
Information literacy skills among incoming first-year undergraduate students at the Catholic University of Eastern Africa in Kenya

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Abstract

This research investigated the information literacy skills and competencies among incoming first-year undergraduate students at the Catholic University of Eastern Africa (CUEA), Kenya. A total of 137 incoming first year undergraduate students for the 2013/2014 academic year were surveyed using self-administered questionnaires. Findings revealed that most or all incoming students: (a) had limited knowledge of strategies used to search for information; (b) possessed computer skills such as the use of the internet and its applications (e.g. social networking sites and websites) as well as word-processing and statistical applications; (c) were not familiar with the various retrieval tools and their applications; (d) were familiar with both electronic and printed information resources; (e) were not aware what constituted primary resources and secondary sources; and (f) exhibited little knowledge of issues relating to intellectual property rights.

Keywords: Information literacy, Information Literacy Standards, plagiarism, undergraduate students, Catholic University of Eastern Africa

Rationale for the study

The level of literacy of a community or an individual and its role in development has been a matter of debate for some time. Hugo (2003) broadly defines literacy as the ability to read and write, both of which are complex cognitive activities that involve many levels of interactive processes. Several authors have offered definitions of the term “literacy”. For example, 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 the one 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. However, this paper argues that some form of basic literacy is a major foundation of other forms of literacy, be it information literacy (hereafter referred to as IL), computer literacy or media literacy. Without basic literacy, individuals cannot acquire the other forms of literacy, this hinders the development of various other forms of skills. The level of literacy in a given country affects society in that country, both economically and socially. It has been observed that the arrival of print technology heralded the need for skills in reading, writing and comprehension, and that societies’ needs evolved as literacy became a universal right (Langford 1999). Literacy is a major concern in both developed and less developed countries. The current study focuses on one form of literacy, namely IL.

Information literacy: a brief introduction

The term ‘information literacy’ was first introduced by Paul Zurkowski, former president of the US Information Industries Association, in 1974 (Kapitzke 2003; Eisenberg, Lowe and Spitzer 2004; Warnken 2004; Horton 2008; Rajaram 2006). According to Paul Zurkowski, 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). However, various authors and organisations have defined the term IL differently. The American Library Association Committee on IL in 1989 described an information literate person as one who is “able to recognise 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 IL 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 IL held in Prague in 2003, with representatives from the seven continents, defined IL as “the ability to identify, locate, evaluate, organise and effectively use information to address issues or problems at hand that face individuals, communities, and nations” (The Prague Declaration 2003).

A number of definitions of IL and characterisations of the information literate individuals are available, but Catts and Lau’s (2008: 12) definition of IL is particularly apt and concise: “IL 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”. All of the aforementioned definitions imply a set of skills that individuals should possess in order to be able to make use of information. Since the concept of IL was introduced, there have been concerted efforts to develop IL skills and competencies, particularly in academic institutions. Various organisations, such as the American Library Association (ALA) and the Society of College, National and University Libraries (SCONUL) have advocated the teaching of IL competencies to individuals and within institutions of higher learning.

In Africa, the Standing Conference of National and University Libraries in Eastern, Central and Southern Africa (SCANUL-ECS) has advocated the teaching of IL in universities. In the late 1980s, Breivicks presented a comprehensive model and programme of IL, which was regarded as a significant milestone in IL initiatives (Marcum 2002). Since then, the development of IL teaching programmes worldwide has gained considerable momentum. International meetings have been held in this regard, such as the Prague meeting in 2003, Alexandria in 2005, and the Ljubljana meeting in 2006, among others (Horton 2008). In 2000, the ALA published a set of information competency standards for higher education. The ALA’s standards have been instrumental in the development of IL programmes in institutions of higher learning worldwide. The standards have been adopted by many universities, often in developed countries, as well as forming an integral part of higher education curricula (Idiodi 2005).

Related studies

The topic of IL has continued to attract attention from information scientists and academic librarians. Many studies have been conducted on IL, for example, IL instruction among students (Maybee 2006); IL in general education (Sellen

2002); IL education and instruction in academic libraries and LIS schools (Jiyane and Onyancha 2010); IL and integrative learning (Galvin 2006); 21st-century learning and IL (Breivik 2010); and millennial undergraduate research strategies in web and library information retrieval systems (Porter 2011). 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 IL pedagogy. The aforementioned studies, among others, have also highlighted changing trends in various aspects with regard to presumed IL skills. The changes have largely 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, because it was important to their ability to retrieve relevant information, make efficient use of time and to avoid plagiarism.

In Africa, interest in IL research continues to grow. A study by Lwehabura and Stilwell (2008) on IL in Tanzanian universities 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 and Stilwell (2008) demonstrated that these problems derived from an inadequate public and school library infrastructure in most developing countries. A study by Kavulya (2003) on the challenges facing IL efforts in Kenya notes that in many countries such as Kenya, schools and public libraries are poorly developed, with the result that the majority of students enter university without adequate knowledge of the role and value of libraries, or the habits and the basic skills needed to use them effectively (Kavulya 2003). Although there are studies on IL in Kenya, most researchers have concentrated on studies in IL programmes carried out by specific university libraries in Kenya. Examples of this include Mathangani and Irura's (2005: 47) study on an IL training programme at the University of Nairobi, and Kaane's (2005: 73) study on user IL at the United States International University library. Further afield, many studies have been conducted on IL among undergraduate students by several scholars, for example Gallacher (2007), Mittermeyer (2003), and Salisbury and Karasmanis (2011).

Purpose of the study

The purpose of this study was to investigate IL skills and competencies among incoming first-year undergraduate students at the Catholic University of Eastern Africa. The specific objectives included:

- to identify the type and formats of resources that incoming undergraduate students were aware of;
- to determine whether the incoming undergraduates were aware of search

- strategies for both print and electronic/online resources;
- to determine whether incoming undergraduate students possessed basic information technology skills;
 - to establish whether incoming undergraduate students knew about information retrieval tools and their use; and
 - to determine whether incoming students were aware of intellectual property rights, copyright and the ethical use of information.

Research methodology

The study was carried out at the Catholic University of Eastern Africa (CUEA). The study adopted the quantitative approach and used a case study design. Only the incoming first year undergraduate students, joining CUEA for the first time, were targeted in this study. The first-year undergraduate students were the preferred population for this study for two reasons: one, the students would have just graduated from high school and purpose of this study was to establish how well prepared they were for university education by examining their IL skills; and, two, the students had not yet been exposed to the university's IL programmes.

A questionnaire, consisting of thirty-eight items, was distributed among 150 students who joined the CUEA for the first time in the 2013/2014 academic year. They were part of a target population of 400 incoming undergraduate students. These students were required to attend the orientation programme provided by the university during the first week of their attendance at university. The orientation programme includes a presentation by the librarian.

With this information in mind, the study initially planned to randomly distribute the questionnaires to 196 students, this being the sample size advised by Krejcie and Morgan (1970). The sample size would have accounted for 49% of the total number of incoming undergraduate students. Only 150 (out of 400) students attended the orientation, therefore the authors opted not to sample the target population and to rather involve all students attending the orientation in the study. A total of 137 questionnaires, accounting for 91.2% of the total number of questionnaires distributed, were completed and returned. Data analysis was conducted using the statistical package for social sciences (SPSS). The data was presented using graphical illustrations (such as tables and graphs) under different headings emanating from the questionnaire which was structured to correspond to the objectives of the study.

Results and discussion

This section presents and discusses the research findings according to the respondents' profiles; the respondents' awareness of information sources; the respondents' knowledge of searching strategies; respondents' information technology skills; their knowledge of retrieval tools, intellectual property and copyright.

Distribution of respondents by gender

Of the 137 students who participated in the study, 87 (63.5%) were female, while 50 (36.5%) were male. The gender difference corroborates Onsogo's (2007) findings that there are more female students than male students joining private chartered universities in Kenya because private universities tend to have flexible admission requirements.

Respondents' use of libraries before joining the university

Some 124 (90.5%) of incoming undergraduate students had used libraries before joining the university. Only a small fraction of the students (7.3%) had not previously used a library before joining CUEA. The high number of students who had previously used libraries was a strong indication that the students came from educational or societal backgrounds where library services were available. The fact that some students had accessed libraries before joining CUEA was a positive indication that they would fit into the complex systems and procedures involved in information-seeking at a university. The incoming students who indicated that they had previously used libraries were requested to indicate their reasons for accessing the libraries. The answers included that these students had visited a library to read books and journals, to borrow books, and to access internet services.

Importance of libraries for studies

The results of the study show that 134 (97.8%) of the surveyed students believed that a library was an important component in their studies. The students who thought that the library was important in their academic lives identified research and the provision of information materials for their studies as the two key functions that made the library important to them. Research is an important component in university education, and it is therefore reassuring to note that 83.6% of the students thought that the library would help them in their research. A further 58.2% of the respondents thought that the library would provide information for their assignments. This demonstrates that a small

majority of incoming students were aware that libraries would play a pivotal role in their educational life. Only one student was of the view that the library would not be of any help to him/her. Although this could be viewed as insignificant, it is cause for concern, as this student may never use the library.

Respondents' attendance of library instruction programmes before joining university

The study found that 88 (64.2%) students had received library instruction before joining CUEA. This finding revealed that school libraries (or some other institutions) were engaged in training students in how to use the library. A significant number of incoming students, that is 46 (33.6%) of the students, had never received any library instruction. The number of students who had not received any training prior to joining CUEA may reinforce the need to offer instruction to all students joining universities, and more particularly the CUEA. When asked about the type of library instruction that had been offered to them, the incoming students who had received library instruction prior to joining CUEA, reported the following, as outlined in Figure 1.

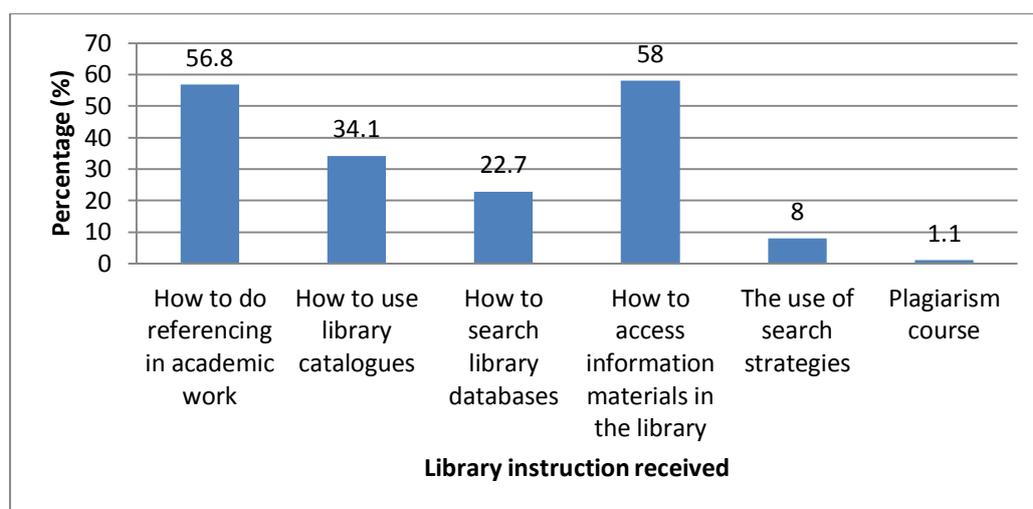


Figure 1: Type of library instruction received prior to university (N = 88)

The six areas covered in the questionnaire are core elements in most library instruction programmes. The results of the survey revealed that the students were trained in a range of skills and knowledge relating to the use of the library, with the emphasis on, in descending order: referencing in academic work, accessing information materials in the library, using library catalogues, searching library databases, the use of search strategies and plagiarism. Very few students were trained in search strategies and plagiarism. Seven students were instructed in the use of search strategies, while only one student was offered training on plagiarism. When asked which institutions had offered them

library instruction, a majority, or 52 (59.1%), had first received library instruction while at secondary school; 43 students (48.9%) received library instruction at primary school; seven (8.8%) received library instruction at the university, while four (4.5%) received instruction at college. It is encouraging to note that school libraries can play an important role in imparting IL skills. As Umar (2013) states, school libraries can play a dynamic and evolving instructional role by giving students opportunities to learn to access, evaluate, analyse and synthesise information from a variety of formats.

Awareness of developing search strategies among undergraduate students

Porter (2011: 270) has noted that students need several key skills and techniques to carry out successful information search queries. Some of the strategies used to search for information include the use of controlled vocabulary; use of natural language; use of Boolean operators; and the use of keywords (Porter 2011). The study sought to examine the students' awareness of Boolean logic operators as well as their skills in evaluating internet sites and the use of search engines. Search operators are devices that are used to combine individual terms that have the effect of either narrowing or broadening a search (Ferguson and Hebel 2003: 27). Boolean logic operators are used in both online public access catalogues and search engines. Bronander *et al* (2004) note that the use of Boolean logic operators can involve additional methods that refine a search, and that researchers therefore require special knowledge and skills to optimally access online information.

Three questions were posed to the students to gauge their knowledge of the use of Boolean operators. The results revealed that a majority of the students, numbering 113 (82.5%) had never heard of Boolean operators; and only 18 (13.1%) students had previously heard of Boolean logic operators as six students did not respond to the question. This reveals significant gaps in the student's knowledge of commonly used search strategies. This would suggest that the majority of the students might experience difficulties in accessing and retrieving information. It should be noted that Boolean operators are an important factor in effective search and retrieval of information from online catalogues and the internet.

Asked to name the Boolean operator that can be used to increase the number of items that can be retrieved during an information search, 19 (13.9%) students selected the operator 'AND'. One student (0.7%) selected the operator 'NOT'. Some six (4.4%) students indicated that all operators could be used to increase the number of items in a search. Eleven (8%) students selected the correct

operator, namely 'OR'. As Ferguson and Hebels (2003: 27) note, the use of the operator 'AND' to link two search terms produces a set of documents that contain both the terms entered, so the operator helps to broaden a search rather than narrowing it.

These results corroborate a study by Bronander *et al* (2004) on the Boolean search experience and abilities of medical students and practicing physicians, which revealed deficiencies in identifying Boolean phrases that would result in successful and efficient information retrieval. According to Bronander *et al* (2004), the students' knowledge was especially poor when the phrases contained operators 'OR' and 'NOT'. Likewise, Porter (2011) showed in a study that the students surveyed tended to use natural language phrases and questions, rather than traditional Boolean language. The lack of awareness of the use of Boolean logic operators among students joining the university can be attributed to lack of exposure in their previous educational environments.

Characteristics used to evaluate the quality of an internet site

Eshet-Alkalai (2004) maintains that we live in an era of unlimited exposure to digital information that can be published easily and manipulated without difficulty, and that the ability to compile and evaluate information effectively has become a survival skill for scholars and information consumers. According to SCONUL's PILLAR 5, an information literate person should have the ability to "evaluate" information. S/he must understand the research process and be able to compare and evaluate information and data. Evaluation involves assessing the quality, accuracy, relevance, bias, reputation and credibility of information and data sources (SCONUL 2011). Shanahan (2008: 519), too, notes that the ability to evaluate the quality of information retrieved from the internet is an important component of successful information research. As a result, this study sought to establish whether students understood the criteria used to evaluate the quality of an internet site. Table 1 outlines the respondents' selections. The results revealed that 30.7% of the incoming students did not know of the criteria used to evaluate an internet site. It was also found that 27.7% of the students who participated in the current study were of the view that one of the criteria used to evaluate an internet site was accessibility of the site. Bronander *et al* (2004), however, are of the opinion that easy access to search engines does not guarantee useful results. Nineteen (13.9%) students selected 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 was clearly indicated. It was encouraging to note that 10.2% of the 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.

Table 1: Criteria used to evaluate an internet site (N=137)

Criteria used to evaluate an internet site	Number of respondents	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

The above findings support those of Mittermeyer (2003) who set out to establish the IL skills of incoming first-year students in Quebec. The study revealed that only 23% of students were able to identify a set of criteria that would enable them to evaluate the quality of an internet website (Mittermeyer 2003: 221).

Eshet-Alkalai (2004) believes that the need to properly evaluate information is not unique to the digital era, it has always been central to successful learning even before the information revolution. However, with unlimited exposure to digital information which can be easily published and manipulated, the ability to evaluate and assess information properly is an important skill. The main problems in evaluating information lie in the difficulties relating to assessing the credibility and originality of information and the professional integrity of its presentation. Shanahan (2008: 519) notes that undergraduates' dependency on the internet as the primary information retrieval system, combined with reported poor skills in evaluating the quality of information provided on the internet, represents a major challenge that must be addressed at institutions of higher learning.

Use of search engines

Search engines are used as information retrieval tools. According to Clarke (2000) and Ferguson and Hebels (2003: 23), search engines were developed in response to a need for information retrieval on the internet. The students were asked to state the types of information which they could retrieve from the internet using a search engine. They were provided with several options to choose from, as shown in Table 2.

Table 2: Information sources that can be retrieved from search engines (N=137)

Information materials	Number of respondents	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

Some 32.5% of the students said that they did not know what types of information could be located using search engines. This result contrasts strongly with what is generally believed about the current generation of students who are described as a millennial generation who are thought to be “tech-savvy”. Salisbury and Karasmanis’ (2011) study on students’ IL skills in the transition from secondary to tertiary education at La Trobe University showed that students saw Google as their first choice in searching for information, and that using search engines to locate information on the internet had become their method of choice in research. The current study, however, shows that a significant number of the surveyed students were not aware of the information sources that were available from search engines, even when they indicated that they were aware that search engines were useful tools for searching for information. It was noted, too, that 59 students (43.1%) stated that books were some of the resources available in search engines. This category of students might have heard about Google Books.

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 is internet and technology knowledgeable. To determine whether the sample of incoming students had basic information technology skills, two questions were posed. The first question sought to establish whether the students had attended any training on computers prior to joining CUEA. The survey revealed that the majority of incoming first-year students, that is 118 (86.1%), had received some training in basic computer skills prior to joining the university. Only 10 (7.3%) had not received any training.

Of those students who had received some computer training prior to joining CUEA (118), 84.7% were able to use word processing programmes such as Microsoft Office. Some 46.7% could use spread sheets, while 10.2% were able to use statistical programmes such as SPSS. The results suggest that majority of incoming students could navigate various tools in their search for information. As noted by SCONUL (2011a), an information literate person should have the ability to locate and access information and data as needed. This includes 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.

The second question focused on the students’ knowledge of the methods associated with storing the information retrieved from online sources in view of SCONUL’s (2011) essential steps in IL. A significant number of the students, that is 107 (78.1%), saved their searches on flash or external disks as the most commonly used method. Others saved their searches on the computer hard drive or sent the searches to email addresses.

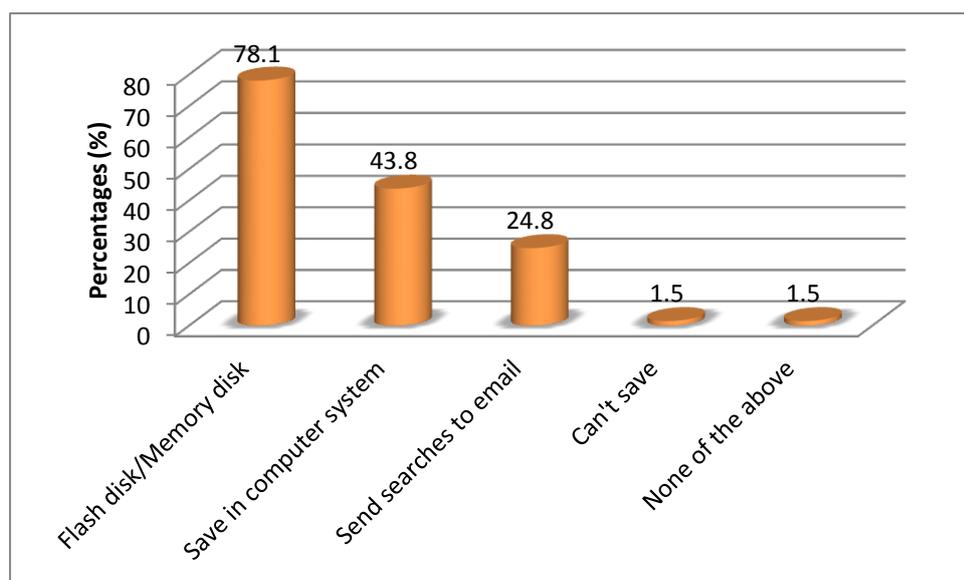


Figure 2: Method used to save results from information searches (N=137)

Knowledge of information retrieval tools and their applications

The students were asked several questions aimed at establishing whether they understood the purpose of the catalogue, one of the main retrieval tools available in libraries. The first question focused on the online public access catalogue (OPAC). Students were asked whether they knew what the acronym

'OPAC' stood for. The survey revealed that only a small number of students namely, 20 (14.6%) knew what the term meant. This means that some 80% did not know what it stood for. While it is clear that knowing what the acronym stands for may be immaterial as long as the students can make use of the tool, it should be noted that IL also entails the knowledge of specific terminologies that may impact on their skills.

The authors also wanted to know whether the incoming students were familiar with the types of information found in library catalogues. It was found that the majority of the students, 90 (65.7%), selected the option: "All the titles of the books available in the library". This was the correct answer (although not entirely), since a catalogue consists of all the information materials, owned by a particular library, which are largely books (Ferguson and Hebels 2003: 82). It is worth noting that the responses that the students gave to this question contrasted with their previous answers, which suggested that most of the incoming first year undergraduate students did not know what the acronym OPAC stood for. Most probably, the students were not aware of the acronym but had a good idea of the definition of the term "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, that is 5 (3.6%), selected the option. A significant number of students, or 21 (15.3%), said that they did not know what items were found in a library catalogue; while (13.9%) did not respond to the question. It follows that a substantial number of students (approximately 30%) were not aware of the range of contents of a library catalogue. This would reinforce the importance of instructing the incoming students on the contents and use of library catalogues. A student's lack of awareness of the contents of a library catalogue would clearly be detrimental to their ability to access and retrieve information in a university library.

Asked how they searched for documents by a specific author in the catalogue, the majority of the students, or 82 (59.9%), believed that using the author's name was an effective way to locate documents in a library catalogue. Some 17 (12.4%) said that they would use the title and a further 12 (8.8%) selected the name of the publisher. It is noted that the most effective way to find all the documents in a library catalogue by an author, Ngugi wa Thiong'o for example, is to use the author's surname. Using the author as the search term will most likely retrieve all of the author's works. On the other hand, a title can also be used to search for books by a specific author. Nevertheless, the underlying question was how to find *all* the documents by Ngugi wa Thiong'o while conducting a search. Use of the title as the search term would likely help retrieve books on Ngugi wa Thiong'o, but it may also produce other works with

the same title.

Knowledge of arrangement of information materials in a library

Knowledge of the physical arrangement of information materials enables students to easily browse and access information materials in a library. Several questions were posed to determine whether they knew how library materials were arranged on the shelves. The first question sought to establish whether the students knew that library materials were arranged in a systematic way. The majority of the students, 121 (88.3%), answered in the affirmative, while only three (5.6%) students did not. It was encouraging to note that new students joining the university knew that library materials were arranged in a systematic manner. However, a follow-up question on whether the students understood the meaning of call numbers or classification numbers revealed that a majority or 84 (61.3%) did not know what a call number or classification number was. This figure indicates that the students who answered in the negative did not know the system used in libraries to classify information resources. Clearly, students need to know the meaning and use of call/shelf or classification numbers, as they are crucial in locating physical information sources in a library. Only five (5.8%) students indicated that the call number could be used to browse the shelves for similar books or locate books on the shelves.

Knowledge of information sources and their formats

In this section, the study sought to determine the incoming students' knowledge of available information sources and their formats. Various questions were posed.

Firstly, the students were asked whether they were aware of the difference between primary and secondary sources of information. Some 55 (40.1%) indicated that they knew the meaning of primary and secondary sources of information, while 62 (45.3%) said that they were not aware of the difference between these two sources of information. Students who said that they knew difference between primary and secondary sources of information were requested to list these. The students listed the several sources in each category, but their lists revealed that some were not able to differentiate between primary and secondary sources of information. For instance, several students listed textbooks as primary sources. On the other hand, others listed journals articles, the grapevine, the media, word-of-mouth, and TV as some secondary sources. The lists of primary and secondary sources provided by the students showed that confusion existed regarding their understanding of the terms. There was a

high non-response rate to this particular question; 39 (70.1%) of the students did not answer the question.

Secondly, students were asked to state which electronic resources they had consulted prior to joining CUEA. The results revealed some diversity regarding the electronic resources accessed by the students. The largest number of students, 50 (36.5%), had consulted e-books prior to joining university, while 49 students (35.8%) had consulted electronic resources such as DVDs. The least consulted e-resource was electronic journals, which were consulted by 21.9% of the students. Those students who had used electronic resources prior to joining university could have been aided by their skills in computer use and library use. The results also revealed that the majority of the students were computer literate (see Section 6.8).

On the third question, which focused on the print information sources consulted by the students prior to joining CUEA, the results outlined in Figure 3 show that the majority of the students had previously used print information resources, which included textbooks, scholarly journals, newspapers, magazines and government publications. Textbooks ranked the highest with 95 students (69.3%), followed closely by newspapers, with 65% of the students having previously consulted these. Print resources previously used by students were magazines, with 53.3% students. Scholarly journals and government publications ranked lowest among the print resources, which had been previously accessed by 32 (23.4%) and 26 (19%) students, respectively. The results show that a significant majority of the students had consulted more than one print source before joining university. This suggests that they had access to such resources at their secondary schools. In Kenya, for example, the government recommends that school textbooks be used in both primary and secondary schools, in line with the curriculum. Scholarly journals and government publications are rarely used at these levels of education. Another factor that could have influenced the low use of scholarly journals and government publications among the surveyed students is a lack of research skills among secondary students. Secondary school students are rarely engaged in research but instead rely on textbooks recommended by the government. The frequent use of newspapers and magazines was also evident, perhaps because many schools can afford to purchase daily newspapers. This is an indication that the incoming students had previously read other information materials apart from textbooks.

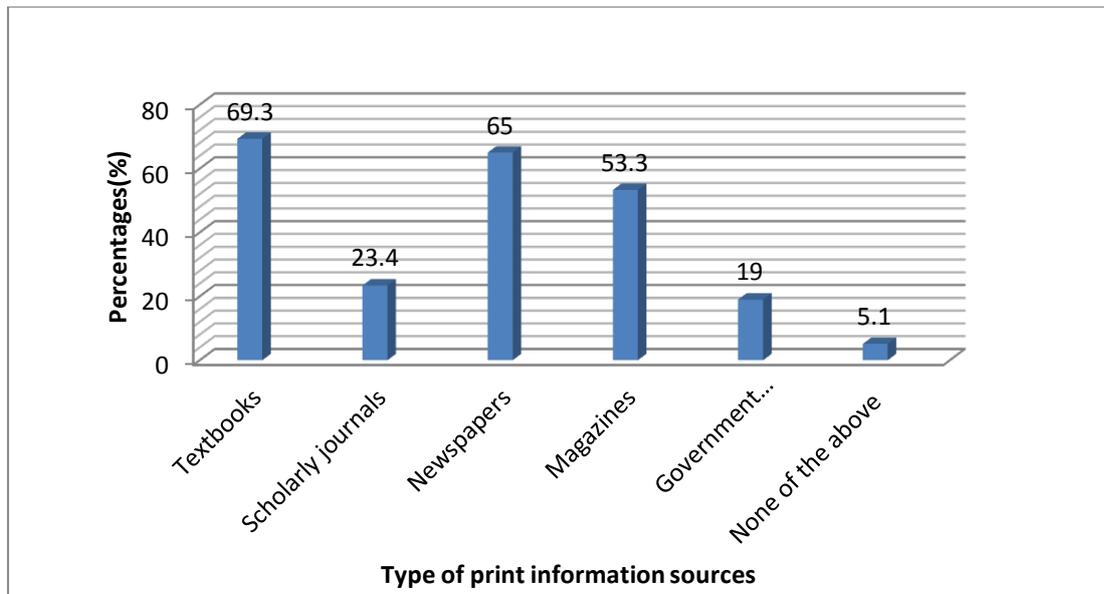


Figure 3: Print information sources previously consulted by incoming first year students (N=137)

Intellectual property and copyright issues

Sentleng and King (2012: 65) note that plagiarism is a complex matter that is often misunderstood by students. Knowledge of ethical issues concerning intellectual property is therefore important, and especially for incoming first-year undergraduate students who may not have been exposed to education about it. They might not be aware that plagiarism is a serious offence in the academic arena (Sentleng and King 2012: 65). Freeman and Lynd-Balta (2010) argue that plagiarism can stem from a student's blatant decision to deceive, or be the result of a student's misunderstanding or inability to process a complicated publication. Ali, Ismail and Cheat (2012) highlighted the problems contributing to plagiarism among students as involving their (perceived) understating of the offense of plagiarism, their need for self-realisation, their ethics and personal attitude, their level of access to the internet, pressure to perform, and their learning environment. To determine the students' understanding of intellectual and copyright issues, they were asked several questions on intellectual property and copyright issues as well as referencing of information materials.

Some 79 (57.7%), or more than half of the students had heard of the terms "copyright" and "intellectual property rights". This is an indication that the two terms were not alien to incoming students, although 44 (27.7%) had never heard of copyright issues. Some students (20 or 14.6%) did not respond to the question. This corroborates previous findings in Sentleng and King's (2012: 65) study on plagiarism among undergraduate students in the faculty of applied

science at South African higher education institutions, which showed that the majority of the students were aware of plagiarism as well as the seriousness of plagiarism. Forty one percent of students had indicated that plagiarism was serious, while 28% thought it was very serious. It was also found that 72 (57.7%) students knew what referencing was, while 32.1% had no knowledge of what it entailed. As Kargbo (2010) observed, referencing is important in academia and the students who did not know how to reference their work, or why, were more likely to engage unknowingly in academic dishonesty. Namwera (1995: 3) argues that most students plagiarise because they do not know the conventions for using and acknowledging sources. To further show their understanding of issues regarding referencing, the incoming students surveyed were asked to select a number of referencing styles or conventions that they know. The results show that almost half the students, 68 (49.6%), did not know of any referencing style. Some 19% did not respond to the question. This contrasts with the earlier result, which showed that 57.7% students knew what referencing was. This suggests that students joining the university were aware of referencing, but may not have known about referencing styles. Of the 137 students, only 10 (7.3%) students knew of the American Psychological Association (APA) style, while five (3.6%) and three (2.2%) knew of the Chicago and Modern Language Association (MLA) referencing styles, respectively. Overall, only a few students knew the various referencing styles applicable for research papers, assignments or term papers. This could represent a challenge for students in researching and writing research papers, term papers and class assignments. Various authors (Namwera 1995: 3; SCONUL 2011; and Sentleng and King 2012: 65) have advocated the need for students to have referencing and writing skills.

Students' awareness that using another author's intellectual work without acknowledgement is a form of theft was also assessed in this study. A total of 98 (71.5%) students surveyed indicated that they were aware that using another author's intellectual work without acknowledgement is a form of theft. Some 24 (17.5%) were not. These findings are corroborated by Babalola's (2012: 55) findings, which showed that undergraduate students generally had a low understanding of plagiarism which was likely to result in incidences of unintentional plagiarism.

When asked to identify items that constituted intellectual property, 59 (43.1%) students selected books followed by journal articles, music and photocopied materials. Thirty-one (22.6%) said they did not know of items that could be considered as intellectual property. The contents of recorded music albums, books and journal articles are considered to be intellectual property. It follows therefore that the majority of the students selected the correct items. The relatively small number of students who indicated that they did not know what

items could be considered to be intellectual property suggests that they had not been made aware of this issue before joining university. Only one (0.7%) student had received training on plagiarism prior to joining the university. This shows that there was a gap in the surveyed students' knowledge of issues relating to intellectual property and copyright issues.

Table 3: Acts of plagiarism known by students (N=137)

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

The students were then asked to name those acts of copying information material that they thought could amount to plagiarism. Some 42 (30.7%) of the students who responded to the question did not know what constituted an act of plagiarism. Table 3 reveals that a majority of students listed an act of plagiarism as “paraphrasing an author's idea without mentioning the author”, “using an author's exact words without giving credit”, “unintentionally paraphrasing 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. All the aforementioned acts constitute plagiarism. The lack of awareness shown by the incoming undergraduate students with regard to intellectual property rights and plagiarism as well as referencing styles could be an indicator of deficiencies in their education backgrounds. Students joining Kenyan universities are secondary school graduates who have not been exposed to IL instruction programmes. Secondary schools in Kenya have not incorporated IL into their curricula. As Kargbo (2010: 231) notes, the fact that a majority of undergraduate students were admitted to college directly from secondary schools where the art of citing references has not been taught means that they are generally unfamiliar with the universe of scholarship and the intended purpose for citing references on scholarly papers.

Conclusions and recommendations

The purpose of the study was to investigate IL skills and competencies among incoming first-year undergraduate students at the Catholic University of Eastern Africa. The study reveals that the students were familiar with both electronic and print information resources, more especially with print sources, prior to coming to university. A large number of students were not aware of the differences between primary and secondary sources. Incoming first-year students had limited knowledge of strategies used to search for information. This was evidenced by the students' lack of knowledge of search strategies such as Boolean logic operators, as well as their lack of understanding of the use of keywords.

The incoming first-year undergraduate students possessed computer skills, including the use of the internet and its applications (for example, social networking sites and the use of websites). They were also familiar with word processing applications such as Microsoft Office. The majority of incoming undergraduate university students were not familiar with the range of information retrieval tools available via libraries or their applications. The majority of students did not know what the acronym OPAC stood for, and were not aware of the meaning and purpose of a call number, although many knew the purpose of a catalogue and what resources could be found via a catalogue. Furthermore, the students exhibited limited knowledge of issues relating to copyright, intellectual property rights, plagiarism and referencing styles.

In view of the above, we make the following recommendations:

- The university's library should formulate workable plans to reach students who are unable to attend library orientation, which is the main programme on library instruction and use. The library should perhaps also investigate the possibility of redesigning its IL programmes to align these with the needs of contemporary library users.
- IL should be integrated into the university curriculum for all incoming first-years. In other words, IL classes should be mandatory. In relation to this, the university should review policies relating to the training in IL vis-à-vis lifelong learning, as espoused by the university.
- The university library should adopt one of the methods of assessing IL skills to help assess the level of IL among incoming students in every academic year. This will help to structure IL training according to the immediate needs of new students. The IL of other students should also be assessed, not only that of incoming students, to determine their levels of IL acquisition as they progress in their studies.

For purposes of conducting further studies, we recommend a longitudinal study on the same topic, to determine whether the students joining the university are able to gain IL skills over a period of time. The current study has shown that the majority of the first-year incoming undergraduate students did not possess the required IL skills when they joined the university; it did not, however, evaluate the IL skills of students when they leave the university. Such a study would help to determine whether students gain effective IL skills as they progress in their studies.

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References

- Ali, W.Z., Ismail, H. and Cheat, H.H. 2012. Plagiarism to what extent it is understood. *Procedia-social and behavioral sciences* 59: 604-611.
- American Library Association.1989. *Presidential Committee on Information Literacy: final report*.
[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.
- Babalola, Y.T. 2012. Awareness and incidence of plagiarism among undergraduate in a Nigerian private university, *African journal of library, archives and information science* 22(2): 53-60.
- Bankole, O.M. and Oludayo, B.S. 2012. Internet use among undergraduate students of Olabisi Onabanjo University, Ago Iwoye, Nigeria. *Library philosophy and practice* 812: 1-19.
- 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): 424-436.
- Breivik, P.S. 2005. 21st century learning and information literacy, change. *The magazine of higher learning* 37(2): 21-27.

Bronander, K.A., Goodman, P.H., Inman, T.F. and Veach, T.L. 2004. Boolean search experience and abilities of medical students and practicing physicians. *Teaching, and learning in medicine: an international journal* 16(3): 284-289.

Catts, R. and Lau, J. 2008. Towards information literacy indicators: conceptual framework paper. <http://unesdoc.unesco.org/images/0015/001587/158723e.pdf> Accessed 16 July 2012.

Clarke, S.J. 2000. Search engines for the World Wide Web. *Journal of Internet Cataloguing* 2(3-4): 81-93.

DeBard, R. 2004. Millennials coming to college. *New directions for student services* (106): 33-45.

Eisenberg, M.B., Lowe, C.A. and Spitzer, K.L. 2004. *Information literacy essential skills for information*. 2nd ed. Westport, 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): 93-106.

Ferguson, S. and Hebels, R. 2003. *Computers for librarians: an introduction to electronic library*. 3rd ed. Wagga Wagga, New South Wales: Centre for Information Studies, Charles Sturt University.

Freeman, E. and Lynd-Balta, E. 2010. Developing information literacy skills early in undergraduate curriculum. *College teaching* 58: 105-115.

Gallacher, I. 2007. 'Who are those guys?' *The results of a survey studying the information literacy of incoming law students*. http://works.bepress.com/ian_gallacher/1 Accessed 23 August 2012.

Galvin, J. 2006. Information literacy and integrative learning. *College and undergraduate libraries* 13(30): 25-51.

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

Howe, N. and Strauss, W. 2003. *Millennials go to college*. <http://students.rcke.edu> Accessed 7 June 2015.

- Hugo, A. 2003. From literacy to literacies: preparing higher education in South Africa for the future. *South African journal of higher education* 17(2): 46-53.
- Idiodi, E. A. 2005. Approaches to information literacy acquisition in Nigeria. *Library review* 54(4): 223-230.
- Ivankovi, A., Spiranec, S. and Miljko, D. 2013. ICT literacy among the students of the faculty of philosophy University of Mostar. *Procedia; social and behavioral Sciences* 93: 684-688.
- Jiyane, G.V. and 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): 11-23.
- Johnston, B. and Webber, S. 2003. Information literacy in higher education: a review and case study, *Studies in higher education* 28(3): 335:352.
- Kaane, S. 2005. User information literacy at the United States International Library. In Kiondo, E. and Msuya, J. eds., *User information literacy*. Oxford: International Network for the Availability of Scientific Publications (INASP), pp.73-90.
- Kapitzke, C. 2003. Information literacy: a positivist epistemology and a politics of out formation. *Educational theory* 53(1): 37-53.
- Kargbo, J.A. 2010. Undergraduate students' problem with citing references. *The Reference librarian* 51(3): 222-236.
- Kavulya, J.M. 2003. Challenges facing information literacy efforts in Kenya: a case study of selected University libraries in Kenya. *Library management* 24(4): 216-222.
- Krejcie, R.V. and Morgan, D.W. 1970. Determining sample size for research activities. *Educational and psychological measurement* 30: 607-610.
- Langford, L. 1999. *Information literacy? Seeking clarification*.
<http://athene.csu.edu.au/~llangfor/papers/paper5.html> Accessed 16 June 2011.
- Lwehabura, M.J. and Stilwell, C. 2008. Information literacy in Tanzanian universities: challenges and potential opportunities. *Journal of librarianship and information science* 40(3): 179-191.

Marcum, J.W. 2002. Rethinking information literacy. *Library quarterly* 72(1): 1-26.

Mathangani, S. and Irura, G. 2005. Information literacy training programme at the University of Nairobi. In Kiondo, E. and Msuya, J. eds. *User information literacy*. Oxford: International Network for the Availability of Scientific Publications (INASP), pp.73-90.

Maughan, 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): 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): 79-85.

Mittermeyer, D. 2003. *Information literacy: study of incoming first-year undergraduates in Quebec*.
<http://www.crepuq.qc/documents/bibl/formation/studies-aug.pdf> Accessed 15 August 2010.

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

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

Porter, B. 2011. Millennial undergraduate research strategies in web and library information retrieval systems. *Journal of web librarianship* 5(4): 267-285.
The Prague Declaration. 2003. *Information literacy: meeting of experts*.
http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/themes/info_lit_meeting_prague_2003.pdf Accessed 27 July 2010.

Rajaram, S. 2006. *Information literacy gap: challenges in bridging the divide*.
<http://www.iam.inflibnet.ac.in:8080/dxml/bitstream/handle/1944/564> Accessed 27 July 2010.

Rickes, P.C. 2009. Make way for millennials: how today's students are shaping higher education space. *The journal of the Society for College and University Planning* 37(2): 7-17.

Salisbury, F. and Karasmanis, S. 2011. Are they ready?: exploring student information literacy skills in transition from secondary to tertiary education. *Australian academic and research libraries* 42(1): 43-58.

SCONUL. 2011. *The SCONUL Seven Pillars of Information Literacy: core model for higher education*.
http://www.sconul.ac.uk/groups/information_literacy/publications/coremodel.pdf
f Accessed 10 February 2012.

Sellen, M.K. 2002. Information literacy in the general education: a new requirement for the 21st century. *The journal of general education* 51(2): 115-126.

Sentleng, M.P. and King, L. 2012. Plagiarism among undergraduate students in the faculty of applied science at a South African higher education institution. *South African journal of libraries and information science* 78(1): 57-67.

Shanahan, M.C. 2008. Transforming information search and evaluation practices of undergraduate students. *International journal of medical informatics* 77: 518-526.

Umar, B.F. 2013. Managing school library services for effective academic performance and customer services in Nigeria. *Information technologist* 10(1): 123-133.

UNESCO. 2006. *Education for all global monitoring report*.
<http://www.unesco.org/education> Accessed 26 July 2011.

Walter, P. 1999. Defining literacy and its consequences in the developing world. *International journal of lifelong learning* 18(1): 31-48.

Warnken, P. 2004. Managing technology: the impact of technology on information literacy education in libraries. *Journal of academic librarianship* 30(2): 151-156.