns, E. 2007. US Search Engine ranking. April 2007. Available :http://searchenginewatch.com (Accessed 14 April 2013).

Byrne, M. 2001. Data analysis strategies for qualitative research – research corner. *AORN Journ* 74(6):904 & 905. Available:

http://findarticles.com/p/articledml_mOFSL/is674/ai81218986 (accessed on 18 June 2012).

Byuns, S, Reffini, C, Mills, JE, Douglas, AC, Niang , M & Stepchenkova, S. 2009. Internet addiction: Metasynthesis of 1996–2006 quantitative research. *Cyber Psychology and Behaviour* 12(2):203–207.

Carlin, AP. 2003. Disciplinary debates and bases of interdisciplinary studies: The place of research ethics in library and information science. *Library and Information Science Research* 25(1):3–18**.**

Centre for International Development and Conflict Management (CIDCM). 1998. *The Internet in Kenya: Impacts and Development Staff Report*. Available

http://www/cidem.umd.edu/ict/papers/internet in Kenya.pdf (accessed on 14 May 2010).

Chang, NC & Perng, JH. 2001. Information search habits of graduate students at Tatung University. *International Information and Library Review* 33(4):341–346.

Chou, C. 2001. Internet heavy use and addiction among Taiwanese college students: An online interview study. *Cyber Psychology and Behavior* 4(5):573–585.

Chowdhury, GG & Chowdhury, S. 2001. *Information sources and searching on the World Wide Web.* London: Library Association Publishing.

Cmor, D & Lippold, K. 2001. Surfing vs searching. The Web as a research tool. Available: http://stafflibrary.munica/DCmor/stlhe/ (accessed on 30 April 2011).

Cohen, L, Manion, I & Morrison, K. 2000. *Research methods in education.* 5th edition. London: Routledge.

Collins English dictionary. 2009. 10th edition. Glasgow: Harper Collins.

Committee on Institutional Cooperation (CIC). 2007. CIC universities join Google library project. *American Libraries* 38(7):36–42.

Computer Industry Almanac. 2009. Worldwide Internet Users Suppases 1 billion available: http:/ww.c-I.G.Com 1 pr 0/06 tm (Accessed 14 May 2009).

ComScore Inc. 2007. Facebook sees flood of new traffic from teenagers and adults. Available: http://www.comscore.com/press/release.asp?press=1519 (accessed on 19 January 2011).

Cormode, G & Krishnamurthy, B. 2008. Key differences between Web 1.0 and Web 2.0. *First Monday* 13(6):1–30. Available: http://firstMonday.org/htbin/cgiwrap/bin/ ofs/index.php/fm/article/view/2125/1972 (accessed on 30 October 2011).

Coyle, CL & Vaughn, H. 2008. Social networking: Communication revolution or evolution? *Bell Labs Technical Journal* 13(2):13–17.

Creswell, WJ. 2003. *Research design: Qualitative and quantitative approaches.* Thousand Oaks, CA: Sage.

Creswell, WJ, Fetters, M & Ivankova, VN. 2004. Designing a mixed method study in primary care. *Annals of Family Medicine* 2(1):7–12.

Creswell, WJ & Plano-Clark, VL. 2007. *Designing and conducting mixed method research.* Thousand Oaks, CA: Sage.

Daiton, M & Aylor, B. 2002. Patterns of communication channel use in the maintenance of long-distance relationships. *Communication Research Reports* 19(1):118129.

Dawson, A. 2005. The impact of the internet on college students. The good, the bad and the ugly. Paper presented at the University of Nebraska, Kearney, 13 October. Available:

http://www.unk.edu/uploadedFiles/academic/cte/newsletters/UNK Dawson. ppt (accessed on 6 May 2009).

DeFleur, ML & Dennis, EE. 2002. *Understanding mass communication: A liberal arts perspective*. Boston, MA: Houghton Mifflin.

Diaz, KR. 1994. Getting started on the net, in *Librarians on the internet: Impact on reference services*, edited by R Kinder. New York: Haworth Press:3–24.

Dooly, M. 2007. Joining forces: Promoting metalinguistic awareness through computer-supported collaborative learning. *Language Awareness* 16(1):57–74.

Duffy, P. 2008. Engaging the YouTube goggle-eyed generation: Strategies for using Web 2.0 in learning and teaching. *The Electronic Journal of E-learning* 12(2):19–130. Available: http://www.ejel.org (accessed on 4 November 2011).

Ebersole, SE. 1999. Adolescents' use of the World Wide Web in ten public schools. A use and gratification approach. PhD thesis, Colorado State University, Fort Collins.

Educause Learning Initiative. 2006. Things you should know about YouTube. Available: http://www.educause,edu/content.asp?page_id=7495&bhcp=1 (accessed on 5 November 2011).

Ellison, NB, Steinfield, C & Lampe, C. 2007. The benefits of Facebook friends. Social and college students' use of online social network sites. *Journal of Computer Communication* 12(4):1143–1168.

Estabrook, L, Witt, E & Rainie, L. 2007. How people use the internet, libraries and government agencies when they need help. Washington, DC: Pew Internet and American Life Project. Available: www.pewinternet.org (accessed on 10 September 2011).

Eziani, CN. 2011. Network literacy skills of academic librarians for effective services delivery. The case of the University of Nigeria Library System. *Library Philosophy and Practice* (e-journal). Available: http://digitalcommunsunl.edu/libphilprac/648 (accessed on 12 June 2012).

Flanagin, AJ. 2005. IM online: Instant messaging use among college students. *Communication Research Projects* 22(30):175–187.

Flanagin, AJ & Metzger, MJ. 2001. Internet use in the contemporary media environment. *Human Communication Research* 27(2):153–181.

Flick, U. 2004. *A companion to qualitative research*. London: Sage.

Flyvbjerg, B. 2003. Five misunderstandings about case study research. Available: http://flyvjberg.pla.aau.ok/MSFiveMIS9OSageASPUBl.pdf (accessed on 18 June 2012).

Fowler, FJ. 2002. *Survey research methods.* Thousand Oaks, CA: Sage.

Gauntlet, D. 2000. *Web studies: Rewriting media studies for the digital age.* London & New York: Arnold.

Geck, C. 2006. The generation Z connection: Teaching information literacy to the newest net generation. *Teacher Librarian* 33(3):19–23.

Goodwin-Jones, R. 2008. Emerging technologies Web 2.0 writing. Enabling documenting and accessing writing online. *Language, Learning and Technology* 19(2):7–11 Available: http://llt.msu.edu/vol12num2/emerging/ (accessed on 23 April 2012).

Greenfield, D. 1999. Psychological characteristics of compulsive internet use: A preliminary analysis. *Cyber Psychology and Behavior* 2(5):403–412.

Greenhow, C, Robelia, B & Hughes, J .2009. Learning, teaching and scholarship in a digital age: Web 2.0 and classroom research. What path should we take now? *Educational Research* 38(4):246–259.

Grosseck, G. 2008. To use or not to use Web 2.0 in higher education. *Procedia Social and Behavioral Sciences* (1):478–482.

Gunn, H. 2002. Virtual libraries supporting student learning. *School Libraries Worldwide* 8(2):27–37.

Hancock, B. 2002. Trend focus for research and development in primary health care: An introduction to qualitative research. Available: http://www.trendresu.org.uk/Cmc/uploads/Qualitativeresearch.pdf (accessed on 7 April 2010).

Hard af Segerstad, Y & Ljungstrand, P. 2002. Instant messaging with Webwho. *International Journal of Human Computer Studies* 56(3):147–171.

Hargadon, S. 2008. Web 2.0 is the future of education. Available : **Error! Hyperlink reference not valid.** (accessed on 5 November 2011).

Harris, C. 2007. Can we make peace with Wikipedia? *School Library Journal* 53(6):26. Available: http://vnweb.hwwilsonweb.com (accessed on 30 April 2012).

Hinson, R & Amidu, M. 2005. Internet adoption among final year students in Ghana's oldest business school. *Library Review* 55(5):314–323.

Hock, R. 2007. *The extreme searcher's internet handbook: A guide for the serious searcher*. 2nd edition. Medford, NJ: Cyberage Books.

Hölscher, C & Strube, G. 2000. Web search behavior of internet experts and newbies. *Computer Networks* 33(1):337–346.

Horrigan, J. 2006. *The internet as a resource for news and information about science: The convenience of getting scientific material on the Web opens doors to better attitudes and understanding of science*. Washington DC: Pew Internet and American Life Project.

Hsieh-Yee, I. 2001. Research on Web search behavior. *Library and Information Science Research* 23(1):167–185.

International Network for the Availability of Scientific Publications (INASP). 2003. Optimising internet bandwidth in developing country higher education. INASP Infobrief 1: July. Available: http://www.inasp.info/pubs/bandwidth/Bandwidth-infobrief-final.pdf (accessed on 18 May 2010).

Internet World Stats. 2009. Internet usage statistics for Africa. Available: http://www.internetworldstats.com/stats/htm (accessed on 18 May 2010).

Jansen, BJ & Pooch, U. 2001. A review of Web searching studies and a framework for future research. *Journal of American Society for Information Science and Technology* 52(2):235–246.

Jansen, BJ & Spink, A. 2006. How are we searching the World-wide Web: A comparison of nine search engines transaction logs. *Information Processing and Management* 4(1):248–263. Available: http.//www.sciencedirect.com (accessed on 12 May 2011).

Jenkins, H. 2007. From YouTube to Youniversity. *Chronicle of Higher Education* 53(24):B9–B10.

Jones, LM. 2007. Using software to analyze qualitative data. *Malaysian Journal of Qualitative Research* 1(1):64–76.

Jones, S, Johnson-Yale, C, Perez, FS & Schuler, J. 2007. The internet landscape in college. *Yearbook of the National Society for the Study of Education* 106(2):39–51.

Jones, S & Madden, M. 2002. *The internet goes to college: How students are living the future with today's technology*. Washington DC: Pew Internet and American Life Project.

Johnson, B & Christensen, L. 2004. *Educational research: Qualitative, quantitative and mixed method approaches*. Boston, MA: Pearson.

Johnson, RB & Onwuegbuzie, AJ. 2004. Mixed methods research: A research paradigm whose time has come. *Educational Researcher* 33(7):14–26.

Johnson, RB, Onwuegbuzie, AJ & Turner, LA. 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research* 1(2):112–133.

Kamonde, RM. 2003. The diffusion, adoption and development of ICTs for research, teaching and communication in public universities in Kenya. MA thesis, University of Nairobi.

Kanaujia, S & Satyanarayana, NR. 2003. Status of awareness and demand of Web-based learning environment among S&T information seekers. Paper presented at the International Conference on Mapping Technology on Librarians and People, 13–15 February 2003, Ahemdabad.

Kenya ICT Strategy. 2006. Collaboration and outsourcing for economic growth. Available: http://www.information.go.ke/docs/Kenya%20Strategy.pdf (accessed on 2 January 2011).

Key, JP. 1997 Qualitative research. Available: http//www.okstate.edu/agedcm4h/acadmicaged50809/newpage21.htm (accessed on 23 February 2011).

Khan, SA, Khan, AA & Bhatti, R. 2011. Internet access, use and gratification among university students: A case study of Islamia University of Bahawalpur, Pakistan. *International Electronic Journal* 32(3):56–58.

Kothari, CR. 2004. *Research methodology: Methods and techniques*. 2nd edition. New Delhi: Wishwa Prakashan.

Kreamer, A. 2008. Happily ever after: Integrating language and literature through technology? *Unterrichtspraxis* 41(1):61–71.

Krejcie, RV & Morgan, DW. 1970. Determining sample size for research activities. *Educational and psychological Measurements* 30:607–610.

Kuar, A & Manhas, R. 2008. Use of internet services and resources in the engineering colleges of Punjab and Haryana (India): A study. *International Information and Library Review* 40(1):10–20.

Kuar, B & Verma, R. 2008. Use and impact of electronic journals in the Indian Institute of Technology, Delhi, India. *The Electronic Library* 27(4):611–622.

Kubey, RW, Lavin, MJ & Barrows, JR. 2001. Internet use and college academic performance decrements: Early findings. *Journal of Communication* 51(2):366–382.

Kumar, R. 2005. *Research methodology: A step by step guide for beginners*. London: Sage.

Kuzyk, R. 2007. Reference into the future. *Library Journal* 132(19):8–11.

Kwanya, TJM. 2005. Uses and gratification of the World Wide Web (WWW) among secondary school students in Kenya. MA research project, University of Nairobi.

Laite, B. 2000. Internet use survey: Analysis. Available: htpp://www.ship.edu/-bhl/survey/ (accessed on 3 June 2011).

Lebow, I. 1995. *Information highways and byways: From the telegraph to the 21st century*. New York: IEEE Press.

Lee, J. 2008. *Towards democracy. Social studies and TPCK. AACTE Committee on Innovation and Technology: Handbook of Technological Pedagogical Content Knowledge (TPCK) for educators*. New York: Routledge.

Leedy, PD & Ormrod, JE. 2005. *Practical research: Planning and design*. 8th edition. Upper Saddle River, NJ: Pearson Education.

Leibenluft, J. 2007. Technology: the future and what to do about it. *Slate (Online Magazine)* New York: Washington Post Company. Available: http://www.slate.com/id/2179393. (Accessed 1 November 2011)

Leiner, BM, Cerf, VG, Clark, DD, Kahn, RE, Kheinrock, L, Lynch DC, Postel, J, Roberts, LG & Wolf, S. 2000. A brief history of the internet. Available: http://www.ISOC.org/Internet/history/brief.shtml (accessed on 10 April 2010).

Lenhart, A., Madden, M. & Hitlin, P. 2005. Teens and Technology. Pew Internet and American Life Project Available: http://www/pewinternet.org/Reports/2005/Teens- and Technology asp (Accessed 28 April 2012).

Lenhart, A, Purcell, K, Smith, A & Zickuhr, K. 2010. Social media and mobile internet use among teens and young adults. Pew Internet and American Life Project. Available: htpp://www.pewimternet.org/Reports/2010.Social-mediaandyoungadults.aspx (accessed on 4 November 2011).

Lenhart, A, Rainie, L & Lewis, O. 2001. Teenage life online: The rise of the instant-messaging generation and the internet's impact on friendships and family relationships. Available: http://www.pewinternet.org/reports/index.asp (accessed on 4 November 2011).

Leung, L. 2001. College student motives for chatting on ICQ. *New Media & Society* 3(4):483–500.

Levin-Clark, M. 2006. Electronic book usage: A survey at the University of Denver. *Collection Building* 26(1):7–14.

Levin, D, Arateh, S, Lenhart, A & Rainie, L. 2002. The digital disconnect: The widening gap between internet-savvy students and their schools. Washington, DC: Pew Internet and American Life Project. Available: http://www.pewinternet.org/PPF/r/67/report_display.asp.Lig (accessed on 10 October 2011).

Lewins, A & Gibbs, RG. 2005. What is qualitative data analysis (QDA)? Available: http://onliveqda.hud.ac.uk/intro.QDA/whatisqda.php (accessed on 18 June 2012).

Lorenzen, M. 2002. High school students and their use of the World Wide Web for research. *Research Strategies* 18(2):151–163.

Luambano, I & Nawe, J. 2004. Internet use by students of the University of Dar-es-Salaam. *Library High Tech News* 10:13–17.

Malaney, GD. 2005. Students' use of the internet. *Journal of Education Systems* 33(1):53–60.

Matisse Enzer glossary of internet terms 2000–2008. Available: http://www.Matissenet/files/glossary.html (accessed on 13 April 2010).

McGee, P & Diaz, V. 2007. Wikis and podcast and blogs! Oh my. What is faculty members supposed to do? *EDUCAUSE Review* 42(5):28–30.

McKenna, KYA. 2002. Plan 9 from cyberspace: the implications of the internet for personality and social psychology. *Personality and Social Psychology Review* 4(1):57–75.

Melville, S & Goddard, W. 2001. *Research methodology: An introduction*. 2nd edition. Lansdowne: Juta.

Meskill C & Anthony N. 2008. Computer mediated communication tools for instructing Russian heritage language learners. Available: http://www.international.licla/languages/artilce.asp?parental=77038 (accessed on 8 April 2013).

Microsoft Press computer dictionary. 1998. Washington DC: Microsoft Press.

Moghaddam, GG & Talawar, VG. 2008. The use of scholarly electronic journals at the Indian Institute of Science: A case study in India. *Interlending and Document Supply* 36(1):15–29.

Morahan-Martin, J & Schumacher, P. 2000. Incidence and correlates of pathological internet use among college students. *Computers in Human Behavior* 16(3):13–29.

Mouton, J. 2006. *How to succeed in your master's and doctoral studies: A South African guide and resource book*. 10th edition. Pretoria. Van Schaik.

Moyer, JE. 2005. Adult fiction reading: A literature review of reader's advisory services, adult fiction librarianship, and fiction readers (bibliographical essay). *Reference and User Services Quarterly* 44(3):220–231. Available: http. Ebscohost.com/ehost/pdf?Vid=2&hid=102&sid=odofcf4c=b8d6-483a–abc0–79da7016ca91%40sessionmgr106 (accessed on 15 October 2010).

Mugenda, OM & Mugenda, AG. 2012. *Research methods dictionary*. Nairobi: Applied and Training Services.

Muniandy, B. 2010. Academic use of internet among students: A preliminary case study in a Malaysian University. *International Journal of Cyber Society and Education* 3(2):171–178.

Mutula, SM. 2001. Internet access in East Africa: A future outlook. *Library Review* 50(1):28–34.

Myers, DM. 2007. Qualitative research in information systems. *Management Information Systems Quarterly* 21(2):241–242.

Nasir Uddin M. 2003. Internet use by the university academics, a bipartite study of information and communication needs: *Online Information Review* 27(1):225-237.

Navarro-Prieto, R, Scaife, M & Rogers, Y. 1999. Cognitive strategies in Web searching. Proceedings of the Fifth Conference on Human Factors and the Web, Available: http://zing.nchl.nist.gov/hfmeb/proceedings/navarro-prieto/index.html (accessed on 30 April 2012).

Neumann, WL. 2000. *Social research methods: Quantitative and qualitative approaches*. 4th edition. Boston, MA: Allyn & Bacon.

Ngulube, P. 2003. Preservation and access to public records and archives in South Africa. PhD dissertation, University of KwaZulu-Natal, Pietermaritzburg.

Ngulube, P. 2005. Research procedures used by Master of Information Studies students at the University of Natal in the period 1982–2002 with special reference to their sampling techniques and survey response rates: A methodological discourse. *International Information and Library Review* 37(2):127–143.

Ngulube, P, Shezi, M & Leach, A. 2009. Exploring network literacy among students of St Joseph's Theological Institute in South Africa. *South African Journal of Libraries and Information Science* 75(1):58–69.

Njiraine, DM. 2000. Underutilization of internet services by university staff members: A study of University of Nairobi and United States International University (Kenya). MA thesis, Makerere University.

Noda, T & Helwig, S. 2005. Rich internet applications: Technical comparison and case studies of AJAX, Flash and Java based RIA. Best Practices Reports. Available: http://www.uwebc.org/ opinionpapers (accessed on 14 May 2011).

Nyamboga, CM. Ongonda, M.A. & Raymond W. 2004. Experiences in the use of the internet at Egerton University library, Njoro. Kenya. *DESIDOC Bulletin of Information Technology* 24(5).

Okello-Obura, C & Magara E. 2008. Assessment of the problems LIS postgraduate students face in accessing e-resources in Makerere University, Uganda. *Collection Building* 29(3):98–105.

Okuogo, G. 2006. E-learning as an aid to teaching. *Daily Nation, Smart Business*, 12 November.

Olaniran, BA. 2006. Applying synchronous computer mediated communication in course design: Some considerations and practical guides. *Campus Wide Information Systems* 23(3):210–220.

Onwuegbuzie, AJ & Collins, KMT. 2007. A typology of mixed sampling designs in social science research. *The Qualitative Report* 12(2):281–316. Available: http://www.nova.edu/ssss/QR/QR12-2/onwuegbuzie2.pdf (accessed on 18 June 2012).

O'Reilly, T. 2003. The architecture of participation. Available: http://oriely.com/pub/wlg/3017 (accessed on 14 April 2012).

O'Sullivan, E, Rassel, GR & Berner, M. 2008. *Research methods for public administrators*. New York: Pearson.

Ouzts, K. 2006. Sense of community in online courses. *Quarterly Review of Distance Education* 7(3):285–296.

Oyadonghan, JC & Eke, FM. 2011. Factors affecting students' use of information technology: A comparative study of Federal University of Technology and Niger Delta University. *Library Philosophy and Practice* (e-journal). Available: htpp://www.unlib.unl.edu/lpp/ (accessed on 11 November 2011).

Papacharissi, Z., & Rubin, A. M. (2000). Predictors of Internet use.
Journal of Broadcasting & Electronic Media, 44, 175-196.

Parameshwar,S &Patil D. B.2009. Use of electronic resources by faculty members and research scholars in Gulbarga University, Gulbarga: a survey. *Journal of Information Management*,46 (10) :51-60.

Patton, MQ. 2002. *Qualitative research and evaluative methods*. 3rd edition. London: Sage.

Peluchette, J & Karl, K. 2008. Social networking profiles: An examination of students' attitudes regarding the use and appropriateness of content. *Cyber Psychology and Behavior* 11(1):95–97.

Peris, R, Gimeno, MA, Pinazo, D, Ortet, G, Carrero, V, Sanchiz, M & Ibanez, I. 2002. Online chatrooms: Virtual spaces of interaction for socially oriented people. *Cyber Psychology and Behavior* 5(2):43–51.

Perry, JP & Schneider, GP. 1999. *New perspectives on the internet – comprehensive.* Cambridge, Mass: International Thomson Publishing.

Pew Research Center. 2008. Pew Internet and American Life Project. Available: http://www.pewinternet.org (accessed on 14 May 2011).

Poling, D. 1994. E-mail as an effective teaching supplement. *Education Technology* 34(5):53–55.

Poulter, A. 2003. World Wide Web, in *International Encyclopedia of Information and Library Science*, edited by J Feather & P Sturges. London: Routledge.

Powell, RR. 1997. *Basic research methods for librarians*. Westport, CT: Ablex.

Powell, RR & Connaway, LS. 2004. *Basic research methods for librarians*. London: Libraries Unlimited.

Purushotma, R. 2006. Communicative 2.0: Video games and digital culture on foreign language classroom. Master's thesis, Massachusetts Institute of Technology, Cambridge. Available: http://lingualgamers.com/thesis/ (accessed on 14 April 2011).

Raacke, J & Bonds-Raacke, J. 2008. MySpace and Facebook: Applying the uses and gratifications theory to exploring friend-networking sites. *Cyber Psychology and Behavior* 11(2):169–172.

Rainie, L 2000. Tracking life online: how women use the internet to cultivate relationships with family and friends. [Online]. Washington DC: Pew Internet and American Life Project. Available: http://www.pewinternet.org/reports/index.asp (Accessed 4 May 2011).

Recchiutti, JK. 2003. College student's uses and motives for email, instant messaging and online chatrooms.   MA   thesis,   University   of   Delaware.   Available:

http://www.udel.edu/communciation/web/thesisfiles/janicerecchuitithesis (accessed on 5 April 2013).

Reohm, HA & Haugtvedt, CP. 1999. Understanding interactivity of cyberspace advertising, in *Advertising and the World Wide Web*, edited by DW Schumann & E Thorson. Hillsdale, NJ: Lawrence Erlbaum Associates.

Richardson, W. 2006. *Blogs, wikis, podcasts, and other powerful Web tools for classrooms*. Thousand Oaks, CA: Crown Press.

Rollett, H, Lux, M, Strohmaier, M, Dosingerm, G & Tochtermann, K. 2007. The Web 2.0 way of learning with technology. *International Journal of Learning Technology* 3(1):87–107.

Rowley, J. 2002. Using case studies in research. *Management Research News* 25(1):16–27.

Rumbough, T. 2001. The development and maintenance of interpersonal relationships through computer mediated communication. *Communication Research Reports* 18(3):223–229.

Saeed, H, Asghar, M, Anwar, M & Ramzam, M. 2000. Internet use in university libraries in Pakistan. *Online Information Reviews* 24(2):154–160.

Safran, C, Helic, D & Gutl, C. 2007. E-learning practices and Web 2.0 Conference. Available: http://www.iicm.tugraz.at/iicm_papers/ICL2007_csafran.pdf (accessed on 28 April 2012).

Sairosse, TM & Mutula, SM. 2004. Use of cyber cafes: Study of Gaborone City, Botswana. *Program: Electronic and Information Systems* 38(1):60–66.

Salaway, G & Caruso, JB. 2008. The ECAR study of undergraduate students and information technology (Research Study vol 8). Available: htpp://net.educause.edu/ir/library/pdf.ERSO808/RS/ER SO808W.pdf (accessed on 1 November 2011).

Savolainen, R. 2002. Network competence and information seeking on the internet: From definitions towards a social cognitive model. *Journal of Documentation* 58(2):211–226.

Schmidt, J. 2003. From library to cybrary. Changing the focus of library design and service delivery. Available: http uq.edu.au/papers/ from library to cybrary.pdf (accessed on 14 April 2011).

Selwyn, N. 2008. *Web 2.0 applications as alternative environments for formal learning: A critical review*. London: Institute of Education, University of London.

Severin, WJ & Tankard, JW. 2001. *Communication theories: Origins, methods and uses in mass media*. 5th edition. New York: Longman.

Shachaf, P. 2005. A global perspective on library association codes of ethics. *Library and Information Science Research* 27:513–533.

Shenton, A. 2005. Publishing research in LIS journals. *Education for Information* 23(3):141–163.

Shuling, W. 2006. Investigation and analysis of current use of electronic resources in university libraries. *Library Management* 28(1/2):72–88.

Sinha, MK. 2004. Studies on the scenario of internet use pattern of Assam University community and local population of Barak Valley: A survey, in *Planner 2004: Content creation, access and management in networked environments*, edited by TAV Murthy. Ahmedabad: INFLIBNET Centre:210–225.

Sinha, MK. 2008. Information communication technology (ICT) and internet awareness amongst the college and university teachers. *International Caliber* (6):94–103.

Soy, SK. 2006. The case study as a research method. Available: http://www.glis.utexas.edu/-ssoy/usesusers/130/dib.htm (accessed on 19 June 2012).

Stone, LD & Pennebaker, JW. 2002. Trauma in real time: Talking and avoiding online conversations about the death of Princess Diana. *Basic and Applied Social Psychology* 24(1):173–183.

Talja, S & Maula, H. 2003. Reasons for the use and non-use of electronic journals and databases: A domain analytic study in four scholarly disciplines. *Journal of Documentation* 59(6):573–569.

Tapscott, D. 2008. *Growing up digital: How the net generation is changing your world*. New York: McGraw-Hill.

Taylor, GR. 2000. *Integrating quantitative and qualitative research*. London: Sage.

Taylor-Powel, E & Renner, M. 2003. *Analyzing qualitative data*. Madison, WI: University of Wisconsin Press. Available: http://wwwlearningstore.unex.edu/pdf.G3652-12pdf (accessed on 19 June 2012).

Teddlie, C & Yu, F. 2007. Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research* 1(1):77–100.

Tella, A, Tella, A, Ayeni, O & Omoba, RO. 2007. Self-efficacy and use of electronic information as predictors of academic performance. *Electronic Journal of Academic and Special Librarianship* 8(2):18–21.

Tellis, W. 1997. Introduction to case study. *The Qualitative Report* 3(2):1–5. Available: http://www.learningstore.uwex.edu/pdf/G3658-12pdf (accessed on 25 February 2011).

Tenopir, C. 2003. Uses and users of electronic library resources: An overview of recent analysis of research studies. Available: http://wwwclir.org/pubs/abstract/pub120abst.html (accessed on 14 April 2011).

Tenopir, C. 2007. Quality still matters. *Library Journal* 132(8):26–36.

Ullrich, C, Boau, K, Luo, H, Tan, X, Shen, L & Shen, R. 2008. Why Web 2.0 is good for learning and research: Principles and prototypes, in *Proceedings of the 17th International World Wide Web Conference* edited by W Ma, A Tomkins & X Zhiang. New York: ACM:701–714.

Ultraseek, W. 2006. Business searches vs consumer search. Available: www.ultraseek.com (accessed on 11 May 2011).

University of Nairobi. 2009. *University of Nairobi calendar 2009/2010.* Nairobi: University of Nairobi Press.

University of Nairobi Library. 2009. *University of Nairobi library service guide 2009.* Nairobi: University of Nairobi Library.

University of South Africa. 2007. UNISA Policy on Research Ethics. Pretoria. Available: http://www.unisa.ac.za/contents/research/docs/Research Ethics Policy_apprvCounc_21 Sept 07.pdf (accessed on 19 June 2012).

Valenza, JK. 2004. The influence of school virtual libraries on the information seeking behaviours of high school students. *School Library Journal* 50(8):1–29. Available: http://joycevalenza.com/virtualstudy.pdf (accessed on 18 October 2010).

Wambilyanga, FW. 2006. ICT and society: An exploratory survey on the role of internet on knowledge acquisition among Nairobi youth. MA research project, University of Nairobi.

West, J & West, M. 2009. *Using wikis for online collaboration*. San Francisco, CA: Jossey-Bass.

Whitty, MT. 2002. Liar, liar! An examination of how open, supportive and honest people are in chat rooms. *Computers in Human Behavior* 18(3):342–352.

Wilkinson, D. 2000. *Researchers' toolkit: The complete guide to practitioner research.* Abingdon, VA: Routledge.

Womboh, BSH. 2008. The state of ICT in Nigerian universities: The experience of Ibrahim Babinga Library – FTU. Available: www.htpp://un.libUnl.edu/lpp/ (accessed on 11 November 2011).

Woods, RH & Baker, JD. 2004. Interaction and immediacy in online learning. *International Review of Research in Open and Distance Learning* 5(2):1–13.

Xin, J. 2006. Building rich internet applications using AJAX 2006. Paper presented at the Proceedings of the 4th World Congress Conference, Orlando (Florida), July.

Yin, RK.2008.Case study research: design and methods. Thousand Oaks,Cali:Sage

Zang, Y. 2001. Scholarly use of internet-based electronic resources. *Journal of American Society for Information Science and Technology* 52(8):628–654.

Zhang, X, Anghelescu, HGB & Yuan, X. 2005. Domain knowledge, search behavior and search effectiveness of Engineering and Science students: An exploratory study. *Information Research* 10(2):33–38.

APPENDICES

Appendix A: Researcher's introduction letter

Dear Respondent

I am seeking your assistance in the completion of the attached questionnaire. I am a Master of Arts in Information Science student at the University of South Africa and am conducting research on "Internet use among university students in Kenya: A case study of the University of Nairobi".

This research is conducted to comply with the requirements of the degree programme. Any information that you provide will be used purely for academic purpose and will be treated with the utmost confidentiality.

Please tick the appropriate box or fill in the blank spaces of the questionnaire with the appropriate information.

I would appreciate it if you complete the questionnaire and make it available for collection at the issue desk of your college library.

Thank you.

Mercy Waithaka

Appendix B: Questionnaire

Internet use among university students in Kenya:

A case study of the University of Nairobi

PART 1

Bio-data

1. To which college of the University of Nairobi (UON) do you belong?

    CHSS   [   ]

    CHS   [   ]

    CAE   [   ]

    CEES   [   ]

    CBPS   [   ]

    CAVS   [   ]

2. Faculty: _____

3. Status:

    Postgraduate: PGD [   ]   Master's [   ]   PhD [   ]

    Undergraduate: 1st yr [   ]   2nd yr [   ]   3rd yr [   ]   4th yr [   ]

4. Gender:

    Male [   ]   Female [   ]

5. Age group:

    17–20 [   ]   21–25 [   ]   26–30 [   ]

    30–35 [   ]   36 and older [   ]

PART II

Awareness/knowledge of internet services

6. Are you aware of the internet services offered by the UON Library?

   Yes [ ]   No [ ]

7. If yes, how did you learn about it?

   Fellow students   [ ]

   Library staff   [ ]

   Notice board   [ ]

   Lecturer   [ ]

   University Website   [ ]

   Other [ ] Please specify: _____

Competence in computer and internet use

8. How do you rate your computer skills?

   Excellent [ ]

   Very good   [ ]

   Not sure   [ ]

   Poor   [ ]

   Very poor   [ ]

9. How do you rate your internet skills?

   Excellent   [ ]

   Very good   [ ]

   Good   [ ]

   Enough to work   [ ]

   Poor   [ ]

10. How did you learn to use the internet? (You may select more than one.)

In-house course offered by the university   [   ]

In-house course offered by the library   [   ]

Self-taught   [   ]

From colleagues   [   ]

Other [   ] Please specify: ……………………….

11. Please indicate your competence in handling the tasks listed   below on the scale of

1. Very poor 2. Poor 3.Fair 4. Good 5. Very good

	1	2	3	4	5
Basic skills (eg typing and word processing)	[ ]	[ ]	[ ]	[ ]	[ ]
Using search engines	[ ]	[ ]	[ ]	[ ]	[ ]
Using information gateways	[ ]	[ ]	[ ]	[ ]	[ ]
Evaluating Websites for relevance	[ ]	[ ]	[ ]	[ ]	[ ]
Web navigation	[ ]	[ ]	[ ]	[ ]	[ ]
Browsing	[ ]	[ ]	[ ]	[ ]	[ ]
Downloading and saving information	[ ]	[ ]	[ ]	[ ]	[ ]
Printing	[ ]	[ ]	[ ]	[ ]	[ ]
Searching for information	[ ]	[ ]	[ ]	[ ]	[ ]
Using search strategies	[ ]	[ ]	[ ]	[ ]	[ ]
Using databases	[ ]	[ ]	[ ]	[ ]	[ ]

12. Do you feel that the UON has an obligation to provide training on internet usage?

Yes [   ]   No [   ]

13. If "yes", indicate the areas of training that you know would benefit you most (in order of priority).

....

....

....

....

....

PART III

Access to and utilisation of internet services

14. Do you have access to internet facilities?

Yes [   ]   No [   ]

15. If "yes", where do you have access to the internet? (You may tick more than one.)

Personal office   [   ]

Departmental office   [   ]

Library   [   ]

Cyber café   [   ]

Home   [   ]

Laboratory/Workshop   [   ]

16. Which technologies do you use to access the internet? (Choose all that apply.)

Desktop computer   [   ]

Laptop   [   ]

Handheld device (iPhone, Smartphone, iPad, etc)   [   ]

Other [   ] Please specify: ....

17. How long have you used the internet for academic work?

Less than a year [   ]

1–2 years [   ]

2–3 years [   ]

3–4 years [   ]

4–5years [   ]

More than 5 years [   ]

18. How regularly do you use the internet?

Never [   ]

Rarely [   ]

Occasionally [   ]

Frequently [   ]

Very frequently [   ]

19. Please estimate the number of hours that you have access to the internet per day.

Home   1 hr [   ] 2 hrs [   ] 3 hrs [   ] 4 hrs [   ] 5 hrs [   ] more than 5 hrs [   ]

UON   1 hr [   ] 2 hrs [   ] 3 hrs [   ] 4 hrs [   ] 5 hrs [   ] more than 5 hrs [   ]

Cyber café   1 hr [   ] 2 hrs [   ] 3 hrs [   ] 4 hrs [   ] 5 hrs [   ] more than 5 hrs [   ]

Office   1 hr [   ] 2 hrs [   ] 3 hrs [   ] 4 hrs [   ] 5 hrs [   ] more than 5 hrs [   ]

Other [   ] Please specify: ....

20. Please estimate the minimum number of hours that you need to have access to the internet to perform academic searches efficiently.

1 hr   [   ]

2 hrs   [   ]

3 hrs   [   ]

4 hrs   [   ]

5 hrs   [   ]

21. If you use a commercial cyber café, please estimate the amount of money you spend on surfing/retrieving academic material per month in Kenya shillings.

<100   [   ]

100–200   [   ]

200–300   [   ]

300–400   [   ]

400–500   [   ]

>500   [   ]

22. For what purpose do you use the internet?

Teaching   [   ]

Learning   [   ]

Research   [   ]

Communication   [   ]

Recreation   [   ]

Read news   [   ]

Read personal and corporate Web pages [   ]

Other [   ] Please specify: ....

23. How often do you use the services listed below?

5 = Daily   4 = Weekly   3 = Monthly   2 = Sometimes   1 = Never

Services	Daily	Weekly	Monthly	Sometimes	Never
E-mail					
World Wide Web					
Telnet					
Discussion list/Newsgroup					
OPACs					
E-journals/E-books					

(Source: Al-Ansari 2006)

24. Do you use search engines to find information from the internet?

    Yes [   ]   No [   ]

25. Which search engines do you prefer? Select all that apply.

    Google   [   ]

    Yahoo   [   ]

    Excite   [   ]

    Alta Vista   [   ]

    Lycos   [   ]

    Hotbot   [   ]

    Northern Light [   ]

    Other [   ] Please specify: ....

26. When using search engines, which options do you use?

Simple search   [   ]

Advanced search   [   ]

Both   [   ]

27. Roughly what percentage of your academic information needs is satisfied through the internet?

Zero %   [   ]

Less than 10%   [   ]

11–20%   [   ]

21–30%   [   ]

31–40%   [   ]

41–50%   [   ]

More than 50%   [   ]

28. For my information needs, I prefer internet resources more than print resources.

Strongly agree   [   ]

Agree   [   ]

Neutral   [   ]

Disagree   [   ]

Strongly disagree [   ]

29. Has access to the internet improved your academic work? Yes [   ]   No [   ]

30. If "yes", how? Please explain:

…………………………………………………………………………………………..............

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

…….……………………………………………………………………………………………..

31. Evaluate the level of reliability of internet resources:

Very unreliable   [   ]

Unreliable   [   ]

Not sure   [   ]

Reliable   [   ]

Very reliable   [   ]

PART IV

Licensed databases and online journals services

32. Do you access electronic resources at the UON Library?

Yes [   ]   No [   ]

33. If "yes", how did you learn about the online journals services?

Library staff   [   ]

Fliers   [   ]

Library's notice board   [   ]

Library orientation programme   [   ]

34. Which online databases do you use (eg EBSCO Host, Emerald and Oxford)?

Database name/host name	Full text	Abstract

35. From where do you access online journals?

Personal office   [   ]

Library   [   ]

Home   [   ]

Departmental office   [   ]

Commercial cyber café   [   ]

36. How long have you used online journals?

1–2 yrs   [   ]

2–3 yrs   [   ]

3–4 yrs   [   ]

4–5 yrs   [   ]

More than 5 yrs   [   ]

37. How regularly do you use online journals?

Never   [   ]

Occasionally   [   ]

Frequently   [   ]

Very frequently   [   ]

38. Please estimate the number of hours you access online journals per day

1 hr   [   ]

2 hrs   [   ]

3 hrs   [   ]

4 hrs   [   ]

5 hrs   [   ]

More than 5 hrs   [   ]

39. Please indicate how satisfied you are with the following aspects of online journals services.

1. Very dissatisfied   2. Dissatisfied 3. Not sure   4. Satisfied   5. Very satisfied

		1	2	3	4	5
a	Retrieval of and downloading relevant articles	[ ]	[ ]	[ ]	[ ]	[ ]
b	Ordering articles	[ ]	[ ]	[ ]	[ ]	[ ]
c	Training of use	[ ]	[ ]	[ ]	[ ]	[ ]
d	Availability of computers	[ ]	[ ]	[ ]	[ ]	[ ]
e	Physical location of the services	[ ]	[ ]	[ ]	[ ]	[ ]
f	Hours of operation	[ ]	[ ]	[ ]	[ ]	[ ]
g	Effectiveness of communication by the staff in charge	[ ]	[ ]	[ ]	[ ]	[ ]

PART V

Utilisation of computer-mediated communication (CMC)

NB: CMC include e-mail, instant messaging, online fax and online chat rooms.

40. Do you use CMC?

Yes [   ] No [   ]

41. Please indicate the purpose for which you use CMC.

Maintaining social and personal contacts   [   ]

Exchanging research materials with colleagues   [   ]

Communicating with lecturers/colleagues   [   ]

Official communication   [   ]

Discussion groups   [   ]

Submitting/Receiving continuous assessment tests   [   ]

42. If you use CMC, how frequently do you use it?

Rarely   [   ]

Occasionally   [   ]

Cannot decide   [   ]

Frequently   [   ]

Very frequently   [   ]

43. Please estimate the number of hours you use on CMC per day

1 hr   [   ]

2 hrs   [   ]

3 hrs   [   ]

4 hrs   [   ]

5 hrs   [   ]

More than 5 hrs   [   ]

44. How would you compare CMC as a means of communication with the communication methods listed below?

1 = Much less effective   2 = Less effective   3 = Equally effective   4 = More effective

5 = Much more effective

		1	2	3	4	5
a	Postal letters	[ ]	[ ]	[ ]	[ ]	[ ]
b	Telephone	[ ]	[ ]	[ ]	[ ]	[ ]
c	Physical travel	[ ]	[ ]	[ ]	[ ]	[ ]
d	Fax	[ ]	[ ]	[ ]	[ ]	[ ]

45. Please comment on the potential of CMC as tools of communication between lecturers and students.

……………………………………………………………………………………………………..............

…………………………………………………………………………………………………….........

…………………………………………………………………………………………………….........

……………………………………………………………………………………………………..........

170

PART VI

Use of social networking sites (SNS)

46. With which SNS do you have accounts? (You may select more than one.)

    Facebook   [   ]

    MySpace   [   ]

    Twitter   [   ]

    LinkedIn   [   ]

    Hi5   [   ]

    Flicker   [   ]

    Friendster   [   ]

    Other [   ] Please specify: ....

47. Please rank the following SNS according to your preference: 1 is "Most favourite" and 5 is "Least favourite".

    Facebook [   ]

    Friendster   [   ]

    MySpace   [   ]

    LinkedIn   [   ]

    Twitter   [   ]

    Hi5   [   ]

    Flicker   [   ]

    Other [   ] Please specify: ....

48. How frequently do you use SNS?

.... times per day

.... times per week

.... times per month

.... times per year

49. For what purpose do you use SNS?

Writing comments on your own profile	[ ]
Writing comments on your friend's profile	[ ]
Sharing photos	[ ]
Sending messages to friends	[ ]
Searching for new friends	[ ]
Looking at profiles of other people	[ ]
Creating events/parties and inviting friends	[ ]
Creating and joining groups	[ ]

Please rate how strongly you agree or disagree with the following statements about your use of SNS.

50. Sometimes I visit SNS when I am in class.

Strongly agree [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

51. My grades are suffering because of my use of SNS.

Strongly agree [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

52. My use of SNS distracts me from studying.

Strongly agree [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

53. I think am addicted to SNS.

Strongly agree [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

54. The time I spend on SNS means I have less study time.

Strongly agree [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

55. I have missed class because of being on SNS.

Strongly agree [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

56. I am able to control my use of SNS so that it does not interfere with my studies.

Strongly agree [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

57. I use SNS to communicate with class mates about course-related issues.

Strongly agree   [   ]   Agree [   ]   Neutral [   ]   Disagree [   ]   Strongly disagree [   ]

PART VII

Problems students have in terms of internet use

58. What problems do you encounter in terms of internet use at the UON Library?

Slow connection	[ ]
Insufficient awareness	[ ]
Lack of adequate internet skills	[ ]
Difficulties in finding the relevant information	[ ]
Information overload	[ ]
Lack of motivation from lecturers	[ ]
Inaccessibility of the internet laboratory	[ ]
Inadequate points of use	[ ]
Power failure	[ ]
Temptation of addiction	[ ]

Other [   ] Please specify: …………………………………

What suggestions would you offer to improve the internet services at the UON Library?

…………………………………………………………………………………….........................

....

....

....

....

Appendix C: Interview protocol for library staff

1. Are the students aware of the internet services offered at the University of Nairobi (UON) Library?

…………………………………………………………………………………………………..
…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

2. How do you create awareness of the services among the students?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

3. Are the students competent enough to use the internet resources?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

4. In your view, do the students have adequate skills to exploit the internet resources to the maximum?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

5. Do you have any network literacy training programmes for the students?

…………………………………………………………………………………………………
…………………………………………………………………………………………………

……
……

6. What internet services does the UON Library offer to the

    students?……………………………………………………………………………………………………

    ……

    ……

    ……

7. What kind of information do students look for on the internet?

    ……

    ……

    ……

    ……

8. Which services/applications do they use most?

    ……

    ……

    ……

    ……

9. For what purpose do the students use the internet?

    ……

    ……

    ……

    ……

10. What factors affect the effective use of internet services at the UON Library?

    ……

    ……

    ……

………

11. Do you think the internet services are used optimally?

………

………

………

………

12. What problems does the UON Library experience in providing effective and efficient
    internet service?

………

………

………

………

………

13. What recommendations do you propose for effective internet accessibility at the UON?

………

………

………

………

………

Thank you for your participation.

Mercy

Appendix D: List of online databases available at the University of Nairobi Library

(Source: http://library.uonlib.ac.ke)

A	

Articles Database (ADB Powered by Vubis)

Descriptions of articles published in more than 14 000 important periodicals. When available, abstract and/or full text is shown. Only accessible through the University' network .

AJOL

Tables of contents and abstracts of over 250 African journals with document delivery.

ACOUSTICAL SOCIETY OF AMERICA

The Journal of the Acoustical Society of America (JASA).

AMERICAN INSTITUTE OF PHYSICS
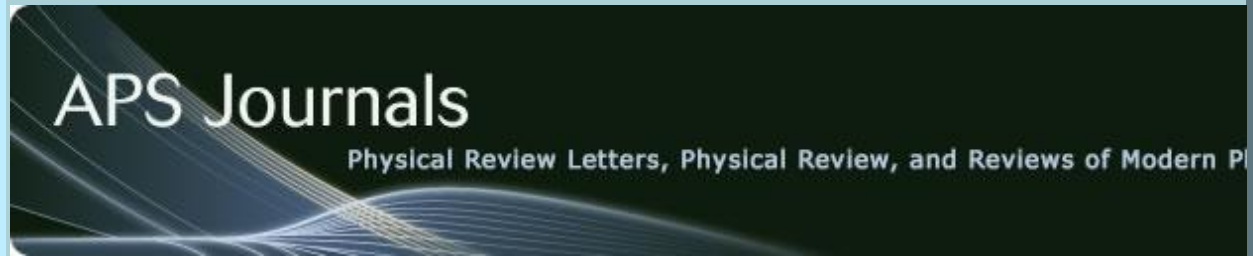

AIP publishes 12 journals, two magazines and a series of conference proceedings in applied and multidisciplinary physics.

AMERICAN OPTICAL SOCIETY

This is the online repository of the American Optical Society. Get access to 12 optics and photonics journals and selected OSA meeting content.

Access all the publications of the American Physical Society through this site.

ANNUAL REVIEWS

Annual Reviews' publications provide authoritative and comprehensive reviewed articles in the biomedical, life, physical and social sciences.

African Journal of Business and Management

The journal is aimed at disseminating research whose theoretical foundations are in business, management and technology (especially ICT). It provides open access to its content on the principle that "making research freely available to the public supports a greater global exchange of knowledge".

African Journal of Midwifery and Women's Health

The African Journal of Midwifery and Women's Health (AJM) is a new quarterly peer-reviewed and evidence-based journal for all midwives and nurses who wish to keep up-to-date with developments in Africa in matters relating to midwifery and women's health. The journal provides clinical and professional articles and is aimed at advancing skills, knowledge transfer and academic discussions in all aspects relating to midwifery practice and women's health matters in Africa. Access is through the University's campus-wide network.

AGORA

The AGORA program, set up by the Food and Agriculture Organization of the UN (FAO) together with major publishers, enables developing countries to gain access to an outstanding digital library collection in the fields of food, agriculture, environmental science and related social sciences. AGORA provides a collection of 1900 journals to institutions in 107 countries. AGORA is designed to enhance the scholarship of the many thousands of students, faculty and researchers in agriculture and life sciences in the developing world. Usernames and passwords are available from the library.

Antiquity

Get access to the quarterly Review of World Archaeology, whose archive dates back to 1927. Access is through the University network

B   Top of the page

BEECH TREE PUBLISHING

Beech Tree publishes three international, peer-reviewed academic journals on public policy for science and technology, research, environmental, social, health and other impacts.

BioONE

BioOne provides a unique aggregation of high-impact bioscience research journals featuring topics on global warming, stem cell research, and ecological and biodiversity conservation. Access is through the University's campus-wide network.

BMC Biology

BMC Biology is the flagship biology journal of the BMC series (now incorporating the Journal of Biology, the premier biology journal of BioMed Central) and publishes peer-reviewed research and methodology articles of special importance and broad interest in any area of biology and biomedical sciences, as well as full reviews, opinion pieces, commentary and questions and answers on topics of special or topical interest.

C   Top of the page

[CAMBRIDGE UNIVERSITY PRESS](#)

CUP publishes over 250 academic peer-reviewed journals on medicine, politics, linguistics, law, mathematics, social sciences and humanities.

Clinical Medicine Journal, journal of the Royal College of Physicians

The Royal College of Physicians publishes the Clinical Medicine Journal, which is available on Open Access one year after publication. It is read by leading physicians in hospitals across the world. It features articles covering original research, current issues, ethics, law, clinical governance and audit, and reports on prestigious college lectures and conferences. Access is through the University's campus-wide network.

[COCHRANE LIBRARY](#)

The Cochrane Library is a collection of online searchable databases containing high-quality, independent evidence to inform healthcare decision making. Cochrane reviews represent the highest level of evidence on which to base clinical treatment decisions.

D   [Top of the page](#)

Directory of Open Access Journals

The aim of the Directory of Open Access Journals is to increase the visibility and ease of use of open access scientific and scholarly journals. Open access journals use a funding model that does not charge readers or their institutions access fees. All scientific and scholarly subjects are covered. Currently there are 6590 journals in the directory. Access to the journals is free.

E   [Top of the page](#)

[EBSCOHOST](#)

Over 11 000 full-text, peer-reviewed journals, and over 15 000 abstracted and indexed titles. Access to eight major databases: Academic Search Premier; Business Source Premier; ERIC; Masterfile Premier; Newspaper Source; Health Source: Nursing & Academic; Health Source:

Consumer Edition; Medline.

Educause Quarterly

The EDUCAUSE Quarterly is an online, peer-reviewed, practitioners' journal from on managing and using information resources in higher education. EQ is published in an online-only format with multimedia (graphics, live links, audio and video) and community-building applications that enhance the magazine's value.

EDINBURGH UNIVERSITY PRESS

Edinburgh University Press publishes over 30 journals across a range of disciplines in the humanities and social sciences.

EMERALD GROUP PUBLISHING LTD

Emerald Management features 140 business and management journals and the Emerald Engineering eJournal Collection features 19 engineering journals (all of which are peer-reviewed and fully searchable) plus reviews from the world's top 300 management journals.

F

Free Medical Journals

The Free Medical Journals site, which currently has 2226 journals, was created to promote the free availability of full-text medical journals on the internet.

G

GALE

Comprises:

Expanded Academic: Online full-text and abstracting databases.

Health and Wellness Resource Center: Online database combining journals, reference, news, and other health and medical content.

[GEOLOGICAL SOCIETY](#)

The Lyell Collection is an e-resource containing new and archival journals, special publications and book content, and is published by the Geological Society of London. It contains key peer-reviewed earth science literature of the highest quality.

H	[Top of the page](#)

HighWire Press

HighWire Press partners with independent scholarly publishers, societies, associations and university presses to facilitate the digital dissemination of 1518 journals, reference works, books and proceedings.

Hinari

The HINARI Programme was set up by the WHO together with major publishers; it enables developing countries to gain access to one of the world's largest collections of biomedical and health literature. More than 7500 information resources (in 30 different languages) are now available to health institutions in 105 countries, areas and territories benefiting many thousands of health workers and researchers, and in turn, contributing to improved world health. Usernames and passwords are available from your branch library.

I	[Top of the page](#)

[INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)](#)

The IEEE Periodicals Package includes the core collection of IEEE engineering, electronics and computer science periodicals, with a back-file to 2005.

[INSTITUTE OF PHYSICS PUBLISHING](#)

IOP publishes over 60 of the world's most prestigious journals on physics and related sciences.

International Journal of Interactive Mobile Technologies

The objective of the iJIM journal is to publish and discuss fundamentals, applications and experiences in the field of interactive mobile technologies in learning and teaching as well as in industrial and other applications. This is an open access journal, but readers are required to register on the site for access.

INSTITUTION OF MECHANICAL ENGINEERS JOURNALS

The Library welcomes you to access the 18 journals of the Institution of Mechanical Engineers (IMechE). The journals include the internationally renowned 16-part Proceedings of the IMechE, which spans a broad range of topics (including aerospace, rail, nano-engineering, and power and energy). Also included are the International Journal of Engine Research and the Journal of Strain Analysis for Engineering Design, both leading titles in their field.

Infection and Immunity Journal

Infection and Immunity (IAI) provides new insights into the interactions between bacterial, fungal and parasitic pathogens and their hosts. Specific areas of interest include mechanisms of molecular pathogenesis, virulence factors, cellular microbiology, experimental models of infection, host resistance or susceptibility, and the generation of innate and adaptive immune responses. click here to access the journal

J   http://uonlibrary.uonbi.ac.ke/node/699 - TOPTop of the page

JSTOR

This is an archive of over 1000 leading academic journals across the humanities, social sciences and sciences, as well as select monographs and other materials that are valuable for academic work.

Journal of Virology

The Journal of Virology (JVI) explores the nature of the viruses of animals, archaea, bacteria, fungi, plants, and protozoa. click here to access the journal
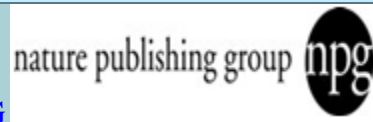
M   Top of the page

[MARY ANN LIEBERT](#)

Liebert Online delivers electronic access to more than 60 authoritative journals published by Mary Ann Liebert, Inc; all full-text, searchable and linked to external bibliographic databases.

[NATURE PUBLISHING](#)

Provides access to over 30 journals across the life, physical and applied sciences, and (most recently) clinical medicine.

NEW ENGLAND JOURNAL OF MEDICINE

Full text of the [New England Journal of Medicine](#) is now available [to all students](#) and staff of the University. Access dates back to 1812 when the journal started publishing.

The [New England Journal of Medicine (NEJM)](#) is a weekly general medical journal that publishes new medical research findings, review articles, case reports and editorial opinion on a wide variety of topics of importance to biomedical science and clinical practice.

Organisation for Economic Co-operation and Development (OECD)

The OECD is renowned for its authoritative, internationally comparable statistics, analysis and outlooks on economics, public policy, social sciences and environmental issues. It provides access to periodicals, books, working papers and statistics.

[Oxford University Press](#)

Oxford University Press publishes over 230 academic and research journals covering a broad range of subject areas, two-thirds of which are published in collaboration with learned societies and other international organisations.

OARE

Online Access to Research in the Environment (OARE) – an international public-private consortium coordinated by the United Nations Environment Programme (UNEP), Yale University, and leading science and technology publishers – enables developing countries to gain access to one of the world's largest collections of environmental science research. Usernames and passwords are available from your branch library.

Error! Hyperlink reference not valid.

Open Access for Africa is a [search engine](#) that filters your search to prioritise results from open access journals and databases in nursing and medicine. It offers an orientation on how to optimise online searching and provides links to free access journals and databases. Resources featured in this guide include journals with full-text access, free medical textbooks, free databases, best search strategies and information about partnering institutions in Africa.**Error! Hyperlink reference not valid.**

P   [Top of the page](#)

[PALGRAVE MACMILLAN](#)

Palgrave Macmillan offers a combined portfolio of over 70 peer-reviewed e-journals in business and management, economics, education, information systems and technology, political science and international studies, social and cultural studies, urban design and architecture.

[PROJECT MUSE](#)

Project MUSE provides online access to almost 500 full-text journals from 140 non-profit publishers in the humanities and social sciences.

Pubmed Central

PMC is a free, full-text archive of biomedical and life sciences journal literature at the US National Institutes of Health's National Library of Medicine (NIH/NLM).

ROYAL SOCIETY

Access is available to seven leading international journals of the Royal Society, the UK's national academy of science. Titles cover biological and physical sciences, and include Philosophical Transactions of the Royal Society, the longest-running continuously published journal in the world.

ROYAL SOCIETY OF CHEMISTRY

37 full-text journals spanning all branches of chemistry, plus a range of key databases in analytical chemistry, catalysts and catalysed reactions, organic synthesis and natural products.

Royal College of Psychiatrists

The Royal College of Psychiatrists allows free access to the online full-text version of its three journals (the British Journal of Psychiatry, the Psychiatric Bulletin and Advances in Psychiatric Treatment) to 75 different developing countries.

ROYAL SOCIETY OF CHEMISTRY ARCHIVES

A backfile containing all articles published by the RSC from 1841 to 2004.

SAGE

Access to over 550 journals in business, humanities, social sciences, science, technology and medicine.

SPRINGERLINK

Springer is one of the leading international scientific publishing companies. Springer's e-journals cover a wide range of subjects, including biomedicine and the life sciences, clinical medicine, physics, engineering, mathematics, computer sciences, human sciences, social

sciences and economics. Contact your librarian for the list of journals in the package available to University of Nairobi.

[SYMPOSIUM JOURNALS](#)

Symposium Journals is a pioneer in the publication of online-only academic journals, that is journals that have no printed editions but otherwise have the same aims, traditions, standards and presentation as conventional journals.

T   [Top of the page](#)

[TAYLOR & FRANCIS ONLINE JOURNALS](#)

More than 1300 titles in the humanities, social sciences and applied sciences.

U   [Top of the page](#)

[UNIVERSITY OF CHICAGO PRESS](#)

The University of Chicago Press publishes nearly 50 scholarly journals, many on behalf of some of the world's most prestigious societies, and several that were the first scholarly publications in their respective fields. The journals present original research in the social sciences, humanities, education, and biological and physical sciences.

W   [Top of the page](#)

[WILEY ONLINE LIBRARY (FORMERLY INTERSCIENCE)](#)

This package provides access to over 350 journals.

[WILEY ONLINE LIBRARY (FORMERLY BLACKWELL SYNERGY)](#)

Access to over 840 leading learned journals in science, technology, medicine, humanities and social sciences.

[WORLD BANK E-LIBRARY](#)

The World Bank e-Library is an electronic portal to the World Bank's full-text collection of books, reports/working papers, journals and other documents on social and economic development.

[WORLD BANK DEVELOPMENT INDICATORS](#)

The World Bank's primary collection of development indicators, compiled from officially-recognised international sources. It presents the most current and accurate global development data available, and includes national, regional and global estimates.

[WORLD BANK GLOBAL DEVELOPMENT FINANCE](#)

It focuses on financial flows, trends in external debt and other major financial indicators for developing countries. It includes over 200 time-series indicators from 1970 to 2009, for most reporting countries.

[WORLD BANK AFRICA DEVELOPMENT INDICATORS](#)
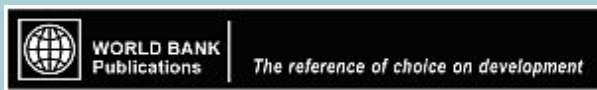
The most detailed collection of data on Africa, containing over 1600 indicators, covering 53 African countries, and spanning the period 1961 to 2008. The data include social, economic, financial, natural resources, infrastructure, governance, partnership and environmental indicators. The data are drawn from World Development Indicators and other sources.