

INFORMATION LITERACY SKILLS AMONG INCOMING FIRST-YEAR
UNDERGRADUATE STUDENTS AT THE CATHOLIC UNIVERSITY OF EASTERN
AFRICA IN KENYA

by

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I declare that **INFORMATION LITERACY SKILLS AMONG INCOMING FIRST-YEAR UNDERGRADUATE STUDENTS AT THE CATHOLIC UNIVERSITY OF EASTERN AFRICA IN KENYA** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.



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SIGNATURE
(Ms H N Kimani)

DATE

DEDICATION

This dissertation is dedicated to God, the source of my life and courage, to my daughter, *Lynn Patience Wanjiku*, and my entire family for their continued support.

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ABSTRACT

Information literacy skills among university students have become a necessity rather than the norm. With the increase of information resources, the need for information skills among university students is important for their continued access to, and retrieval of, information. The purpose of this research was to investigate information literacy skills and competencies among incoming first-year undergraduate students in institutions of higher learning in Kenya, with special reference to the Catholic University of Eastern Africa. The objectives of the study were; to identify the types and formats of resources that incoming undergraduate students are aware of, to determine whether the incoming undergraduates are aware of search strategies for both print and electronic/online resources, to determine whether incoming undergraduate students possess basic information technology skills, to find out whether incoming undergraduate students know information retrieval tools and their use, and to determine whether incoming students are aware of intellectual property and copyrighted materials and their ethical use. The study adopted a quantitative approach and used the case study research method. The study targeted first year incoming undergraduate students at the Catholic University of Eastern Africa for the academic year 2013/2014. 137 incoming undergraduate students participated in the study. Data was collected by using self-administered questionnaires. Quantitative data was coded and analysed by using Statistical Package for Social Science (SPSS). Qualitative data generated from open-ended questions was presented in narrative form under respective subheadings. The findings of the study observed that: (a) Incoming first-year students have limited knowledge of strategies used to search for information. (b) The incoming first-year undergraduate students at the Catholic university of Eastern Africa do possess computer skills in applications such as the use of the internet and its applications (e.g. social networking sites and the World Wide Web) as well as the word-processing applications such as (Microsoft Office and Microsoft Word) and statistical applications such as SPSS. (c) Majority of incoming undergraduate university students are not familiar with the various retrieval tools and their applications. (d) The incoming first-year undergraduate students are familiar with both electronic and printed information resources. (e) A significant number of students were not aware what constitutes primary resources and secondary sources. (f) Incoming first-year undergraduate students exhibited little knowledge of issues relating to intellectual property rights and copyright. Several recommendations have been made based on the findings of the study. One of the recommendations is that the university library mandated with offering information literacy instruction to incoming students should adopt several incentives aimed at encouraging the students to attend library orientation. Another recommendation is to integrate the information literacy training with the normal university curriculum to become a credit-earning course for all incoming students. The university library should also carry out a needs assessment on information literacy training to help determine the existing gaps in the current information literacy programme. The programme should also be tailored to help in emerging issues such as electronic plagiarism of information resources. The study further recommends a longitudinal study to determine whether students joining the university are able to gain information literacy skills over a period of time.

LIST OF ABBREVIATIONS

ALA:	American Library Association
ACRL:	Association of College and Research Libraries
AASL:	American Association of School Libraries
AECT:	Association for Educational Communications and Technology
ANZIIL:	Australian and New Zealand information literacy
BI:	Bibliographic Instruction
CATs:	Continuous Assessments Tests
CHIEA:	Catholic Higher Institute of Eastern Africa
CUEA:	Catholic University of Eastern Africa
ECDE:	Early Childhood Development Education
EFA:	Education for All
ETS:	Educational Testing Service
ICT:	Information Communication Technology
IL:	Information literacy
INSAP:	The International Network for the Availability of Scientific Publication
IR system:	Information retrieval system
ISST:	Information skills test
NFIL:	National forum on information literacy
NCLIS:	National Commission on Libraries and Information Service
NLS:	New literacy studies
SALIS:	Standardized Assessment of Information Literacy
SCANUL-ECS:	The Standing Conference of National and University Libraries in Eastern, Central and Southern Africa
SCONUL:	Society of College, National and University Libraries
UN:	United Nations
UNESCO:	United Nations Educational, Scientific and Cultural Organisation

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CHAPTER ONE: INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Conceptual setting

The level of literacy of a community or an individual has been a debatable issue for some time. Hugo (2003) broadly defines literacy as the ability to read and write, which are complex cognitive activities consisting of many levels of interactive processes. Several authors have defined the term literacy. Horton (2008:4) defines literacy as the “acquisition of the basic competencies of reading, writing and numeracy”. UNESCO (2006:149), on the other hand, defines literacy as “a set of tangible skills – particularly the cognitive skills of reading and writing – that are independent of the context in which they are acquired and the background of the person who acquires them”. Walter (1999:31) argues that a literate person is a person who has a high degree of formal schooling, is proficient at comprehending complicated texts and writing concise essays, has a broad knowledge of many subjects, and is adept at critical thinking and analysis.

Generally, basic literacy is a major foundation of other forms of literacy, be it information literacy, computer literacy or media literacy. Without basic literacy, individuals cannot acquire the other forms of literacy, hindering development of various other forms of skills. The level of literacy in a given country affects society in that country, both economically and socially. The level of development is rather slow in countries with low literacy levels, compared to that of countries with high literacy levels. The arrival of print technology heralded the need for skills in reading, writing and comprehension, and as the society’s needs evolved, literacy became a universal right (Langford 1999). Literacy is a major concern in both developed and less developed countries.

According to the United Nations 2005, report on millennium development goals (MDG), goal 2 that was “to achieve universal primary education” aimed at ensuring that every child has access to free universal education. This in turn helps to increase the literacy levels among societies. In Kenya, Vision 2030, which is the country’s blueprint for development, advocates basic education for every child in the country. Vision 2030 is anchored on three pillars, namely economic, social and political pillars, in line with the UN millennium development goals. One of the objectives embedded in Vision 2030 social pillar is to “have a globally competitive quality education, training and research for sustainable development” (Government of the Republic of Kenya, 2007). This would be achieved through strategies such as increasing the gross enrolment rate in Early Childhood Development Education (ECDE), the provision of free primary education and increasing the transition rate from primary school to secondary school, and from secondary school to university.

In most African countries, the level of literacy is low and this has been influenced by various factors. Jiyane and Onyancha (2010: 11) indicate that Sub-Saharan Africa suffers from a myriad of problems and challenges such as poverty, hunger, disease, poor governance, and ignorance. Kenya is no exception and its literacy level has been below expectation since independence. This is due to factors such as poverty, poor governance, and other factors such as the HIV/AIDS epidemic. The effects of HIV/AIDS on literacy levels, for instance, is highlighted by the World Bank report (2004:6), which states that children infected with HIV at birth do not live to enrol in school. Children also have to drop out of school when they become orphans due to HIV/AIDS or stay at home to take care of their sick parents. However, efforts to eradicate illiteracy in Kenya have been on-going through programmes such as Education for All (EFA) and the Vision 2030.

In today’s world, the word ‘literacy’ is being used in a much broader, metaphorical sense to refer to other skills and competencies, for example ‘information literacy’, ‘visual literacy’, ‘media literacy’ and ‘scientific literacy’ (UNESCO, 2006:150). These necessitated the various forms of literacy to be classified according to their context. According to Eisenberg, Lowe & Spitzer (2004:7) there are several forms of literacy

including visual literacy, media literacy, computer literacy and digital literacy. Horton (2008:3) goes further to describe the various forms of literacies, which he calls:

“The family of 21st century “survival literacies” and includes six categories : (1) the Basic or Core functional literacy fluencies (competencies) of reading, writing, oralcy and numeracy; (2) Computer Literacy; (3)Media Literacy; (4) Distance Education and E-Learning; (5) Cultural Literacy; and (6) Information Literacy.” This study is mainly concerned with information literacy.

Kapitzke (2003:39) notes that the concept of being literate with and about information emerged not from an educational context, but from the industrial sector. The concept of information literacy constitutes the answer to the question of how possible it is to filter, from the abundance of information, the relevant information to the relevant areas (Kauhanen-Simanainen 2007).

The term information literacy was first introduced by Paul Zurkowski in 1974, former president of the US Information Industries Association (Kapitzke 2003; Eisenberg, Lowe & Spitzer 2004; Warnken 2004; Horton 2008; Rajaram 2006). Various authors and organisations have defined the term information literacy differently. According to Paul Zurkowski, who is credited for coining the term information literacy, information literate individuals “are people trained in the application of information resources to their work, who have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in moulding information-solutions to their problems” (Maughan 2001: 71-72). The ALA Committee on Information Literacy in 1989 described an information literate person as one who is “able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” (American Library Association 1989). Johnston and Webber (2003:336) defined information literacy as “the adoption of appropriate information behaviour to obtain, through whatever channel or medium, information well fitted to information needs, together with critical awareness of the importance of wise and ethical use of information in society. A major international meeting on information literacy held in Prague in 2003, with representatives from the seven continents, defined information

literacy as “the ability to identify, locate, evaluate, organize and effectively use information to address issues or problems at hand that face individuals, communities, and nations” (The Prague Declaration, 2003).

Despite a good number of definitions of information literacy and characterisation of information literate individuals, UNESCO’s Information for All Programmes’ (IFAP 2008) definition of information literacy is apt and concise, namely “information literacy is the capacity of people to: Recognise their information needs; Locate and evaluate the quality of information; Store and retrieve information; Make effective and ethical use of information, and apply information to create and communicate knowledge”. The above definitions from various authors and institutions imply a set of skills that individuals should possess in order to be able to make use of information.

Since the concept information literacy was introduced, there has been a concerted effort to develop information literacy skills and competencies in academic institutions and the community at large. Various organisations, such as the American Library Association (ALA) and the Society of College, National and University Libraries (SCONUL) have continuously advocated information literacy competencies among individuals and in institutions of higher learning. In Africa, the Standing Conference of National and University Libraries in Eastern, Central and Southern Africa (SCANUL-ECS) has been advocating information literacy in Universities.

In the late 1980s, Patricia Breivicks presented a comprehensive model and programme of information literacy, which was a turning point in information literacy initiatives (Marcum 2002). Since then, the development of information literacy worldwide has been gradual and phenomenal. International meetings have been held in this regard, such as the Prague meeting in 2003, Alexandria, Egypt in 2005, and the Ljubljana meeting, among others (Horton, 2008). In 2000, the ALA came up with information competency standards for higher education. The standards have been instrumental in the development of information literacy programmes in institutions of higher learning. So far, the standards have been adopted by universities, mostly in developed countries.

In academia, information literacy has become an integral part of higher education curricula. Idodi (2005) states that “information literacy has gradually become a strategic issue for tertiary institutions, where the emphasis is placed on teaching and learning strategies that deliver the skills needed by students to succeed in an increasingly competitive work environment”.

1.2 Contextual setting

Kenya is a country in East Africa. It gained its independence from the British on 12 December 1963. According to the Kenya National Bureau of Statistics (2010), Kenya has a population of 38610097 people. Upon attainment of internal self-government, the then prime minister, Mzee Jomo-Kenyatta, identified three enemies of national growth, namely ignorance, sickness and poverty, which he said must be overcome by an independent Kenya. In 1964, the Kenya Education Commission, commonly known as the Ominde commission, was formed to investigate issues concerning education. This was because the inherited colonial education system was discriminative against black Africans, thereby denying them an opportunity to quality education. The Ominde commission recommended the provision of free basic primary education consisting of three main elements of literacy, numeracy and rudiments of citizenship (Kenya Education Report 1964:44; Maxmon, 1995:126). According to the Ominde report, the colonial day’s education was stratified on racial lines, namely European education, Asian education and African education (Kenya Education Report (1964:21). This, in essence, denied most Africans basic education, resulting in a high level of illiteracy among them. In the Kenyan perspective, the literacy levels and the education systems are closely interrelated. The levels of literacy have been largely affected by continuous changes in the education system, which has still been evolving since independence.

After Kenya gained independence, it adopted the 7-4-2-3 structure of education. The system or mode of education comprised 7 years of primary education, 4 years of secondary education, 2 years of post-secondary education and 3 years of university education. Following the Mackay report of 1982, Kenya changed its education structure

in 1985 from the 7-4-2-3 to the current system of 8-4-4 structure (Makori, 2005; Wanjohi, 2011). The 8-4-4 system comprises 8 years of primary education followed by 4 years of secondary education and 4 years of university education. (Bedi, Kimalu, Manda, & Nafula, 2002: 7). To join university in Kenya, students are required to attain a minimum grade of C+ in their secondary education.

In the 1980s, due to economic hardships bedevilling the country and economic sanctions imposed by international organisations such as the World Bank, the Kenyan government introduced cost sharing in the education sector. This affected the enrolment of pupils in both primary and secondary schools, thereby reversing the gains experienced before. This affected the overall literacy levels of its citizens because only a few children could access education. However, this situation was once again reversed in 2003 when the government reintroduced free primary education, after which the rate of enrolment in schools increased. As from 2008, secondary fees were also subsidised; hence, the enrolment rate of secondary education students also increased. The higher levels of enrolment in both phases were meant to offer education to all children, in this way increasing the levels of literacy in the country. The introduction of free primary education and subsidy of tuition fees in secondary schools since 2003 and 2008, respectively, also led to an increased demand for higher education.

Higher education in Kenya has seen tremendous growth and changes since the early 1990s. Since then, the number of public and private universities has increased, and some universities have established satellite campuses. They have also incorporated e-learning or open and distance learning as modes of teaching. In Kenya, there are 14 registered private universities. The Catholic University of Eastern Africa, which is the university under study, is a private university owned by the Catholic Church. Mutula (2002) opines that private universities offer market-driven courses and provide an environment conducive to academic excellence. Most of them have a modern infrastructure, including libraries, information and communication technologies that are vital for academic excellence and research.

In recent years, the expansion of universities internationally and locally has seen the establishment of virtual campuses. This was possible because of the rapid development of information communication technology (ICT). In Kenya, this has changed the education arena, but also brought a number of challenges. As Yengin, Karahoca, Uzunboylu (2010) points out, the growing number of the practices in virtual education brought about some key issues and trends, which needed to be addressed. New trends, policy issues, cost issues, teaching and learning concerns are some of the items that had to be addressed for virtual learning. In essence, this includes the provision of information services to support virtual learning. According to Yengin, Karahoca, Uzunboylu (2010), in virtual universities the learning environments provide mechanisms for the learning activities where students' engagement with the learning materials and courses are the main keys. The nature of learning in virtual universities requires students to be information clever. Information literacy skills are a prerequisite for the students to be able to utilise information resources. This requires universities to impart information literacy (IL) skills to students and equip them with the necessary skills to enable them to make maximum use of e-learning opportunities presented by the development and growth of education.

The role of universities in imparting IL skills is highlighted by Breveick (2005), who explains that most of the responsibility for developing information literacy skills is being placed squarely on the shoulders of higher education institutions. According to Amunga (2011), efforts have been made to improve information literacy in Kenyan universities through programmes such as the Maktaba Award, INASP/KLISC capacity Building Workshops, the New Partnership for Africa's Development (NEPAD) e-school programme launched in June 2003, amongst others. All these initiatives continue to create awareness of the importance of information literacy in schools, colleges and universities in Kenya.

IL in Kenyan universities usually depends on individual universities. Various case studies on user information literacy by International Network for the availability of scientific publications (INASP) and The Standing Conference of African National and University Libraries in Eastern, Central and Southern Africa (SCANUL-ECS) 2005 show that

information literacy programmes are carried out by university libraries. Most universities have not incorporated information literacy into their academic curriculum, but IL is rather viewed as a library function. This has hampered IL education growth in the country. Amunga (2011:430) highlights the problem of information literacy in institutions of higher learning by indicating that, in Kenya, there is no national policy on information literacy and information literacy-related activities are individual institutional matters.

The information literacy activities at the Catholic University of Eastern Africa are usually performed by the library. However, it does not have tools to assess the level of information literacy skills among students and this hinders the development of an information literacy programme designed to suit the student's information needs.

1.3 Statement of the problem

Literacy levels among University students in Kenyan universities are still low. Majority of students usually come from Kenyan secondary schools with 8-4-4 educational system background, which has been criticised for various reasons, among them quality. According to EFA (2004), it is driven by the performance of national examinations at the expense of knowledge, skills and attitudes that the graduates acquire. The 8-4-4 curriculum does not provide for information literacy and this has created a vacuum in information literacy skills acquisition, both at primary and secondary levels of education.

The large amounts of information available in both print and electronic formats demand IL skills and competencies from undergraduate students. The students need IL skills to “recognize their information needs, distinguish ways of addressing gaps, to construct strategies for locating, and accessing information resources, compare and evaluate information resources, organize, apply, synthesize and create information” (SCONUL 1996:6).

As already noted in the preceding section, there is a lack of emphasis on information literacy in African primary and secondary schools education systems. This has greatly stymied the development and inculcation of information literacy skills to students

entering institutions of higher learning. Most first-year undergraduate students joining the Catholic University of Eastern Africa come from such schools. As a result, they may not possess adequate information literacy skills and competencies to meet the challenges of university education. Most schools at both primary and secondary level do not have well-equipped libraries, a situation that is affecting the reading culture and use of information.

The overall problem addressed in this study is that, despite efforts to raise the literacy levels in Kenya, little has been done to assess the levels of information literacy skills of the incoming undergraduate students. According to UNESCO (2006), “the main challenge in all countries is the development of policies at national and institutional levels which would guide and facilitate the integration of IL programs from primary schools through to institutions of higher learning”. Most studies done in Kenya are related to information literacy programmes in universities; however, only a couple of studies exist, if any, on the assessment of information literacy skills among students in institutions of higher learning. The assessment of IL skills and competencies among incoming undergraduate students in institutions of higher learning in Kenya has not yet taken root. This has created a gap in the formulation of information literacy programmes and their integration into the curriculum. This is in relation to pre-assumed information literacy skills and capabilities among incoming students into institutions of higher learning. This study is aimed at filling the gap created by the lack of assessment of information literacy skills among incoming undergraduate students. It is geared towards determining the information skills capabilities against their educational background of the 8-4-4 education system, which, according to Oketch (2004), is at fault for producing graduates who are not prepared to join institutions of higher learning. Besides, Mittermeyer (2003) observes very little research has been done on the evaluation of information literacy skills of students joining the university for the first time. Few universities, if any, have programmes to assess the information literacy of their undergraduate students.

1.4 Purpose of the study

The purpose of the study was to investigate information literacy skills and competencies among incoming first-year undergraduate students in institutions of higher learning in Kenya, with special reference to the Catholic University of Eastern Africa.

1.5 Objectives of the study

The study seeks to achieve the following objectives that are formulated in line with the above purpose of the study:

- 1) To identify the type and formats of resources that incoming undergraduate students are aware of.
- 2) To determine whether the incoming undergraduates are aware of search strategies for both print and electronic/online resources.
- 3) To determine whether incoming undergraduate students possess basic information technology skills.
- 4) To find out whether incoming undergraduate students know information retrieval tools and their use.
- 5) To determine whether incoming students are aware of intellectual property and copyrighted materials and their ethical use.

1.6 Research questions

The research study was guided by the following research questions:

- 1) Which types of information resources are incoming undergraduate students aware of?
- 2) Are incoming undergraduate students aware of search strategies for both electronic/online and print sources?
- 3) Do incoming undergraduate students possess information technology skills?

- 4) Do incoming undergraduate students have knowledge of retrieval tools and their use?
- 5) Are incoming undergraduate students aware of intellectual property and copyrighted materials, and their ethical use?

Table 1: Research questions, objectives and possible sources of data table

Research questions	Objectives	Possible sources of data
What are the types and formats of resources that incoming undergraduate students are aware of?	To identify the type and formats of resources that incoming undergraduate students are aware of?	Questionnaires
Are incoming undergraduate students aware of search strategies for both electronic/online and print sources?	To determine whether the incoming undergraduates are aware of search strategies for both print and electronic/online resources.	Questionnaires
Do incoming undergraduate students possess information technology skills?	To determine whether incoming undergraduate students possess basic information technology skills.	Questionnaires
Do the incoming undergraduate students know information retrieval tools and their use?	To determine whether incoming undergraduate students have knowledge of retrieval tools and their use?	Questionnaires
Are incoming students aware of intellectual property and copyrighted materials and their ethical use?	To determine whether incoming students are aware of intellectual property and copyrighted materials and their ethical use.	Questionnaires

1.7 Significance of the study

Research studies conducted are always of great importance to various stakeholders. The importance of this particular study includes the following:

Theoretically, the study will help in adding on the already existing knowledge of information literacy skills among undergraduate students. Although there are IL studies in Kenya, few if any exist on IL skills among incoming students. The study will help bridge the gap that exists due to lack of information studies among incoming students in Kenya. It will also form a basis for further research in the area of information literacy.

The study will be of great significance in terms of policy formulation by universities and library management. The findings of this study will help form the basis on which the university library can engage in information literacy programmes that will address the needs of incoming students. It is hoped that it would assist in laying the foundation on which information literacy programmes and curriculum can be designed in relation to the presumed information literacy skills among incoming undergraduate students. To other university libraries, the research will provide an important reference point for launching their own IL programmes, as well as conducting IL and competency assessment of their first-year undergraduate students.

Practically, the study will be of great significance to information professionals working in university libraries. It is hoped that the study will help point out the strengths and weaknesses of IL skills for incoming undergraduate students.

The study will also be important to the university under study in two ways, as it will help librarians working in the university library in assessing IL skills among incoming students. It will also help create awareness among students on the importance of information skills and the role it plays in their research assignments.

1.8 Scope and limitation of the study

The study was carried out at the Catholic University of Eastern Africa, Kenya. According to SCONUL (2011), IL is an umbrella term, which encompasses concepts such as digital, visual and media literacies, academic literacy, information handling, information skills, data curation and data management. The study limits itself to information literacy skills among incoming undergraduates joining the university in the academic year 2013/2014. The Chartered Institute of Library and Information Professionals (2012) notes that IL is knowing when and why you need information, where to find it and how to evaluate, use and communicate it in an ethical manner. It highlights the following skills:

- A need for information
- The resources available
- How to find information
- The need to evaluate results
- How to work with or exploit results
- Ethics and responsibility of use
- How to communicate or share your findings
- How to manage your findings

The study sought to determine incoming undergraduate students' skills with regard to information handling and information skills, especially library instruction and basic computer skills. It also sought to determine their ability to identify information resources in various formats, their knowledge of search strategies, knowledge of information retrieval tools and their use, basic computer skills that enable them to make use of information resources and copyright and intellectual right issues in relation to the ethical use of academic information resources.

1.9 Literature review

Literature review is an important aspect of this study and it helped to bring IL skills among students into perspective, highlighting the gaps existing in relation to the assessment of information literacy skills among incoming first-year students.

1.9.1 Historical development of the concept of information literacy

The focus of the literature review was laid on the importance of information literacy and emphasis by various organisational bodies. The historical development of information literacy was discussed. It helped to bring into perspective the emergence and growth of the concept of information literacy around the world from 1960s to currently. This was highly important for this study because it assisted in understanding the importance of information literacy from the time the term was first used in the 1970s and how it has evolved from bibliographic instruction to IL.

1.9.2 Importance of information literacy

The importance of IL in higher education has gained prominence among librarians and academicians. The role of IL skills among students cannot be underrated. In view of this, the importance of IL is also discussed.

1.9.3 Literacies related to information literacy

IL does not operate in a vacuum. There is a relationship between IL and other literacies. With regard to this, other related literacies have already been discussed. They include numeracy, functional literacy and ICT literacy.

1.9.4 Information literacy standards and models

The issue of IL standards and models around the world is another important topic that was discussed while reviewing literature. The importance of information literacy standards and models cannot be underrated. The standards are important because they act

as benchmark for both information literacy training and assessment. Some of the information standards that have been discussed included ALA information literacy competence for higher education, Australian and New Zealand information literacy framework while some of the models discussed included Eisenberg & Berkowitz Big6 information skills model, Kulthau information research process model, and SCONUL seven pillars of information literacy.

1.9.5 Information literacy conceptual framework

The conceptual framework has been examined in literature review. As indicated by Orodho (2004:29) a conceptual framework represents the relationships between variables in the study and shows the relationship graphically or diagrammatically. The conceptual framework in this particular study shows diagrammatically the relationship between an information-literate student and presumed IL skills. It is importance because it helps show the proposed relationship between the two. The SCONUL seven pillars of information literacy (2011) was used as the conceptual framework for this study.

1.9.6 Methods and approaches of assessing information literacy

The methods and approaches used in assessing IL were also discussed because the study aimed at assessing information literacy skills among incoming first-year students. The topic is of great importance, especially with regard to the various tools used in IL assessment. Some of the methods discussed used in information literacy assessment include; Standardized Assessment of Information Literacy (SALIS), ETS iSkills, James Madison University's Information Seeking Test (ISST), Measuring the Impact of Networked Electronic Services (MINES).

1.9.7 Information literacy skills among students

In relation to the aim of this study, the assessment of IL skills among incoming undergraduate students is key to this particular study and forms part of the literature review. The review of literature on IL skills among students was important since it helped to understand the topic from a wider perspective. Under this heading, the importance of

information skills among undergraduate students has been explored. The literature reveals problems relating to students' skills.

1.9.8 Related studies

Review of related studies was discussed under the following sub-topics:

- *Awareness of search strategies*
- *Information technology skills among students*
- *Student's knowledge of information retrieval tools*
- *Students' knowledge of the types of sources and their formats*
- *Intellectual property and fair use of resources by students*

This was particularly of importance because it helped identify the knowledge gaps that existed in other studies. The literature has been reviewed from various sources, both in print and electronic formats. The above topics are interrelated and show the existing relationship with various aspects of information literacy. Detailed information on literature review is provided in chapter two and any sources used are provided as references.

1.9.9 Awareness of search strategies

Information research strategy is always credited to successful research. Information on research strategies used by students is reviewed in chapter two. Some of the strategies discussed included the use of Boolean logic operators.

1.9.10 Information technology skills among students

IL in relation to technology has also been discussed. The importance of technology in relation to IL cannot be underestimated. As noted by Rockman (2004), computer ownership does not guarantee information literacy; students can use information technology to manipulate data and create documents without demonstrating information literacy skills. Due to the continued development of information technology, especially

the Wide Area Networks, the demand for IL skills is on the rise. University libraries are incorporating electronic resources (online databases, e-books, e-journals), among others, in their collections, which made it necessary for students to have basic information technology skills to be able to navigate the electronic resources. One cannot discount the enormous impact that technology has in transforming the educational landscape in the past several decades and in making information easier to access, but technology alone does not make one information literate (Rockman 2004) . It is therefore hard to separate information technology from any information literacy discussion.

1.9.11 Students' knowledge of information retrieval tools

Information retrieval tools assist in obtaining the right information in the easiest way possible. And, as Tella (2009:13) notes, information gathering is a challenging task for university students in Africa. These students are given many assignments and class representations that require them to search for information on their own in an environment that seems academically unfriendly in terms of limited resources. Information retrieval tools are necessary components in any information search.

1.9.12 Students' knowledge of the types of sources and their formats

According to Tella (2009:5), a variety of information resources may be available to an individual within his / her information milieu. The type of information sources and format used by undergraduate students is reviewed. These enabled students to review what type of information sources are mostly used by university students. These sources included both electronic and print sources.

1.9.13 Intellectual property and copyright issues

The ethical use of information resources in academics is a great concern. According to Molnar, Kletke & Chongwatpol (2008), there appears to be an ongoing disconnect between students' ideas of what is ethical in terms of their personal ethics or character

and their actions in terms of intellectual property violations. The intellectual property and fair use of resources by students have been discussed in relation to their knowledge on copyrights rights and ethical use of information. This is particularly important to the topic in this study because there is a relationship between information literacy skills and use of information.

1.10 Research methodology

The section on methodology provides information about the research design, research method, and study area and target population. Also covered in chapter three are data collection procedures and methods, data collection methods and instruments, validity and reliability of research instruments, piloting of the research instruments, data analysis and presentation. The chapter also discusses the ethical concerns of the study.

A research design is the plan and structure of an investigation, conceived to obtain answers to research questions. It is the overall scheme or programme of the research (Kerlinger & Lee 2000:449). According to Punch (2005:63), a research design includes four main ideas, the strategy, the conceptual framework, the information that will be studied, tools and procedures to be used for collecting and analysing empirical materials. The study used the quantitative research approach, which, according to Creswell (2009: 4), is a means of testing objective theories by examining the relationships among variables. The study employed a case study design and was limited to the Catholic University of Eastern Africa, which is a private university located in Nairobi, Kenya. The study population consisted of incoming undergraduate students joining CUEA in the academic year 2013/2014.

Data was collected using self-administered questionnaires, distributed by the researcher to first-year incoming undergraduate students.

A pilot study was done, which helped to determine the reliability and validity of the instruments and data analysis was done using a statistical package for social sciences (SPSS).The chapter also provides the ethical concerns of the study. This entailed

obtaining permission to conduct the study from the university under study and from the university where the researcher is undertaking her studies. Voluntary participation and confidentiality of the participants was part of the ethical consideration that was upheld during the study.

1.11 Organisation of the dissertation

The dissertation is organised in six chapters as outlined in Figure 1, namely Introduction, Literature review, Research methodology, Presentation of the findings, Discussion of the findings, summary of the research findings, conclusions and recommendations.

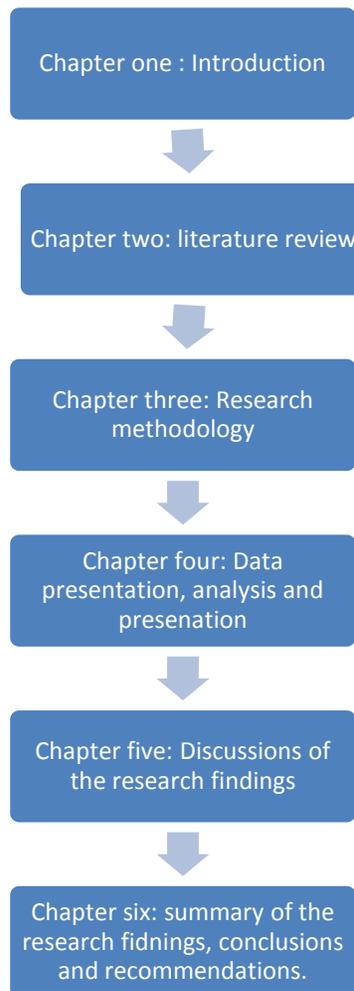


Figure 1: Overview structure of the dissertation

Chapter one: Introduction

Chapter one includes the introduction and background of the study, which comprises; conceptual setting, contextual setting, statement of the problem, purpose of the study, objectives, and research questions, significance of the study, scope and limitation of the study. The chapter also outlines the literature review and the various topics discussed under literature review.

Chapter two: Literature review

The chapter consists of reviewed literature related to information literacy among undergraduate students.

Chapter three: Research methodology

It is the master plan of the research and outlines the research methodology employed. The research methodology comprises research design, study area, target population, data collection methods and procedures, data collection procedure, data collection instruments, and pretesting of instruments. Finally, the chapter presents the ethical concerns of the study.

Chapter four: Data presentation, analysis and interpretation of the findings

Chapter four is an important component of the dissertation. It contains data analysis, interpretation and presentation. The research results are contained in chapter four whereby data analysis was presented based on the research questions. As Kerlinger & Lee (2000: 191) report “the analysis of research data, does not in and of itself provide the answers to research questions. Interpretation of the data is necessary”. In chapter four, data analysed was interpreted and presented in various formats, percentages, pie charts and graphs.

Chapter five: Discussion of the findings

The research finding was discussed under the following sub-headings.

- Gender participation
- Awareness of search strategies among incoming undergraduate students
- Basic information technology skills
- Knowledge of information retrieval tools and their use
- Knowledge of information sources and formats
- Intellectual property and copyright issues.

Chapter six: Is the final chapter of the dissertation and consists of a summary of the research findings, conclusions and recommendations.

1.12 Dissemination of the research findings

According to Wellington & Szczerbinski (2007:170), a piece of research cannot be considered complete, unless it enters the public domain. Its findings should be disseminated. A completed copy of the dissertation was submitted to the university where the researcher is registered, which made the findings of the research available and accessible to users. Another copy of the dissertation was submitted to the university under study. In future, the dissertation will be converted into a journal article to be published in a peer reviewed journal. This would enable the research finding to be widely available and accessible.

1.13 Chapter summary

Chapter one brought into perspective the background information of the study. It highlighted both the conceptual and contextual settings. The chapter outlines the statement of the problem, purpose of the study, objectives of the study, research questions which guided this particular study, significance of the study, scope and limitations of the study. It also outlines how the literature was reviewed and the research methodology used in the study. Finally, it outlines how the study is organised in the various chapters and how the research findings will be disseminated.

1.14 Operational definitions of the terms

Information-seeking behaviour: Is the purposive seeking for information because of a need to satisfy some goal (Wilson, 2000).

Information literacy: In the context of this study, information literacy refers to a set of abilities requiring individuals to “recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information.” (Information Literacy Competency Standards for Higher Education, ACRL, 2000).

Information resources: Refer to reading materials available in different formats such as print format and electronic format.

Information literacy assessment: Evaluation of the level of information literacy skills among individuals.

Institutions of higher learning: In this particular study, institutions of higher learning refer to universities and colleges offering higher education.

Lifelong learning: The provision or use of both formal and informal learning opportunities throughout people’s lives in order to foster the continuous development and improvement of the knowledge and skills needed for employment and personal fulfilment (<http://dictionary.reference.com>).

Literacy rate: Is defined as the percentage of people who can, with understanding, both read and write a short, simple statement about their everyday life (World Bank, 2007).

University library: Refers to the building used to store information materials.

Vision 2030: Kenya’s blueprint (strategic plan) for development (Government of the Republic of Kenya : 2007).

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter focuses on the review of the literature related to the topic “information literacy among incoming first year undergraduate students”. The interest in IL skills among undergraduate students arose from the importance placed on IL skills and competencies in education, research and lifelong learning. Literature review has several benefits such as that it helps the researcher to find out what has been done in the area or subject related to the research problem that is being investigated. It also helps to draw attention to previous studies conducted in the same field and research topic (Bryman, 2008:95, Neuman 2006: 111). In this study the review of literature is organised in themes related to information literacy and related topics.

The chapter reviews the literature under the following heading and subheading:

- Historical development of the concept of IL
- Importance of IL
- Literacies related to IL
- IL standards and models
- SCONUL seven pillars of IL conceptual frameworks
- Methods and approaches of assessing IL
- IL skills among students
- Related studies

Awareness of search strategies

IT skills among students

Students' knowledge of information retrieval tools

Students' knowledge of the types of sources

Intellectual property and fair use of resources by students

The literature is reviewed in line with the objectives of the study, which included the following:

- i. To determine whether the incoming undergraduates are aware of search strategies for both print and electronic/online resources.
- ii. To determine whether incoming undergraduate students possess basic information technology skills.
- iii. To find out whether the incoming undergraduate students know information retrieval tools and their use.
- iv. To identify the type and formats of resources that incoming undergraduate students are aware of.
- v. To determine whether incoming students are aware of intellectual property and copyrighted materials and their ethical use.

2.2 Historical development of the concept of IL

In order to fully understand the historical development of IL the way in which it started and how it has continued to grow should be reviewed. A paper on “Information Literacy Instruction: a history in context” by Gilton, (n.d.) traces the development of IL through bibliographic instruction of the late nineteenth and early twentieth century. Gilton (n.d.), states that a number of universities offered courses on library use in the nineteenth century and early twentieth century. The courses combined the history of books and libraries with basic research strategies and critical evaluation of materials. Gilton (n.d.) further notes that there were developments between the years 1920-1980 that were important for the history and the future of teaching about information, although the developments had little effect on most libraries. According to Gilton (n.d.), four of the most important developments related to library instruction during this period were; the bibliographic instruction programme by Lamar Johnson at Stephens College; the publication of Louis Shores article about “library colleges”, the publication of “teaching with books” by Harvie Branscomb; and two early studies of student knowledge and the use of library resources in the 1930s by Peyton Hurt and C. M. Loutt & James R. Patrick. On one hand, Lamar offered orientations, instruction in the use of basic reference tools,

point of use instruction, individualised instruction, course-related instruction, and full courses at Stephens College in the years 1931-1950. On the other hand, Louis Shores' "library college" article focused on why libraries should be the centre of colleges, that students should be educated by doing independent studies in libraries, and that lecturers should be "librarian-teachers" (Gilton, n.d.).

According to Gilton,(n.d.), two programmes that were influenced by Shores' "library college" concept, were major catalysts to the development of a full bibliographic instruction movement in academic libraries in the 1970s. One of the programmes included the Monteith experiment at Wayne State University led by Patricia Knapp in 1960-1962 (Gilton, n.d., Hardesty, 1995, Pashaie, 2004). Hardesty, (1995:340) notes that Knapp pioneered modern bibliographic instruction through such efforts as the Monteith college project. Pashaie (2004:7) is of the view that the experiences and success of Knapp led to much interest in Bibliographic Instruction among academic librarians in the 1970s. The interest paved way in the early 1970s for the creation within the Association of College and Research Libraries (ACRL) of the ad hoc bibliographic committee, leading to the eventual creation of the bibliographic section of ACRL in 1977 (Pashaie 2004:7). Patricia Knapp's programme at Monteith College in the 1960s brought a sophisticated understanding of the library and bibliographic instruction to the forefront of undergraduate experience (Pashaie, 2004:6). Gilton,(n.d.) and Pashaie, (2004) noted that the programme attempted to integrate bibliographic instruction into the college curriculum. In 1966, Knapp introduced an "instruct the instructors" programme in order to educate instructors on the uses of library resources and their educational value. She also devised a plan of instruction for the students that would integrate library use into the framework of variety of courses across the curriculum; the instructions entailed assignment-based problem-solving activities devised to emphasise the process of research (Pashaie, 2004:7).

The other one was a similar programme started by Evan Farber at Earlham College (Gilton, n.d.), which proved to be a success and motivated Farber to make a presentation to the American Library Association in 1969. Gilton (n.d.) notes that Farber's

presentation helped spark a full-scale national movement for bibliographic instruction (BI). Hardesty (1995:340) concurs by stating that “the modern bibliographic instruction can be dated from Farber’s presentation in 1969 to the college libraries section of the Association of College and Research libraries, followed by Kennedy’s (1970) article in *Library Journal*”. To summarise it all, Gilton (n.d.) was of the opinion that bibliographic instruction “caught fire” in 1969. Consequently, “information literacy” has evolved from library instruction in the 1960s and bibliographic instruction of 1970s. Hardesty noted that by the early 1970s, bibliographic instruction had emerged as an authentic movement with its own conference at Eastern Michigan University (Hardesty, 1995:340).

Gilton (n.d.:14) opined that:

“Traditional bibliographic instruction was most successful in promoting immediate and specific information use in local libraries. The emphasis of much of this instruction was on how to find information. This movement matured in the 1980s and created a new specialized journal and other books, but the biggest event of the decade was the gradual growth and development of a distinct *information literacy movement*, which would absorb bibliographic instruction in the 1990s. The 1980s would turn out to be a very transitional decade”.

Johnston & Webber (2003: 336) are of the opinion that bibliographic/library instruction provides theoretical underpinning for the aspect of information literacy.

The concept of information literacy first appeared in the 1970s (Behrens 1994; Wooliscroft 1997; Bruce 2002). The term was coined by Paul Zurkowski (Johnston & Webber 2003:336) who first used it in 1974 while submitting a proposal to the National Commission on Libraries and information Science (NCLIS). He suggested that people trained in applying information resources to their work could be called information literates; they have learned techniques and skills for utilising the wide range of information tools as well as primary sources in moulding information solutions to their problems (Behrens, 1994:310). The concept of IL again appeared in 1976 in a paper presented by Lee Burchinal at the Texas A&M University library symposium that considered the future of organising knowledge (Behrens 1994:310). According to Burchinal (1976), being information literate requires a new set of information skills.

These include how to efficiently and effectively locate and use the information needed for problem-solving and decision-making.

As IL gained momentum in librarianship, it was embraced and it replaced terms like library skills, library use or bibliographic instruction (Lawrence J. McCrank cited by Maughan 2001: 72). Salleh et al. (2011: 506) noted that IL evolved over a long history of library traditions, which included library orientation, library instruction or bibliographic instruction. Johnston & Webber (2003:336) are of the view that two areas that have been particularly influential to information literacy are information science and bibliographic/library instruction. According to Gilton (n.d.), between 1945 and 1981, the U.S.A was gradually changing from a modern industrial society to a post-modern information-based society. New information industry that used computers as its driving force emerged. Bruce (2002) noted that the idea of IL emerging with the advent of information technologies in the early 1970s, has grown, taken shape and strengthened to become recognised as the critical literacy of the 21st century. In the 1980s the new technologies begun to permeate society (Behrens, 1994). Warnken (2004:151) argues that it was not until the 1980s, when the technology was heavily impacting on library services that the term began to take on more specific meaning. Warnken (2004:152) opines that technology impact on libraries has changed the focus from “bibliographic instruction” which referred to traditional library resources to “information literacy” a much more inclusive concept that takes into account and integrates the rapid advances in digital technologies that have proliferated the amount of information available. Behrens (1994) also noted that by the middle of 1980s the advancing information technology (IT) had begun to affect the information-handling requirements for IL.

In the 1980s there were heightened activities regarding information literacy. Gilton [n.d.] highlights some of the events that led to the foundation of information literacy instruction as “*A nation at risk*” (Behrens, 1994, Gilton, n.d.) a report published in 1983, which identified the management of information in electronic and digital forms as an important skill in learning society. Several researchers who published works on information literacy such as Jacqueline Macnall, Shirley Aaron and Sue A Walker, members of the National

Commission on Libraries and information Service (NCLIS) with their paper “*Educating students to think*” and Carol Kuhlthau who published “*Information skills for an information society*” (Gilton, n.d.) are also mentioned.

Another initiative was the appointment in 1987 of a committee on information literacy. This committee was appointed by the ALA president with the mandate to define “information literacy within higher literacies, and its importance to students’ performance, lifelong learning, and active citizenship. To design one or more models for information literacy development, appropriate to formal and informal learning environments throughout people’s lifetimes and determine implications for continuing education and development of teachers” (ALA 1989). In 1989 the ALA presidential committee on information literacy released its final report (Behrens, 1994; Warnken, 2004). The report emphasised the importance of achieving information literacy and stressed that it could be achieved by means of a new model of resource-based learning. The report was widely publicised and gained significant attention worldwide. As a result, the ALA’s definition of information literacy is the most widely used today and the awareness of the importance of information literacy grew in the 1980s (Behrens, 1994:317).

In 1990, the National Forum on Information Literacy (NFIL) was established (Gilton, n.d, Johnston & Webber, 2003:337). This forum was formed as a result of the ALA report of 1989, which recommended that a coalition be formed to coordinate national organisations that promote information literacy (Behrens, 1994). The NFIL as an organisation examines the role of information in libraries; integrates information literacy into their programmes, support, initiates, and monitors programmes in the U.S. and abroad; encourages the creation and adoption of information literacy guidelines; and works with teacher education programmes to make sure teachers incorporate information literacy in their curriculums. Another organisation dealing with information literacy is the Institute of Information Literacy, a part of the ACRL, which was established in 1998 (Gilton, n.d., Johnston & Webber, 2003:337). Both the National Forum on Information

Literacy and Institute for Information Literacy were instrumental in formulating IL standards for schools and higher education sectors (Salleh, et al. 2011: 507).

From the foregoing discussion, the development of information literacy concept cannot be attributed to an individual or single institution. Horton (2008:1), in his work entitled *Understanding information literacy; a primer*, notes that “information literacy is a concept that cannot be credited to an individual, a single research study or a cause, but rather it is a convergence of myriad thinking drawn from 'developments, disciplines, sectors and areas of research', notably: The International Action Plan for Implementing Resolution 56/116 of the Dakar Framework for Action, which called for 'a renewed vision of literacy that goes beyond the limited view of literacy that prevailed in the past'. Paul Zurkowski's paper of 1974 on the need for people to become information literate in order to survive in the information age, changing definitions and standards, technological revolution, and 'A Presidential Committee on Information Literacy established by the American Library Association; Final report published in 1989”.

2.3 Importance of information literacy

The importance of information literacy skills in both the community and institutions of higher learning cannot be overemphasised. As Salleh et al. (2011: 507) state, many countries in the developed and developing parts of the world recognised the importance of information literacy among their citizens and implemented programmes to inculcate the information literacy competencies and skills among students at all levels. Hadimani & Rajgoli (2009: 2) opined that IL has a greater significance for economic growth, educational achievement and social cultural and personal wellbeing. According to Wooliscroft (1997:1), IL is vitally tied to the strategic value and use of information. IL skills are important to lifelong learning of students and the general public. Salleh et al. (2011: 507 and Hadimani & Rajgoli, 2009: 1) opined that IL has formed the basis of the learning processes, which could be practised in all disciplines, in all learning environments and at all levels of education. It enables learners to master the context and extend their investigations, become more self-directed and assume more control in their

own learning (Hadimani & Rajgoli, 2009: 1). The ALA noted that IL allows people to cope by giving them the skills to know when they need information and where to find it effectively and efficiently. It includes the technological skills needed to use the modern library as a gateway to information. It enables us to analyse and evaluate the information we find, thus giving us confidence to use that information to make a decision or create a product. The ALA imitates that IL is a solution to data smog, which is a term coined by David Shenk. Data smog refers to the idea that too much information can create a barrier in our lives (<http://www.ala.org>).

IL is critical to both lifelong learning and day-to-day activities. Lifelong learning incorporates both formal and informal education, ranging from basic education, tertiary education and adult education. The importance of IL in lifelong learning is highlighted by the ALA's IL standards on higher education which state that "Information literacy is a key component of, and contributor to, lifelong learning. Information literacy competence extends learning beyond formal classroom settings, and provides practice with self-directed investigations as individuals move into internships, first professional positions, and increasing responsibilities in all areas of life. Because information literacy augments students' competence with evaluating, managing, and using information, it is now considered by several regional and discipline-based accreditation associations as a key outcome for college students" (ALA 2000:4). The Alexandria meeting of experts held by the National Forum on information literacy in 2005 proclaimed that IL and lifelong learning are the beacons of the information society, illuminating the courses of development, prosperity and freedom. It also went further and stated that, "Information literacy lies at the core of lifelong learning by empowering people of all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals (National Forum on information literacy, 2005)".

The meeting of experts also emphasised the importance of lifelong learning by stating that:

"Lifelong learning enables individuals, communities and nations to attain their goals and to take advantage of emerging opportunities in the evolving global environment for

shared benefits. It assists them and their institutions to meet technological, economic and social challenges, to redress disadvantage and to advance the well-being of all (National Forum on Information Literacy, 2005:1)”.

As lifelong learners, individuals must have IL skills, which are a necessity to their continued success in both workplaces and in the educational environment. Wooliscroft (1997:5) argues that “since characteristic of the present time is an overwhelming amount of information, it is imperative that people develop a mind-set that predisposes them to continue learning throughout their lives to keep abreast of relevant developments thus remaining engaged in a real sense to the world about them”. The current information age requires IL to enable every individual to survive in the current competitive times. According to Wooliscroft (1997:3) IL provides an important connection between information society and the learning society. He further states that IL skills assist people to learn and relearn, to train and retrain as the various vicissitudes of living in a rapidly changing world require them to be adaptable and flexible with speed and competence barely imaginable few years ago. Donald (1999:36) links the needs for skills and learning in the knowledge society by stating that

“in the knowledge era, construction of and access to information will determine well-being. More specifically, the internet sends the message that the race is only for those who have access to computer keyboard. Not only will both general and specialized knowledge be needed, but so will skills to acquire and utilize it on a continuous lifelong learning”.

2.4 Literacies related to information literacy

According to Horton (2008:3), literacy encompasses a wide range of individual functionalities, each of which can be observed and measured on a scale of competencies, i.e. beginner, intermediate and advanced. Modern demands of literacy include far more than decoding and producing text; they have expanded to include information processing and critical-thinking skills (Ntiri 2009). There are several types of literacies such as functional literacy, computer literacy, financial literacy and media literacy, among others.

According to Bilawar & Pujar (2011), information literacy has a bunch of ‘literacies’ in terms of components, which include basic literacy, library literacy, media literacy, ICT literacy, computer literacy, among others. Ntiri (2009) notes that the new wave of global change and technological innovation has further pushed the boundaries of literacy and led to the growth of multiple literacies to address diverse audiences and needs. Although each component is often treated separately, all literacies rely on each other and sometimes build on each other. Horton (2008:3) notes that it includes many learnable skills, positive attitudes and behaviour that impact on every aspect of one’s life. Stedman & Kaestle as cited by Ntiri (2009), are of the view that literacy cannot be thought of as a single set of skills, but various skills by which a person may demonstrate different levels of competence. Characterising someone as literate or illiterate raises the question of degree and type of literacy. Horton (2008:3) argues that information literacy must not be seen as standing alone as if it were some arcane technical subject that one would learn and then forget about. This section provides a synopsis of literacies related to information literacy, namely functional literacy and ICT literacy.

2.4.1 Functional literacy

Olaleju (2010:112) defines literacy as the ability to read and write at a level of proficiency adequate for communication. Olaleju further states that literacy can be described as the ability to read and write and use numeracy to handle information. Ntiri (2009) notes that literacy demands have undergone a major shift and moved beyond the traditional. They now focus on readying individuals and nations for economic performance. Olaleju (2010:112) concurs by stating that literacy promotes access to higher education, increased job opportunities, higher socio-economic status and improved health. The term “functional literacy” came into common use in the 1960s, when the United Nations Educational, Scientific and Cultural Organization (UNESCO) began addressing the lack of literacy skills among a large percentage of the population of adults and out-of-school children in developing countries (<http://www.oxfordbibliographies.com>).

Functional literacy is also referred to as basic literacy. Horton (2008:34), refers to functional literacy meaning the classic or conventional literacies of learning how to read, write and how to perform numeric calculations and operations so that an individual can function at the most basic or elementary level in society at home, at work, at school, and in community settings; basic literacies in almost all societies are learnt in primary formal educational settings, but sometimes, where learnt are not available, such as in remote and isolated villages, basic literacies are learned at home or in non-formal community centres. Olaleju (2010:113) describes functional literacy as the empowerment of adults to meet the reading and writing demands placed on them. Olaleju (2010:113) further notes that functional literacy refers to those approaches to literacy which stress the acquisition of appropriate verbal, cognitive and computational skills that can help the learner function effectively in culturally specific setting. Functional literacy acts as the foundation for other literacies such as computer literacy, media literacy and information literacy, among others. This is because functional literacy is core to the progression of the other literacies.

2.4.2 ICT literacy

Educational testing service (ETS) (2002:2) defines ICT literacy as the ability to use digital technology, communication tools and or /networks to access, manage, integrate, evaluate, create and communicate information ethically and legally in order to function in a knowledge society. According to ETS (2002:3), the definition lists five critical components of ICT literacy. The five components represent a set of skills and knowledge presented in a sequence that suggests increasing cognitive complexity. These components include to access, manage, integrate, evaluate and create. Katz (2005) refers to information and communication technology (ICT) literacy skills as the ability to effectively research and communicate using technology necessary to navigate and make good use of the abundance of information today. In their report, ‘ Transformation’ 2002, ETS notes that it is only in the integration of technology skills and cognitive skills, such as traditional literacy, numeracy and problem solving that one can adequately define ICT literacy. The ETS (2002) definition brings together concepts in information communication technology. It brings out the issue of digital technology and communication tools or networks. It is hard to discuss ICT literacy without touching on

computer literacy and digital literacy which are also synonymous with ICT literacy. Computer literacy, digital literacy and ICT literacy are all interrelated and intertwined converging together in the new technologies. They also related to information literacy, which is the topic under study.

Horton (2008:4) defines computer literacy as a set of skills, attitudes and knowledge necessary to understand and operate the basic functions of information and communication technologies, including devices such as laptops. Computer literacy is usually subdivided into hardware and software. Childers (2003:101) opines that other terms such as computer competency, digital literacy, internet literacy, computer skills, informatics and computer proficiency are used to define computer literacy. Computer literacy involves skills aimed at helping one understand how to use computers. Childers (2003:102) tries to differentiate between computer proficiency and computer literacy by arguing that computer proficiency should describe the skills needed to do whatever tasks are necessary on computer. He further states that proficiency is not literacy, but the ability to do things based on rote memorisation or using very little adaptation. However, proficiencies can be used to estimate a person's computer literacy.

The concept of digital literacy, according to O'Brien & Scharber (2008: 66) has a wide range of descriptors such as; digital media, new technologies, new literacies or new literacy studies (NLS). O'Brien & Scharber (2008:66) defines digital literacy as socially situated practices supported by skills, strategies and stances that enable the representation of ideas using a range of modalities enabled by digital tools. Digitally literate people not only represent an idea by selecting modes and tools, but also plan how to juxtapose spatially and temporarily multimodal texts to best represent ideas. Digital literacies enable the bridging and complementing of traditional print literacies with other media (O'Brien & Scharber, 2008:66). Goodfellow (2011) refers to 'digital' as the latest descriptive term used in education to express the incorporation into its activities of new information and communications media. It succeeds 'computer' (-based, -assisted and -mediated), 'online', 'networked', 'web-based' and the now ubiquitous 'e-'. Eshet-Alkalai (2004:93) argues that digital literacy involves more than the mere ability to use software

or operate a digital device; it includes a variety of complex cognitive, motor, sociological and emotional skills, which users need in order to function effectively in digital environments. Digital literacy has been necessitated by the growth of technology involving digital applications. Poore (2011) outlines some of these applications as Facebook, You Tube, iTunes and Smartphone, among others. O'Brien & Scharber (2008) notes that digital literacy is at the core of new literacies and they are here to stay.

The need for ICT literacy is well explained by Katz (2005) who notes that just because someone can navigate a website, or even knows how to construct a website it does not mean that the person can identify reliable, authoritative resources from the web or know how to best interpret and communicate a website's content via a well-supported argument. He argues that technological competence alone does not equal ICT literacy. In the current knowledge-based society, ICT-literacy skills are a necessity. This is well captured by Katz (2005:2) who states that:

“Whether one is gathering information about a political candidate using the Internet, communicating with a friend via e-mail, managing personal finances or looking up a book on a computerized catalogue at the library, the evidence of our technology and information centric society surrounds us. The costs of not being able to find and process information effectively via technology are real barriers in academia, the workforce and society”.

The relationship between information literacy and ICT literacy cannot be underscored. Katz (2005:3) opines that ICT literacy is a specialisation of information literacy, focusing on information competence as demonstrated through technology. Childers (2003: 3) noted that some of the computer literacy fervour has shifted to a concept termed information literacy. Information literacy is usually defined as the combination of traditional literacy concepts and fundamental computer-literacy skills. When someone talks about IL, the computer skills component is usually assumed, or a secondary thought after the skills of assessing and using information. Katz (2005:3) states that ICT literacy focuses on the skills needed to use technology effectively when dealing with and communicating information. ICT literacy focuses on the critical thinking and problem

solving that we do when dealing with information in digital environments. It consists of the research and communication skills that occur in the context of technology. Whereas these skills are often gained through education, they extend well beyond the academic life to the workplace and other real-world pursuits that help us function in an information- and technology-rich society. On the other hand, Eshet-Alkalai(2004:94) in his paper “*Digital literacy: a conceptual framework for survival skills in the digital era*” proposes a conceptual framework for the concept of digital literacy incorporating five types of literacy: photo visual literacy, reproduction literacy, information literacy, branching literacy and social emotional literacy.

2.5 Information literacy standards and models

There are several information literacy standards and models developed by various institutions around the world. The models and standards of information literacy are used for communicating the character of information literacy, for curriculum design and evaluation for staff development and for assessing students (Bruce, 2002). Some of the standards that exist especially for higher education include Association of College and Research Libraries (ACRL), (2000) developed in the USA, Australian and New Zealand information literacy framework, while some of the models include SCONUL (1999) developed in the UK, models such Kuhlthau information search process (1989), Eisenberg & Berkowitz the Big 6 (1990) among others. According to Warmkessel (2007), ACRL’s information literacy competency standards for higher education (2000) provided for guidelines for librarians and others in higher education who had been struggling to develop performance measures for IL.

The importance of information literacy is underlined by various efforts by learning institutions, especially higher learning institutions, to standardise information literacy by developing information literacy standards. The importance of information literacy standards in information literacy is summarised by Salleh et al. (2011: 508) who states that:

“Standards have been conceptualized, developed and endorsed to help in the planning, implementation and continuous evaluation of information literacy initiatives. These standards were aimed to help libraries to understand the concept of information literacy, their roles in fostering literacy programs. The standard enabled libraries to measure students and graduates information literacy competencies.”

The existing information literacy standards are tailored for institutions of higher learning in the developed countries. The SCONUL (1999) model was specially designed for institutions of higher learning in the United Kingdom while the ALA (2000) Information Literacy Competency Standards for Higher Education were designed for the United States. No information IL was specifically designed to cater for developing countries. However, the assumption is that the available IL standards can be applied to students anywhere around the world, but with modifications to suit different institutions.

According to Mokhtar & Majid (2008), standards not only list the information-related competencies that students ought to possess and exhibit, but they also make recommendations as to how these competencies can be integrated into school curricula and they also give the various strategies that can be implemented to effectively impart these competencies to students. Cahoy (2002:12) describes two information literacy standards in the United States of America, “Information Literacy Standards for Student Learning”, published in *Information is Power: Building Partnership for Learning* by the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT) in 1998, and “Information Literacy and Competency Standards for Higher Education” published by The Association of College and Research Libraries (ACRL) in 2000. According to Cahoy, both sets of standards ‘communicates the skills that students need in order to be lifelong learners, critical thinkers, and effective users of information’. The AASL/AECT standards were meant for K-12 students, whereas the ACRL standards were meant for undergraduate students. Cahoy views the two sets of standards as a means of collaboration between high schools and universities, to ensure the continuum of information literacy skills training and a smooth transition and integration of students leaving high school and joining universities. Also, as a means of stymieing the high dropout rates of students joining universities due

to their inability to cope with rigours of university education. According to AASL /AECT K-12 Standards, an information literate individual is able to: Access information efficiently and effectively, evaluate information critically and competently, use information accurately and creatively. While as per the ACRL post-secondary standards an information literate individual is capable of determining the extent of information needed, accessing the needed information effectively and efficiently, evaluating information and its sources critically, incorporating selected information into one's knowledge-base, using information effectively to accomplish a specific purpose and understand the economic, legal and social issues surrounding the use of information, and accessing and using information ethically and legally (Cahoy 2002: 14).

Some of the information literacy standards and models adopted around the world and commonly used by schools, colleges, and universities include the following:

- Information literacy competence standards for higher education by ALA in 2000
- Australian and New Zealand information literacy framework by ANZIIL in 2004

The following is a brief explanation of aforementioned standards.

2.5.1 The ALA information literacy competency standards for higher education

In 1987, Margaret Chisholm, the then president of the ALA, appointed a presidential committee on IL to review issues pertaining to information literacy (ALA 1989). The result of the above committee was the IL competency standards for higher education published by the ALA in 2000. The ALA considers information literacy as being critical in developing lifelong learners who have 'the intellectual abilities of reasoning, critical thinking, and learning how to learn' (ALA 2000:4).

According to the ALA (2000:5) Information Literacy Competency Standards for Higher Education provide a framework for assessing the information literate individual. It also extends the work of the American Association of School Librarians Task Force on

Information Literacy Standards, thereby providing higher education an opportunity to articulate its IL competencies with those of K-12, so that a continuum of expectations develops for students at all levels. This is also noted by Fitzpatrick & Meulemans (2011:142) who state that the standards provide a framework for academic librarians in developing, delivering and assessing instructions on finding and using information in the higher educating setting, both within majors and in general education courses. The ALA Information Literacy Competency Standards for Higher Education consist of five standards, 22 performance indicators, and their outcomes. These standards provide a base which can be used to mount an information literacy programme, besides preparing an information literacy assessment test for incoming first-year undergraduate students to determine their information literacy skills. According to the standards students must(a)determine the nature and extent of information needed, (b)access needed information effectively and efficiently,(c)evaluate information and its sources critically and incorporate selected information into their knowledge base and value system,(d)use information effectively to accomplish a specific purpose and, (e)understand many of the economic, legal and social issues surrounding the use of information, and access and use of information ethically and legally (Fitzpatrick & Meulemans, 2011:142).

According to the ALA (2000:6), the standards focus on the needs of students in higher education at all levels and list a range of outcomes for assessing students' progress towards information literacy. The outcomes also serve as guidelines for faculty, librarians and others in developing local methods for measuring students in the context of an institution's unique mission. Stewart (2011) opines that since the creation of ACRL standards, libraries used them as baseline for instruction design as well as a tool for advocating information literacy to be incorporated into institutions' learning outcomes.

2.5.2 Australian and New Zealand information literacy framework

In 2000 the Council of Australian University Librarians (CAUL) produced an Australian version of ACRL Standards for Information Literacy (Johnston & Webber 2003: 339). The Australian and New Zealand information literacy framework was derived from the Association of College and Research Libraries (ACRL) information literacy competency

standards for higher education (ANZIIL 2004:3) and borrows heavily from the ALA IL competency standards for higher education. The CAUL version of the standards took a broader approach to IL than the ALA; it spoke about the information literate person (rather than student) it also added to standards (Johnston & Webber, 2003: 339). The ANZIIL framework consists of six core standards, which underpin information literacy acquisition, understanding and application (ANZIIL 2004:7). According to ANZIIL, the framework provides principles, standards and practices that can support IL education in all sectors. It incorporates standards and learning outcomes that consist of characteristics, attributes, processes, knowledge, skills, attitudes, beliefs and aspirations associated with information literate persons (ANZIIL 2004:7). The ANZIIL information literacy framework standards are grounded in generic skills, information skills, values and beliefs. The standards put great emphasis on IL skills and lifelong learning (ANZIIL 2004:7). The standards are used for both evaluation and assessment of students' IL skills.

Table 2: Comparison of information literacy standards

	<i>ALA IL competency standards for higher education (2000)</i>		<i>Australian and New Zealand IL frame work (2004)</i>
1.	The information literate student determines the nature and extent of the information needed.	1.	The information literate person recognizes the need for information and determines the nature and extent of the information needed
2.	The information literate student accesses needed information effectively and efficiently.	2.	The information literate person finds needed information effectively and efficiently
3.	The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.	3.	The information literate person critically evaluates information and the information seeking process
4	The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.	4.	The information-literate person manages information collected or generated
5	The information literate student understands many of the economic, legal and social issues surrounding the use of information and accesses and uses information ethically and legally.	5.	The information literate person applies prior and new information to construct new concepts or create new understandings

		6. The information literate person uses information with understanding and acknowledges cultural, ethical, economic, legal, and social issues surrounding the use of information.
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A comparison of the two standards, as shown in table 2 shows the various skills an information literate person should have. As noted by Catts & Lau (2008), all standards recognize with different emphasis, the ability to recognise an information need and the capacity to locate, evaluate, store, retrieve and apply information and to communicate new knowledge. They all can measure and provide a framework for accessing information literate persons. Also, the above three IL standards are similar because all of them share the principle that IL skills are a continuum, both in terms of capacities required at different levels of human endeavour (Catts& Lau, 2008). Although there are differences between the two standards(the ALA (2000) and ANZIIL (2004), in the numbers of the core standards and performance indicators, they can all be used as benchmarks to measure IL skills among students.

2.6 Information literacy models

According to SCONUL (2011a), a model defines the core skills, competencies (abilities),attitudes and behaviours (understanding) at the heart of IL development in higher education. Bilawar & Pujar (2011) opine that defining and applying search strategy, interpreting, analysing, synthesis, evaluating and communication are basic objects of the information models. Some of the information models developed by experts include:

- Eisenberg & Berkowitz., The Big 6 information-solving skills (Eisenberg & Berkowitz, 1990)
- the Kuhlthau model of the information search process (Kuhlthau, 1991)
- SCONUL’s seven pillars of information literacy (Society of College, National and University Libraries, 2011).

According to Bruce (2002), the information skill models developed in the 1980s provide a series of processes or steps that students need to negotiate during information problem solving. Salleh et al. (2011: p.508) argue that all these models have contributed to the theoretical foundation of information literacy and the theories were being utilised to facilitate the planning and teaching of information literacy at all levels of education all over the world. Through the models IL have gained widespread acceptance (Salleh, et al. 20011: 508).

2.6.1 Eisenberg & Berkowitz' Big 6 information-solving model (1990)

The Big 6 information-solving model was developed by Eisenberg & Berkowitz in 1990. The models have six steps meant to help information problem-solving, which include:

- task definition
- information-seeking strategies
- location and access
- use of information
- synthesis
- education

Wolf (2003) notes that Eisenberg & Berkowitz's (1990) Big6 model is a six-step process that provide support in the activities required to solve information-based problems.

2.6.2 Kuhlthau model of the information search process (ISP)

Kuhlthau model of information search process was developed by Carol Kuhlthau. The ISP model was developed in a series of studies of the experience and behaviour of library users involved in extensive research projects and more recently people in the workplace using information for complex work-related tasks (Kuhlthau, 1999) The ISP consist of six stages:

- Initiation
- Selection

- Exploration
- Formulation
- Collection
- Presentation

The model has been used as a framework and diagnostic tool for understanding the information search experience of people in a variety of library and information settings (Kuhlthau, Heinström, & Todd, 2008). A study done to check whether the model is still useful in view of the development in the information environment showed that the information search process model remains useful for explaining students' behaviour (Kuhlthau, Hailstorm & Todd, 2008).

2.6.3 SCONUL seven pillars of information literacy

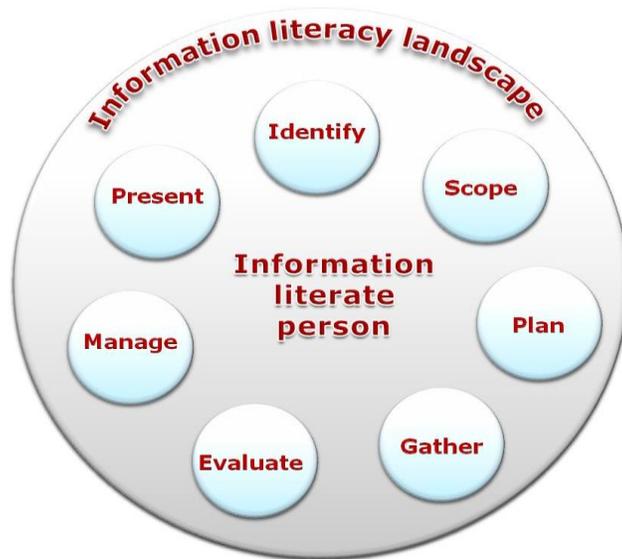
This model was chosen as a conceptual framework of the current study. Punch (2005:53) defines a conceptual framework as a representation, either graphically or in narrative form, of the main concepts or variables, and in their presumed relationship with each other. He explains that the conceptual framework is usually best shown in a diagram. He considers the following benefits of conceptual framework:

- Clarifying the research questions.
- Making explicit what we already know and think about the area and topic.
- Helping in the preparation of the research proposal and making it more convincing.
- Encouraging selection and assisting in focusing and delimiting thinking during the planning stage.

In 1999 the Standing Conference of National and University Libraries (SCONUL) developed a model for IL designed specifically for UK higher education, featuring seven pillars of information skills required to be information literate. The model which has since been revised to incorporate two components, SCONUL seven pillars of information literacy core model for higher education (2011a), and SCONUL seven pillars of information literacy research lens for higher education (2011b). According to SCONUL

(2011a) the new model reflects more clearly the range of terminologies and concepts which we now understand as information literacy.

The SCONUL (2011a) core model recognises information literacy as an umbrella term encompassing concepts such as digital, visual and media literacies, academic literacy, information handling, information skills, data curation and data management. According to SCONUL (2011a), an information literate person demonstrates an awareness of how they gather, use, manage, synthesise and create information and data in an ethical manner and will have the information skills to do so effectively. The element of ethical handling of information is highlighted in SCONUL's new model, as part of an information literate person. Appendix 1 shows skills and competencies (ability), and attitudes and behaviours from SCONUL's seven pillars of information literacy core model for higher education (2011a). According to SCONUL (2011a), developing as an information literate person is continuing, holistic processes, which are often simultaneous activities or processes which can be encompassed within the Seven Pillars of Information Literacy. Within each "pillar" an individual can develop from "novice" to "expert" as they progress through their learning life, although, as the information world itself is constantly changing and developing, it is possible to move down a pillar as well as progress upwards



Source: <https://www.sconul.ac.uk>

Figure 2: Conceptual framework adopted from SCONUL seven pillars of information literacy; core model for higher education (2011)

The SCONUL model which is illustrated in figure 2 is conceived as a three dimensional circular “building”, founded on an information landscape which comprises the information world as it is perceived by an individual at that point in time (<https://www.sconul.ac.uk>). This study adopted SCONUL seven pillars of information literacy as the framework that would appropriately inform the current study. The SCONUL framework was deemed appropriate because it was reviewed and updated in 2011 in line with the changing world of information. The SCONUL seven pillars of IL include:

- ✚ **Identify:** Able to identify a personal need for information.
- ✚ **Scope:** Ability to access current knowledge and identify gaps.
- ✚ **Plan:** Ability to construct strategies for locating information and data.
- ✚ **Gather:** Ability to locate and access the information and data they need.
- ✚ **Evaluate:** Ability to review the research process and compare and evaluate information and data.
- ✚ **Manage:** Ability to organise information professionally and ethically.

- ✚ **Present:** Ability to apply the knowledge gained: presenting the results of their research, synthesising new and old information and data to create new knowledge and disseminating it in a variety of ways.

Source: (*Society of College, National and University Libraries, 2011*)

Each pillar is described by a series of statements relating to a set of skills/competencies and a set of attitudes/understandings. It is expected that as a person becomes more information literate, he/she will demonstrate more of the attributes in each pillar and so move towards the top of the pillar (<https://www.sconul.ac.uk>). Figure 2 depicts the relationship of undergraduate students and the information literacy skills they ought to have to be able to make use of available information and to become lifelong learners and critical thinkers. As SCONUL notes, the figure is also coloured by an individual's personal IL landscape, in other words, their aptitude, background and experiences, which will affect how they respond to any IL development. IL consists of more than one skill. As Lupton (2008:399) notes, IL is a broad educational concept that has two intertwined elements, commonly understood as one seeking, locating, evaluating, selecting and organising information. It also involves using information to analyse, synthesise and create new knowledge, communicate, make decisions and solve problems.

The model has been adopted by librarians and teachers around the world as a means of helping them to deliver information skills to their learners (Bent & Stubbings, 2011). A study done by SCONUL on the “*use of SCONUL's 7 pillars model for information literacy: findings of a study of SCONUL institutions 2008-2009*” revealed that the models is used in a variety of ways, which included the following:

- ✚ Underpins IL programme design
- ✚ Used in strategy and/or policy documents
- ✚ Library or HEI IL frameworks are based on it
- ✚ Used for learning outcomes or competencies
- ✚ Provides framework for online/VLE IL module
- ✚ Used for discussion and debate; was a starting point for developing IL
- ✚ Linked to IL quiz

2.6.4 Assessing information literacy skills and competencies among students

This section deals with the:

- Importance of assessing information literacy competencies and skills among students; and
- Approaches or methods used to assess information literacy competencies and skills among students.

2.6.4.1 Importance of assessing information literacy competencies and skills among students

Assessment of information literacy skills among incoming undergraduate students in institutions of higher learning is important. Maughan (2001:74) contends that it is important to assess the IL in order “to establish a baseline of student skills around which an information literacy program might be built, to assess the effectiveness of particular library instruction sessions or approaches to instruction, to determine the impact of library instruction programs on student information literacy skills and academic success, and to generate data with which to communicate with faculty”. Moggs (2002:14-16) argues that the majority of assessment carried out by libraries in the higher education sector is meant to assess library skills rather than information skills. In addition, the assessments are evaluative and summative, aimed at gaining an understanding of the effectiveness of library courses with a view to improving them but not to establishing the deficiency of information literacy skills of the undergraduates. She further asserts that diagnostic assessment in the IL to assess the need of students for training in IL is uncommon. However, she advocates the use of diagnostic assessment to establish the levels of information literacy of incoming undergraduates, because it can gauge how information literate the students are. The majority of information literacy assessment tests focus more on library skills than information literacy skills. They target mostly the ability to locate and access information, and less on evaluating information, defining the research topic, determining information needs, organising and synthesising information, and the ethical, legal use of information (Mogg 2002: 16-19).

2.6.4.2 Approaches or methods used to assess information literacy competencies and skills among students

According to Brown, Bull & Pendlebury (1996:8) the term assessment consists, essentially, of taking a sample of what students do, making inferences and estimating the value of their actions. Stewart (2011) opines that there are two metrical strategies that have the potential as tools to show the impact of information literacy to broader institutional audiences. The two strategies can be broadly categorised as direct and indirect methods. Some of the direct methods used include: Measuring the Impact of Networked Electronic Services (MINES), Standardized Assessment of Information Literacy (SALIS), James Madison University's Information Seeking Test (ISST), and ETS iSkills (Stewart, 2011: 271). The indirect assessment methods according to (Stewart 2011:271) involve users reporting of activities, opinions and goals, reached information literacy. The above methods as noted by Fain(2011) are designed to assess student performance on tasks that demonstrate a student mastery of the underlying information literacy concept.

The methods below are discussed in relation to the assessment of information literacy competences and skills.

- Standardized Assessment of Information Literacy (SALIS)
- ETS iSkills
- James Madison University's Information Seeking Test (ISST)
- Measuring the Impact of Networked Electronic Services (MINES)

Standardized Assessment of Information Literacy (SAILS) was developed by Kent State University (Fain, 2011, Stewart, 2011). The SAILS test items are based on the ACRL Information Literacy Competency Standards for Higher Education. According to Kent University, the use of ACRL standards maximises the ability of the instrument to be used by a wide variety of academic institutions for internal and external benchmarking (Kent State University, 2013). "SAILS are a knowledge test with multiple-choice questions targeting a variety of information literacy skills. The Kent University has developed two types of SAILS test, one that gives cohort-level scores and one that gives individual

scores. The individual scores test gives an overall information literacy score for each student”. Students are directed to the SAILS website to take the web-based test. Each student may take the test once per administration. Responses are sent to a central database where data are analysed and reports are generated and made available for downloading as a spreadsheet. While the SAILS Cohort Test measures IL knowledge of groups (cohorts) of students. Results are reported by class standing and by major. Comparisons with the entire SAILS benchmark are also offered benchmarking (Kent State University, 2013).

Stewart (2011) notes that SAILS seeks to answer questions of relevancy of information literacy for students’ success, the library role in information literacy, and determining if a student possesses necessary skills to be considered information literate.

Another tool for assessing IL is James Madison University’s Information Seeking Test (ISST). James Madison University believes that the fundamental knowledge and skills you need to find good information are necessary for both for successful completion of your university classes and for life after graduation. The ISST requirement helps to ensure that all students develop the necessary knowledge and skills early in their university career. All students enrolled in General Education Cluster one are required to pass the Information-Seeking Skills Test (ISST) during the freshman year (James Madison University, 2013).

With the advance of information technology, most libraries are using the internet method to assess the ability of their first year students. ETS iSkills is another method of assessing information skills. In 2003, Educational Testing Service (ETS) established the National Higher Education ICT literacy initiative comprising of a consortium of colleges and universities that recognized the need for an ICT assessment targeted at higher education. The consortium developed the iSkills assessment (Katz, 2007:4). This assessment was designed to support initiatives to improve ICT literacy on college campuses (Katz, 2005:6) The iSkills assessment are aligned with the ACRL Information Literacy Competency Standards for Higher Education (Educational Testing Service, 2013). Katz, (2007) defines ETS’s iSkills assessment as an Internet-delivered assessment that

measures students' abilities to research, organise and communicate information using technology. The assessment focuses on the cognitive problem-solving and critical-thinking skills associated with using technology to handle information. *iSkills* assessment measures students' ability to navigate, critically evaluate and make sense of the wealth of information available through digital technology(<https://www.ets.org>). According to (Katz 2007:4) the assessment measures ICT literacy through seven performance areas, which represent important problem-solving and critical thinking aspects of ICT literacy skills. These seven performance areas include: define access, evaluate, manage, integrate, create and communicate. The *iSkills* assessment is offered at two levels: core level and advanced level. The core level was designed to assess readiness for ICT literacy demands for college. It is targeted at high school and first-year students. The advanced level is designed to assess readiness for ICT literacy challenges in transitioning to higher-level college course work, such as moving from sophomore to junior year or transferring from a two-year to four-year institution. The advanced level targets students in their second or third year of post-secondary education (Katz 2007: 6).

Kyrillidou (2003) explains that Measuring the Impact of Networked Electronic Services (MINES) is an online survey that employs a web-based methodology that “mines” digital content usage to determine users’ demographics location of virtual library use and purpose of use; a short survey of three to five questions is normally delivered at the point of use of an e-journal, database articles or digital collection or services. This is affirmed by Stewart (2011:271), who states that the online based survey is done by users while they are assessing online resources whereby they are given the opportunity to answer a short list of questions about how and why the resource is being used as well as some demographic information about the user.

Fain (2011) argues that these assessments work best as benchmarks, indicating where student skill levels are at a particular time in their college. However, according to Fain (2011) there are generally a number of disadvantages to standardised assessments, as they are generally unable to track changes in skills levels of individual student learning. They also may not be effective due to time lag between administration and receiving results.

2.7 Information literacy competencies skills among students

As university libraries enter into the 21st century, and with the increased availability of information resources in different formats, the need for university students to possess relevant information literacy skills has become urgent. To be prepared for the 21st century, today's students need to be "information literate" (Breivik 2005). Fain (2011) argues that college students are experiencing the paradox of the information age; the proliferation of information technologies, coupled with seemingly unending digital resources has created an environment where research appears to be much more challenging to conduct than 20-30 years ago.

There is much concern about the ways in which university students utilise library and web resources to locate, synthesise and use information (O'Brien & Symons 2007). Salisbury & Karasmanis (2011) note that in order to succeed, students need to grasp and assimilate an understanding of information literacy, both the lower order skills needed to find and access resources and the higher order thinking required to use and evaluate information.

According to Breivik (2005), today's undergraduates are generally far less prepared to do research than students of earlier generations despite their familiarity with powerful new information. She further explains that students use computers to play games and send emails, and, in the same spirit, they are satisfied with whatever information a quick search produces. Fain (2011) on the other hand notes that for students faced with a multitude of choices, it makes sense to go with the resources that are easiest and quickest to use, regardless of their appropriateness as source material for college level research. He further opines that first-year college students exhibit information searching skills that seem to rely on rankings provided by internet search engines rather than careful analyses of results.

IL skills among students are sets of abilities that students should possess in order to make effective use of information, and become critical thinkers (American Library Association,

2000). Baro and Fyeman (2009:660) note that students cannot learn everything they need to know in their field of study in a few years at university. However, IL equips them with the critical skills necessary to become independent lifelong learners. Acquisition of adequate IL knowledge and skills among information users is a fundamental issue because competent information users are empowered and enabled to become competitive in using information in the global information age. Students in institutions of higher learning should be in a position to evaluate information, formulate search strategies, locate the right information materials and make effective use of available information. Wooliscrofts (1997:1) notes that, “the vast quantity of information available in a variety of media, and the fact that especially through the internet, much information has not been through process of peer review or scholarly editorial process before being widely disseminated, means that it is imperative that users apply critical thinking to the information gathering and evaluating process if their own work is to withstand scrutiny”. Warken (2004:153) states that it is critical that students understand how to do research and be self-reliant in the electronic information environment at a time when it is no longer necessary to consult with librarians and not even come to the library.

Warnken (2004:152) summarises the problems encountered by students when trying to find information by saying that, “Students expect to find vast amounts of information quickly and easily, and they consider their searches successful when short search strings on popular internet search engines yield many results. They also become satisfied when they identify multiple sites from which to choose. And most often, they do not consider the type of site or the validity of the information and are generally unaware of the concept of evaluation criteria.” He goes further to explain that students often have no concept of how information is organised and do not understand indexing and are unaware of controlled vocabulary; nor do they understand the distinction between internet resources and information available in electronic formats. But Salisbury & Karasmanis (2011) say that while this is not surprising, it should not be expected that commencing students are ready and equipped for discovering and using scholarly information. It should also not be assumed that this lack of readiness and awareness means students are information illiterate.

2.8 Related studies

The topic IL has continued to attract attention from information scientists and academic librarians. Various studies on IL exist, touching on various aspects of IL, among them IL instruction among students (Maybee, 2006); information literacy in the general education (Sellen, 2002); IL education and instruction in academic libraries and LIS schools in institutions of higher education in South Africa (Jiyane & Onyancha 2010); Information Literacy and Integrative Learning (Galvin, 2006); 21st century learning and information literacy (Breivik 2010); Porter (2011) Millennial Undergraduate Research Strategies in Web and Library Information Retrieval Systems are some of the studies on information literacy in general.

According to the study by Maybee (2006), undergraduate students experience information use in a complex, multi-tiered way that needs to be addressed by higher educators when creating information literacy pedagogy. The underlining importance of information literacy skills has been discussed by the above studies. Information literacy studies reveal changing trends in various aspects with regard to presumed IL skills. This has been influenced by the advancement of information technology and changing needs of information by students. A study by Mittermeyer (2003) which was conducted to establish the information skills of students entering university stressed the importance of IL skills for students' success, in terms of retrieving relevant information, efficient use of time and in avoiding plagiarism.

In Africa, interest on IL research continues to grow. A study by Lwehabura & Stilwell (2008) on "Information literacy in Tanzanian universities: challenges and potential opportunities" revealed that students enrol at universities and other higher learning institutions, knowing very little or nothing about basic library use and information search skills. Lwehabura & Stilwell (2008) further explain that the problems emanate from an inadequate public and school library infrastructure in most developing countries. A study by Kavulya (2003) of challenges facing information literacy efforts in Kenya notes that, "in many countries such as Kenya, schools and public libraries are poorly developed.

This means that majority of the students in the region enter into universities without adequate knowledge about the value of libraries or the habits and the basic skills of using them”. Although there are studies on IL in Kenya most researchers have concentrated on IL programmes carried out by various institutions. Some of the studies carried out in Kenya on information literacy include: “Challenges facing information literacy efforts in Kenya” (Kavulya, 2003); “Information literacy as a marketing strategy: a case study of Moi University Library” (Tanui, 2005); Information literacy training programme at the University of Nairobi (Mathangani & Irura, 2005); User information literacy at United States International University Library (Kaane, 2005); amongst others. This has left a gap in IL skills and competencies among university students in Kenya. The above studies have not been adequate in revealing the level of information literacy skills among undergraduate students in Kenya.

Further afield, several studies have been conducted of information literacy among undergraduate students by several scholars, for example, Gallacher (2007), Mittermeyer (2005), Salisbury & Karasmanis, (2011). According to Mittermeyer (2005), academic librarians who are usually involved in IL programmes are very much concerned by what seems to be a low level of knowledge of the information-seeking process, particularly among incoming first-year undergraduate students. Mittermeyer’s (2005) survey revealed that incoming undergraduate students’ knowledge of basic elements characterising the information-seeking process is rather limited.

The assumption that incoming undergraduate students join university with no IL skills is countered by Salisbury & Karasmanis’ (2011) survey on entry level IL skills of first-year students at Latrobe University in 2009, which revealed that students do bring skills to universities that are commensurate with their current level of educational attainment. According the study, entry-level students have some of the skills outlined in the foundation level of the Library Information Literacy Framework, indicating that they are well placed to start building skills in areas in which they are less competent.

A survey on the information literacy of incoming law students in America (2007), from different law schools showed that incoming law students overestimate their writing and research skills and come to law school inadequately trained in information literacy. According to the survey, although incoming law students are clearly intelligent and capable, and have excelled academically at every previous stage of their education, the data suggested that many incoming students have IL deficits that would affect them through their career in law school and on into the practice of law, and that they are unaware that such deficits exist. However, Salisbury & Karasmanis (2011) also noted that “Lack of understanding of prior knowledge of students by university libraries is in itself a barrier to engaging students in the research process in their first year, as it may result in programs that do not inspire students, or do not give relevant feedback or encouragement to build on what students already know”.

Although research on IL of first-year incoming students exists internationally, the literature review shows an existing gap on studies on IL of incoming students in a Kenyan scenario. This study is an effort to determine the level of IL skills among incoming undergraduate students and bridge such a gap.

The following sub-sections provide a review of related studies, in line with the objectives of the study as follows:

- Awareness of search strategies.
- Information technology skills among students.
- Students’ knowledge of information retrieval tools.
- Students’ knowledge of the types of information sources.
- Intellectual property and fair use of resources by students.

2.8.1 Awareness of search strategies

Information access and retrieval can be an uphill task not only for incoming students but also for any other individual who is not conversant with about the way in which to do it. But this is made easier by the use of search strategies which assist in easy retrieval of information. Students need several key skills and techniques to perform successful

information search queries (Porter, 2011:278). The availability of ready information on the web and online databases has brought a shift on how information is retrieved and accessed. Search strategies are applied in both online library information retrieval systems and on the Internet. A search strategy is the global /comprehensive plan followed in order to retrieve information that will meet the user's needs and can be based on a variety of approaches (Wessels, 2004:52).

There are several search strategies and they are important during information searches. Such search strategies include Boolean operators, use of parentheses, natural language, and keywords which are used to effectively retrieve stored information. Natural language can be described as common spoken language (Smart computing as cited by (Porter 2011)). In his study, Porter (2011: 277) observed that students mostly used natural language searches, followed by keyword searches, but preferred the use of natural language phrases and questions, instead of traditional Boolean language. Smart computing as cited by Porter (2011) describes Boolean language as a system language relying on keyword coding and Boolean operators/connectors to retrieve relevant articles. Boolean logic consist of AND OR and NOT. According to Dinet, Favart, Passerauit (2004), Boolean logic, when used to construct a search expression, can be very useful for specifying exactly which information is needed by the user. A study by Dinet, Favart, Passerauit (2004) found that University students do not frequently use Boolean operators, it also revealed that commonly used operator was AND. This view was reinforced by Sasikala & Dhanraju 2011 who performed a study on “the assessment of information literacy skills among students of Adhra university”. According to the results of the study the majority of the students do not have proper knowledge about the benefits of using Boolean operators and truncation techniques while searching online source. A study on millennial undergraduate research strategies in web and library information retrieval systems by Porter (2011), revealed that natural language appears to be a search feature highly desired by the students. Students almost exclusively used natural language in the creation of their search strings. Porter (2011: 280) argues that while a query constructed with natural language may still produce results, it is not always the most effective type of search query in a library information retrieval system. The students did not exhibit

detailed search strategies for each task given; very little time was expended by students in developing search terms (Porter, 2011: 278). This was a contrast to a study done by Yongyan li (2012) at the University of Hong Kong, on undergraduate students searching and reading, which revealed that the students employed a range of search engines to conduct online research. The study by Yongyan li (2012: 211) also revealed that the student participants seemed in general to exhibit more sophisticated web searching skills than sometimes reported in the literature, for instance, they selected search terms with discretion according to their needs which they might adjust as their research and writing progressed. Porter (2011:278) notes that when students deemed search results unsuccessful, the most common refining techniques they used were to replace a word with a synonym, or add or remove natural language phrasing from the original search string.

The problems experienced by undergraduate students had been highlighted by Porter (2011:267), who argues that the current crop of undergraduate students who are referred to as “millennial” and who have never known a world without a web and who use search engines, have come to expect that searches can be completed using an easy, single search box that produces complete articles on just about any topic.

2.8.2 Information technology skills among students

IL is related to information technology skills, but has a broader implication for the individuals, the educational system and society. Information technology skills enable an individual to use computers, software applications, databases and other technologies to achieve a wide variety of academic, work-related and personal goals (<http://www.ala.org>). The current generation of students has been privileged to have access to modern technologies enabling them to access information easily. Salisbury & Karasmanis (2011) refer to the current generation of students as the Google generation. A study by Salisbury & Karasmanis (2011) showed that students preferred Google as their first choice in finding information. Search engines have become their first choice in

research. This highlights the influence of the Internet in information access and use among university students.

Catts & Lau (2008) argue that people can be information literate in the absence of ICT, but the volume and variable quality of digital information, and its role in knowledge societies, has highlighted the need for all people to achieve IL skills. For people to use information within a knowledge society, both access to information and the capacity to use ICT are prerequisites.

There seems to be a close correlation between information literacy and information technology in the information environment. However, information literacy is a broader concept and, as noted by (American Library Association 1989:3) “Information literacy, while showing significant overlap with information technology skills, is a distinct and broader area of competence. Increasingly, information technology skills are interwoven with, and support information literacy”. Besides, information literacy encompasses more than information technology skills as expressed by Maughan (2001:72) who states that “information literacy is a far more comprehensive concept, encompassing abilities such as critical thinking, synthesis, communication, and research methodologies”. Bruce (2002) notes that IL is inextricably associated with information practices and critical thinking in the information and communication technology (ICT) environment. In order to be able to navigate the large amount of information available in electronic format, students require information technology skills. Warnken (2004:152) observes that, “in general classroom settings or in formal studies, students at both the undergraduate and graduate levels generally feel comfortable with technology but do not necessarily have the skills to function effectively and manage the ever-increasing quantities of information resources available in electronic environment”.

This highlights the need for information technology skills among students, which will enable them to effectively use information resources. However, Kate Manuel as cited by Warnken (2004:152), warns that students’ ease with computers can hinder the mastery of information literacy skills because those students overestimate their ability to effectively search for and access information. These problems have been compounded by the

availability of search engines such as Yahoo and Google as preferred tools for research by undergraduate students.

2.8.3 Students' knowledge of information retrieval tools

Corall (2008) contends that the ability to find, assess and use information effectively is now widely recognised as an essential competence for effective participation in contemporary society. Library OPACs and search engines exist as some of the most widely used tools for information retrieval. Porter (2011:268) highlights two types of information retrieval systems that is web-based information retrieval (IR) systems, also known as search engines (Yahoo, Google and ask Jeeves), and library information retrieval systems. Library IR systems are proprietary resources that libraries subscribe to and often consist of journals databases and a large collection of information resources (Porter 2011:268). Mi & Weng (2008) note that for many years, before the Internet search engine emerged, library catalogues were the sole information-seeking gateway, but there is a paradigm shift due to the emergence of the internet. Mi & Weng (2008) opine that academic library OPACs are losing ground to online search engines. Although there is a paradigm shift, OPACs remain key to information retrieval in academic libraries since they facilitate efficient retrieval of information. OPACs are mainly concerned with searches for bibliographic records, searching at the level of items rather than full-text content (Dinet, Favart & Passerault, 2004). Today's undergraduate students are techno savvy and are moving away from the traditional information retrieval tools to online search engines. Porter (2011) notes that the current students think about information and process information differently than previous generations. Holman as cited by Porter is of the view that this group of students referred to as "Millennials" do not necessarily follow organised, hierarchical structures of information gathering or processing, but instead they prefer "hypertext", thinking where information comes from multiple sources and is pieced together through horizontal information gathering. Some of the reasons information consumers are embracing search engines as information retrieval tools according to MI & Weng (2008) are that they do not need to worry about forgetting important but infrequently used search rules or commands. In addition, the search results delivered by online search engines are sorted using relevance ranking systems that are

more user-friendly than the ones currently employed by academic library OPACs. While Porter (2011:268) notes that student search strategies on the Internet require less expertise than searching for information in online library IR system.

2.8.4 Students' knowledge of the types of sources

There are various types of information sources available for undergraduate students in university libraries. These include primary sources, secondary sources and tertiary sources. Primary sources are original materials which have not been filtered through interpretation, condensation, or, often, even evaluation by a second party; for example, journal articles, monographs, reports, patents, theses, diaries, letters, photographs, poems. Secondary sources include: A secondary source is information about primary or original, information, which has usually been modified, selected or rearranged for a specific purpose or audience. It is not always easy to discern the difference between primary and secondary sources. Examples include biographies, histories, monographs, review articles, textbooks, and any index or bibliography used to locate primary sources. These consist of information, which is a distillation and collection of primary and secondary sources. Twice removed from the original, they include encyclopaedias, fact books and almanacs, guides and handbooks. Some secondary sources such as indexing and abstracting tools can also be considered tertiary sources (<http://www-public.jcu.edu>).

Information sources are no longer confined to print sources only. Academic libraries have embraced technology and are stocking information resources both in print and electronic format. With the advancement of information technology, information sources are available in different formats, such as DVD, CD-ROM, online databases, e-books, e-journals, and others. Students are no longer relying on the traditional sources of information. More often than not they are consulting online resources in order to complete their assignments. The use and access of information sources among students depend on knowledge of sources. Maybee (2006) points out that knowledge of sources allows for successful retrieval of the information contained within. A study by Porter (2011) revealed that the undergraduate students place high value on the credibility of sources. This was evidenced by how they selected websites by origin of the producing

agent (e.g. government, education and organisation) how they reviewed sites for reliability and collaboration and how they explicitly trusted all library results as credible.

A study by Baro and Fyneman (2009:114) on IL among undergraduate students in Niger Delta University revealed that undergraduate students used library books, archival materials, journals articles, Internet, databases reference materials they also consulted human resources such as community heads/chiefs, lecturers and colleagues for information. Porter (2011:281), in his study, discovered that students preferred resources that provided general overviews, ideas and starting points. This inclination was evident in their use of new articles from the web and their overwhelming fondness for Wikipedia entries.

2.8.5 Intellectual property and fair use of resources by students

The ethical use of information materials is usually connected to copyright issues. Sasikala & Dhanraju (2011), state that awareness of copyright is important for students in order for them to use the required information without violating copyright regulations, specifically plagiarism, which has become a concern in academe (Ferullo 2011; Lewis, Duchac, & Beets 2011). Plagiarism is also referred to by most authors as academic dishonesty or cheating (Burkill & Abbey, 2004; Scanlon, 2003; Yeo, 2007). Yeo (2007) defines plagiarism as knowingly presenting the work or property of another person as one's own, without appropriate acknowledgment or referencing. Although plagiarism has increased with the rapid development of information communication technology, in particular on the Internet, which Scanlon (2003), opines could be exacerbating the problem of student plagiarism because presumably, "the technology makes illicit cutting and pasting so easy as to be nearly irresistible". He further notes that, widespread use of the Internet may be shaping a new generation of students' conception of "fair use," leading them to view the mass of information so freely shared in cyberspace as public knowledge.

Lewis, Duchac, & Beets (2011) note that allegations of plagiarism have plagued creative works and scientific discoveries for centuries. Scanlon (2003) noted that the anxiety level

regarding student plagiarism, as well as academic honesty in general, has risen along with increased use of the Internet as a tool for research and writing.

Many studies on the fair use of information, copyright issues and plagiarism among undergraduate students have been conducted by various researchers, which have enabled them to highlight some of the issues bedevilling students when it comes to fair use of information. Yeo (2007), in his study, notes that most students provided an adequate to good definition of plagiarism, but their understanding of actions that constitute plagiarism were varied. In their study “accessing information literacy competence among undergraduate students of college of agriculture”. Raichur, Hadimani & Rajgoli (2009) found out that undergraduate students have some knowledge regarding copyright and privacy laws, but lack the competence in electronic access to information and institutional policies related to access and use of information. In this case it can be assumed that the lack of competence in electronic access can be tied to the level of information skills and competences among students. A study by Molnar, Kletke and Chongwatpol (2008) on “Ethics vs. IT Ethics: Do Undergraduate Students Perceive a difference” found that undergraduate students in general find cheating using IT more acceptable than cheating without the use of IT. The act of academic dishonesty has increased with the advent of technology although Walker (2010) notes that there is an issue of an accurate measure of actual prevalence of plagiarism. Walker (2010) further notes that researchers have relied on student self-reporting of their own and/or their peers’ plagiarising behaviour to obtain such measures. This view is reinforced by Risquez, O’Dwyer & Ledwith (2011) who notes “much of the literature on academic honesty has been built upon students’ own reports of their perceptions and behaviour, collected through surveys or interviews.” The above studies reveal the gap in the awareness of plagiarism among students in the use of information, especially electronic information.

2.9 Chapter summary

Chapter Two reviewed the published literature related to information literacy and undergraduate students. The literature was reviewed from various sources and formats. These include both print and non-print information resources such as online journals, electronic books, online databases, online thesis and dissertations and printed books and journals. The chapter brings into perspective the information literacy landscape, and its historical development and growth. This helped to bring into perspective how information literacy has developed for library instruction and bibliographic instruction. It also reveals the relationship between the other literacies and information literacy. The role and importance of information literacy among students has also been discussed. Other related topic discussed included methods and approaches used in assessing information literacy, information literacy assessment for incoming students, the various international information literacy standards and the model which has been informing information literacy research, undergraduate students' information literacy skills, their awareness of search strategies, information technology skills among students, students' knowledge of information retrieval tools, students' knowledge of the types of sources and intellectual property and fair use of resources by students.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this chapter is to outline the research methodology adopted by the researcher to conduct the current study. The chapter covers the following issues: research design, study area, target population, data collection procedures, data collection methods and instruments, pretesting of the research instruments, data analysis and presentation. The chapter describes the research methodology which was used to determine information literacy skills among incoming first year undergraduate students at the Catholic University of Eastern Africa in Kenya.

3.2 Research paradigm

There are three research paradigms namely; qualitative, quantitative and mixed methods research. Punch (2005: 27) defines a paradigm as a 'set of assumptions about the social world, and about what constitutes proper techniques and topics for inquiry'. Neuman (2006:80) notes that the three approaches are different ways of looking at the world, ways to observe, measure and understand social reality. According to Jwan & Ong'ondo (2011: 2), the choice of a particular paradigm, normally points towards a particular approach, which usually implies the adoption of specific methods, which in turn suggests the use of specific data generation techniques and interpretations.

Qualitative research is defined by Jwan & Ong'ondo (2011:3), as an approach to enquiry that emphasise a naturalistic search for relativity in meaning, multiplicity to interpretations, particularity, detail and flexibility in studying a phenomenon or the aspect(s) of it that a researcher chooses to focus on at a given time. In qualitative research, numerical data is not necessarily generated. Ngulube (2005) notes that qualitative research approach is usually confined to in-depth studies of small groups or individuals. Qualitative methods include bibliographical and historical methods, case

studies, phenomenology, action research studies, grounded theory and ethnography and discourse analysis. Data collection methods include observation, unstructured in-depth interviews and focus group interviews (Powell as cited by Ngulube 2005). The advantage of qualitative research is that it seeks to generate deeper understanding of the subject Jwan & Ong'ondo (2011:3). It also helps to gain new perspectives on things about which much is already known. It also permits research to go beyond statistical results (Mugenda, 2003: 155).

On the other hand, mixed methods research employs both qualitative and quantitative approaches. The assumption is that mixing or integrating methods can add insights and understanding that might be missed when a mono-method (qualitative or quantitative) strategy is used (Ngulube, Mokwatlo & Ndwandwe 2009). Creswell (2009:203) notes that the combined use of both quantitative and qualitative research provides an expanded understanding of a research problem. Ngulube, Mokwatlo & Ndwandwe (2009) opine that the methods provide researchers with the possibility of addressing issues from a large number of perspectives. Mixed methods research is used as a middle ground for both qualitative and quantitative research methods. They also complement each other. As Ngulube, Mokwatlo & Ndwandwe (2009) argue, the rationale of using mixed method research is to bridge the gap between qualitative and quantitative paradigms in order to answer research questions holistically.

Quantitative research is another type of research paradigm. Creswell (2011:4), defines it as a means for testing objective theories by examining the relationship among variables. According to Ingrid (2012) quantitative methods, traditionally associated with the positivist paradigm, and involving the counting and measurement of events and statistical analysis of a body of numerical data, constitute the primary research approach to this investigation. Quantitative research methods include descriptive studies, exploratory and/or explanatory studies, operation research studies, citation analysis, bibliometrics, experiments and quasi-experiments (Ngulube, 2005).

This study adopted the quantitative approach. One of the reasons why the quantitative paradigm was deemed appropriate for this study is because it is able to give statistical data on various issues regarding information literacy skills among incoming undergraduate students. The method is able to quantify opinions, behaviours and attitude of the incoming undergraduate students. Compared to the qualitative paradigm, through the quantitative research paradigm the researcher is able to collect data from a large population.

3.3 Research design

According to Bryman (2008:31), a research design or method provides a framework for the collection and analysis of data. It is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 2006:31). On the other hand, Punch (2005:63) sees a research method as the basic plan for a piece of research, that includes four main ideas; the strategy, the conceptual framework, the question of who or what will be studied and the tools and procedures to be used in collecting and analysing empirical materials. A research design or method helps the researcher to be able to obtain answers to the research questions. It shows how the research questions will be connected to the data (Punch, 2005:142). As outlined by various authors, a research design is a master plan of how the research will be conducted.

Out of the different research methods in quantitative approach, the current study adopted the case study method. According to Kombo & Tromp (2006: 72) a case study seeks to describe a unit in detail, in context and holistically.

Although a case study is mostly regarded as a qualitative approach, Jwan & Ong'ondo (2011:31) and Neuman (2006:41), note that it is also used in quantitative research. Punch (2005:144) notes that: "the basic idea is that one case (or perhaps a small number of cases) will be studied in detail, using whatever methods that seem appropriate. While there may be a variety of specific purposes and research questions, the general objective

is to develop as full understanding of that case as possible". On the other hand, Neuman (2006) contends that in case study, the data is usually more detailed, varied and extensive.

A case study was deemed suitable for this study because it focuses on a single unit, which, in this study, was the Catholic University of Eastern Africa. Although in case studies the issue of generalisation of the research findings is always a concern, the advantage of using case study design in this particular research outweighs the disadvantages. Punch (2005:146) contends that the intention of a case study is not to generalise, but rather to understand the case in its complexity and its entirety, as well as in its context. The case study enabled the researcher to have an in-depth assessment of information literacy skills among incoming undergraduate students at the Catholic University of Eastern Africa.

3.4 Study area

The study was carried out at the Catholic University of Eastern Africa (CUEA) library. CUEA is a private university located within Nairobi County. The university is guided by the following core values: witness of life, prayers, truthfulness, honesty, excellence, commitment and competence. The mission of CUEA library is to support scientific research with a relevant and comprehensive collection of printed and electronic information, equipping itself with appropriate information communication technologies, and by linking up with other institutions within and outside the country so as to facilitate resource sharing (<http://www.cuea.edu>). The university library has a seating capacity of 3 000 people. It has a collection of 86646 in books and print journals. Online databases and electronic journals constitute 57887 items (University librarian office, unpublished data, 2013). The library staff consists of professionals, paraprofessionals, support staff and administrative staff. Being a university library, the CUEA library serves the university community comprising undergraduate and postgraduate students, academic and non-academic staff, researchers, external subscribers, alumni and members of affiliate and constituent colleges.

The library consists of the following sections, circulation services which are involved with the lending and returning of information resources and interlibrary services, the reference/research section which offers information literacy lessons to staff, students and external users. It also offers research services to users.

3.5 Target population

A study population is the aggregate of elements from which a sample is actually selected (Babbie 2010: 199). In research, population can be individuals, objects, either items or events. Nachmias & Nachmias (1996: 179) note that a population is the aggregate of all cases that conform to some designated set of specification. According to Kombo & Kombo (2006: 76) population refers to an entire group of persons or elements that have at least one thing in common, for example, population can be primary school children, university students, nurses working in public hospitals, etc. In scientific research, it is important to define the target population. Cox (2008) opines that the definition of target population determines whether sampled cases are eligible for the survey; the target population also defines those units for which the findings are meant to generalise. In line with the title of the study, the target population for this study constituted of all incoming undergraduate students for the academic year 2013/2014. For the purpose of this study, the undergraduate students referred to student taking a four-year bachelor degree course.

According to the statistical data available for the academic year 2013/2014 CUEA has a student population of 5300 (CUEA registry department, unpublished data 2013), both at undergraduate and post-graduate levels. The registered incoming undergraduate students joining CUEA for the academic year 2013/2014 were 400. The number constituted the target population of the current study.

The library orientation session acted as the most appropriate session in which data collection could be conducted. This was because it is the only programme whereby the new students joining university assembled before the commencement of the regular

academic programmes. It was necessary to collect data from the incoming students before they could use the library as by doing so, the researcher could determine the preparedness of the students in terms of their IL skills. It also enabled the researcher to access the target population quite easily. Out of the 400 registered incoming undergraduate students only 150 incoming undergraduate students attended library orientation translating to 37.5% of the target population. Due to the low turn-up of students for the library orientation, sampling which was initially thought to be necessary as the total number of incoming students was high (that is 400), became unnecessary. The study was therefore conducted among the 150 incoming students who attended the library orientation session.

The first-year undergraduate students were the preferred population for this study for two reasons: one, as mentioned above, the majority of them will have just graduated from high school and, therefore, it is imperative to establish how well prepared they are for university education by examining their IL skills; and, secondly, they have not been exposed to the university's IL programmes.

3.6 Sampling procedures and techniques

Gall & Borg (2007:166) describes sampling as the process of selecting a sample from a defined population with the intent of the sample accurately representing that population". Krathwohl (1998:160) defines sampling procedures as ways of selecting a small number of units from a population to enable researchers to make reliable inferences about the nature of the population. Sampling involves selecting a number of units or elements from the target population to act as a representative sample. Sampling is important especially when the target population is too large. In the current study no sampling was done since the researcher used the available target population.

3.6.1 Sample size

A sample size is the total elements or unit selected from the target population to participate in the research. The sample size consisted of 150 incoming undergraduate

students who attended the library orientation. According to Gall & Borg (2007:177) the general rule in quantitative research is to use the largest sample possible. They argue that the larger the sample, the more likely the research participant scores on measured variables will be representative of population scores. Out of the 400 incoming students, 250 students did not attend the library orientation, which made it impossible for the researcher to access them. Being new students it was not possible to reach them after the library orientation because some reported late after the initial opening date. It was also impossible to locate them from their different locations within the university.

3.7 Data collection methods and instruments

There are several data collection methods and instruments in quantitative research. These include interviews, observation and questionnaires. This section discusses the questionnaire method, which was used to collect primary data from the respondents.

3.7.1 Questionnaires

Babbie (2010: 256) defines a questionnaire as a document containing questions and other types of items designed to solicit information appropriate for analysis. As indicated by Kothari (2006:100) a questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questions on a questionnaire can be either closed-ended or open-ended (Nachmias & Nachmias, 1996). The questionnaire will have both closed- and open-ended questions, which enables the collection of both qualitative and quantitative data from the respondents.

Sekaran (2003: 251) and Kothari 2006 (100-101) note that the use of questionnaires is advantageous in terms of speed and the volume of data collected, and it saves in money. It is flexible, able to collect accurate data, easy to distribute to the research population and it has the ability to guard respondents in terms of confidentiality.

In the current study, the researcher adopted, but modified existing information literacy assessment questionnaires used by various researchers and those discussed in related

studies such as Mittermeyer (2003), which was used *to assess incoming first-year undergraduate students* and Monash University's (2005) *library information literacy questionnaire*.

The researcher distributed the self-administered questionnaires to the 150 first-year undergraduate students who attended library orientation. The students had assembled in one location which made it easier for the researcher to distribute the questionnaires.

The respondents were given time to complete the questionnaires before the library orientation started. This gave them ample time to complete the questionnaire and return them to the researcher. The distribution of questionnaires before the library orientation helped avoid sensitising incoming students on information literacy skills. This was because the purpose of the study was to investigate information literacy skills and competencies among incoming first year undergraduate students.

3.8 Data collection procedures and methods

This section outlines the procedures and methods used for data collection both from the respondents.

3.8.1 Permission to conduct research

It is important to seek permission from all the parties involved before carrying out research. In this case it was the institution where the research was carried out, that is the Catholic university of Eastern Africa, UNISA, where the researcher is a registered postgraduate student and finally the students who participated in the current study. Permission was necessary, especially from CUEA because it enabled the researcher to comply with CUEA regulations and procedures with regard to research activities within the institution. As for the students, they had to participate in the study voluntarily so the researcher had to ask their permission. This was done in the form of an introduction

letter. UNISA also had to give the student permission to carry out the research in line with the institution procedures.

Before the commencement of data collection, permission to engage in research in CUEA was sought from the respective administrators of the university. The researcher wrote a letter to the university's registrar and the university's librarian for research authorisation to enable her to carry out research at CUEA. Permission was granted through the endorsement of the letter enabling the research to collect data from the university registry, university library and incoming undergraduate students.

Permission was also sought from the University of South Africa (UNISA) where the researcher is enrolled for her studies. After the permission was granted, a questionnaire with a covering letter was distributed to students who attended the library orientation session. The researcher distributed the questionnaires herself. The students were requested to complete the questionnaires before the library orientation session to avoid sensitising the subjects, and thus threatening the validity of the research data.

3.8.2 Data sources

Relevant data for this study was obtained from both secondary sources and primary sources. Stebbins (2006:62) defines secondary sources as those sources which report on, analyse, summarise or distil, in some way, information garnered from primary sources, while primary sources can be defined as the "words of witnesses or the first recorders of an event". Secondary data was collected from published and unpublished official documents, books and journals, relating to information literacy as published by different authors. Primary data (raw data) was collected from incoming first-year students at CUEA.

3.9 Validity and reliability of research instruments

Validity and reliability are usually associated with research instruments used to collect data. They are central concepts in measurement in research instruments (Punch 2005). Kerlinger & Lee (2000:641) argue that if one does not know the reliability and validity of one's data, little faith can be put in the results obtained and the conclusions drawn from the results of the research. Data obtained from research instruments that are faulty cannot be relied upon, thus the need to ensure the research instruments' reliability and validity. As Neuman (2006:188) notes, perfect reliability and validity are virtually impossible to achieve, they are rather ideals researchers strive for.

3.9.1 Validity of the research instrument

Thyer (2001) notes that validity is an important component of quantitative measurement and means that the concept we think we are measuring (e.g. depression) is actually what we are measuring rather than some other concept (e.g. anxiety, anger). Validity refers to the issue of whether an indicator (or set of indicators) devised to gauge a concept really measures that concept (Bryman, 2008:151). According to Punch (2005:97), validity means the extent to which an instrument measures what it claims to measure; an indicator is valid to the extent that it empirically represents the concept it purports to measure. The three types of validity in a research instrument are face, construct and content validity. Borden & Abbot (2008:129) opine that face validity describes how well a measurement instrument appears to measure (judging by its appearance) what it is designed to measure. While construct validity applies when a test is designed to measure a construct which is a variable, not directly observable, that has been developed to explain behaviour on the basis of some theory (Borden & Abbot, 2008:129). In research content validity describes how well a research instrument measures the behaviour or attitude which it was intended to measure.

To ensure validity of the research instrument, the researcher consulted an expert in the field of information science who is knowledgeable in the topic under study. In this case

the researcher's study supervisor. To verify them independently for content, construct and face validity. His input and recommendations were incorporated in the final research instrument.

3.9.2 Reliability of the research instruments

Reliability is a central issue in relation to research instruments (Neuman, 2006:188; Punch 2005:95). According to Thyer (2001) reliability is the degree to which the same instrument provides a similar score when used repeatedly. The reliability of a research instrument concern both consistency and stability. Bryman (2008:149) refers to reliability as “the consistency of a measure of concept” while Kerlinger & Lee (2000:641) point out that reliability is the lack of distortion or precision of a measuring instrument; it comes from necessity for dependability in measurement. According to Bryman (2008), three factors are involved when considering whether a measure is reliable; stability, internal reliability and inter-observer indicators. In order to ensure the reliability of the research instruments, a pilot study was carried out using incoming undergraduate students for the academic year 2011/2012. The pilot study was done using the exact procedures planned for the main study in collecting data using self-administered questionnaires. The pilot study helped the researcher to improve the research instrument.

3.10 Piloting of the research instruments

One of the methods used in assessing reliability of research instrument in research include pilot studies. Van Teijlingen & Hundley (2001) defines pilot studies' as mini versions of a full-scale study (also called 'feasibility' studies), as well as the specific pre-testing of a particular research instrument such as a questionnaire or interview schedule. To measure the reliability of the research instrument a pilot study was carried out. This helped determine the dependability and consistency of the questionnaire.

The population involved in the pilot study had the same characteristics as the target population for the main study. The population consisted of incoming students who were joining the university for the first time and have not been exposed to any information

literacy programme. The respondents were informed that the questionnaires were for a pilot study by the researcher.

During the pilot study, a checklist with 13 questions was used to help determine whether the questionnaire was able to meet the following criteria: ambiguity, the sequence of the research questions, grammatical mistakes, the length of the questionnaire and if the questionnaire had any technical terms which the respondents did not understand.

The pilot study helped the researcher to identify the clarity of the questions in terms of the grammar.

During the pilot study 100 questionnaires were distributed to incoming first-year students. Out of the 100 distributed questionnaires 77 were completed and returned to the researcher. A total of 54 (70.1%) were fully completed while 23 (29.9%) were not fully completed. The higher percentage of uncompleted questionnaires helped the researcher to review the questionnaire regarding issues that may have caused the limited response rate, for example length. For instance, one of the issues raised by the respondents was that the questionnaire was too long. As a result, some of the questions that were almost similar, were removed or combined. These helped ensure that the questionnaire is of the desired length without affecting its content.

3.11 Data analysis and presentation

According to Kerlinger & Lee (2000:192), data analysis means categorising, ordering, manipulating and summarising data to obtain answers to research questions. Data analysis according to Obure (2002:1) involves data sorting, data editing, data coding/variable generation, data entry, data cleaning, data processing and interpretation of results. In the current research, data was evaluated for ambiguity, completeness, comprehensiveness, internal consistency, relevance and reliability. The purpose of analysis, as Kerlinger & Lee (2000:192) said, was to reduce data to intelligible and interpretable form so that relationships of research problems could be studied and tested.

Data collected was analysed using Statistical Package for Social Science (SPSS), which was used to analyse quantitative data (Obure, (2002:1).

Questions were coded for easy identification or correction of data entry errors. Coding was done during data editing. Questions, variables and response categories were coded to enable data tabulation and counting. Coding is the specific and concrete activity that starts the analysis (Punch, 2005:199). Coding was done by assigning numerals to answers in the questionnaire. For instance, questions with YES or NO answers were assigned 1 for Yes and 2 for No while unanswered question were assigned 0. This made it easier to input and analyse the data using SPSS. Statistical techniques were used to summarise quantitative data. Descriptive statistics were used to describe or indicate several characteristics common to the entire sample by summarising data on single variables. The statistically summarised data was then presented in some of the following formats according to the suitability of each format and the data being presented.

- Tables
- Frequency distribution graphs
- Bar graphs
- Pie charts

3.12 Ethical consideration

In research, there are guidelines meant to guide researchers while conducting their research. The Social Research Association (2003) highlights the importance of ethical issues by explaining that ethical considerations across the research community have come to the forefront, partly because of legislative changes in human rights and data protection, and also as a result of increased public concern about the limits of enquiry. Ethical issues arising from research touch on the confidentiality of the respondents and also on the data collected.

Neuman (2006: 129) points out that ethical conduct ultimately depends on the individual researcher. It begins and ends with the researcher. He further states that the researcher has

the moral and professional obligation to be ethical, even when research subjects are unaware of or unconcerned about ethics.

While conducting research, the researcher should seek for consent from the respondents to participate in research. The participation must be voluntary and respondents should not be forced to participate. Gregory (2003: 35) explains that ‘every code of ethics designed to guide research involving human subjects gives primacy to the requirement of fully informed voluntary consent on the part of individuals concerned. The very clear presumption is that research involving human subjects undertaken without the explicit consent of the researched, lacks an adequate moral basis’. Another aspect of ethics in research is confidentiality. According to Neuman (2006: 139) “confidentiality means that information may have names attached to it, but the researcher holds it in confidence or keeps it secret from the public”.

In order to adhere to ethical issues for the current study, the researcher adhered to the following principles.

- i. Plagiarism; termed by Jones (2011) as academic dishonesty. Although there is an increase in plagiarism concerning students, due to rapid advancement of information communication technology enabling easy accessibility of information resources, the researcher ensured that any information materials from other people’s work used was duly acknowledged in the form of references.
- ii. Confidentiality; the researcher ensured the participant confidentiality by protecting their identity. Names of the participants were not included in the research instrument ensuring anonymity.
- iii. Informed consent; Neuman (2006:135) notes a fundamental ethical principle in research is; never coerce anyone into participating in research. The researcher sought permission from the respondents to be involved in the research, participation was voluntary. The researcher sought permission to carry out the research from the Catholic University of Eastern Africa administrators and the University the researcher is enrolled in.
- iv. Data integrity; as noted by Jwan & Ong’ondo (2011:161) one of the serious ethical breaches a researcher can commit is publishing falsified data. The

researcher ensured data integrity through using only data collected from the field without any falsification. This ensured that the research findings reflect the true picture of the findings.

3.13 Summary of the chapter

Chapter three outlines the research methodology used in this study. It discusses the three research paradigms available for social scientists. It also outlines the research paradigm adopted for the current study; quantitative research approach and why it was deemed appropriate. It outlines the research method used, which was the case study method. It discusses the study area, study population which consisted of incoming first-year undergraduate students at the Catholic University of Eastern Africa. It also discusses the data collection procedures and methods, validity and reliability of research instruments, piloting of the instruments, data analysis and presentations, and finally ethical considerations.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of the study according to the set out objectives and research questions. Data was collected from incoming first-year undergraduate students at the Catholic University of Eastern Africa for the academic year 2013/2014.

The findings of the study are presented according to the following major sub-headings:

- General background information
- Awareness of search strategies
- Basic information technology skills
- Knowledge of information retrieval tools and their use
- Knowledge of information sources and their formats
- Intellectual property and copyright issues

4.2 Characteristics of the Respondents

This section presents the findings in terms of the gender distribution of the respondents, the respondents' access to library services before joining the university, the importance of library to students, and respondents' attendance of library instruction programmes before joining the university.

4.2.1 Distribution of respondents by gender

The first-year undergraduate students who attended the library were a total of 150. But only 137 who completed and returned the questionnaire. Out of the 137 incoming first-year undergraduate students, at Catholic University of Eastern Africa, who participated in

the study, 63.5% were female and 36.5% were male. Figure 3 below shows the number of students who participated in the research according to gender.

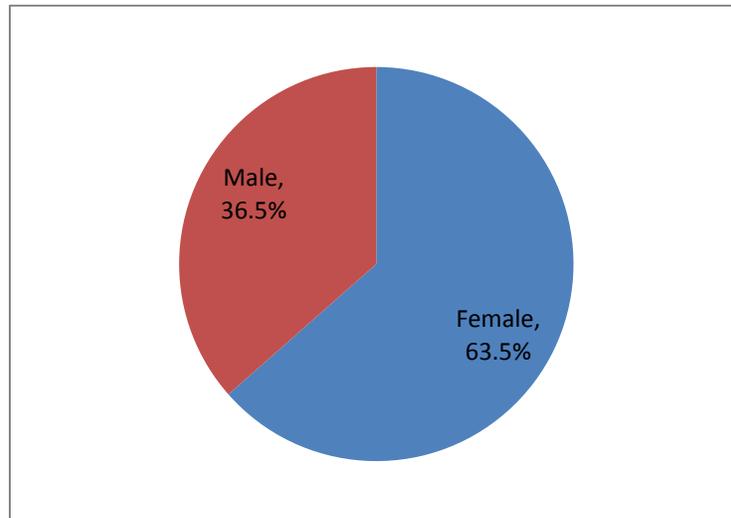


Figure 3: Respondents by gender
(N=137)

4.2.2 Respondents' use of library before joining the university

A question on whether the incoming students have previously used a library was posed to respondents. This was important in order to establish whether incoming first-year students had prior knowledge of library services. According to the findings, 90.5% of the incoming students indicated that they have used libraries before while only 7.3% indicated that they have never used a library, three 2.2% of the students did not respond to the question.

Those incoming students, who indicated they had used libraries previously, were requested to indicate the reasons for accessing the libraries. Figure 4 below shows the reasons for accessing the libraries. The students had the option to select more than one option why they access the library from the options provided.

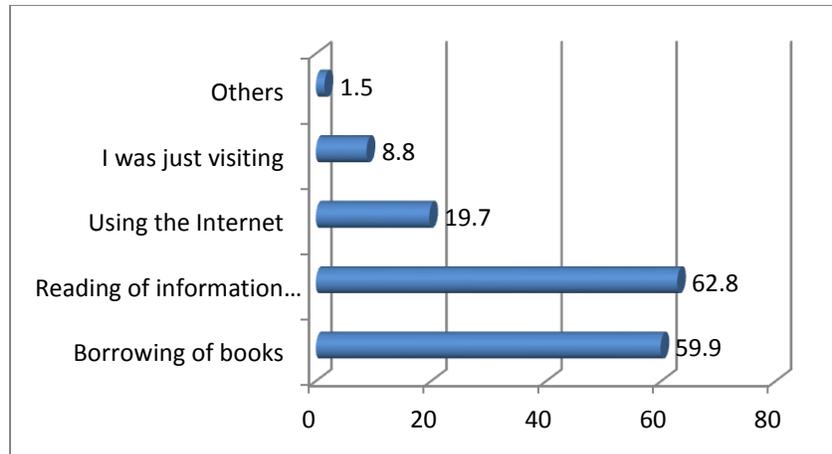


Figure 4: Reasons for accessing libraries

Figure 4 demonstrates that the main reason for accessing libraries by the respondents prior to joining the university was reading information resources, that is books and journals, which was posted by 62.8% of the respondents. Borrowing of books was the second reason with 59.9% of the respondents while the least was to use the Internet and to visit the libraries, which was recorded by 19.7% and 8.8% respondents, respectively.

4.2.3 Importance of libraries in supporting studies

On the question of whether the library is an important component in their studies, 97.8% of the incoming students indicated that it is an important component while 2.2% felt that a library is not important for their studies.

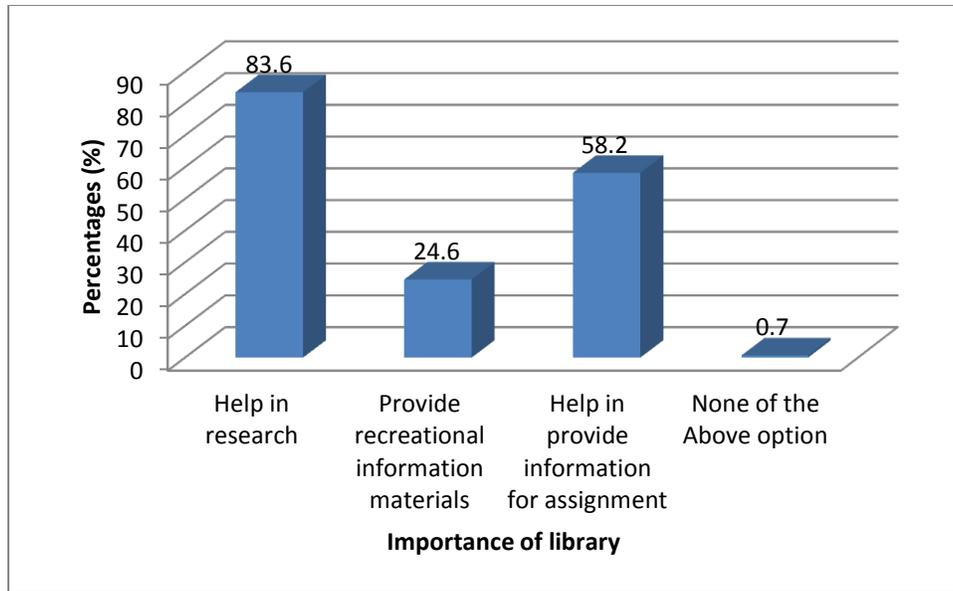


Figure 5: Importance of library to incoming students

(N=134)

A further question was posed to the students who said that the library was important, to find out why they thought that the library was important. According to the findings presented in Figure 5, majority of the students that is 83.6% believed that the library will help them in their research, 58.2% believed the library would help in providing information for their assignments while 24.6% believed that the library would provide recreational information materials. Only 0.7% indicated the library would not help in any way.

4.2.4 Respondents attendance of library instruction programmers before joining the university

A question was raised on whether the students have ever attended library instruction prior to joining university. According to the findings, 64.2% indicated that they have received some form of library instruction while 33.6% indicated that they have never received any kind of library instruction. 2.2% of the respondents gave no response. Figure 6 shows the kind of library instruction the students had received prior to joining university.

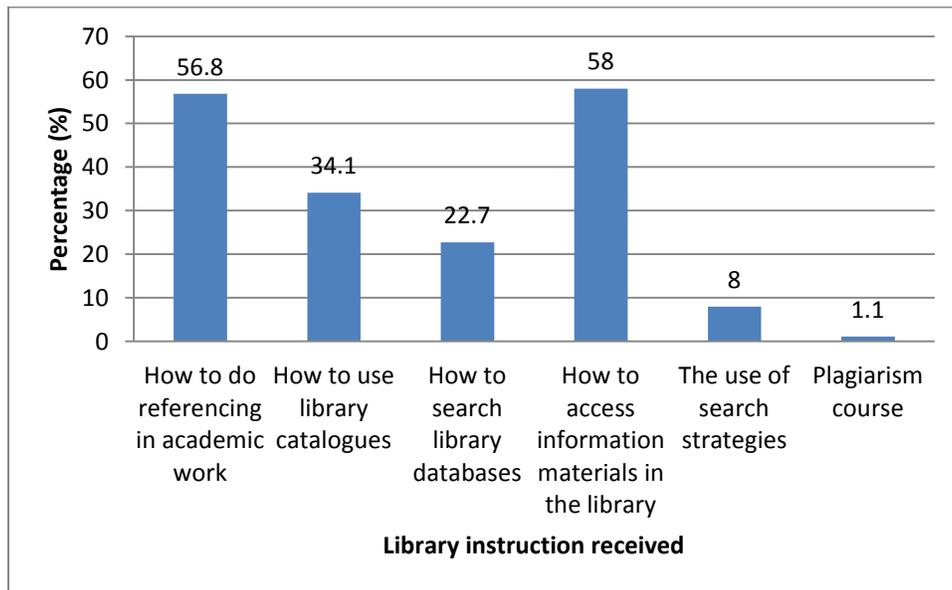


Figure 6: Type of library instruction received.

(N=88)

When asked what type of instruction the respondents received, 58% of those who had indicated that they had attended library instruction said that they were taught how to access information materials in the library, 56.8% indicated that they were taught how to do referencing in academic work, 34.1% indicated that they received instruction on how to use the library catalogues, while 22.7% said that they were taught how to search library databases. Only 8% and 1.1% indicated that they were taught on the use of search strategies and plagiarism course, respectively. The student had the chance to select more than one option on the kind of the training they had received.

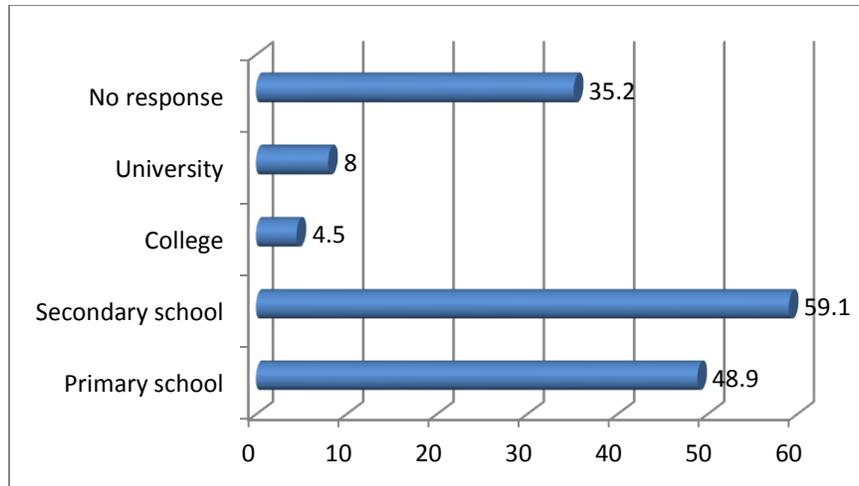


Figure 7: Where library instruction was received

(N=88)

Figure 7 shows the places at which the majority of the students first received library instruction. Of the 88 students who had indicated that they had received some kind of library instruction before joining university, quite a significant number of students totalling 59.1% first received library instruction while at secondary schools; 48.9% received library instruction at primary school; 8.8% received library instruction at the university, while 4.5% received instruction in college. (35.2%) did not respond to the question.

4.3 Awareness of search strategies

This section is meant to establish the awareness of search strategies among incoming undergraduate students. Search strategies are important in the research process because among others, the search strategies enable students to easily access the required information.

4.3.1 Awareness of search strategies among undergraduate students

In order to determine whether incoming students have any knowledge of search strategies they were asked whether they have ever heard of the term ‘search strategy’. Figure 8 shows that 62% have never heard about search strategies while 31.4% were aware of search strategies, 6.6% of the intended respondents did not respond to question.

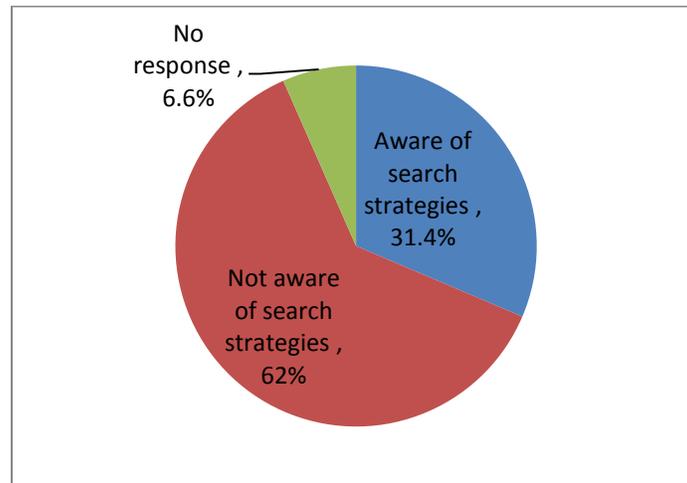


Figure 8: Awareness of search strategies among undergraduate students

(N=137)

A follow-up question was posed to those students who had indicated that they had heard of a search strategy prior to the conduct of the current study to indicate what a search strategy is.

Table 3: Definition of what is a research strategy

(N=137)

What is a search strategy	Frequency	Percentage (%)
A manual describing the proper format for a research paper	7	5.1%
A hand out explaining how to get books from other libraries	1	0.7
A list of books on specific topics	2	1.5%
A plan of action that gives direction to your research	25	18.2%
Do not know	27	19.7%
No response	75	54.7%

Students were asked to select the option(s) that best described what a search strategy is. According to the findings in Table 3, the majority of the students 54.7% did not answer the question, while 19.7% indicated they did not know what a search strategy is. Only 18.2% of the students provided the correct statement of what a search strategy was, that is “A plan of action that gives direction to your research”. Seven 5.1% and 0.7%, respectively, did not select the correct answer from the options provided. They believed that a search strategy was, “A manual describing the proper format for a research paper” and “A hand out explaining how to get books from other libraries”, respectively.

4.3.2 Awareness of Boolean logic operators

A question was posed to the students on their awareness of the Boolean logic operators. 82.5% of the students indicated that they have never heard of Boolean Logic operators, while only 13.1% have heard of the operators, (4.4%) students did not respond to the question.

In order to establish whether the students knew how Boolean operators were used, the following question was asked “Boolean operators are used to combine search terms and show their relationship: is true or false? To which 72.3% of the students did not answer, 3.6% indicated that the statement was “false” while only 24.1% were of the opinion that

the statement was “True”, that Boolean logic operators “are used to combine search terms and show their relationships”.

In relation to the use of Boolean logic operators during a search process, the respondents were asked the following question. “When searching in a research database, the use of Boolean operators “AND”, “OR” and “NOT” can be useful in narrowing or widening your search results. Which operator would you use to increase the number of the items you will retrieve? Figure 9 below shows the students responses.

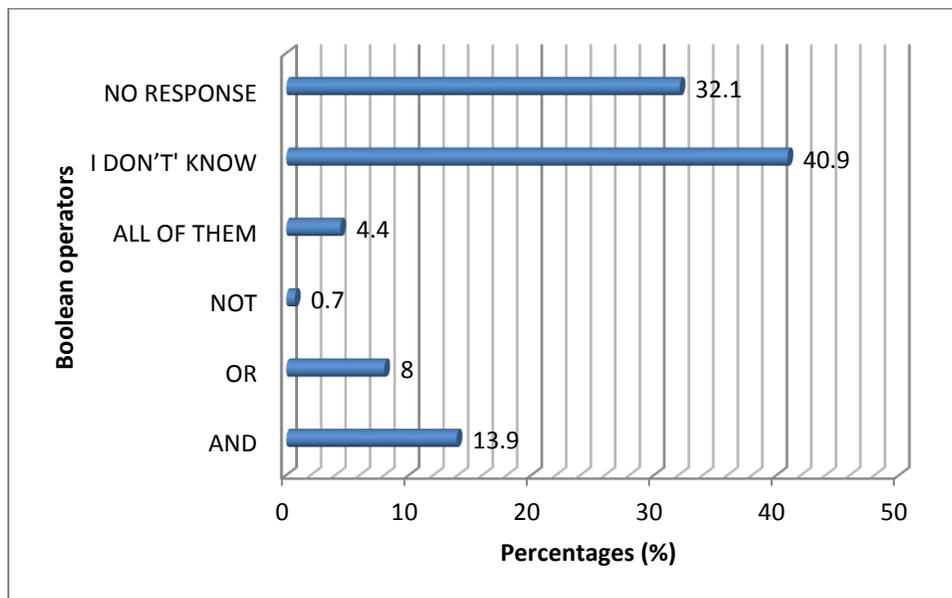


Figure 9: Which Boolean operators can be used to increase number of items during searches

(N=137)

The majority of the respondents 40.9% indicated that they did not know, while 32.1% did not respond to the question. Nineteen (13.9%) students selected the operator AND as the one used to increase the number of items during a search, 0.7% selected the operator NOT, while 4.4% indicated that all operators could be used to increase the number of items in a search. Only 8% picked “OR” as the correct option.

4.3.3 Characteristics used to evaluate the quality of an Internet site

To determine whether the incoming students were aware of how to evaluate internet sites, they were asked to select, from among the options, those characteristics that can be used to evaluate an internet site. The table 4 below shows the responses from the students.

Table 4: Characteristics used to evaluate an internet site

(N=137)

Characteristics used to evaluate an internet site	Frequency	Percentage (%)
The date of publication is provided	14	10.2
The author	19	13.9
Responsibility for the site is clearly indicated	34	24.8
The site is easily accessible	38	27.7
None of the above	3	2.2
I don't know	42	30.7

Table 4 indicates that 30.7% of the incoming students indicated that they did not know the characteristics used to evaluate an Internet site, while 2.2 % indicated that none of the outlined characteristics applied to the evaluation of an Internet site. It was also noted that 27.7% of the students indicated that one of the characteristics used in evaluating an Internet site is accessibility while 10.2% said that the date of publication is one of the characteristics. A further 13.9% and 24.8% students observed that the characteristic used for evaluation of an Internet site included the author of and the responsibility for the site, respectively.

4.3.4 Uses of search engines

A question was asked on which information resources the students would find while using search engines such as Google or Yahoo. Table 5 shows the responses according to percentages and frequencies.

Table 5: Information sources that can be retrieved from search engines

(N=137)

Information materials	Frequency	Percentage (%)
The books available in the library	59	43.1
Biographical information about famous people	2	1.5
Merchandise catalogues	6	4.4
Information about companies	4	2.9
Don't know	45	32.5
Other	1	7
No response	20	14.6

The highest number of students 43.1% were of the opinion that books available in the library could be found in the Google and Yahoo search engines, 1.5% of the students felt that biographical information about famous people are found in the search engines, while 4.4% and 2.9% students, respectively, noted that merchandise catalogues and information about companies can be found in both Google and Yahoo. A further 32.5% students indicated that they did not know which type of information resources could be found in Google and Yahoo, while 14.6% students did not respond to the question.

4.3.5 Searching for information within a book

In order to determine whether incoming students know how to search for right information in a book, they were asked what section of a book they would consult to find other documents on the same topic. Specifically the following question was posed “You

have found a book that is right on your topic, which section of the book will you consult to find other documents on the topic?”.

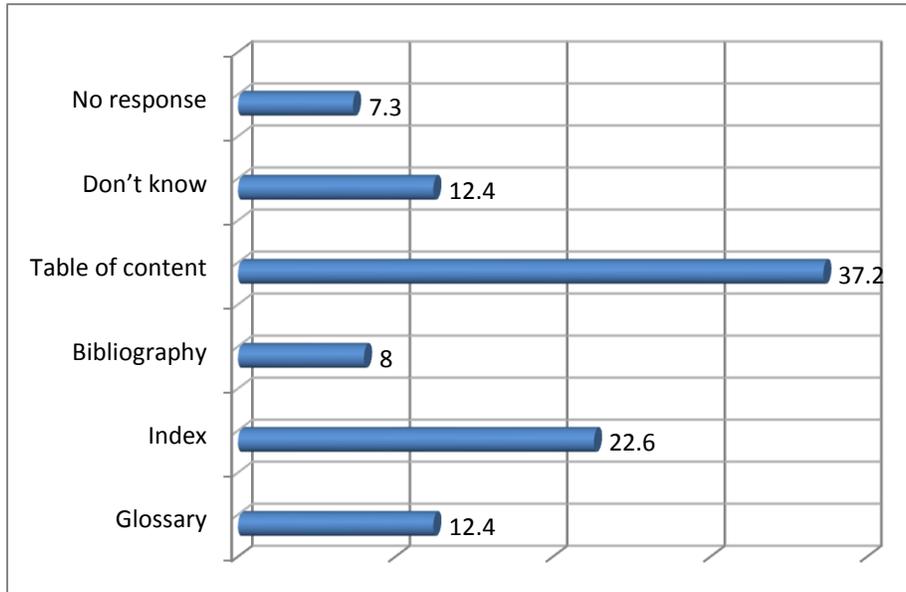


Figure 10: Sections of a book to consult for other documents on same topic (N=137)

According to the finding in Figure 10, 37.2% students indicated that they needed to consult the table of content for other documents on a topic, 22.6% respondents indicated that they would consult an the index; 12.4% of the respondents were of the view that the glossary would serve the purpose while 8.0% believed that the bibliography would provide the answers. Seventeen (12.4%) students indicated that they did not know the answer while 7.3% students did not respond to the question.

The students were also asked to state what the **BEST** way is to search for books on a given topic in the library.

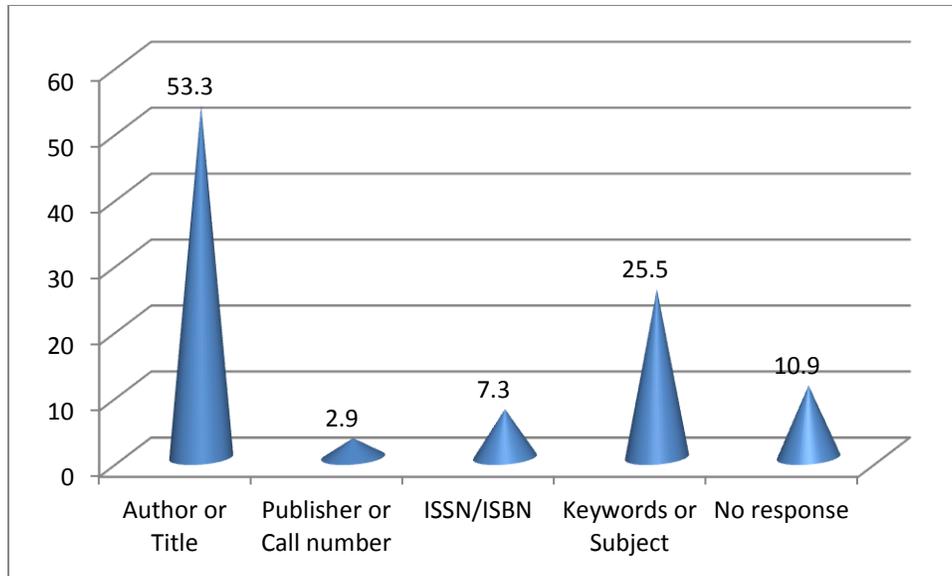


Figure 11: Best search methods for books on a given topic
(N=137)

According to the findings, in Figure 11, 53.3% of the students indicated that the author or title is the best way to search for books on a given topic in any given library while, 25.5% students identified the use of keywords or subject terms as the best way to search for books on a given topic. The findings also indicated that 7.3% and 2.9% students felt that the best way to search for books on a given topic is by the use of ISSN/ISBN and publisher or Call number, respectively. There were 10.9% students who did not respond to the question.

4.3.6 Characteristics used in evaluating information sources

Evaluation of information resources is critical in research. In order to establish whether incoming students knew how to evaluate information sources for the purpose of determining the quality, the students were asked to select the various characteristics used in evaluating information sources. The following question was posed to students, “Which of the following characteristics can be used to evaluate the quality of information sources?”

Table 6: How to evaluate information sources

(N=137)

Evaluation method	Frequency	Percentage (%)
Timeliness of the information	14	10.2
Credentials of the author	20	14.6
Length of the information source	29	21.2
Accuracy of the information	21	15.3
Don't know	26	19
No response	27	19.7

Table 6 shows the responses using frequencies and percentages. According to the findings, 9.0% students indicated that they did not know the characteristics that are used to evaluate the quality of information resources, 19.7% students did not respond to the question, while 21.2% felt that the length (or size) of the source could be used to evaluate the quality of the information resources. A total of 15.3% felt that the accuracy of the information sources could be used to evaluate the quality of the sources. A further 14.6% of the students pointed out that credentials of the author can be used to evaluate the quality information resources while 10.2% students believed that the timeliness of the information resources could be used to evaluate information resources.

4.4 Basic information technology skills

This section aims to identify the information technology skills among incoming university students.

4.4.1 Computer skills gained prior to joining university

Students were asked to state whether they possessed any computer skills prior to joining the Catholic University of Eastern Africa. A total of 86.1% students indicated that they had received basic computer skills before joining the university, while 7.3% had not received any training. A further 6.6% students did not respond to the question. Of the

128 students who possessed some training in computer-related aspects, 90.6% were able to use word processors, such as Microsoft Office and Microsoft Word) 50.0% were able to use spreadsheets, 10.9% are able to use statistical programme for example (SPSS); while 63% indicated that they are able to use other computer programmes.

4.4.2 Use of Internet and the World Wide Web

On the part of the students’ skills in using the Internet and related technologies, 88.3% of the students knew how to use the Internet and World Wide Web while only 3.6% did not know how to use the internet and WWW, 8.0% did not respond to the question.

For those who indicated they knew how to use internet and the WWW, a follow-up question was posed for them to state the reasons for which they use the Internet and WWW. They were provided with the following options to choose from: Searching for information, Playing games, Networking with friends using Face Book, Twitter, MySpace, etc. Their responses are provided in Figure 12.

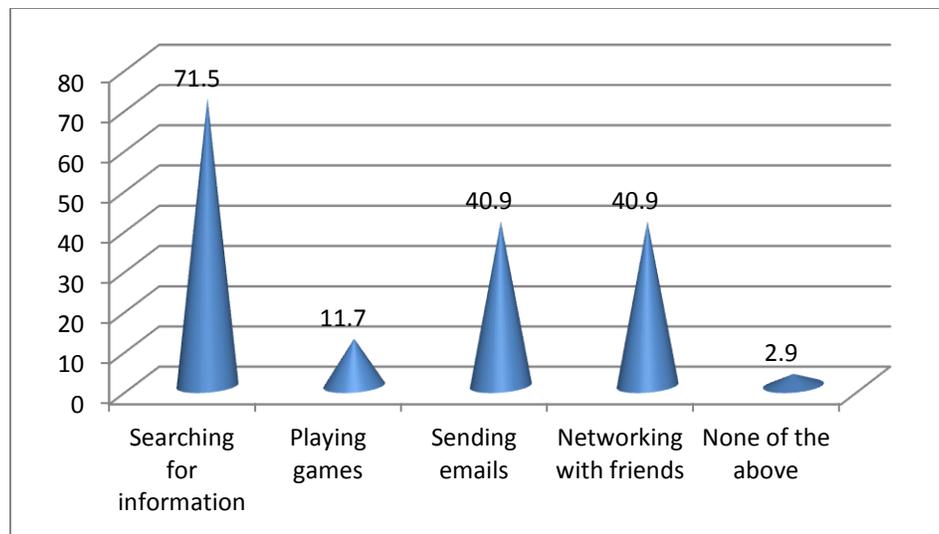


Figure 12: Reasons for Internet and WWW use among incoming undergraduate students

(N=137)

71.5% students used the Internet and the WWW to search for information, 40.9% used the Internet to send emails, 40.9% used it for networking with friends using Face Book,

Twitter, MySpace etc. A further 11.7% students used the Internet to play games, while 2.9% said that they do not use internet and WWW in respect to the activities provided.

4.4.3 Methods used to save results obtained from information searches

The students were asked which method they would use to save their Internet searches. They were provided with the following methods for them to choose from; flash disk/memory disk, saving on the computer system, sending the searches to their email addresses. They were also given the option of selecting more than one method to save their searches.

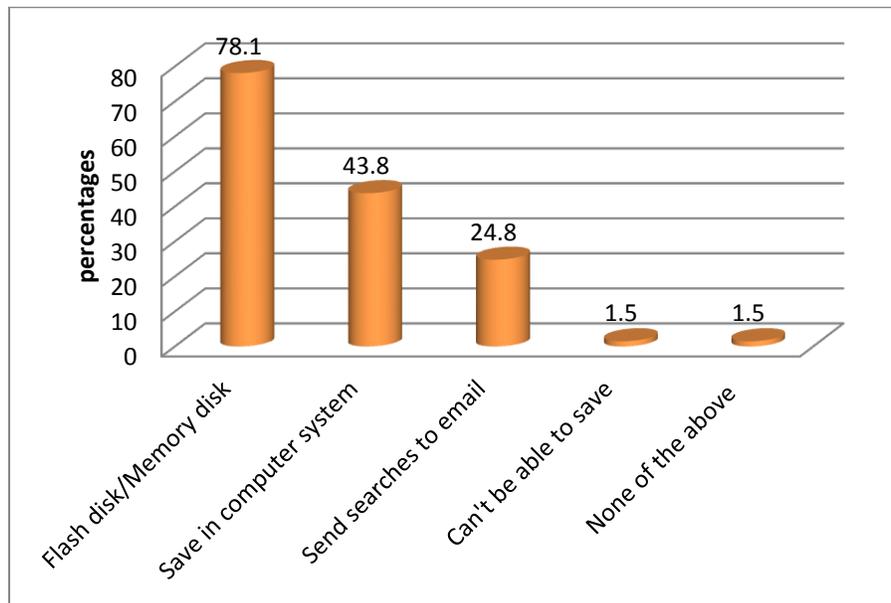


Figure 13: Method used to save results from information searches

(N=137)

Figure 13 shows the various methods students could use to save their Internet searches. It was noted that 78.1% of the students would use flash disk/ memory disk; 43.8% indicated that they would save the searches in the computer system; 24.8% would send the searches results to their email addresses; 1.5% said that they would use none of the above methods; 1.2% of the respondents indicated that they would not be able to save the search results.

4.5 Knowledge of information retrieval tools and their application

This section seeks to present findings that focused on establishing whether incoming first-year undergraduate students have any knowledge of information retrieval tools and their applications.

Firstly, the students were asked whether or not they understood what OPAC stands for. 17.5 % of the students did not respond to the question while 58.4% of the students indicated that they did not know what an OPAC was. 8.8% students indicated that the acronym OPAC stood for Online Periodical Access Center and 0.7% said that OPAC stood for Online Portfolios for Academic Classes. Only 14.6% indicated that OPAC stood for Online Public Access Catalogue.

The second question in the series of questions on the students' knowledge of information retrieval tools was meant to determine whether the students were aware of information sources. The students were asked to select the source they would consult when they were not familiar with a subject, or a topic they knew very little about. Figure 14 shows their responses.

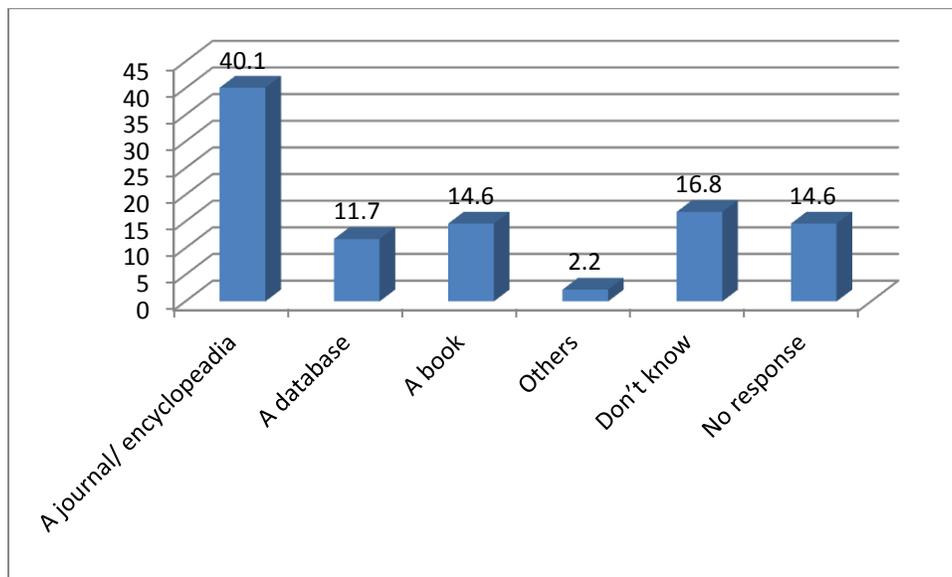


Figure 14: Information sources

(N=137)

In their answers 40.1% of the students indicated that they would first consult a journal or an encyclopaedia in order to become familiar with a subject about which they knew little; 14.6% students indicated that they would consult a book in order to become familiar with as subject about which they knew little; 11.7% students selected a database; 16.8% students said that they did not know; while 4.6% students did not respond to the question. The third question sought to find out if students knew the type of items that would be found in a library catalogue. 65.7% of the respondents selected the option all the titles of the books available in the library; 0.7% students selected the option all the titles of the books available on the market; 3.6% students indicated that the catalogue contained information of all the titles of journals available in the library; while 0.7% students believed the choices provided were not applicable. A further 15.3% of the respondents indicated that they did not know the answer, while 13.9% of the students did not respond to the question.

On how to find documents written by a specific author, a specific question was asked on how to find documents authored by *Ngugi Wa Thiong'o* in the library catalogue.

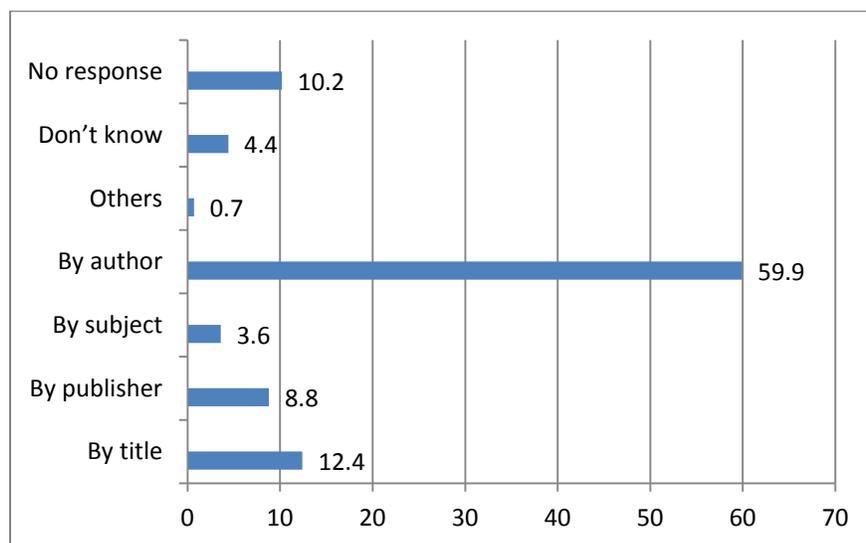


Figure 15: How to locate items authored by Ngugi Wa Thiong'o in the library (N=137)

Figure 15 show the students' responses. According to the findings, majority of the students, that is 59.9%, said that the name of the author is the correct way to locate items by a specific author in a library catalogue; 12,4% of the students indicated that items by a specific author could be located using the title; 8.8% students believed that the publisher is the best way to locate a book by a specific author; 4,4% and 0.7% students selected the option of did not know and 'others', respectively. A total number of 10.2% of the students did not respond to the question.

The fifth question was asked to determine whether incoming university students knew how library materials are arranged on the shelves, whereby 88.3% of the students said that library materials are arranged in a systematic way, 5.6% students said they did not know that library materials are arranged in a systematic way while, 8% students did not respond to the question.

Although most of the students had indicated they were aware that information materials in a library are arranged in a systematic way, when asked what a call number or classification number was, 61.3% of the students responded that they did not know what a call number or classification number was. Thirty-three (24.1%) student said that they knew what a call number is; while 14.6% did not respond to the question.

A follow-up question was asked in order to gauge whether or not those who had indicated that they knew what a call number or classification number was they knew their purpose. 19% of the students indicated that a call number or classification number is used to locate a book in the library; 4.4% students said that the call number is used to checkout a book; while 5.8% students believed that it is used to browse the shelves for similar books.

In order to establish whether incoming students knew how to locate current information on drugs, the following question was asked and options provided “to *find the most recent information about drugs you would consult*”. Figure 16 show the responses from the students.

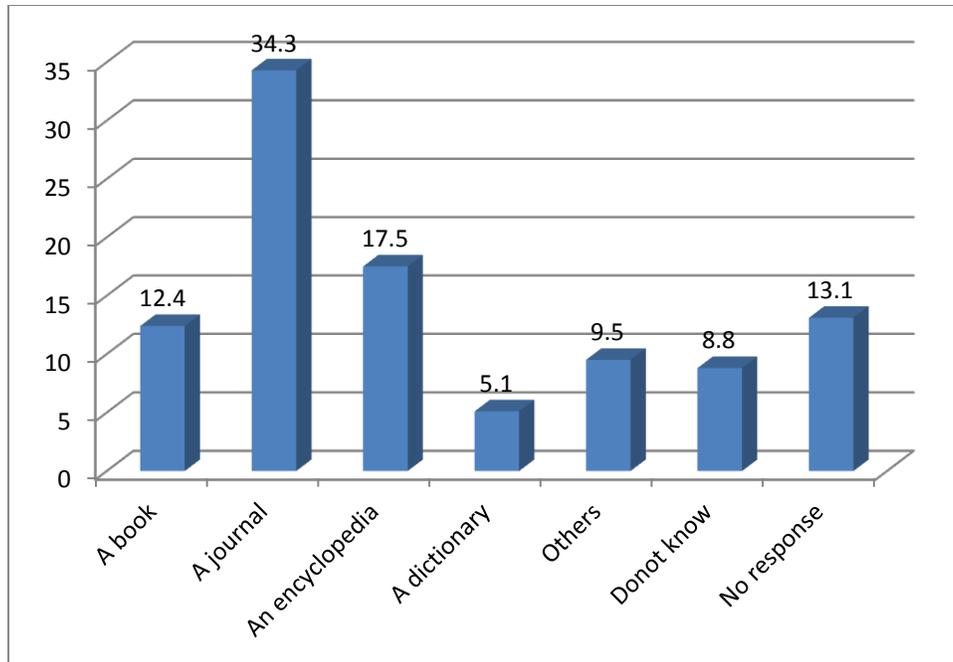


Figure 16: Where to find current information on drugs

(N=137)

According to the findings, 34.3% of the students indicated that current information on drugs abuse could be found in a journal; 17.5% students said that the information on drug abuse could be found in an encyclopaedia; 12.4% students indicated that current information on drug abuse could be found in a book; 5.1% said that that the information could be found in a dictionary; 9.5% of the respondents indicated that current information on drug abuse could be found in other sources; 8,8% indicated that they did not know the answer while 13.1% students did not respond to the question.

One of the ways used in easier and more efficient retrieval of information is by the use of information retrieval tools. In order to gauge students' knowledge of information retrieval tools the following question was asked. *What is an abstract?* Students were then provided with options from which they could pick their answers.

Table 7: What is an abstract

(N=137)

What is an abstract	Frequency	Percentage (%)
A quote from a book	23	16.8
A full text article	5	3.6
A type of government document	17	12.4
A summary of a resource	35	25.5
Don't know	30	21.9
No response	27	19.7

From the five options that were provided (see table 7), 25.5% students indicated that an abstract is a summary of a resource; 16.8% students selected ‘a quote from a book’ as the correct answer; 12.4% students believed that an abstract is a type of government document; 3.6% said an abstract was a full text article; while 21.9% indicated that they did not know what an abstract was. 19.7% students did not respond to the question.

4.6 Knowledge of information sources and their formats

This section seeks to present the findings generated from the questionnaire regarding students’ knowledge of information sources and their formats.

Firstly, the students were asked whether they were aware of primary and secondary sources of information. A total of 40.1% students said that they were aware of primary and secondary sources of information; 45.3% students indicated that they were not aware of what primary and secondary sources of information were; while 14.6% students did not respond to the question.

The students who indicated they were aware of primary and secondary sources were asked to provide examples of primary and secondary sources they were aware of. Of the 55 students who were aware of the primary and secondary sources, 70% of the respondents did not answer the question; while 29.1% respondents listed a number of sources as follows:

Primary sources

Observations, A book, Newspapers, Individuals, Interviews, Magazines, information that you gather from individuals/people, conversions, data from field, journals, authors, information being passed from one person to another and speeches.

Secondary sources

Journalism, someone telling you something, Internet, books, journal articles, information from textbooks, newspapers, and written materials, e.g. scrolls, watching television sets, written sources, grapevine and journals.

In order to establish which information format incoming students were aware of the respondents were asked to select these from three options provided, namely print format, electronic format or both formats. A total of 29.2% students indicated that they were aware of print information sources, 5.8% selected electronic format, while 30.7% indicated they were aware of both electronic and print format. Another 16.1% students indicated that they did not know any kind of format, while 18.2% students did not answer the question.

In order to determine the electronic information sources the students had previously consulted, six options were provided. Students were allowed to select more than one option. The responses are shown in Figure 17

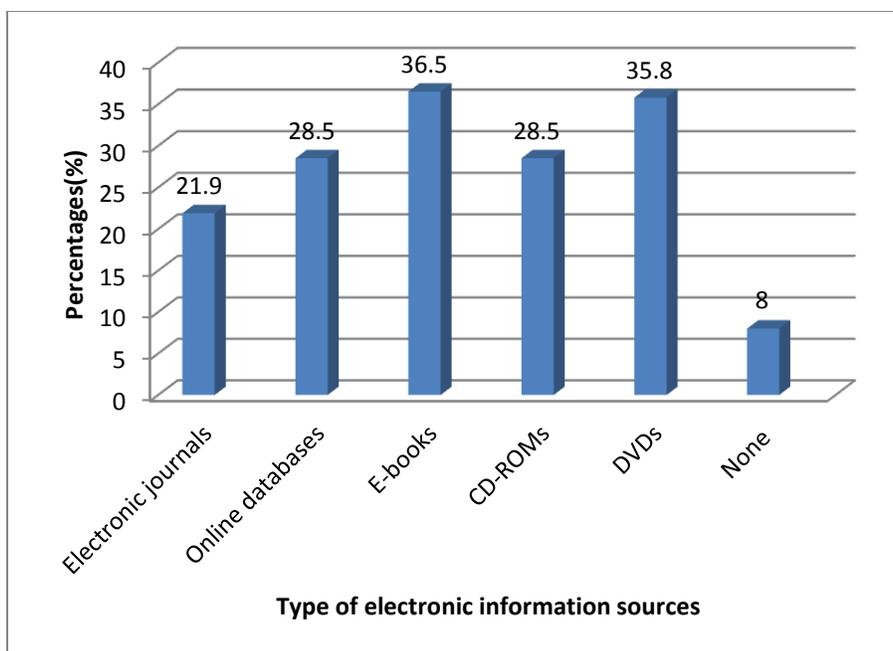


Figure 17: Electronic information sources previously consulted by incoming first year students

(N=137)

According to the findings in figure 17 the highest number of students, that is 36.5%, had consulted e-books prior to joining the university. Other information sources that recorded the highest frequencies are DVDs which posted a total number of 35.8% students, online databases which had previously been consulted by 28.5% of the students just like the CD-ROMS. It was also found that 21.9% students had consulted electronic journals previously. Only 8.0% students indicated that they have never used any electronic information sources on the list.

A follow-up question on the types of print information resources that incoming students had previously consulted before joining university was asked. A list was provided for them to select from. Figure 18, shows the print resources previously accessed by incoming first-year students.

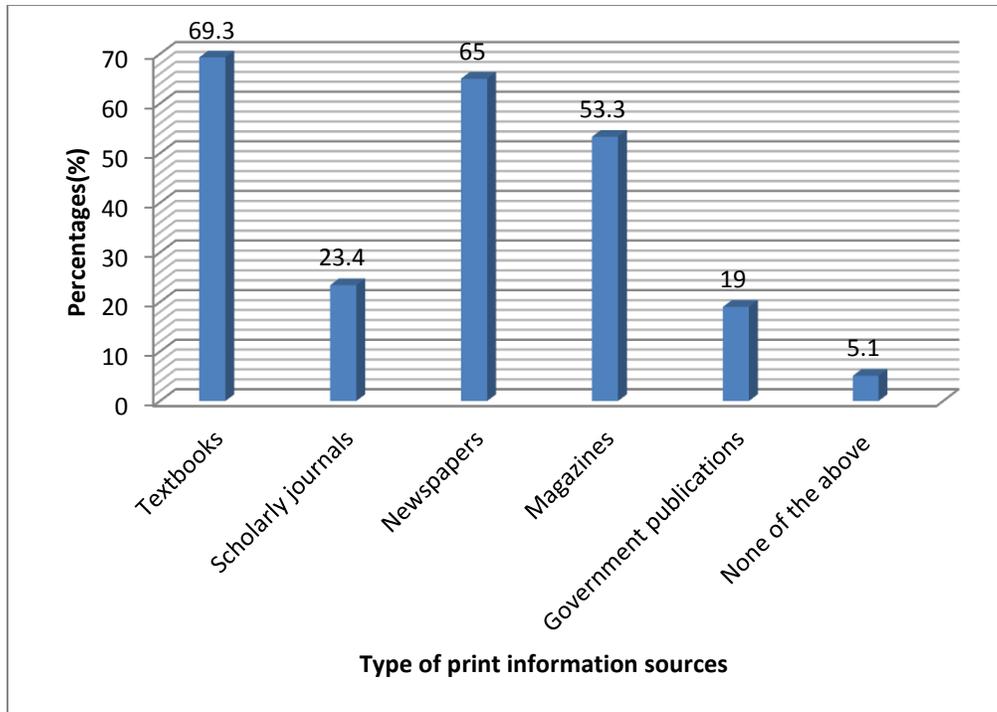


Figure 18: Print information sources previously consulted by incoming first year students

(N=137)

According to the findings as reflected in figure 18, students who had previously consulted textbooks were 69.3%, which was the highest number as shown in Figure 18. Others print information sources which also ranked high was newspapers which posted 65% of the students and magazines, which had 53.3% students who had previously consulted them. Others previously consulted print resources were scholarly journals and governments publications, which were consulted by 23.4% and 19% students, respectively. Only 5.1% students indicated that they had not previously consulted the print resources provided in the list.

4.7 Intellectual property and copyright issues

This section seeks to determine whether incoming first-year undergraduate students were aware of intellectual property rights and copyright issues. The students were asked whether they have ever heard of the terms intellectual rights and copyright while using any information material. The majority of the students totalling 57.5% indicated that they have heard about both terms previously; 27.7% students said that they have never heard of the terms intellectual property rights and copyright before; while 14.6% students did not respond to the question.

In order to determine whether the students were aware of what referencing was, they were asked the following question “*do you know what is referencing?*”. Most students, that is 52.6%, indicated that they knew what referencing was; 32.1% students said that they did not know what referencing was; while 15.3% students did not respond to the question.

A follow-up question was asked on which referencing style the students were familiar with. The following question was asked “*Which of the following referencing standards do you know?*”. They were given the following list to select from; APA, Chicago, MLA, and Harvard. Figure 19 shows the various referencing styles the respondents were familiar with.

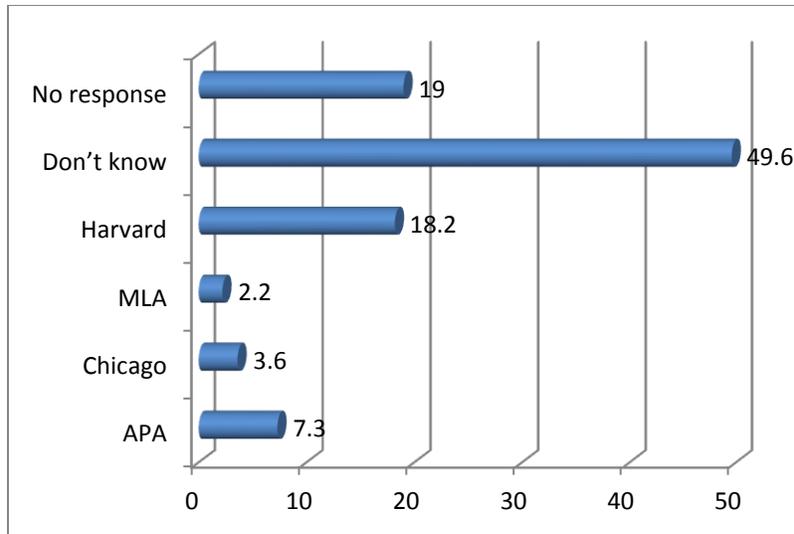


Figure 19: Types of referencing styles

(N=137)

According to the finding in Figure 19, 49.6% students who comprised the majority of indicated that they did not know any of the referencing styles listed in the questionnaire, while 19.0% students did not respond to the question. 7.3% indicated that they knew the APA referencing style; 18.2% said they knew the Harvard referencing style. Those students who knew about Chicago and MLA referencing style were 3.6% and 2.2%, respectively.

In order to establish whether the students were aware of plagiarism the following question was asked. “*Are you aware that using another authors intellectual work without acknowledgement is a form of theft?*”. A great majority of students, that is 71.5%, were aware that using another author’s intellectual work without acknowledgement is a form of theft. Further 17.5 % students indicated that they were not aware that using another author’s intellectual work without acknowledgement is a form of theft, while 10.9% did not respond to the question.

A follow-up question was asked in order to establish whether incoming students knew the correct TERM used when one fails to give credit to information sources consulted. The following question was posed. “*Failure to give credit to the authors of the sources of*

information that you have consulted is called?”. Figure 20, shows the students’ responses.

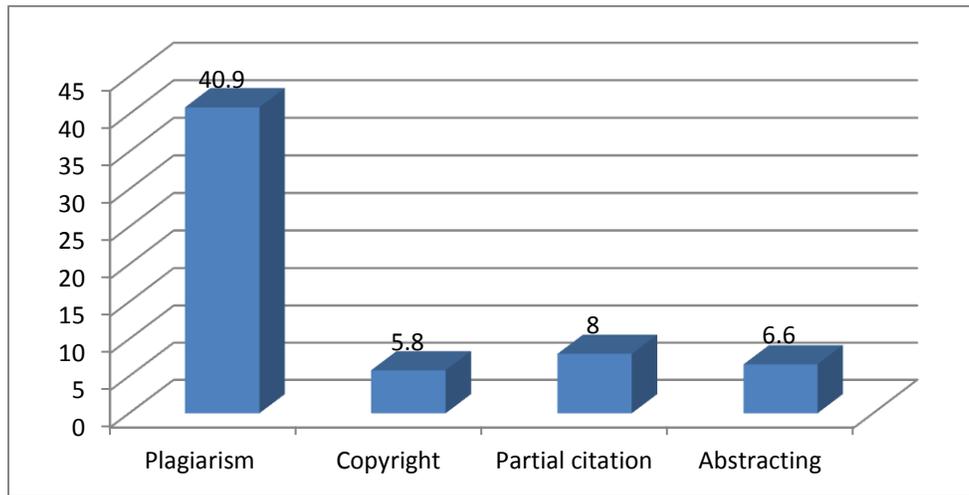


Figure 20: The term used for failure to credit information sources (N=137)

Figure 20 shows that 40.9% students selected “plagiarism” as the term used to describe when one fails to give credit for information sources that one has consulted; 8% students indicated that the action is called partial citation; 6.6% said that it is called abstracting; 5.5% believed that the action can be termed as copyright; while 38.7% students did not respond to the question.

In order to establish whether incoming first-year student’s knew any items that can be considered intellectual property, they were provided with a list of items to select from. They were also given an option of selecting more than item considered as intellectual property. Figure 21, shows the student responses.

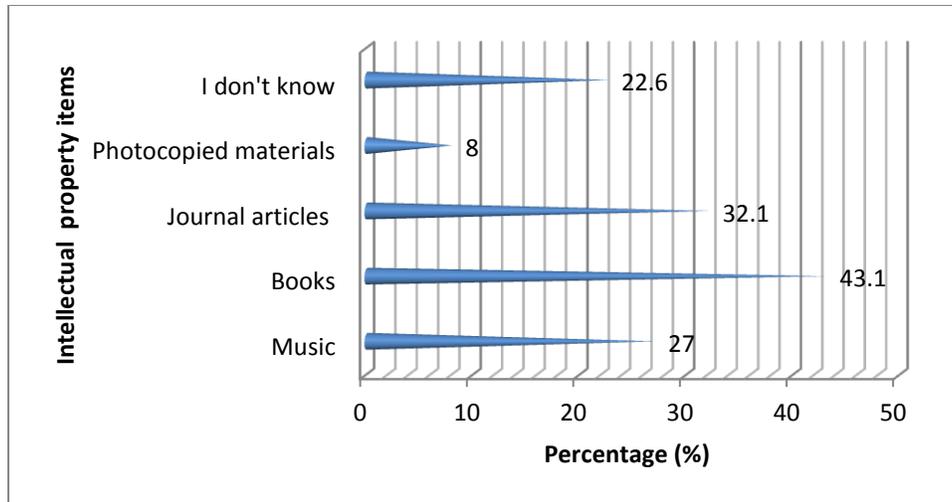


Figure 21: Items considered as intellectual property

Figure 21 shows the responses in terms of the number of students and the items they considered as intellectual property. Only a couple of students that is 8.0% indicated that photocopied materials can be termed as intellectual property. 22.6% students said that they did not know the items considered as intellectual property. The following shows the numbers of students and the type of item they considered as an intellectual property; music 27.0%, books 43.1%, journal articles 32.1% students.

Table 8: Acts of plagiarism

(N=137)

Phrase	Frequency	Percentage (%)
Paraphrasing an author's idea without mentioning	32	23.4
Using an author's exact words without giving credit	39	28.5
Unintentionally paraphrasing an author's idea without mentioning it	10	7.3
Changing a few of the authors words and not using quotation marks	9	6.6
Don't know	42	30.7

Furthermore, students were asked to select from the various options listed in table 8 what actions may be regarded as acts of plagiarism. According to the findings 30.7% of the

incoming students indicated that they did not know what an act of plagiarism is; 28.5% of the respondents felt that using an author's exact words without giving credit amounted to plagiarism. Also considered to be an act of plagiarism is paraphrasing an author's idea without mentioning which was selected by 23.4% students. A further 7.3% and 6.6% students considered unintentionally paraphrasing an author's idea without mentioning it and changing a few of the authors words and not using quotation marks as acts of plagiarism, respectively.

4.8 Summary of the chapter

Chapter four represents the research finding on information literacy skills among incoming undergraduate students at the Catholic University of Eastern Africa for the academic year 2013/2014. The findings have been presented using narratives, frequencies, percentage, tables, pie charts and bar graphs. The findings reflect the true findings according to student responses on questions provided in appendix III. The finding can be termed as the presentation of the level of information literacy skills among incoming undergraduate students at the Catholic University of Eastern Africa.

CHAPTER FIVE: DISCUSSION OF THE FINDINGS

5.1 Introduction

Chapter five present the discussions relating to the findings of the study. The main aim of the study was to assess the level of information literacy skills among incoming undergraduate students at the Catholic University of Eastern Africa for the academic year 2013/2014. The findings are discussed under the following sub-headings:

- General background information
- Awareness of search strategies among undergraduate students
- Basic information technology skills
- Knowledge of information retrieval tools and their applications
- Knowledge of information sources and their formats
- Intellectual property and copyright issues
- Conclusions

5.2 General background information

The following section discusses the research finding in line with the study objectives and research questions. It discusses the distribution of the respondents by gender, respondents' use of library before joining university, importance of libraries to the respondents, and finally respondents' previous attendance of library instruction programs prior to joining the Catholic University of Eastern Africa (CUEA).

5.2.1 Distribution of respondents by gender

The current study's findings revealed that majority of the students joining University were female. Out the 137 students who participated in the study, 63.5% were female, while 36.5% were male. This was an indication that there were more female students joining Catholic university than their male counterparts. The finding revealed that there was gender disparity among students joining CUEA, which is a private chartered university. Onsogo (2007: 114) opines that gender equality means giving men and women, girls and boys, the same opportunities to participate fully in the development of their societies and achieve self-fulfilment. The findings corroborates Onsogo's (2007) earlier finding that there were more female students than male students joining private chartered universities in Kenya. The reason for more female students joining private university could be as a result of the university's flexible admission requirements. This is also highlighted by Onsogo (2007:118) who states that private universities increase access to university education for women through flexible admissions policies and programmes. The trend could also be attributed to the affirmative action adopted in Kenya since the early 1990s aimed at improving female students' access to university education in Kenya (Onsogo, 2009). As Onsogo (2009) notes, affirmative action is used to increase women's access to university. She further explains that affirmative action is a body of policies and procedures designed to eliminate discrimination against marginalised groups, including ethnic minorities and women. The high number of girls joining CUEA, as revealed in this study could imply that the emphasis by the Kenyan government to give girls equal chance in education has borne fruits.

5.2.2 Respondents use of library before joining the university

It was observed that majority of incoming undergraduate students had used libraries before joining the university. It was only a small fraction of the students who had not previously used the library before joining CUEA. The high number of students who had previously used libraries was an indication that the students were coming from an

educational background where library services were available. The fact that some students had accessed libraries before joining CUEA is a positive indication that they can fit into the complex system of information seeking at a university. However, they might require some guidance on how to search, retrieve and use information for their studies, among other aspects.

According to the findings, incoming students had previously accessed the following library services; visit to a library to read books and journals, borrowing of books, and accessing Internet services.

The visit to the library for various services was an indication that the students are able to identify their information needs. This, in essence, necessitated them to visit the library for various services. According to SCONUL seven pillars of information literacy (2011), an information literate person should be able to “identify” his/her personal need for information. SCONUL (2011) also states that being information literate involves developing a learning habit so new information is being actively sought all the time.

5.2.3 Importance of libraries for studies

The current study’s findings revealed that majority of the students 97.8% were of the view that the library was an important component in their studies. Generally, a library is important to any student because it acts as a custodian of information/knowledge. It can be said that no serious student can survive without a library since it is the place where they carry out their research, get information for their class assignments, research papers and even continuous assessments tests (CATs).

The findings revealed that for those students who thought the library was important, majority identified research and the provision of information materials for studies as the two key functions that make the library important to them. Indeed, it is well acknowledged that research is an important component in university education and it is therefore not surprising to note that 81.8% students thought the library would help them

in their research. This was an indication that incoming students are aware of the importance of libraries in research vis-a-vis their studies as undergraduate students. Also, a higher number of respondents 56.9% thought the library would help in providing information for their assignments. This showed that the majority of incoming students were aware that libraries play a pivotal role in their education life. The students are expected during their stay in the university to be able to complete their class assignments in time and also carry out research for their term papers. In this case, they need libraries to help them in providing information materials for their assignments and research. Only one student who was of the view that the library would not be of any help to him/her. Although one student could be considered insignificant, it is cause for concern, as this student may never use the library. This attitude that the library is not important could be attributed to several factors; probably the student lacked awareness of the role of the library with regard to his/her studies or the student planned to use virtual libraries or the internet to download information materials for his studies. Without the necessary information skills, the student might also encounter difficulties in accessing information from the virtual libraries or internet.

5.2.4 Respondents' attendance of library instruction programme before joining university

Library instruction plays an integral part in imparting information skills on students. According to the findings, majority of 64.2% had received library instruction before joining CUEA. There was a significant number of incoming students that is, 33.6% who had never attended any library instruction. This pattern revealed that school libraries (or some other institutions) were engaged in training students on how to use the library. Given the importance of library instruction, the number, which had not received any training prior to joining CUEA could be considered high. This revealed that some new students lacked basic library skills since they had not received any library instruction. This brings to the fore the importance of the library orientation offered to new students as a way of training them on library use. Although, other methods can be employed to address this problems.

For those incoming students who had received library instruction prior to joining CUEA the findings revealed that they were trained on the following; how to access information materials in the library, how to reference in academic work, how to use library catalogues, how to search library databases, and the use of search strategies, and plagiarism course, respectively. This was an indication that the availability of library services in their previous educational background enabled students to receive instruction on basic library skills. The diversity of the areas of instruction augurs well for the students as the students will be well equipped to handle information-related challenges. The five areas covered in the questionnaire are critical and core in the library instruction programmes. Students need to be instructed on search strategies, information technology skills, knowledge of information retrieval tools and their applications, information sources and plagiarism, immediately they join university. This helps to lay the foundation for their university studies. Although according to the findings, very few students were trained on search strategies and plagiarism. Only one student who was instructed on plagiarism and seven were instructed on the use of search strategies. According to SCOUNL (2011) it is the responsibility of an information literate person to be honest in all aspects of information handling and dissemination (e.g. copyright, plagiarism and intellectual property issues).

The findings revealed that most of the students first received library instruction in secondary and primary schools. A small number of students 5.1% received instruction at university, while 2.9% of the students had previously received instruction at college. This may mean that the majority of the students were coming from educational backgrounds where library facilities were readily available. It also revealed that library instruction was offered in their previous schools. Library instruction carried by libraries help in imparting information literacy skills to students. This is affirmed by Umar (2013), who states that school libraries play a dynamic and evolving instructional role; students learn to access, evaluate, analyse and synthesise information from a variety of formats.

5.3 Awareness of search strategies among undergraduate students

Smith et al. (2013) opines that students making the transition from high school to university experience dramatic shifts as they are expected to manage their own learning. The expectations and environments change from highly structured tasks guided by teachers in high school to independent, less structured learning formats in post-secondary education environment. Hence, there is a need for students to possess information literacy skills and competencies to enable them access and make use of available information. Porter (2011:270) notes that students need several key skills and techniques to perform successful information search queries. Some of the search strategies used in searching information include controlled vocabulary, natural language, Boolean operators and keyword searching, (Porter 2013).

In order to determine students' awareness of search strategies, the following items were assessed; what is a research strategy, knowledge of Boolean logic operators, the use of Boolean operators, characteristics used to evaluate an internet site, the use of search engines, best strategy for searching the right topic/subject within a book, and characteristics used to evaluate information sources.

The findings revealed that a significant number of students, 62%, have never heard of search strategies, while only 31.4% said they have heard previously of the term search strategies. A small number 6.6% of the students did not respond to the question. It was important for the new students to know or understand what a search strategy. This was because with a clear understanding of the term the students are able to comprehend the role of a search strategy. The high number of students who indicated they have never heard of search strategy and those who did not respond could imply that they did not even know the importance of a search strategy.

In order to determine whether the students knew what a research strategy was, they were asked select the options provided which correctly defined as a search strategy. It was expected that the students would select the option that defined a research strategy as “*a plan of action that gives direction to your research*”.

It was noted that only 18.2% of the students who selected the correct answer that is, a research strategy is, “*a plan of action that gives direction to your research*”. This pattern tends to concur with the answer of the previous question whereby the majority of the students who numbered 62% had indicated they have never heard of the term search strategies. This reveals an existing gap in terms of knowledge and information literacy skills among incoming undergraduate students especially in regard to understanding of the concept research strategy.

This could be an indication that the library instruction offered to the students previously may have not covered aspects on search strategies.

5.3.1 Awareness of Boolean logic operators

Search operators are devices that are used to combine individual terms which have effect in either narrowing or broadening a search (Ferguson and Hebels, 2003:27). Boolean logic operators are used in both online public access catalogues and search engines.(Bronander et al. 2004; Munson & Kurt, 2000) notes that Boolean logic operators provide additional methods to refine a search. Questions 7, 8 and 9 in Appendix III were posed to the students in order to gauge their knowledge on Boolean operators.

According to the findings, majority of the students 82.5% had never heard of Boolean logic operators, while only 13.1% students had previously heard of Boolean logic operators. The number of those who have never had about the term Boolean operators was high, compared to those who knew the term. This confirms the earlier finding whereby the majority of the students had indicated they have never heard of the term search strategies. This reveal the gaps which exist on student’s knowledge on search strategies commonly used while doing a search. This could also imply that majority of the students will experience difficulties in information access and retrieval. In this case it will be the work of the librarians to carry out information literacy skills instruction for the new students in order to bridge the existing gap.

Boolean operators are used for effective search and retrieval of information resources from online catalogues, internet or the World Wide Web. The findings revealed that majority of the students are not conversant with Boolean operators. This was evidenced by the various responses they gave when asked the following question. *“When searching in a research database, the use of Boolean “AND”, “OR” and “NOT” can be useful in narrowing or widening your search results. Which Operator would you use to increase the number of items you will retrieve?”* The students gave the following answers; 13.9% of the students selected AND as the operators used to increase the number of items; 8% of the students said OR is the correct operator, while 0.7% of the student said it was the operator NOT. The correct answer in this case could have been “OR”. As Ferguson and Hebels, (2003:27) notes, the use of the operator AND to link two search terms produces a set of documents which contain both terms entered. So the operator AND helps narrow the search of two terms rather than widen it. Ferguson and Hebels (2007: 29) also points that the operator NOT is used to narrow a search by excluding documents that contain certain terms. On the other hand “OR” is the Boolean operator used to widen a search or increase the number of items during information retrieval.

The findings show that only 8% students got the answer right. The results corroborates a study by Bronander et al. (2004) on Boolean search experience and abilities of medical students and practicing physicians which revealed deficiencies in identifying Boolean phrases that would result in most successful and efficient information retrieval. According to Bronander et al (2004), the students were especially poor when the phrases contained operators OR and NOT. This explains why students used natural language phrases and questions instead of traditional Boolean language according to Porter’s study (2011). The lack of awareness of the use of Boolean logic operators among students joining the university can be greatly attributed to inadequate training in their previous educational background. The inadequate skills in searching using Boolean logic operators among incoming students could be addressed through information literacy training offered by the university library.

According to the above findings, the majority of the students are not aware of search strategies. This is evidenced by the fact that they did not even know what a search strategy was. They also did not know the use of Boolean logic operator OR. The findings reveal inadequate information skills among incoming students in relation to various search strategies. These findings are in tandem with the earlier finding regarding the type of instruction the students had received prior to joining university, which had revealed that only 5.1% had received training on the use of search strategies. This is an indication that the training received by secondary school students is not adequate to prepare them for serious searching and retrieval of information necessary for their studies at university level.

5.3.2 Characteristics used to evaluate the quality of an internet site

Eshet-Alkalai (2004) argues that in this modern era of unlimited exposure to digital information, which can be published easily and manipulated without difficulty, the ability to evaluate and assess information properly has become a survival skill for scholars and information consumers. According to SCONUL PILLAR 5, an information literate person should have the ability to “evaluate”, he/she must have the ability to review the research process and compare and evaluate information and data, evaluate issues of quality, accuracy, relevance, bias, reputation and credibility relating to information and data sources (SCONUL, 2011). Shanahan (2008:519), too, notes that evaluating the quality of retrieved documents from the Internet is an important component of successful information searching when using the internet.

As a result, this study sought to find out if students understood the characteristics used to evaluate the quality of an internet site. They were provided several options to select from.

The study revealed that 30.7% of the incoming students did not know the characteristics used to evaluate an Internet site. Freeman and Lynd-Balta (2010) noted that, nowadays, students rely on online sources, but they have difficulty judging whether they are scholarly or not. It also found that 27.7% of the students who participated in the current study were of the view that one of the characteristics used to evaluate an internet site is

when the site is easily accessible, but this could not be fully used as a characteristic to evaluate an internet site. Bronander et al (2004) concurs by stating that easy access to search engines does not guarantee useful results. 13.9% of the students indicated authors as one of the characteristics used to evaluate an Internet site while 24.7% students said it was when the responsibility for the site is clearly indicated. It was encouraging to note that 10.2% students indicated that the date of publication could also be used to evaluate an Internet site. This is of particular importance, especially where current information is needed for research. Many researchers or researches require current information in some disciplines such as ICT's, knowledge management, health and medicine, among others.

The above findings corroborate with a study by Mittermeyer (2005) who conducted a similar study on incoming first-year students in which she wondered; how information literate they are. The study revealed that only a small number of students, 23%, were able to identify the characteristics presented to enable them evaluate the quality of an internet website (Mittermeyer, 2005: 221).

Bankole and Oludayo (2012) notes that the Internet is a very useful tool for university students. It enables them to gain access to timely, accurate and relevant information that cannot be obtained from library shelves. However, without the necessary skills, it is a challenge to the students, especially getting authentic information. Eshet-Alkalai (2004) also point that the main problems in evaluating information lie in the difficulty to assess the credibility and originality of information and the professional integrity of its presentation. Shanahan (2008: 519) notes that the combination of dependency on the Internet as primary information retrieval system by undergraduate students, together with their reported poor skills in evaluating Internet information presents a major challenge that must be addressed by academics that use independent learning activities within courses or programmes of study.

5.3.3 Use of search engines

Search engines are used as information retrieval tools. According to Clarke (2000) search engines have been developed in response to the need for information retrieval on the World Wide Web. Ferguson and Hebels (2003: 23) note that search engines are search tools that index the content of the web. The index is then made available to users for searching. Some of the search engines available include Google, Yahoo, Excite, DogPile, HotBot, Webcrawler, Alta Vista and Ask.com (Ferguson and Hebels, 2003: 23; Porter, 2011:268). The students were asked the following question “using *a search engine such as Google or Yahoo, you would find?*” They were provided with the several options to choose from (*see also* Table 4.3 in Chapter four).

It was found that 32.5% of the students said that they did not know the type of information that can be found in search engines like Google and Yahoo. This was a significant number. Furthermore, it was in big contrast to what people generally believed about the current generation of students. They are even referred to as the millennial generation and techno-savvy because of their assumed knowledge in the use of information and communication technology. Although Salisbury and Karasmanis (2011) showed that students preferred Google as their first choice in finding information and the search engines have become their first choice in research, the finding in the current study revealed that a significant number of students are not aware of the information available in search engines. They may, however, be aware of the search engines as tools for searching for information but not so much as the information they contain.

5.3.4 Searching for information within a book

Finding relevant information is important to any student. Smith et al. (2013:89) opine that students entering the university often lack the information skills necessary to effectively and efficiently locate, access and use information. In order to determine whether new students knew how to search for the right information within a book they

were asked what section of a book they would consult to find documents on the same topic, The question read thus: *“You have found a book that is right on your topic. Which section of the book will you consult to find other documents on the topic?”* Students were presented with five options from which they were supposed to select one answer.

The findings revealed that majority of the incoming students were not aware of the bibliography as an information retrieval tool, which they could use to find other documents on a topic. It was revealed that only a few students (i.e. 8%) who selected a bibliography as the correct answer.

On what is the best way to search for books on a given topic, 53.3% students selected the author or title. Although this method could be appropriate, it has its own limitations since the student could only retrieve books by only a specific author. Furthermore, the assumption is that students would be aware that a certain author publishes on the topic in question. This is hardly the case, especially with fresh students who are joining the university for undergraduate studies. These students are believed to have little knowledge on who has authored which books in their disciplines of study. It was encouraging to find that 25.5% students selected keywords or subject terms as the best way to search for books on a given topic. When conducting research, this could be termed as the best method since it helps retrieve many information materials of the same topic but from different authors, giving the researcher a variety of resources to choose from. It was not surprising to note that 7.3% of the students selected ISSN OR ISBN as the best way to search for books on a given topic, while 2.9% students selected the publisher or the call number. The finding revealed that only a few students knew how to search for books on a given topic by using keywords or subject terms.

Although a majority of the students, comprising 81.8% and 56.9%, of the respondents had previously indicated that the library will help them in research, and in providing information for their assignments, respectively, the findings reveal that they did not have the requisite information literacy skills. The majority is not aware of the various search strategies. The inadequate information literacy skills among incoming university students could pose a big challenge to students in their quest for information.

5.3.5 Characteristics used in evaluating information sources

Various characteristics are used in evaluating information materials. According to the findings a significant number of the incoming students did not know how to evaluate information resources. 19% said that they did not know the criteria used to evaluate information resources. Twenty-nine students (21.2%) said that the criteria used was the length of Information sources. The criteria on timeliness of the information were selected by 10.2% of the students, while 14.6% students selected the credentials of the author. Further 15.3% students selected the accuracy of the information. It is generally agreed that the aforementioned are credible ways of evaluating information sources since the credentials of the author reveal the authenticity of the work, while the accuracy of the work shows that the work can be relied on as facts or true presentation. On the other hand, timeliness reveals the currency of the work, which is very important in any research.

Overall, the findings revealed that students joining university were not aware of search strategies, which included Boolean logic operators, the use of key words in searching for topics/subjects within a book as well as the criteria used to evaluate information resources. It was noted that the majority of the students did not know what a search strategy was. They did not know the use of Boolean operators and the characteristics used to evaluate information sources and Internet sites. Smith et al. (2013:94) too found that the information literacy skills of high school students are insufficient to effectively and efficiently complete undergraduate work. This corroborates findings by Porter (2011) who in his study found that students did not exhibit detailed search skills for each task they were given and, very little time and energy were expended by students in developing search terms. Porter (2011: 270) notes that important aspects of successful search strategies include diversity in searching strategies, proper planning, refining searches, and adequately delving into a topic.

5.4 Basic information technology skills

Ivankovic, Spiranec, and Miljko (2013) argue that questions about the level of ICT literacy among students are rarely raised due to the common belief that the new generation of students are Internet and technology savvy, since they have grown up in a world saturated by ICTs. These basic competencies should not be taken for granted since they affect abilities of new generations to participate in different domains in the e-society. This is also highlighted by Holman (2011), who states that millennial students have grown up in the information age, whereby they are constantly wired and continually connected. Millennials exhibit generational learning characteristics that impact their approach to information retrieval. In order to determine whether incoming students have basic information technology skills, five questions were posed. The findings revealed that the majority of incoming first-year students 86.1% had training on basic computer skills prior to joining the university. Only 7.3% had not received any training. The number of students who had received training before joining university was high, indicating that the majority may have basic computer skills. These students are highly advantaged because the skills are a necessity in higher education. The number of students who had not received any computer training was small but this reveals that not all students joining university have the requisite computer skills.

For those students who had computer training prior to joining CUEA 84.7% were able to use word processors such as Microsoft office and MS word, 46.7% could use spread sheets, 10.2% were able to use statistical programmes (SPSS) while 5.8% were able to use other computer programs. These findings suggest that incoming first-year students are computer literate as far as the use of various applications is concerned. This was evidenced by the fact that majority were trained on how to use computers prior to joining university and they were also able to use various computer programs. This may be an indication that they can navigate various sources of information. As noted by SCOUNL (2011a), an information literate person should have the ability to locate and access information and data they need. This is in terms of using the available resources both in print and non-print formats aided by computer technology. As noted by Freeman and

Lynd-Balta (2010) the tasks of collecting and processing information are now inextricably tied to computer technology skills. However, it is worth noting that it was not clear how well versed the students were in the use of applications and on whether or not they can make use of the knowledge and skills that they gained prior to joining the university to successfully access and navigate through the large amounts of information available in electronic formats.

5.4.1 Internet use among incoming undergraduate students

The Internet is a source of current and timely information. The current study revealed that 88.3% incoming undergraduate students knew how to use the Internet and/or the World Wide Web. According to findings presented in Chapter four, the majority of the students used the Internet to search for information, while a minority used it to send emails, for networking with friends using face book, twitter, MySpace, etc. and to play games. The findings were in agreement with previous findings by Baro and Fyneman (2009:669) which revealed that 75% of undergraduate students used the Internet as a source of information, to retrieve relevant material and 77% used emails as a means of communication.

5.4.2 Methods used to save information searches

SCONUL's (2011) information literacy PILLAR 7 states that an information literate person should have the "ability to apply the knowledge gained: presenting the results of their research, synthesizing new and old information and data to create new knowledge and disseminating it in a variety of ways" (SCONUL, 2011). One of the steps inherent in the above statement is the ability to store the information. As a result the following question was posed to the students to find out how they save their information after searches. *"If you were to do internet searches in which of the following methods are you able to save your work?"* The finding revealed that a significant number of the students numbering 78.1% saved their searches using flash disk/memory disk which was ranked the highest. It was followed by saving the searches in the computer system and sending

the searches to their email addresses. It was encouraging to note that the modern technologies of storing information have been readily embraced by the students.

5.5 Knowledge of information retrieval tools and their applications

As was the case with 5.4 above, the students were asked several questions to find out if they understood various information retrieval tools and their applications.

5.5.1 Online Public Access Catalogue (OPAC)

“OPAC” is an acronym that stands for the Online Public Access Catalogue (Ferguson and Hebels, 2003:82). Previously, most libraries operated a card catalogue which was largely manual and has been replaced with online one. The findings revealed that only a small percentage (i.e.14.6%) knew what the acronym (OPAC) stood for. It was interesting to note that a whole 80% did not know what OPAC stood for. These students thought that OPAC stood for Online Access Center or Online Portfolios for Academic Classes. As much as the knowledge of what the acronym stands for may be immaterial as long as the students can make use of the tool, it should be noted that information literacy also entails the knowledge of specific terminologies that may impact on their skills.

Since OPAC acts as one of the retrieval tools in the library, the high number of students who did not know or who did not get the right answer of what OPAC stands for may mean that they have not heard of the acronym before joining university. It may therefore further imply that library instructions provided to students at high school lacks some details about essential tools such as OPAC.

5.5.2 How to retrieve relevant information

To determine whether the students were aware of how to retrieve relevant information, they were asked the following question “*In order to become familiar with a subject about which you know very little, first you consult?*” to which the majority said that they would

consult a journal/encyclopaedia. Other sources listed as possible answers were databases (11.7%), books (14.7%), others (2.2%). It was not surprising to discover that a whole 16.8% of the respondents said that they did not know which sources to consult, most probably because they have not been made aware. We can safely say that journals /encyclopaedias could have been more appropriate sources. Given that these are new students, a significant number was not familiar with the right sources to consult.

We also sought to know whether or not the incoming students were familiar with information found in library catalogues.

It was found that the majority of the students, 65.7%, selected the option of “*all the titles of the books available in the library*” could be found in a library catalogue. Indeed this was the correct answer since a catalogue consists of all information materials (largely books) owned by a particular library. The same view is held by Ferguson and Hebels, (2003:82) who states that a library catalogue describes information resources available in a specific library, or in a library network. It is worth noting that the response that the students offered in this question contrasted their previous answers which suggested that incoming first year undergraduate students did not know what OPAC stood for. Most probably, the students may not be aware of the acronym but have a rough idea of a ‘catalogue’.

It was worth noting that although “all the titles of journals available in the library” can also be found in a library catalogue, only a few students numbered (i.e. 3.6%) selected the option. This is an indication that a significant number of students were aware that a library catalogue contains information on all the titles of the books but not journals. To some extent, this may be true as some libraries do not catalogue journals but index them separately using a different system of classification.

There were a significant number of students (i.e.15.3%) who said that they did not know what items were found in a library catalogue, while (13.9%) did not respond to the question. This trend may imply that there were quite a substantive number of students (approximately 30%) who are not aware of the contents of a library catalogue. This may

further show the importance of instructing the incoming students about library catalogues as Ferguson and Hebels (2003:82) attest, the library catalogue is a form of bibliographic database that describes information resources in a specific library, or in a library network or increasingly, on the Internet, and help users to identify, select and locate either specific known resources (for example, works by a known author) or resources that contain information on a specified subject. The students' lack of awareness on the content of a library catalogue could thus be detrimental when it comes to information access and retrieval. To be able to retrieve the right information, students should be aware of the various retrieval tools.

On how to find documents authored by a specific author, the majority of the students (i.e. 59.9%) were of the view that to find all documents, for example, authored by Ngugi Wa Thiong'o in a library catalogue, they could use the author's name while (12.4%) said that they could search using the title and a further (8.8%) selected the option of the publisher. The researcher contends that using the publisher to search for all titles by Ngugi Wa Thiong'o may not be the best method to search since the author has used different publishers to publish his books. For example, the following three titles from the same author have been published by different publishers; "The river between" is published by Heinemann publishers, "Decolonizing the mind" is published by East African Educational Publishers, while Pen points, Gun points and dreams is published by Oxford Clarendon Press. In essence, it is rather difficult to use publishers as a way of getting documents from the same author. If anything, it is rare to find students who know the publisher's name. The best way of finding **ALL** documents by Ngugi wa Thiong'o in a library catalogue, in the researcher's view, is by using the author's name. During the search process, using the author as the "*search term*" helps to retrieve all the works by Ngugi at the same time and easily. On the other hand, the title could also be used to search for books by a specific author, but the underlying question was **ALL** the documents by Ngugi wa Thiong'o while doing a search. The use of title as the search term/s will help retrieve books on Ngugi wa Thiong'o but the assumption is that the student should know the specific titles.

5.5.3 Knowledge of information materials arrangement in a library

The knowledge of the physical arrangement of information materials enables students to easily browse and access information materials in a library. In order to determine whether incoming university students knew how library materials are arranged on the shelves, several questions like questions 23, 24 and 25 were posed (in Appendix III). The first question sought to find out if the students knew that library materials are arranged in a systematic way, to which majority of the students answered in the affirmative, while only a few students who did not know. It was encouraging to note that new students joining the university knew that materials are arranged in a systematic manner as it is through such knowledge that they will be able to access the information they will require for their assignments and studies in general.

However, a follow-up question on whether the students knew what a call number or classification number was revealed that, although most of the students had indicated that they were aware that a library is arranged in a systematic way, the majority (61.3%) said they did not know what a call number or classification number was. This pattern may imply that the students do not know what system is used in libraries to classify information resources. It is the researcher's conviction that students need to know what a call or classification number is as it is very crucial when locating information sources in the library. The classification numbers or call numbers are often used to help arrange information materials on the shelves in a systematic and organised manner depending on the classification system used. The lack of knowledge of what a call number was also manifested in the number of students who did not know what it was meant for. Only 5.8% of the students indicated that the call number could be used to browse the shelves for similar books or locate books on the shelves.

5.5.4 Where to find current information

It is important for students to be aware of where to find current information. The findings revealed that a significant number of students (34.3%) were aware current information on

drug abuse could be found in a journal. Others were of view that an encyclopaedia, a book and a dictionary, as a source of current information on drug abuse, while 8.8% did not know where they could find current information on drug abuse. Whereas current trends in the publication of information resources has made it possible to have continuous updates of such sources as books, encyclopaedias and other monograms, a journal is still the most preferred source for current information. Journals are likely to dominate the scholarly communication world as they become increasingly convenient to carry around in modern storage devices such as memory sticks, external hard drives or tablets. Most books and encyclopaedias are largely available in print formats.

5.6 Knowledge of information sources and their formats

The following section sought to determine incoming students' knowledge on the available information sources and their formats.

5.6.1 Information sources

The students were asked whether they were aware of primary and secondary sources of information and (40.1%) students indicated that they were aware of both primary and secondary sources of information, while (45.3 %) said that they were not aware of either source of information. Students require both primary and secondary sources of information to accomplish their tasks during their studies. A study by Baro, Onyenania and Osheheni, (2010:109) indicated that undergraduate students needed academic information to enable them to write their assignments, seminar papers, prepare for class discussions, examinations and tests and also to write their research papers. This kind of academic information is sourced from both primary and secondary sources depending on the type of activities they are doing. It is then worrying that a significant number of students involved in the current study were not aware of these sources. This could imply that students might not be able to effectively identify the correct information sources for their work.

Those students who said that they knew primary and secondary sources of information were requested to list them. Although the students listed the several sources in each category, the list revealed that some are not able to differentiate between primary and secondary sources of information. For instance, several students listed books (textbooks) as primary sources. On the other hand, some students listed journals articles, grapevine, journalism, someone telling you something, written scrolls, newspapers, and watching TV as some of the secondary sources. Comparing the list of primary and secondary sources as listed by the students, the results show that confusion existed regarding what primary and/or secondary sources actually consisted of. There was a high non-response rate in this particular question. 70.1% of the students did not answer the question, leading the researcher to conclude that most probably, the students did not understand the question or they did not know the categories of sources. This pattern reveals, as all the other findings, the dire need for information literacy programmes for incoming university students. This is also manifested in the students' answers when asked to name the different formats of information sources whereby the majority (30%) identified books only. The researcher believes the students have been exposed to mainly books in their high school education.

5.6.2 Electronic information sources previously consulted by incoming first year students

According to the findings, there was diversity regarding the electronic resources accessed by the students. The highest number of students (36.5%) had consulted e-books prior to joining university while the second most consulted electronic resources were DVDs with 35.8% students. The least consulted e-resource was electronic journals, which were consulted by 21.9% of the students. The high number of students who had used electronic resources prior to joining university could have been influenced by their skills in computer use as the findings had also revealed that the majority of the students are computer literate. Some forms of modern technologies that have made e-books readily available are smart phones and tablets. This assertion is confirmed by a survey by Bomhold (2013:424) on educational use of smart phone technology, which showed that

77% of the undergraduate students owned smart phones such as iTouch, iPhones, Androids, Blackberry and other devices and 76,1% used them to find academic information.

5.6.3 Print information sources previously consulted by incoming first-year students

The findings revealed that the majority of students had previously used print information resources, which included textbooks, scholarly journals, newspapers, magazines, and government publications. Textbooks ranked highest with 69.3% of incoming students having previously accessed them prior to joining university. It was followed closely by newspapers with 65% of the students having previously consulted them. The third print resources which were highly used by students previously were magazines with 53.3% students having consulted them before joining university. Scholarly journals and government publications ranked least in print resources previously accessed by students at 23.4% and 19% respectively. The finding revealed that some students had consulted more than one print source before joining university.

Students joining universities are secondary school graduates. This could have been one of the factors that had influenced the type of print information sources previously consulted. In Kenya, the government recommends school textbooks to be used in both primary and secondary schools in line with the curriculum. Scholarly journals and government publications are rarely used at this level of education. This could have prevented the use of both scholarly and government publications since they recommended textbooks to be used in schools. Another factor that could have influenced the low use of scholarly journals and government publications among students is the lack of research skills among secondary students. Secondary school students are rarely engaged in research but they would rather use textbooks recommended by the government, resulting in minimal use of scholarly journals or publications.

The findings also revealed the high use of newspapers and magazines with 65% students indicating that they had previously used newspapers and 53.3% having used magazines. This is an indication that incoming students previously read other information materials apart from the textbooks. The findings are in line with one of the reasons as indicated earlier by students why they think the library was important, that is “*it helps provide for recreational information materials*”.

5.7 Intellectual property and copyright issues

The act of plagiarism in academic institutions is highly rampant. This is compounded by the ease of availability of information resources from the internet. Sentleng and King (2012:65) states that plagiarism is complex and is misunderstood by most students. Knowledge of ethical issues concerning intellectual property is important, especially for incoming first-year undergraduate students. This is because they might not be aware that plagiarism is a serious offence (Sentleng and King 2012:65) in the academic arena. Freeman and Lynd-Balta (2010) argue that plagiarism could stem from a student’s blatant choice to deceive, or it could be the result of student’s misunderstanding or inability to process a complicated publication. Ali, Ismail & Cheat (2012) highlighted the problems contributing to plagiarism among students to include understating of plagiarism, their self-realisation, ethics and personal attitude, internet access pressure and learning environment.

In order to determine the students’ understanding of intellectual and copyright issues, they were asked several questions on intellectual property and copyright issues and referencing of information materials. In the first instance, it was found that the majority of the students (57.7%) had heard about the two terms of copyright and intellectual property rights. This corroborates previous findings by Sentleng and King (2012:65) on a study on plagiarism among undergraduate students which also revealed that the majority of the students were aware of plagiarism as well as the seriousness of plagiarism. This was an indication that the two terms were not alien to incoming students, although there

was quite a high number of those who had never heard about copyright issues and also those who did not respond to the question.

When students are writing research papers or doing class assignments, acknowledging or giving credit to other authors' work is done by citing of references. This helps to avoid plagiarism in academic work. Kargbo (2010:222) states that citing references is essential in academia. It gives credit where it is due and adds authority to a statement and shows that a writer is not just giving his/her views, but also includes those of other writers. In view of the above, the researcher sought to find out whether the students understood what the term referencing meant.

The findings revealed that 57.7% students knew what referencing was, and 32.1% did not know what referencing was. The above findings reveal that although a sizeable number indicated that they were aware of what referencing meant, an equally significant number of students do not understand the meaning of the term. This number consists of those students who indicated they did not know what was referencing and those who did not answer the question. As pointed by Kargbo (2010), referencing is important in academia and therefore it is worth to note that those students who did not know what referencing was are likely to engage in academic dishonesty unknowingly. Namwera (1995:3) concurs with this view by stating that most students plagiarise because they do not know the conventions for using and acknowledging sources.

To further show their understanding on issues regarding referencing, the students were asked to select a number of referencing styles or conventions that they know.

The findings presented in Chapter four revealed that the majority of the students (50%) did not know of any referencing style. The number of those students who did not know of any referencing style and those who did not respond to the question was quite significant (49.6% and 19%), respectively. This was in contradiction to the earlier finding where (57.7%) students had indicated they knew what referencing was. This may imply that although students joining the university are aware of referencing, some may not know the referencing styles, hence the few students who indicated that they knew the various

referencing styles. A total number of 7.3% students knew of the APA style, while 3.6% and 2.2% knew of Chicago and MLA referencing styles, respectively.

Overall, only a few students knew the various referencing styles applicable while writing research papers, assignments or term papers. This could pose serious challenges when doing their research papers, term papers and class assignments. As Namwera (1995:3) says, to avoid plagiarism, students must know the conventions of acknowledgement. SCONUL's seven pillars of information literacy too indicate that an information literate person should have the ability to organise information professionally and ethically (SCONUL 2011). To achieve this, Sentleng and King (2012:65) note that referencing and academic writing skills must be taught by lecturers at all levels. A study by Estow, Lawrence and Adams (2011: 257) revealed that giving students hands-on experience and repeated exposure to the topic of plagiarism improves their ability to identify faulty paraphrasing, enhance their own paraphrasing and deepens understanding as to why students should avoid plagiarism.

The students' awareness about using another author's intellectual work without acknowledgement as constituting a form of theft was also assessed in this study. As reported in Chapter four, 71.5% of the students indicated that they were aware that using another author's intellectual work without acknowledgement is a form of theft, while 17.5% were not aware. It is not at all surprising to note that the majority of the students were not aware that it is wrong to use other peoples' works without acknowledging it; yet it was a small percentage of the surveyed students who were aware of the referencing styles available to guide them. This is because students may have not been exposed to any of the referencing styles as stated above.

The students who indicated that they were not aware that using another person's works without acknowledging might in future experience problems while doing their assignments as they may be penalised for doing so. Namwera (1995: 2) highlights this by stating that students get into trouble by plagiarising, that is using or copying another writer's exact words, ideas or information without acknowledgement. These findings are corroborated by Babalola's, (2012:55) findings which revealed that undergraduate

students have a generally low understanding of plagiarism which is likely to result to incidences of unintentional plagiarism.

When asked to identify items that constitute intellectual property most students selected books followed by journal articles, music and photocopied materials. 22.6% of the students said they did not know the items, which could be considered intellectual property. Music, books and journal articles are considered to be intellectual property and the majority of the students selected the correct items. Only photocopied materials could not be considered to be intellectual property. The few students who indicated that they did not know what items can be considered to be intellectual property may imply that they have not been made aware of this before joining university. Nevertheless, this finding is in line with findings on the kind of training received by students on plagiarism before joining CUEA. The findings had revealed that only one (0.7%) students had received training on plagiarism prior to joining the university. A situation, which further revealed a gap on training on issues, related to intellectual property and copyright issues.

The students were further asked to name those acts of plagiarism that they thought could amount to plagiarism. It was noted that many students (30.7%) who responded to the question, did not know what constitutes acts of plagiarism while a significant number listed “paraphrasing an author’s idea without mentioning”, “using an author’s exact words without giving credit”, “unintentionally paraphrasing of an author’s idea without mentioning the sources”, and “changing a few of the author’s words and not using quotation marks” as acts of plagiarism. Indeed, all the aforementioned acts constitute plagiarism since using another person’s work without duly acknowledging that person, is termed plagiarism.

A study by Ali, Ismail & Cheat (2012) on plagiarism, revealed that students’ understanding of the concept of plagiarism are still not satisfactory. As a result, Sentleng and King (2012:65) advise that students need to understand what plagiarism is, how to avoid it and why they should be penalised for it. According to Ali, Ismail and Cheat (2012:610) the concept of plagiarism should be made widely known in a more aggressive manner among the students through various activities such as seminars, campaigns and so

forth. This can be instilled also in lectures or practical sessions to enable students to truly understand what is meant by plagiarism.

The lack of awareness among incoming undergraduate students on intellectual property rights, copyright issues and referencing styles could be a pointer to their education background. This is because students joining Kenyan universities are secondary school graduates who have not been exposed to any information literacy instruction programmes. The pattern may also be attributed to the fact that secondary schools in Kenya have not incorporated information literacy into the curriculum. This is collaborated by respondent's response on not receiving instruction on plagiarism. Kargbo (2010:231), in his study, noted that the fact that a significant majority of undergraduate students were admitted to college directly from secondary schools where the art of citing references is not taught makes them generally unfamiliar with the universe of scholarship and the intended purpose for citing references on scholarly papers.

5.8 Summary of the chapter

Chapter five discusses the findings of the current study presented in Chapter four. The students were assessed on five major areas including awareness of search strategies, basic information technology skills, knowledge of information retrieval tools and their applications, knowledge of information sources and their formats and intellectual property and copyright issues.

In the five areas, the students were assessed regarding the level of information literacy skills they possessed. Only one area, that is, information technology skills could be said they have the requisite skills since the majority of the students had possessed computer skills before joining the university. In the other four areas that were assessed, that is, awareness of search strategies, knowledge of information retrieval tools and their applications, knowledge of information sources and their formats and intellectual property and copyright issues the students showed low information literacy skills.

Overall, the study revealed that university students joining CUEA have low information literacy skills. It corroborates Ukpebor and Emojo, (2012) and Mittenmeyer,(2005) studies which revealed that new students have limited information literacy skills.

The low information literacy skills among incoming university students could be a hindrance to their effective and successful search and use of available information in the university library. Information literacy as earlier noted in literature review is necessary for undergraduate students during their four years in the university.

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

Chapter six presents the summary of the research findings. It also provides conclusions derived from the finding of the study. Finally, it gives recommendations and suggestions for further research.

The aim of the study was to investigate information literacy skills among incoming first-year undergraduate students in institutions of higher learning in Kenya, with special reference to the Catholic University of Eastern Africa. The study was guided by the following objectives:

- i. To identify the type and formats of resources that incoming undergraduate students are aware of.
- ii. To determine whether or not the incoming undergraduates are aware of search strategies for both print and electronic/online resources.
- iii. To determine whether incoming undergraduate students possess basic information technology skills.
- iv. To find out whether incoming undergraduate students know information retrieval tools and their use.
- v. To determine whether incoming students are aware of intellectual property and copyrighted materials and their ethical use.

The study adopted the case study method. The study population consisted of first-year incoming undergraduate students at the Catholic University of Eastern Africa for the academic year 2013/2014. Out of the 400 registered students for the academic year 2013/2014, 137 students participated in the study. These students attended the library orientation organised by the university library, which was the main venue for data collection. The research instrument used to collect data for this study was self-administered questionnaires. Data collected from the field was analysed using

quantitative methods. Statistical package for social sciences was used to analyse quantitative data into frequencies and percentages.

6.2 Summary of the research findings

The research findings are summarised under the following sub-headings:

- General background of the study
- Awareness of the search strategies
- Basic information technology skills
- Knowledge of information retrieval tools and their use
- Knowledge of information sources and their formats
- Intellectual property rights and copyright issues

6.2.1 General background information

The findings revealed that there were more female students joining the Catholic University of Eastern Africa than their male counterparts. There were 63.5% female students and 36.5% male students.

The findings also revealed that incoming university students used libraries prior to joining university, both at primary and secondary schools. The following were the services, which the students accessed prior to joining the university; borrowing books, reading of information resources and accessing the internet. Reading information resources, that is books and journals, was the most sought out service with the highest number of students who totalled (62.8%) accessing this service, followed by borrowing books with (59.9%) students who sought the service. The services, which attracted the lowest number of students, were visiting the library, with only (8.8%) students and using the internet with (19.7%) students.

Out of the 137 students who had participated in the study (97.8%) said the library would be important in their studies. For those students who indicated that the library was important, they highlighted the following activities as the reasons to support their answer;

it will help them in research, providing for recreational information materials, and provide information for their assignments. Helping in research ranked highest as one of the reasons why the students thought the library was important with (83.6%) students, followed by the option the library will help provide information for students' assignments with (58.2%) students. Only few students, at (24.6%) thought the library will help in providing recreational information materials.

The findings also revealed that (64.2%) of the students had received library instruction prior to joining university. Only (33.6%) students had never received library instruction prior to joining the university. The students had received instruction on the following; how to do referencing in academic work, how to use the library catalogues, how to search library databases, how to access information materials in the library, use of search strategies and plagiarism. However, the findings revealed that the library instruction offered to students previously was inadequate.

6.2.2 Awareness of search strategies among undergraduate students

The study revealed the following with regard to the students' awareness of the search strategies:

The majority of the students were not aware of search strategies. The majority of the students did not even know what "a research strategy is".

The students did not know about Boolean operators. A significant number of students (82.5%) had never heard about Boolean operators. Only, (13.1%) students had heard about Boolean operators prior to joining university. The majority of the students did not know what Boolean operators are used to combine search terms and show their relationships. Only 8% of the students knew the purpose of Boolean operator "OR" that it is used to increase the number of items during a search. There was also a high 'non-response rate' on the use of Booleans, which was at 72.3%.

Majority of the incoming first-year undergraduate students did not know the characteristics observed to evaluate the quality of an internet site.

A significant number of students knew what information is available from the search engine Google and Yahoo. They were able to distinguish information, which could not be found in a search engine such as Yahoo and Google.

The students did not understand the use of keyword/subject as the best way of searching for books on a given topic.

Majority of the students were aware of the characteristics, which could be used to evaluate the quality of information sources.

6.2.3 Basic information technology skills

In terms of the students' possession of information technology skills, the study found that:

The majority of the incoming university students were computer literate and possessed basic computer skills before joining university. Out of 137 students who had participated in the study, (86.1%) had computer training prior to joining university. Only (7.3%) had not previously received any computer training. The new students had knowledge of word processing programs such as Microsoft word, MS-word; they also knew how to use statistical program such as SPSS.

The majority of students (i.e. 88.3%) were able to use the Internet and WWW. They used the Internet and WWW for the following purposes: Searching for information, playing games, sending emails and networking with friends using social networks, such as Face Book, Twitter and MySpace, among others. Searching for information ranked highest among the reasons why students used the Internet.

6.2.4 Knowledge of information retrieval tools and their use

The findings revealed the following:

Only (14.6%) students indicated that OPAC stands for Online Public Access Catalogue.

A significant percentage of students (40.1%) said that they would consult a journal or an encyclopaedia in order to become familiar with a subject they knew little about.

A number of students (65.7%) selected “all the titles of the books available in the library” as the best option to describe of the items that can be found in a library catalogue.

Majority of the students (88.3%) were aware that library materials are arranged in a systematic order. Though the majority possessed knowledge that library materials are arranged in a systematic way, (61.3%) students did not know what a call number was.

The majority of the students were not aware of where to find current information. When asked where they could find recent information on drug abuse, only (34.3%) students said they could find such information from a journal. On the other hand, only (25.5%) knew that an abstract is a summary of a resource.

6.2.5 Knowledge of information sources and their formats

In terms of students’ knowledge of information sources and their formats, the study found that:

Only, (40.1%) students were aware of primary and secondary sources of information.

There was diversity on the kind of information format the students were aware of. The findings revealed that a significant number (30.7%) knew both electronic and print information formats, while (29.2%) knew print format. Only (5.8%) knew of only electronic information format.

Most students had used various information formats prior to joining the university, for example; electronic journals, online databases, e-books, CD-ROMs and DVDs. The most used electronic resources were e-books. The least used electronic resource was electronic journals.

Textbooks were the most used print information with (69.3%) of the students having used them before joining university, while government publications were the least used by students previously with only (19%) of the student having previously used them.

6.2.6 Intellectual property and copyright issues

The finding revealed that:

57.7% of the students had heard the terms intellectual property rights and copyright prior to joining university.

52.6% of the students knew what referencing was.

One half of the students were not aware of the various referencing styles available such as APA, Chicago, MLA, and Harvard.

71.5% of the students knew that using another author's intellectual work without acknowledgment was a form of theft.

More than half of respondents did not know that failure to give credit to information sources was plagiarism. Only (40.9%) students knew that failure to give credit to sources of information is called plagiarism.

Quite a significant number of students knew of items that are termed as intellectual property such as; music, books, journal articles. Only a few students (8.0%) did not know the items that could be termed as intellectual property as they indicated photocopied materials could be termed intellectual property. Further (22.6%) students indicated they did not know the materials, which could be referred to as intellectual property.

6.3 Conclusions

Based on the research findings and discussions of the finds as provided in Chapters four and five, the research make the following conclusions according to the objectives of the study:

The incoming first-year undergraduate students are familiar with both electronic and print information resources. However, a significant number of students were not aware what constituted primary and secondary sources.

Incoming first-year students have limited knowledge of strategies used to search for information. This was evidenced by the students lack of knowledge on search strategies such as Boolean logic operators, lack of understanding of the use of keywords among other search strategies. This revealed the gap that existed on the information literacy skills the incoming students possessed.

The incoming first-year undergraduate student do possess computer skills in such applications as the use of the internet and its applications (e.g. social networking sites and the world wide web) as well as the word processing application such as (Microsoft office and MS word) and statistical applications such as SPSS.

The majority of incoming undergraduate university students are not familiar with the various retrieval tools and their applications. The majority of the students did not know what the acronym OPAC stands for, they were not aware of the purpose of a call number.

Incoming first-year undergraduate students exhibited little knowledge on issues relating to intellectual property rights and copyright.

6.4 Recommendations

The findings of the study point towards a low level of information skills among incoming first-year undergraduate students at the Catholic University of Eastern Africa.

6.4.1 Library orientation program

Although there is a programme in place aimed at imparting information literacy skills, the low level of attendance of library orientation clearly pointed to apathy toward library orientation from incoming first-year undergraduate students. This is one of the biggest challenges to the university library, which is mandated to carry out information literacy training. The question of the factors contributing to the low turn-up rate for library orientation among incoming first-year students should be raised and explored further in order to solve any existing problems. The university library should use various methods to ensure all students attend such forums. This is because the library orientation helps lay the foundation of information literacy skills among students. The university library can adopt several incentives aimed at encouraging new students to attend library orientation. The issue of incoming students who did not attend the library orientation is also pertinent. Out of 400 incoming students, 250 did not attend the library orientation raising the question of what happens thereafter. The library should come up with procedures of how to reach students who are unable to attend library orientation, which is the main program on library instruction and use.

6.4.2 Integration of information literacy program in the university curriculum

The findings of the study point mainly to the fact that incoming undergraduate university students do not possess the requisite skills in information literacy. This calls for great measures to be instituted by the University in relation to information literacy skills. The recommendation is to integrate information literacy training to become part of the

university curriculum for all incoming first-year students and be part of the core and common course among new students. This will ensure that information literacy classes are mandatory. In relation to this, the university should review policies relating to the training in information literacy vis-vis to lifelong learning as espoused by the university.

6.4.3 Information literacy skills assessment

The university library, which is mandated with offering information literacy training should carry out a needs assessment for information literacy training. This will help determine the gaps existing in the current programme. The library orientation which is a two to three hour session might not be adequate to impart the relevant information literacy skills to new students. The library should structure information literacy classes to be an ongoing process instead of one short programme.

There are several methods of assessing information literacy skills among students as discussed in Chapter two during the literature review. The university library should adopt one of the methods to help assess the level of information literacy among incoming students in every academic year. This will help in structuring the information literacy training according to the immediate needs of new students. The assessment of information literacy should not only be among incoming students it should also extend to other students in order to determine the level of IL acquisition as they progress in their studies.

6.4.4 Training on plagiarism

Plagiarism has been pointed out as a problem by various authors among students in universities. With the advent of the Internet, there is excess information available for free to students. The information literacy programme should be tailored to address the existing gap in the programme and the content should address emerging issues especially plagiarism. The students should be trained on referencing skills. This will enable them to use other people's work while duly acknowledging the sources. This will help avoid plagiarising people's work unknowingly.

6.5 Further research

Following the findings of the current study, there is a need for further research. A longitudinal study on the same topic is necessary to determine whether the students joining university are able to gain information literacy skills over a period of time. This is necessary because the current study revealed that the majority of the first-year incoming undergraduate students did not possess the necessary skills. This kind of research will be able to determine whether students are able to gain information skills as they progress in their studies.

REFERENCES

ALA *see* American Library Association

Ali, W.Z., Ismail, H., & Cheat, H.H. (2012). Plagiarism to what extent it is understood, *Procedia-Social and Behavioral Sciences*, 59 pp.604-611.

American Library Association (1989). *Presidential Committee on Information Literacy: final Report*. Available at:
[http://www.ala.org/Content/NavigationMenu/ACRL/Publications/White/Papers and Reports/ Presidential Committee on Information Literacy.htm](http://www.ala.org/Content/NavigationMenu/ACRL/Publications/White/Papers%20and%20Reports/Presidential%20Committee%20on%20Information%20Literacy.htm). [Accessed 29 August 2010].

American Library Association. (2000)..*Information Literacy Competency Standards for Higher Education*. Available at: <http://www.ala.org/acrl/>. [Accessed 29 August 2010].

Amunga, H.A. (2011).*Information literacy in the 21st century universities: the Kenyan experience*. Available at:
<http://shodhganga.inflibnet.ac.in/dxml/bitstream/handle/1944/1636/44.pdf>. [Accessed 25 June 2011].

Australian and New Zealand Institute for Information Literacy. (2004)..*Australian and New Zealand information literacy framework, principles, standards and practice*. 2nd ed. / edited by Bundy, Alan. Available at: <http://www.anziil.org/index.htm>. [Accessed 20 August 2010].

Babalola, Y.T. (2012). Awareness and incidence of plagiarism among undergraduate in a Nigerian private university, *African Journal of Library, Archives & Information Science*, 22(2), Pp.53-60

Babbie, E. (2010). *The practice of social research*. 12th ed. Belmont: Wadsworth Cengage Learning.

Bankole, O.M. & Oludayo, B.S. (2012). Internet use among undergraduate students of Olabisi Onabanjo University, Ago Iwoye, Nigeria, *Library Philosophy and Practice* (online journal), Available at: <http://digitalcommons.unl.edu/libphilprac/812/> [Accessed 24 February 2014].

Baro, E.E.& Fyneman, B. (2009). Information literacy among undergraduate students in Niger Delta university, *The Electronic Library*, 27(4), pp. 659-675

Baro, E.E., Onyenania, G.O. & Osaheni, O. (2010). Information seeking behaviour of undergraduate students in the humanities in three universities in Nigeria, *South African Journal of Library and information science*, 76(2).

- Bedi, B.D., Kimalu, P.K., Manda, D.K.& Nafula, N.N. (2002). *The decline in primary school enrolment in Kenya*. Nairobi: Kenya Institute for public policy research and analysis.
- Behrens, S.J.(1994). A conceptual analysis and historical overview of information literacy, *College & Research Libraries*, 55 (4), pp.309-322.
- Bent, M. & Stubbings, R.(2011). *SCONUL seven pillars of information literacy*. Available at: <http://www.informationliteracy.org.uk>[Accessed 8 November 2013].
- Bilawar, P.B. & Pujar, S.M. (2011). Information literacy models: correlation and conceptual model for higher education. Available at: <http://www.ir.inflibnet.ac.in/bitstream/handle/1944/1632/40.pdf>. [Accessed 2 November 2013].
- Breivik, P.S.(2005). 21st century learning and information literacy, change, *The Magazine of Higher Learning*. 37 (2), pp. 21-27.
- Bomhold, C.R. (2013). Educational use of smart phone technology: a survey of mobile application use by undergraduate university students, *Electronic Library information systems*, 47(4).
- Bordens, K. & Abbot, B.B. (2006). *Research design and methods: a process approach*. 7th ed. Boston: McGraw-Hill Higher Education.
- Bronander, KA. et al. (2004). Boolean search experience and abilities of medical students and practicing physicians, teaching, and learning in medicine, *An International Journal*, 16(3) pp.284-289.
- Brown, G., Bull, J. & Pendlebury M.(1996)..*Assessing student learning in higher education*. London: Routledge.
- Bruce, C.S.(2002). *Information literacy as a catalyst for educational change: a background paper*. Available at: <http://www.nclis.gov/libinter/infolitcon&meet/papers/bruce-fullpaper.pdf>. [Accessed 18 August 2011].
- Bruce, C.(2003). *Seven faces of information literacy*. Available at: <http://www.bestlibrary.org/digital/files/bruce.pdf>. [Accessed 24 March 2010].
- Bryman, A. (2008). *Social research methods*. 3rd ed. Oxford: Oxford University Press.
- Burchinal, L.G.(1976). *The Communications Revolution: America's Third Century Challenge, in The Future of Organizing Knowledge: Papers Presented at the Texas A & M University Library's Centennial Academic Assembly, Sept. 24, 1976*. Available at: http://personalpages.manchester.ac.uk/staff/drew.whitworth/burchinal_the_communications_revolution.pdf. [Accessed 21 November 2013].

Burkill, S. & Abbey, C.(2004). Avoiding Plagiarism, *Journal of Geography in Higher Education*, 28 (3), pp. 439-446.

Cahoy, E.S. (2002). Will your students be ready for college? Connecting K-12 and college standards for information literacy, *Knowledge Quest*, 30 (4), pp.12-15.

Catts, R. & Lau, J.(2008).*Towards information literacy indicators*. Paris: UNESCO.

Chartered Institute of Library and Information Professionals. (2012).*Information literacy: the skills*. Available at: <http://www.cilip.org.uk/get-involved/advocacy/information-literacy/pages/skills.aspx>. [Accessed 12 June 2012].

Childers, S. (2000). Computer Literacy: Necessity or Buzzword? *Faculty Publications, UNL Libraries*. Paper 90. Available at: <http://digitalcommons.unl.edu> [Accessed 13 August 2012].

Clarke, S.J. (2000). Search engines for the World Wide Web, *Journal of Internet cataloguing*, 2 (3-4).

Corall, S. (2008). Information literacy strategy for development in higher education: an exploratory study, *International Journal of Information Management*, 28, pp. 26-37

Cox, B.G. (2008). *Encyclopedia of survey research*. Available at: <http://www.Knowledgesagepub.com>. [Accessed 19 March /2013].

Creswell, J.W. (2009). *Research design: qualitative, quantitative, and mixed methods approach*. 3rded. Los Angeles: Sage publications.

Catholic University of Eastern Africa, University library records, unpublished data, 2013).

Catholic University of Eastern Africa, Registry department (2013). *Admission documents*, unpublished data.

Dinet,J., Favart, M.& Passerault, J. (2004). Searching for information in an online public access catalogue (OPAC): the impacts of information search expertise on the use of Boolean operators, *Journal of Computer Assisted learning*, 20, pp.338–346.

Donald, J. G.(1999).*What kind of university?: International perspectives on knowledge, participation and governance*. Edited by, Brennan, J., Fedrowitz J., Huber M.& Shah, T. Buckingham: Society for Research into Higher Education.

Educational Testing Service (2002).*Digital transformation: a framework for ICT literacy; a report of the International ICT literacy panel*. Available at: <https://www.resources.oncourse.iu.edu>. [Accessed 2 November 2013].

Educational Testing Service (2013). *The iSkills assessment*. Available at: <https://www.ets.org>. [Accessed 2 November 2013].

- EFA, (2004). Seeking new direction for Kenya's education. *Education for All news*, 6
- Eisenberg, M.B. & Berkowitz, R.E.(1990). *Information problem solving: the big six skills approach to library and information skills*. New Jersey: Ablex Publishing Corporation.
- Eisenberg, M.B., Lowe, C.A.& Spitzer, K.L. (2004).*Information literacy essential skills for information*. 2nd ed. Connecticut: Libraries Unlimited.
- Eshet-Alkalai, Y. (2004). Digital literacy: a conceptual frame work for survival skills in the digital era.*Journal of Educational Multimedia and Hypermedia*, 13(91), pp. 93-106.
- Estow, S., Lawrence, E.K. & Adams, K.A.(2011). Practice makes perfect: improving students skills in understanding and avoiding plagiarism with a themed methods course,*Teaching Psychology*, 38(4), pp.255-258.
- Fain, M. (2011). Assessing information literacy skills development in first year students: a multi-year study, *The journal of Academic Librarianship*, 37(2), pp.109-119.
- Ferguson, S. & Hebel, R. (2003).*Computers for librarians: an introduction to electronic library*. 3rd ed. Wagga wagga, New South Wales: Centre for Information Studies.
- Ferullo, D.L. (2011). Managing copyright services at a university, *Reference and User Services Quarterly*, 51(2).
- Fitzpatrick, M.J.& Meulemans, Y.N. (2011) Assessing an information literacy assignment and workshop using quasi experimental sign, *College Teaching*, 59, pp. 142-149.
- Freeman, E.& Lynd-Balta, E. (2010). Developing information literacy skills early in undergraduate curriculum, *College Teaching*, 58, pp. 105-115.
- Gall, M.D., Gall, J.P. & Borg, W. R., (2007). *Educational research: an introduction*. 8th ed. Boston: Pearson Education, Inc.
- Gallacher, I. (2007). *Who Are Those Guys?: The Results of a Survey Studying the Information Literacy of Incoming Law Students*. Available at: http://works.bepress.com/ian_gallacher/1. [Accessed 23 August 2012].
- Galvin, J. (2006). Information Literacy and Integrative Learning, *College & Undergraduate Libraries*, 13(30), pp. 25-51.
- Gilton, D.L. [n.d.]*Information literacy instruction: history of context*. Available at: <http://www.uri.edu>. [Accessed 3 November 2013].
- Goodfellow, R.(2011). Literacy, literacies and the digital in higher education, *Teaching in Higher Education*, 6(1), pp.131-144
- Government of the Republic of Kenya (2007). *Kenya Vision 2030: a globally competitive and prosperous Kenya*. Nairobi: Government of the Republic of Kenya.

Hardesty, L. (1995). Faculty culture and bibliographic instruction: an exploratory analysis'. *Library trends*,44(2), pp. 339-67.

Grinnell, R.M. (2001). *Social work quantitative research and qualitative evaluation approaches*. Illinois: Peacock.

Hadimani, M. B. & Rajgoli, I. U. (2009). Assessing information literacy competence among the undergraduate students of college of Agriculture, Raichur: a case study, *DESIDOC, Journal of Library & Information Technology*, 30(2), pp.70-73

Hardesty, L. (1995). Faculty culture and bibliographic instruction: an exploratory analysis', *Library trends*, 44(2), pp. 339-67.

Holman, L. (2011). Millennial students' mental models of search: implications for academic librarians and database developers, *The Journal of Academic Librarianship*,37(1), pp. 19-27.

Horton, F.W. (2008). *Understanding information literacy: a primer*. Available at: <http://www.unesdoc.unesco.org/>. [Accessed 7 July 2010].

<http://www.ala.org/acrl/issues/infolit/overview/intro>. [Accessed 23 October 2013].

<http://dictionary.reference.com/browse/lifelong+learning>[Accessed 23 October 2013].

<http://www.cuea.edu>. [Accessed 1 October 2010].

<https://www.ets.org> . [Accessed 13 March 2011].

<http://www.oxfordbibliographies.com>. [Accessed 2 November 2013].

http://www-public.jcu.edu.au/libcomp/assist/training/JCUPRD_026231[Accessed [23 August 2012].

http://www.sconul.ac.uk/groups/information_literacy/sp/newmodel.jpg. [Accessed 10 February 2012]

Hugo, A. (2003). From literacy to literacies: preparing higher education in South Africa for the future, *SAJHE/SATHO*, 17(2).

Idiodi, E. A. (2005). *Approaches to information literacy acquisition in Nigeria*. Available at: <http://www.emeraldinsight.com/0024-2535.htm>. [Accessed 27 July 2010].

IFAP See UNESCO. Information for All Programme (IFAP).

Ingrid, A. M. (2012). The use of quantitative and qualitative methods in the analysis of academic achievement among undergraduates in Jamaica, *International Journal of Research & Method in Education*, 35(2), pp.195-216.

Ivankovi, A., Spiranec, S.& Miljko, D.(2013). ICT literacy among the students of the faculty of philosophy university of Mostar, *Procedia; Social and Behavioral Sciences*, 93, pp. 684-688.

James Madison University.(2013). *Information literacy competence*. Available at: http://www.jmu.edu/gened/info_lit_general.shtml. [Accessed 2 November 2013].

Jiyane, G.V. & Onyancha, O.B.(2010). Information literacy and instruction in academic libraries and LIS schools in institutions of higher education in South Africa. *South African Journal of Libraries and Information Science*, 76(1), pp. 11-23.

Johnston, B. & Webber, S. (2003). Information literacy in higher education: a review and case study, *Studies in Higher Education*, 28(3)

Jones, D.L. (2011). Academic Dishonesty: Are More Students Cheating? *Business Communication Quarterly*, 74, pp. 141.

Jwan, J.O. & Ongo'ndo, C.O.(2011). *Qualitative research: an introduction to principles and techniques*. Eldoret, Kenya: Moi University Press.

Kapitzke, C. (2003) Information literacy: a positivist epistemology and a politics of out formation, *Educational theory*, 53 (1). pp. 37-53.

Kargbo, J.A., (2010). Undergraduate students problem with citing references, *The Reference Librarian*, Vol.51 (3) 222-236.

Katz, I. R. (2005). *Beyond technical competence: literacy in information and communication technology*. Available at: https://www.ets.org/Media/Tests/ICT_Literacy/pdf. [Accessed November 2013].

Katz, I. R. (2007). *Testing information literacy in digital environment: ETS iSkills assessment*. Available at: <http://www.ala.org/lita/ital/sites/ala.org.lita.ital/files/content/26/3/katz.pdf>. [Accessed November 2013]

Kauhanen-Simanainen, A. (2007). *Corporate literacy: discovering the senses of the organisation*. Oxford: Chandos publishing.

Kavulya, J.M. (2003). Challenges facing information literacy efforts in Kenya: a case study of selected University libraries in Kenya, *Library Management*, 24(4), pp.216-222.

Kent State University.(2013). *Standardized Assessment of Information Literacy (SALIS)*. Available at: <https://www.projectsails.org/Background>. [Accessed 2 November 2013].

Kenya education report, (1964). Nairobi: Government of Kenya.

Kenya National Bureau of Statistics.(2010). *Kenya: 2009 population and housing census*. Nairobi: Kenya National Bureau of Statistics.

Kerlinger, F.N. & Lee, H.B. (2000). *Foundations of behavioral research*. 4th ed. Australia: Cengage Learning

Kombo, D.K & Tromp, L.A. (2006). *Proposal and thesis writing: an introduction*. Nairobi: Paulines publications.

Kothari, C.R. (2006) *Research methodology: Methods & Techniques*. New Delhi: New Age.

Krathwohl, D.R., 1998. *Methods of educational research and social science research: an integrated approach*. 2nd ed. Illinois: Waveland Inc.

Kuhlthau, C. (1999). Accommodating the user's information search process: challenges for information retrieval system design, *Bulletin of the American Society for Information Science*, 25(3).

Kuhlthau, C. Heinström, J. & Todd, R.J. (2008). The 'information search process' revisited: is the model still useful? *Information Research*, 13(4),

Kyrillidou, M. (2013). *MINES for libraries: measuring the impact of networked electronic resources*. Available at: <http://www.arl.org/news/arl-news/2774>. [Accessed 21 November 2013]

Langford, L. (1999). *Information literacy? Seeking clarification*. Available at: <http://athene.csu.edu.au/~llangfor/papers/paper5.html>. [Accessed 16 June 2011].

Lewis, B.R., Duchac, J.E.& Beets, S.D. (2011). An academic publisher's response to plagiarism, *Journal of Business Ethics*, 102, pp.489-506.

Lupton, M.(2008). Evidence, argument and social responsibility: first-year students' experiences of information literacy when researching an essays, *Higher education research and development*,27(4)

Lwehabura, M.J. & Stilwell, C. (2008). Information literacy in Tanzanian universities: challenges and potential opportunities, *Journal of Librarianship and information science*, 40(3)

Makori, A. (2005). *The Kenya's educational policy: exploring some of the major impediments to redesigning pedagogy*. A paper presented at the International conference 30 May to 1 June. Nanyang Technological University, Singapore.

Marcum, J.W. (2002). Rethinking information literacy, *Library Quarterly*, 72 (1).

- Maxmon, R.M.(1995). *Social and cultural changes, In Decolonization and independence in Kenya 1940-1993*, edited by BA Ogot and WR Ochieng'.London: James Currey:126-143.
- Maughn, P.D. (2001). Assessing information literacy among undergraduates: a discussion of the literature and the University of California Berkeley Assessment experience, *College and Research Libraries*, 62(1), pp.71-85.
- Maybee, C. (2006). Undergraduate perceptions on information use: the basis for creating user centered student information literacy instruction, *Journal of Academic Librarianship*, 32(1),pp. 79-85.
- Mittermeyer, D. (2003). *Information Literacy: Study of Incoming First-Year Undergraduates in Quebec*. Available at <http://www.crepuq.qc/documents/bibl/formation/studies-aug.pdf>. [Accessed 15 August 2010].
- Mittermeyer, D.(2005). Incoming first year undergraduate students: How information literate are they? *Education for Information*, 23(1), pp. 203–232.
- Mi,J.& Weng, C.(2008). Revitalizing the library OPAC, *Information technology and libraries*, 6.
- Mogg, R.(2002). *An investigation into the information literacy skills needs of first-year undergraduates and into an appropriate method of assessing incoming students' information literacy abilities at Cardiff University*. Available at: http://dagda.shef.ac.uk/dissertations/2001-02/External/Mogg_Rebecca_MALib.pdf. [Accessed 29 August 2010].
- Molnar, K.K., Kletke, M.G. & Chongwatpol, J. (2008). Ethics vs IT ethics: do undergraduate students perceive a difference. *Journal of business ethics*, 83 pp. 657-671.
- Morgan, D.L. (2008). *The sage encyclopaedia of qualitative research methods*. Available at: <http://www.knowledge.sagepub.com>. [Accessed 18 March 2008].
- Mokhtar, I.A. & Majid S. (2008). Information literacy standards, guidelines and their implementation: an analysis, *DESIDOC. Journal of library and information technology*, 28 (2), pp. 5-12.
- Mugenda, O. M. (2003). *Research methods: quantitative and qualitative approaches*. Nairobi: African Centre for Technology Studies.
- Mutula, S.M. (2002). University education in Kenya: current developments and future outlook , *International Journal of Educational Management*, 16(3) pp. 109-119.
- Nachmias, C.F.& Nachmias, D. (1996) *Research methods in the social sciences*. 5th ed. London: Arnold .

Namwera, L. (1995). *Basic presentation of term papers, theses and dissertations required by CUEA*. Nairobi: CUEA Press.

National Forum on Information literacy. (2005). *Beacons of information society: the Alexandria proclamation on information literacy and lifelong learning*. Available at: <http://www.ifla.org/publications/beacons-of-the-information-society-the-alexandria-proclamation-on-information-literacy>. [Accessed 20 November 2013].

Neuman, W.L. (2006). *Social research methods: quantitative and qualitative approaches*. 6th ed. India: Pearson Education, Inc.

Ngulube, P., Mokwatlo, K., & Ndwandwe, S. (2009). Utilisation and prevalence of mixed methods research in library and information science research in South Africa 2002-2008. *South African Journal of library and information science*, 75(2).

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, *The International Information 26; Library Review*, 37(2), pp.127-143

Ntiri, D.W.(2009). Towards a functional and cultural salient definition of literacy. *Adult Basic Education and Literacy*, 3(2).

O'Brien, D. & Scharber, C. (2008). Digital literacies go to school: potholes and possibilities, *Journal of adolescent & adult literacy*, 52(1)

O'Brien, H.L. & Symons, S. (2007). The information behaviors and preferences of undergraduate students, *Research Strategies*, 20 pp. 407-423.

Obure, M.J. (2002). *Handbook on data analysis using SPSS*. Nairobi: M&O data experts training and consultants.

Oketch, H.O. (2004). Education and training for the informal sector. *Education Research Paper*,(11), pp.332.

Olaleju, M. A. (2011). *Functional literacy empowerment for nomadic herdsman in Osun State, Nigeria, Language, Culture and Curriculum*. 23(2), pp. 102-121.

Onsogo, J.(2009). Affirmative action, gender equality and university admissions-Kenya, Uganda and Tanzania, *London Review of Education*, 7(1) pp. 71-81.

Onsogo, J. (2007). The growth of private universities in Kenya: implications for gender equity, *JHEA/RESA*, 5(2&3), pp.111-133.

Orodho, J.A. (2004). *Techniques of writing research proposals and reports in education and social sciences*. 1st ed. Nairobi: Reata Printers

- Pashaie, B. (2004). *A history of information literacy in community college; as represented by articles in the professional press*. Available at: <http://pages.gseis.ucla.edu/faculty/maack/Documents/Pashaie.pdf>. [Accessed 20 November 2013].
- Poore, M. (2011). Digital Literacy: human flourishing and collective intelligence in a knowledge Society, *Literacy learning, the middle years*, 19(2).
- Porter, B. (2011). Millennial Undergraduate Research Strategies in Web and Library Information Retrieval Systems, *Journal of Web Librarianship*, 5 (4), pp. 267-285
- Prague Declaration *see Information Literacy: meeting of experts*. 2003.
- Punch, K.F.(2005). *Introduction to social research: quantitative and qualitative approaches*. 2nd ed. London: Sage Publications.
- Rajaram, S. (2006). *Information literacy gap: challenges in bridging the divide*. Available at: <http://www.iam.inflibnet.ac.in:8080/dxml/bitstream/handle/1944/564>. [Accessed 27/July/2010].
- Risquez, A., O'Dwyer, M. & Ledwith, A. (2011) 'Thou shall not plagiarize': from self-reported views to recognition and avoidance of plagiarism, *Assessment & Evaluation in Higher Education*, (e-journal) Available at: <http://dx.doi.org/10.1080/02602938.2011.596926>. [Accessed 8th August 2012].
- Rockman, I.F. (2004). *The importance of information literacy*. Available at: <http://media.wiley.com/>. [Accessed 2 July 2012].
- Salleh, M.I.etal. (2011). Measuring the effect of information literacy on the undergraduate academic performance in higher education. *International Conference on Social Science and Humanity. IPEDR*. 5.
- Salisbury, F. & Karasmanis, S.(2011). Are they ready: exploring student information literacy skills in transition from secondary to tertiary education, *Australian Academic & Research Libraries*, 42(1).
- Sasikala, C.& Dhanraju, V. (2011). Assessment of information literacy skills among students of Andhra University, *Library philosophy and practice*. (e-journal). Available at: <http://www.unlib.unl.edu/lpp/>. [Accessed 13 November 2013].
- Scanlon, P.M. (2003). Student Online Plagiarism: how do we respond? , *College Teaching*, 51(4), pp. 161-165
- SCONUL.(1999). *Information Skills in Higher Education: A SCONUL position paper*. Available at: <http://www.Sconul.ac.uk/publications/99104/Rev1.doc>. [1 September 2010].
- SCONUL. (2011). *The SCONUL Seven Pillars of Information Literacy: core model for higher education*. Available at:

http://www.sconul.ac.uk/groups/information_literacy/publications/coremodel.pdf.
[Accessed 10 February 2012].

SCONUL. (2011a). *The SCONUL Seven Pillars of Information Literacy: core model for higher education*. Available at:
http://www.sconul.ac.uk/groups/information_literacy/publications/coremodel.pdf.
[Accessed 10 February 2012].

SCONUL. (2011b.). *The SCONUL Seven Pillars of Information Literacy: a research lens for higher education*. Available at:
https://www.sconul.ac.uk/groups/information_literacy/publications/researchlens.pdf.
[Accessed 3 August 2012].

Sekaran, U. (2003). *Research methods for business: a skill building approach*.
New Jersey: John Wiley.

Sellen, M.K. (2002). Information literacy in the general education: a new requirement for the 21st century, *The Journal of General Education*, 51(2).

Sentleng, M.P.& King, L. (2012). Plagiarism among undergraduate students in the faculty of applied science at the South African higher education institutions, *South African Journal of library and information Science*,78(1).

Shanahan, M.C.(2008). Transforming information search and evaluation practices of undergraduate students, *International Journal of Medical Informatics*, 77, pp. 518-526.

Smith, et al. (2013). Information literacy proficiency: assessing the gap in high school student's readiness for undergraduate academic work, *Library and Information Science research*, 35, pp. 88-96.

Social Research Association. (2003). *Ethical guidelines*. Available at: <http://www.the-sra.org.uk/documents/pdfs/ethics03.pdf>. [Accessed 12 October 2010].

Stebbins, L.F. (2006). *Student guide to research in the digital age: how to locate and evaluate information sources*. West, Connecticut: Libraries Unlimited.

Stewart, C. (2011). Measuring information literacy: beyond the case study, *The Journal of Academic Librarianship*, 37(3), pp. 270-272.

Tella, A. (2009). Correlates of Undergraduates Information-Seeking Behavior, *College & Undergraduate Libraries*, 16(1) pp. 1-19.

Thyer, B.A. (2001). *The handbook of social research methods: reliability and validity in quantitative measurement*, in SAGE Research Methods. Available at: <http://www.DOI:10.4135/9781412986182>. [Accessed 25 May 2012].

- Ukpebor, C.O. & Emojorho, D. (2012). Information literacy skills: a survey of the transition of students from secondary to university education in Edo state Nigeria. *Library Philosophy and Practice (online)*. Available at: <http://digitalcommons.un.edu/libphilprac>. [Accessed 25 May 2012].
- Umar, B.F. (2013). Managing school library services for effective academic performance and customer services in Nigeria, *Information technologist*, 10(1).
- UNESCO. (2006) *Education for all global monitoring report*. Available at: <http://www.unesco.org/education>. [26 July 2011].
- United Nations. (2005). *The millennium development goals*. Available at: <http://unstats.un.org/unsd/mi/pdf/MDG%20Book.pdf>. [Accessed 25 May 2012].
- User information literacy: case studies from university library programmers in the SCANUL-ECS region*. (2005). Edited by Kiondo, E. & Msuya, J. Oxford: International Network for Availability of Scientific Publications.
- VanTeijlingen, E.&Hundley,V. (2001). The importance of pilot studies. *Social Science Research Update*, (35). Available at: <http://sru.soc.surrey.ac.uk/SRU35.html> [Accessed 18 January 2013].
- Walker, J. (2010). Measuring plagiarism: researching what students do, not what they say they do, *Studies in Higher Education*, 35(1), pp. 41-59.
- Walter, P.(1999). Defining literacy and its consequences in the developing world.*International Journal of Lifelong Learning*, 18(1). pp.31-48.
- Wanjohi, A.M. (2011). *Development of education system in Kenya since independence*. Available at:<http://www.kenpro.org/papers/education-system-kenya-independence.htm>. [Accessed 23 February 2012]
- Warmkessel, M.M. (2005). Information literacy assessment, *Public Quarterly Services*, 3(1-2).
- Warnken, P.(2004). Managing technology: the impact of technology on information literacy education in libraries, *Journal of Academic librarianship*, 30 (2).
- Wellington, J. & Szczerbinski, M.(2007). *Research methods for the social sciences*. London: Continuum.
- Wessels, N. (2004). *Advanced information organisation and retrieval: only study guide for AIS405-S, ACH304-5*. Pretoria: Department of information science; University of South Africa.
- Wilson, T.D.(2000). Human information behaviour, *Information Science Research*, 3(2).

Wolf, S.(2003).*The Big6 information skills as a metacognitive scaffold: a case study*. Available at: <http://www.ala.org>. [Accessed 23 October 2013]

Wooliscroft, M. (1997). *From Library User Education to Information Literacy: some issues arising in this evolutionary process*. Paper prepared for COMLA Workshop, Gabarone, Botswana, July. Available at: http://www.library.otago.ac.nz/pdf/tandlpapers_MJW.pdf. [Accessed [23 November 2010].

World Bank, (2004). *Kenya, strengthening the foundation of education and training in Kenya: opportunities and challenges in primary and general secondary education*. Nairobi: World Bank.

Yengin, I., Krahoca, D.& Uzunboylu, D. (2010). Rethinking virtual universities, *Procedia Social and Behavioral Sciences*, pp. 5769-5774.

Yeo, S. (2007). First year university science and engineering students: understanding of plagiarism, *Higher Education Research & Development*, 26(2), pp. 199-216.

Yongyan Li. (2012). Undergraduate students and reading web sources for writing. *Educational Media International*, 49 (2), pp. 201-215.

Appendix 1: Skills and competencies (ability) and attitudes and behaviours from SCONUL seven pillar of information literacy (2011).

PILLAR: IDENTIFY

Able to identify a personal need for information

Understands:

- That new information and data is constantly being produced and that there is always more to learn
- That being information literate involves developing a learning habit so new information is being actively sought all the time
- That ideas and opportunities are created by investigating/seeking information
- The scale of the world of published and unpublished information and data

Is able to:

- Identify a lack of knowledge in a subject area
- Identify a search topic / question and define it using simple terminology
- Articulate current knowledge on a topic
- Recognise a need for information and data to achieve a specific end and define limits to the information need
- Use background information to underpin the search
- Take personal responsibility for an information search
- Manage time effectively to complete a search

PILLAR: SCOPE

Can assess current knowledge and identify gaps

Understands: Able to identify a personal need for information

- What types of information are available
- The characteristics of the different types of information source available to them and how they may be affected by the format (digital, print)
- The publication process in terms of why individuals publish and the currency of information
- Issues of accessibility
- What services are available to help and how to access them

Is able to:

- “Know what you don’t know” to identify any information gaps
- Identify which types of information will best meet the need
- Identify the available search tools, such as general and subject specific resources at different levels
- Identify different formats in which information may be provided
- Demonstrate the ability to use new tools as they become available

PILLAR: PLAN

Can construct strategies for locating information and data

Understands:

- The range of searching techniques available for finding information.
- The differences between search tools, recognising advantages and limitations
- Why complex search strategies can make a difference to the breadth and depth of information found
- The need to develop approaches to searching such that new tools are sought for each new question (not relying always on most familiar resources)
- The need to revise keywords and adapt search strategies according to the resources available and / or results found
- The value of controlled vocabularies and taxonomies in searching

Is able to:

- Scope their search question clearly and in appropriate language
- Define a search strategy by using appropriate keywords and concepts, defining and setting limits
- Select the most appropriate search tools
- Identify controlled vocabularies and taxonomies to aid in searching if appropriate
- Identify appropriate search techniques to use as necessary
- Identify specialist search tools appropriate to each individual information need

PILLAR: GATHER

Can locate and access the information and data they need

Understands:

- How information and data is organised, digitally and in print sources

- How libraries provide access to resources
- How digital technologies are providing collaborative tools to create and share information
- The issues involved in collecting new data
- The different elements of a citation and how this describes an information resource
- The use of abstracts
- The need to keep up to date with new information
- The difference between free and paid for resources
- The risks involved in operating in a virtual world
- The importance of appraising and evaluating search results

Is able to:

- Use a range of retrieval tools and resources effectively
- Construct complex searches appropriate to different digital and print resources
- Access full text information, both print and digital, read and download online material and data
- Use appropriate techniques to collect new data
- Keep up to date with new information
- Engage with their community to share information
- Identify when the information need has not been met
- Use online and printed help and can find personal, expert help

PILLAR: EVALUATE

Can review the research process and compare and evaluate information and data

Understands:

- The information and data landscape of their learning/research context
- Issues of quality, accuracy, relevance, bias, reputation and credibility relating to information and data sources
- How information is evaluated and published, to help inform personal evaluation process
- The importance of consistency in data collection
- The importance of citation in their learning/research context

Is able to:

- Distinguish between different information resources and the information they provide

- Choose suitable material on their search topic, using appropriate criteria
- Assess the quality, accuracy, relevance, bias, reputation and credibility of the information resources found
- Assess the credibility of the data gathered
- Read critically, identifying key points and arguments
- Relate the information found to the original search strategy
- Critically appraise and evaluate their own findings and those of others
- Know when to stop

PILLAR: MANAGE

Can organize information professionally and ethically

Understands:

- Their responsibility to be honest in all aspects of information handling and dissemination (e.g. copyright, plagiarism and intellectual property issues)
- The need to adopt appropriate data handling methods
- The role they play in helping others in information seeking and management
- The need to keep systematic records
- The importance of storing and sharing information and data ethically
- The role of professionals, such as data managers and librarians, who can advise, assist and support with all aspects of information management

Is able to:

- Use bibliographical software if appropriate to manage information
- Cite printed and electronic sources using suitable referencing styles
- Create appropriately formatted bibliographies
- Demonstrate awareness of issues relating to the rights of others including ethics, data protection, copyright, plagiarism and any other intellectual property issues
- Meet standards of conduct for academic integrity
- Use appropriate data management software and techniques to manage data

PILLAR: PRESENT

Can apply the knowledge gained: presenting the results of their research, synthesising new and old information and data to create new knowledge and disseminating it in a variety of ways

Understands:

- The difference between summarising and synthesising
- That different forms of writing/ presentation style can be used to present information to different communities
- That data can be presented in different ways
- Their personal responsibility to store and share information and data
- Their personal responsibility to disseminate information & knowledge
- How their work will be evaluated
- The processes of publication
- The concept of attribution
- That individuals can take an active part in the creation of information through traditional publishing and digital technologies (e.g. blogs, wikis)

Is able to:

- Use the information and data found to address the original question
- Summarise documents and reports verbally and in writing
- Incorporate new information into the context of existing knowledge
- Analyse and present data appropriately
- Synthesise and appraise new and complex information from different sources
- Communicate effectively using appropriate writing styles in a variety of formats
- Communicate effectively verbally
- Select appropriate publications and dissemination outlets in which to publish if appropriate
- Develop a personal profile in the community using appropriate personal networks and digital technologies (e.g. discussion lists, social networking sites, blogs, etc.)

Appendix II: Checklist for the questionnaire

1. Are the instructions given in the questionnaire clear?
 - i. Yes ()
 - ii. No ()
2. Are there any grammatical mistakes you have encountered?
 - i. Yes ()
 - ii. No. ()
3. If yes please indicate the questions affected.....
4. Is the questions in the questionnaire easy to understand/ clear
 - i. Yes ()
 - ii. No ()
5. If No to question above, which questions are not clear?
Please indicate-----
6. Is the sequence of questions logical?
 - i. Yes ()
 - ii. No. ()
7. If No to question 6 above why?-----

8. Is the questionnaire too long?
 - i. Yes ()
 - ii. No ()
9. Is there any technical term which you are not able to understand?
 - i. Yes ()
 - ii. No. ()
10. If yes to question 9 please indicate which ones
 - i.
 - ii.
 - iii.
 - iv.
11. Is the language used in this questionnaire acceptable to you?

i. Yes ()

ii. No ()

12. If No to question 7 above, what do think can be done to improve the language?

13. Can you give any suggestions to help improve the questionnaire?

.....

Appendix III: Questionnaire on information literacy skills among incoming first year students, Catholic University of Eastern Africa

Dear respondent,

I am a student at the University of South Africa (UNISA) doing a Master's Degree information science. I am carrying out a survey on information literacy skills among first year undergraduate students at the Catholic university of Eastern Africa. I am kindly requesting you as an incoming first year CUEA student, to assist me in this research by answering the questions below. Your answers will be treated in upmost confidentiality and they are only meant to help me in collecting the relevant data for academic purposes as well as assisting the CUEA library to improve its provision of information literacy programmes.

Thanking you in advance.

Ms Hannah Kimani

Instructions: Please tick \surd where applicable

Section A: General background information

1. Please indicate your gender

a) Female []

b) Male []

2. Have you ever used a library before?

i. Yes []

ii. No []

If yes, which library services did you access? (N/B you can select more than one option)

i. Borrowing of books []

ii. Reading of information resources (Books/Journals) []

iii. Using the internet []

iv. I was just visiting []

v. No of the above []

vi. Any other, please specify

3. As a new student in CUEA do you think the library is an important component in your studies?

i. Yes []

ii. No []

If yes, how do you think it is of importance to you? (N/B you can select more than one option)

i. Help in research []

ii. Provide recreational information materials []

iii. Help in providing information for my assignments []

iv. None of the above []

v. I don't know []

4. Have you ever attended any instruction on the use of a library?

i. Yes []

ii. No []

If yes, what type of instruction/service did you receive?

- a) How to do referencing in academic work []
- b) How to use library catalogues []
- c) How to search library databases []
- d) How to access information materials in the library []
- e) The use of search strategies []
- f) Plagiarism course []
- g) Any other, please specify. []

5. If you have ever received any library instruction. Where did you first receive the instruction?

- a) Primary school []
- b) Secondary school []
- c) College []
- d) University []
- e) Any other, please specify.....

Section B : Awareness of Search strategies

6. Have you ever heard of search strategies?

- i. Yes []
- ii. No []

If yes, a research strategy is

- a) A manual describing the proper format for a research paper []
- b) A hand out explaining how to get books from other libraries []
- c) A list of books on specific topics []
- d) A plan of action that gives direction to your research []
- e) I don't know []

7. Have you ever heard of Boolean logic operators

- a) Yes []
- b) No []
- c)

8. Boolean operators are used to combine search terms and show their relationships.
- i. True []
 - ii. False []
9. When searching in a research database, the use of Boolean operators “And”, “Or” and “Not” can be useful in narrowing or widening your search results. Which word would you use to increase the number of the items you will retrieve?
- i. And []
 - ii. OR []
 - iii. NOT []
 - iv. All of them []
 - v. I don’t know []
10. Name some of the characteristics used to evaluate the quality of an internet site:
- i. The date of publication is provided []
 - ii. The author []
 - iii. Responsibility for the site is clearly indicated []
 - iv. The site is easily accessible []
 - v. None of the above []
 - vi. I don’t know []
11. Using a search engine such as Google or Yahoo, you would not find:
- i. The books available in the library []
 - ii. Biographical information about famous people []
 - iii. Merchandise catalogues []
 - iv. Information about companies []
 - v. I don’t know []
 - vi. Other (Please specify)_____
12. You have found a book that is right on your topic. Which section of the book will you consult to find other documents on the topic?
- i. The glossary []
 - ii. The index []
 - iii. The bibliography []

- iv. The table of contents []
- v. Other (Please specify) []
- vi. I don't know []

13. What is the BEST way to search for books on a given topic?

- i. Author or title []
- ii. Publisher or call number []
- iii. ISSN or ISBN []
- iv. Keywords or subject []

14. Which of the following characteristics can be used to evaluate the quality of information sources?

- i. The timeliness of the information []
- ii. The credentials of the author []
- iii. The length of the information source []
- iv. The accuracy of the information []
- v. I don't know []

Section C : Basic information technology skills

15. Have you ever been trained in any computer skills?

- i. Yes []
- ii. No []

If yes, which of the following computer program are you able to use?

- i. Word processors (Microsoft office, Ms Word) []
- ii. Spread sheets []
- iii. Statistical programs (SPSS) []
- iv. Any other _____

16. Do you know how to use the internet/World Wide Web?

- i. Yes []
- ii. No []

17. If answer is yes to question 16 above, which are the main activities do you use the internet for?

- a) Searching for information []
- b) Playing games []
- c) Sending emails []
- d) Networking with friends (Face book, Twitter, MySpace etc) []
- e) None of the above. []

18. If you were to do Internet searches, in which of the following methods are you able to save your work? (N/B You can tick more than one)

- a) Flash disk /Memory disk []
- b) Saving in the computer system []
- c) Sending the searches to my email address []
- d) Can't be able to save the searches. []
- e) None of the above []

Section D : Knowledge of information retrieval tools and their use

19. OPAC stands for:

- a) Online Periodical Access Center []
- b) Online Public Access Catalogue []
- c) Online Portfolios for Academic Classes []
- d) I don't know []

20. In order to become familiar with a subject about which you know very little, first you consult:

- i. A journal\An encyclopaedia []
- ii. A database []
- iii. A book []
- iv. Other (please specify) []
- v. I don't know []

21. Some of the items that can be found in the library catalogue include:

- a) All the titles of the books available in the library []
- b) All the titles of the books available on the market []
- c) All the titles of journal available in the library []
- d) None of the above []

- e) I don't know []
22. To find all the documents authored by Ngugi Wa Thiong'o in the library catalogue, you would do a search;
- a) By title []
- b) By publisher []
- c) By subject []
- d) By author []
- e) Other (please specify) []
- f) I don't know []
23. Do you know the library materials are arranged in a systematic way?
- i. Yes []
- ii. No []
24. Do you know what is a call number or classification number?
- i. Yes []
- ii. No []
25. If your answer is yes, to question 25 above, how do you use a call number? (Choose 2)
- a) To locate a book in the library []
- b) To checkout a book []
- c) Browse the shelves for similar books []
- d) To verify the accuracy of a classification number []
26. To find the most recent information about drug abuse, you would consult;
- i. A book []
- ii. A journal []
- iii. An encyclopaedia []
- iv. A Dictionary []
- v. Other specify []
- vi. I don't know []
27. An abstract is
- a) A quote from a book []
- b) A full text article []
- c) A type of government document []

- d) A summary of a resource []
- e) I don't know []

Section E: Knowledge of information sources and their formats

28. Are you aware of primary and secondary sources of information?

- i. Yes []
- ii. No []

a.) If yes, give an example of a primary source of information-

b.) Also give an example of a secondary source of information

29. Which of the following information format are you aware of?

- i. Print Format []
- ii. Electronic format []
- iii. Both []
- iv. None of the above []

30. From the list below, please indicate the electronic information sources you have previously consulted (you can select more than one)

- i. Electronic journals []
- ii. Online databases []
- iii. E-books []
- iv. CD-ROMS []
- v. DVD'S []
- vi. None of the above []
- vii. Any other[]

31. From the list below, please indicate the print information sources you have previously consulted (you can select more than one).

- i. Textbooks []
- ii. Scholarly Journals []
- iii. Newspapers []

- iv. Magazines []
- v. Government publications []
- vi. None of the above []
- vii. Anyother_____

Section F : Intellectual property & copyrights issues

32. Have you ever heard of the terms intellectual property right and copyright while using any information material?

- a) Yes []
- b) No []

33. Do you know what is referencing?

- a) Yes []
- b) No []

34. Which of the following referencing standard do you know?

- a) APA []
- b) Chicago []
- c) MLA []
- d) Harvard []
- e) I don't know []
- f) Any other_____

35. Are you aware that using another author's intellectual work without acknowledgment is a form of theft?

- i. Yes []
- ii. No []

36. Failure to give credit to your sources of information is called

- a) Plagiarism []
- b) Copyright []
- c) Partial citation []
- d) Abstracting []

37. Which of the following items are considered as intellectual property? (N/B you can select more than one option)

- i. Music []
- ii. Books []
- iii. Journal articles []
- iv. Photocopied materials []
- v. I don't know []

38. Which of the following is an act of plagiarism? (Select all that apply)

- a) Paraphrasing an author's idea without mentioning []
- b) Using an author's exact words without giving credit []
- c) Unintentionally paraphrasing an author's idea without mentioning the source []
- d) Changing a few of the author's words and not using quotation marks []
- e) I don't know []

Thank You!