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Online search behaviour of University of Zambia Library and Information Studies students

Online search
behaviour

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Abstract

Purpose – The purpose of this paper is to investigate factors that affect web searching behaviour of the students of the University of Zambia (UNZA).

Design/methodology/approach – This study adopted a qualitative research approach in order to get an insight into the interactions of the students at the UNZA with the real web situation. A post-search questionnaire was used as a tool to gather information from 65 Library and Information Science students about search techniques used, web experience, and subject knowledge of users.

Findings – This study shows that the main purpose for using the internet by students at the UNZA is for academic work. The findings also show that factors such as experience and topic familiarity had an effect on search behaviour, whereas, age of searcher did not affect the search technique used. Google was preferred for searching more than electronic databases.

Originality/value – This is the first systematic examination of students online search behaviour in Zambia. It allows the researchers to compare with search behaviour of students in a different social economic environment.

Keywords User studies, Students, Information searches, Online retrieval, Zambia, World Wide Web

Paper type Case study

1. Introduction

Many libraries are going through financial constraints resulting in budget cuts and making it difficult for them to purchase adequate hard copy books and journals that would enable their users, especially students, to have access to much needed information. The web offers a good alternative for libraries in information provision to their clients as the internet is a good source of information. The exponential growth of the internet has brought with it a number of challenges such as information explosion; unreliability of information, that is, available on the internet; and inadequate time to sift through the internet for the relevant information. So much information creates a challenge to finding quality information for academic purposes on the World Wide Web, particularly to a novice. Additionally, it is not just the quality of information that is at stake but also the relevancy of that information, that is, difficult to navigate, find and retrieve for many users, most often leading to them not meeting their information needs. This information explosion, therefore, requires that users acquire and possess good information retrieval skills in order to sift through vast sources of information in the quickest possible time.

In as much as the growth of the internet and its services brings some challenges, it also brings with it a lot of benefits for the information seeker. Due to vast amounts of information available on the internet, it is up to the information seeker to be able to sift through these huge and sometimes disorganised databases of information, requiring the relevant requisite information search and retrieval skills in order to be able to effectively navigate the internet. This is because the large sources of information pose a challenge to users, as they are forced to find the right information within an acceptable amount of time. In such a situation, the information user should possess the necessary search skills to be able to sift through these huge amounts of information.



The growth of large amounts of information has given impetus to a number of searching services such as search engines, and other online services to help the user find information. Google is one such service that has been the most successful of all the search engines as evidenced by the large numbers of people using its services. Many users attribute the popularity of Google to its user friendliness and simple interface. Google's rate of success in retrieval is better than other search engines due to its huge indexes (Lossau, 2004). This is because online searching for research materials is becoming more convenient as researchers increasingly utilise a single interface to search across multiple resources (Google Scholar, Open Archives Harvesters, Library Metasearch Engines).

2. Zambia's internet situation analysis

Zambia's internet situation like many other countries in Africa has been developing positively over the years. Zambia is known to be the pioneer of internet usage in Sub-Saharan Africa outside South Africa. However, in recent years, many countries in the region have advanced more than Zambia in terms of internet services and infrastructure. That notwithstanding, the internet subsector in Zambia is fully liberalised and is one of the most competitive in the information and communication technology (ICT) services industry. With the introduction of Zambia's National ICT policy in 2006, internet services have continued to develop though the potential for rapid growth is undermined by inadequate telecommunication infrastructure development across the country, poor telephone accessibility and high access costs (UNDP, 2016).

3. Internet connectivity at UNZA

The establishment of the Zambia Research Network in 2012 has greatly improved access to internet for universities and research institutions including the University of Zambia (UNZA). This internet service provider provides fibre optic internet connection to public universities and research institutions at an affordable cost. Currently, the UNZA has access to 575 m/s of bandwidth, servicing a population of 35,000 students and over 2,000 members of staff. This, however, is far from adequate. To access the internet, the majority of the students use laptops, most of whom were obtained on hire purchase through a government facilitated scheme. The contextual factors affecting the search performance of students of the UNZA when using the web have so far not been investigated, hence this study tries to investigate the same. This study adopted a qualitative research approach in order to get an insight into the interactions of the students at the UNZA with the real web situation. The aim was to investigate factors that affect web searching behaviour of the UNZA students.

4. Literature review

The investigation of online searching generally employs methods including surveys, interviews, screen capturing, or transactional logs (Tsai *et al.*, 2011). Earlier studies of web searching, transaction log analysis (TLA) forming the core of many of these studies, have usually been quantitative in nature, focussing on analysing the number of search terms used, and not the search tasks, the characteristics of the users, the success of these searches, or the concepts that the online searchers used in their queries. Mansourian and Madden (2006) among other qualitative researchers are critical of the narrowness of quantitative studies which focus on log studies, and instead stress the need for understanding the human-computer interaction on the web. A study by Sinh and Nhung (2012) focussed on identifying the searching behaviours of the users including their specific reactions, their difficulties as well as their expectations from the library support while using online databases provided by the library.

Aula (2003) outlined factors that affect information search, such as environmental (the database, the search topic), searcher (e.g. online experience), search process (e.g. commands used), and search outcome variable (precision and recall). In the same vein, Mansourian and Ford (2007) highlighted the main contextual elements that affect search performance of users, as being web users' characteristics, type of the search tool employed, search topic, search situation and features of the retrieved information resources.

A number of studies have been carried out to determine what purposes college students use the internet for. Sinh and Nhung (2012) revealed that studying was the primary purpose for database searching. A study by Vilar and Zumer (2011) reveals that the characteristics of digital scholars (phrase used in many studies to denote researchers who predominantly use digital tools to assist in their information activities) preferred simpler searching interfaces resembling web search engines, and expressed annoyance with numerous options on the screen. Zimmerman (2012) survey of the digital natives search behaviour concludes that digital natives are different in their search behaviour, preferring to use web-based search engines such as Google, Yahoo, and Bing. This is because the flexibility and simplicity of the web and web search engines allows different users, expert or not, to complete different search tasks successfully.

It is generally presumed that a user's demographic characteristics and experience of working with computers, the web and other information retrieval systems tend to change their information search pattern (Kumar, 2012). The study by Sinh and Nhung (2012) shows that most young searchers preferred to use the simple search as compared to advanced or expert search. The reason being that they liked something easy to use that would enable them quickly get results.

Furthermore, log studies have shown that web searchers use short queries (typically from 1 to 3 terms), seldom do they use advanced operators, do not regularly iterate their queries, and only go through a couple of result pages per query (Aula *et al.*, 2010). In being consistent with other studies, the results in a study by Wu and Cai (2016) showed that nearly 74 per cent of participants only browsed the first page of the search results and most students entered their queries through the default search box on the Directory Web Guides. This is confirmed by Lau and Goh (2006) who stated that users are not patient in searching for information and this lack of perseverance leads them to terminate their searches rather than look beyond the first screen of results (hits).

Other studies have found differences in the search behaviour of novices and experts. The study by Al-Maskari and Sanderson (2011) indicates that participants with search experience and high cognitive skills were more effective than those with less experience and slower perceptual abilities. They conclude that experienced searchers locate more relevant documents than less experienced. These results are in line with an earlier study by Mansiourian (2007), who stated that search experience was a key factor leading to successful searching. According to Tamine and Chouquet (2017), "experts formulate longer queries and make use of more technical concepts than novices but the latter are slightly as able as experts to use unique and specific words. We also showed that in comparison to novice's language, expert's language used for query formulation better matches the language used to express the content of clinical documents".

A pilot test by Wen *et al.* (2006), to investigate the effects of topic familiarity on search behaviour, found that topic familiarity can affect the number and type of resources selected by searchers and the ability of a searcher to use relevance criteria. According to a study by Tang *et al.* (2013) on the influence of task familiarity on user behaviours, when searching for an unfamiliar topic, users were more likely to change their queries, indicating the effect of familiarity on search behaviours. The test concluded that participants recommended significantly more documents on the unfamiliar task than on the familiar task. Mansiourian (2007) also affirmed the fact that when the user is not an expert of the area of search, one

does not know much about the area and it might be somehow difficult for him/her to develop an efficient search strategy. Therefore, selecting appropriate terms in an unfamiliar area might be challenging for the user.

5. Main objective

To examine the contextual factors that affect online search performance of UNZA students.

6. Specific objectives

- (1) to establish the purposes for which students seek information on the web;
- (2) to establish the search services students prefer to use when seeking information on the web;
- (3) to find out whether UNZA students are aware of the existence of the online databases available to them from UNZA Library; and
- (4) to reveal the problems students face when using the internet.

The study seeks to address the following questions:

- (1) What contextual factors affect search performance of the web users?
- (2) For what purpose do students seek information on the web?
- (3) What search services/tools do students prefer when seeking information and why?
- (4) Are the students aware of the existence of the online databases available to them at UNZA Library?
- (5) What problems do students face when using the web to search for information?

7. Methodology

A survey was conducted of Library and Information Studies undergraduate students attending a second-year course called "Information Sources and Services". In total, 65 participants were recruited from a population of 150 full-time second-year undergraduate students. According to the statistics obtained from the Department of Library and Information Science, the Department registered a total number of 1,300 Library and Information Science undergraduate students for 2016/2017 academic year in all its undergraduate programmes. The study, which was conducted in July 2016, recruited the 65 participants who attended the first session of the Information literacy class conducted in a computer laboratory within the main Library of the UNZA. The participants were given a questionnaire to fill in after they had performed an internet searching exercise.

This particular group of students was surveyed due to the fact that all the students taking this course come from a variety of other majors such as economics, sociology, philosophy, education, development studies and some courses in the Natural Sciences such as mathematics and geography and therefore the results could be generalised to students in other disciplines. Furthermore, the results from this cohort give us enough time to deal with the short comings identified in the result as they proceed to the third and fourth years of their studies.

8. The task

A set of questions was given for which the participants were required to search EBSCOhost, Science Direct or JSTOR within 15 minutes in a controlled environment in a computer laboratory of the UNZA library. The choice of the databases was based on the databases

that UNZA Library subscribes to and also cover a knowledge area that the participants would be familiar with. The following was the task given.

Find relevant documents for each of the following topics from Emerald, JSTOR or Science Direct:

- Question 1: health implications of water pollution.
- Question 2: acquisition and deployment of technology in the library environment.
- Question 3: effective library support for distance education programmes.

After the search task, the participants were requested to respond to a set of questions based on their experience of the task in order to get insights into their satisfaction levels and purposes for which web services were being used. This study borrows from a study by Mastora *et al.* (2008), who used a similar method to study 27 undergraduate and 7 postgraduates of the Department of Archive and Library Sciences at the Ionian University in Corfu, Greece.

The search task dealt with four of the five entities of information-seeking process based on the searcher's actions, namely, problem identification, need articulation, query formulation, and results evaluation (Sutcliffe and Ennis, 1998). Data gathered from the survey were coded and analysed using SPSS version 16 from which basic descriptive statistics and cross-tabulations were run.

9. Findings and discussions

The study sought to address contextual factors affecting search performance of the web user at the UNZA. In an effort to gain a better understanding of why users behave the way they do, the study needed to establish what search strategies were used by students in searching for internet-based resources and for what reason and why certain search tools were preferred.

This study did not use the TLA to obtain quantitative data as these were not available from the web servers at the time of the research. In the absence of data from TLA, the researchers depended entirely on the data from questionnaires. Moreover, the qualitative user survey data were able to provide a real understanding of why users behave in the ways they do. The objective of qualitative research is neither generalisability nor representativeness, as the fundamental focus is on the depth and complexity of the researched phenomena.

9.1 Characteristics of respondents

In total, 65 Library and Information Studies second-year undergraduate students who were recruited in this study were given a search task to perform after which they responded to a questionnaire. In total, 45 respondents were female, representing 69.2 per cent of the total number of respondents, as shown in Figure 1, whilst males were 20 (30.8 per cent). Of these, 67.7 per cent were below the age of 25 years.

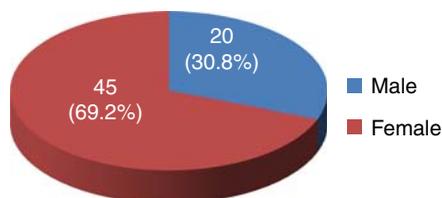


Figure 1.
Demographic characteristics of respondents

9.2 Purpose which students use internet-based information resources

The participants in this study indicated various purposes for which they used the web, such as communication, course work and general information, out of which 41.7 per cent indicated that they used the internet for the purpose of study, as can be seen in Figure 2.

Similar to many studies, Sin, Nielsen (2010), George *et al.* (2006), John Lubans (1998), Matthew (1998) and Rena *et al.* (2007) have shown that the primary purpose for which college students use the internet was to do course work. The findings of this study collaborate earlier studies mentioned here. The purpose of any university is to produce a scholar who is analytical and inquisitive and therefore using the internet to help in course work is progressive. Next was to establish which resources the students use for their course work and why.

9.3 Library databases vs Google

Asked to indicate which tools they would have preferred to use for the task, had they been given a choice, only 35 per cent of the respondents indicated that they would use the e-resources databases for the search task. These statistics show that students rely heavily, if not exclusively, on internet search engines for information search tasks. The web users at UNZA like many users the world over are Google fanatics, as can be seen in Figure 3. Among the reasons given was that Google is easy to use (see Figure 3).

Awareness of a resource or service may affect the extent to which it will be used. Out of the 65 respondents, 41 were not aware of the availability of the databases at the UNZA prior to the given search task. These results have implications on how to tailor the information literacy courses that will sharpen the search skills of the students to allow them to better search the e-resources databases. We presumed that this cohort would be more knowledgeable about the value of using e-resources databases to search for research information as compared to the other students without library and information science background, as being information brokers will be their main activities once they enter the

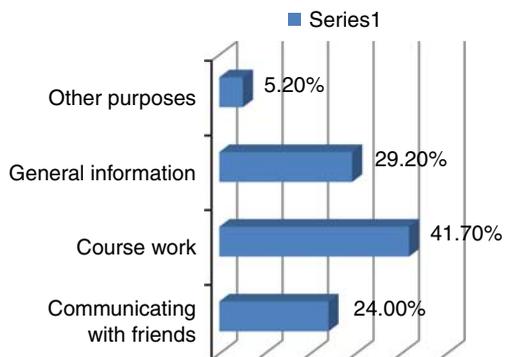


Figure 2.
Purpose for which
www is used

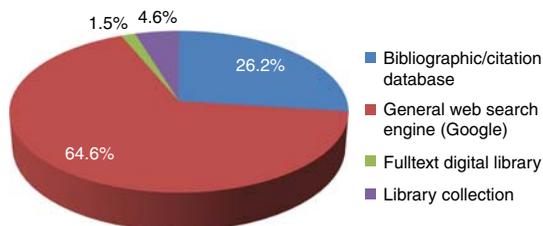


Figure 3.
Search tools used

job market. Therefore, the results may help the libraries advocate for the inclusion of information literacy skills course in the university curriculum and also consider the potential of effective search strategies and the particular needs of students in the use of these resources.

In comparison to the interfaces provided by publisher databases, even with the knowledge that the information found in these databases is of great academic quality, the respondents still preferred to use Google arguing for its user-friendly interface. Lossau (2004) also asserted that most people prefer to use Google because the rate of success in retrieval is better than other search engines due to its huge indexes. The findings of this study indicate that 35 per cent of the respondents were more familiar with Google whilst 13 per cent said that they chose Google because it contains a lot of information, and 11.1 per cent said it was easy to use (see Table I). This confirms the popularity of Google among the study respondents.

A survey by Vilar and Zumer (2011) found that digital scholars who preferred search facilities resembling internet search engines were bothered with a large amount of information on the screen, and, on the whole, liked it if search facilities were as simple as possible. Therefore, the Library administration may have to invest in discovery tools with interfaces resembling Google due to the fact that students tend to be intimidated by the complicated and sometimes over crowded interfaces of some of the e-resource databases. In spite of this, the students need to be shown the advantages of using electronic resource databases, as the organisation and various search capabilities of e-resource databases allow users to search for and retrieve focussed and more relevant results.

9.4 Factors affecting web search behaviour

9.4.1 Online experience. Most of the participants in this study were experienced web users, as shown in Table II, with 40 (61.5 per cent) indicating that they had used the web for more than two years.

This has implications on the search techniques being used, whether simple or advanced. Contrary to Aula *et al.* (2005), who found that experienced web users used strategies that take little time and effort, this study found out that despite the fact that most of the users had been using the internet for more than two years, the majority of the respondents used only one

	Frequency	%
<i>Valid</i>		
Contains a lot of information	7	13.0
Database is easy to used	13	24.1
More familiar with it	19	35.2
Easy to use	6	11.1
Best database	4	7.4
Its popular	4	7.4
Non-response	1	1.9
Total	54	100.0

Table I.
Why Google is a preferred search tool

Online search experience	Frequency	%
6 months-1 year	15	23.1
1-2 years	10	15.4
more than 2 years	40	61.5
Total	65	100.0

Table II.
Web experience

search term for all the three search topics given during the exercise, implying that not much effort was put in the search process. Web experience may not necessarily translate to better search strategies unless one has been trained on how to formulate effective search strategies.

9.4.2 Search process. Proceeding from the above findings on web experience, one would assume that with the more experienced web users, the search strategies employed would be diverse. However, the results show equal preference for both simple search and advanced search, at 38 per cent each followed by 29 per cent who used the title search (see Figure 4).

The study done by Sihh, however, shows that most searchers preferred to use the simple search as compared to the advanced search technique as they wanted quick results. In line with the same study, the results of this study show that the users used only one search term for each of the topics given.

9.4.3 The effect of age on search technique used. The assumption of the researchers was that the younger searchers tend to use simple searches as compared to the older generation who want to put more thought in the search. The younger searcher wants to carry out a search in the simplest and quickest possible way with little effort in the search process. However, the findings of this study do not support this assumption as the indication is that the majority of the users aged below 25 years used both the simple and advanced search equally, as can be seen in Table III.

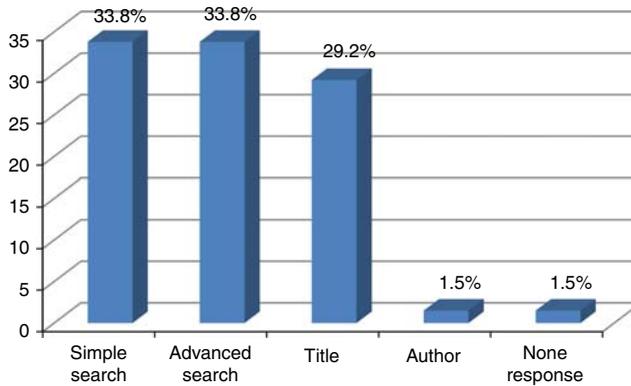


Figure 4. Search technique used

	Search technique used to search				Total
	Simple search	Advanced search	Title	Author	
<i>Age</i>					
25 and below					
Count	17	16	11	0	44
% within age	38.6	36.4	25.0	0.0	100.0
35 and below					
Count	2	3	4	1	10
% within age	20.0	30.0	40.0	10.0	100.0
Above 36					
Count	3	2	4	0	9
% within age	33.3	22.2	44.4	0.0	100.0
Total					
Count	22	21	19	1	63
% within age	34.9	33.3	30.2	1.6	100.0

Table III. Age and search technique used

Therefore, the conclusion is that within this study, age did not have any effect on what search technique was used by the searchers at the UNZA. This points to the lack of training on how to use effective search techniques, resulting in trial and error in the search process. In fact, the research revealed that most of the respondents taught themselves how to use the internet and therefore did not possess the necessary skills to decide which search technique to use during the search task given to them (see Figure 5).

9.4.4 Topic familiarity. In order to determine whether familiarity of the search topic had any effect on the way the online searchers behaved, three different search topics were given to the participants to search as follows:

- Topic 1: health implication of water pollution.
- Topic 2: acquisition and deployment of technology in libraries.
- Topic 3: effective library support for distance education programmes.

While 49 per cent of the respondents were familiar with all the topics given in the search exercise, there is a persistent minority that were unfamiliar with the topics given (see Table IV). Wen *et al.* (2006) explained that topic familiarity can affect the number of and type of resources selected by searchers and the ability of a searcher to use relevant criteria.

For all the three topics, it was established that over 60 per cent of the respondents used only one search term. In contrast to Wen's test, the respondents used less search terms in familiar topics than unfamiliar topics. The results, however, are contradictory, as they used less search terms in the topics which they were familiar with. Whereas the research may not totally disagree with Wen's findings, the results at UNZA may have other factors that may affect the search behaviours of students. For instance, time limitation could have played a part, as Mansourian and Ford (2007) highlighted the search situation as among the main contextual elements that affect search performance of users.

9.5 Awareness of the electronic databases available

This survey has shown that prior to this exercise the majority (55.4 per cent) of the respondents had no knowledge of the existence of the three databases given to them to use in the exercise. Unfamiliar territory can affect the search strategy and success thereof. The fact that the databases were unfamiliar to the searchers, and that they did not have

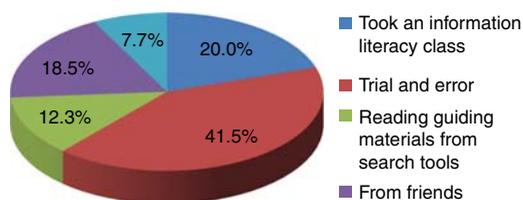


Figure 5.
How students learned
to use internet

Familiarity	Topic 1 (%)	Topic 2 (%)	Topic 3 (%)
Very unfamiliar	27.7	27.7	29.2
Unfamiliar	19.3	9.2	12.3
A bit familiar	13.8	18.5	20.0
Familiar	29.2	29.2	18.5
Very familiar	10.0	15.4	20.0
	100	100	100

Table IV.
Familiarity with topic

the knowledge of using all the search facilities available on these databases, they, therefore, resorted to using the single search terms which were more comfortable to use (see Figure 6).

9.6 How the respondents felt about the search

The respondents were generally satisfied with their search results but indicated that they would be happy to receive training on how to conduct effective searching. Asked how they felt about the search exercise given, here are some of the responses:

- the search was easy;
- search was good;
- search was challenging;
- search was positive; and
- helpful, interesting, exciting, and successful.

The intention of this study was to measure search outcome variable which included precision and recall but this was not confirmed as the user viewpoint after unsuccessful searches was not established due to the lack of transaction logs.

9.7 Challenges faced when using the internet-based resources

This study also intended to find out what challenges students faced when searching for information in the electronic databases in order to find solutions to these challenges. To determine what challenges the respondents faced, they were asked how long it took them to get the information they needed after punching their search query. They were further asked if they had abandoned the search at any point during their search and why. In total, 50 per cent of the respondents indicated that they took less than 5 minutes, while the rest took up to 10 minutes to retrieve the results from the databases (see Table V). This indicates that there could be some technical issues to do with bandwidth or performance of the computers in the computer laboratory. The computers in the laboratory are connected to one server and sometimes the server was not able to contain the traffic, making the computers to slow down. This can be resolved by purchasing a server with enough space to deal with the 60 computers in the laboratory.

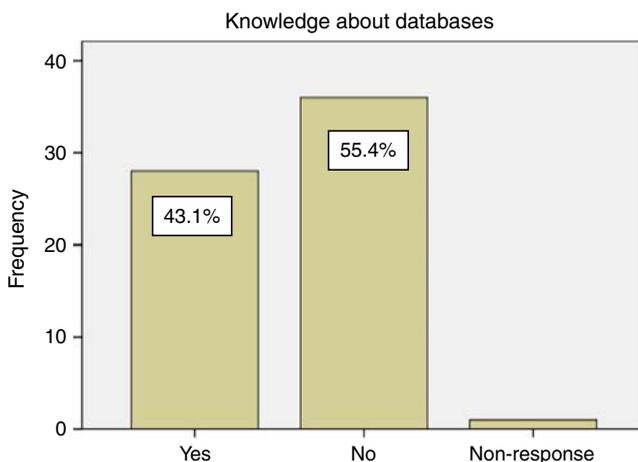


Figure 6.
Awareness of
the databases

On whether they abandoned the searching during the exercise, only 26.6 per cent indicated having abandoned the search midway (see Figure 7) due to the following reasons:

- unable to find website within time allowed;
- could not find website and gave up; and
- technical problem affected search.

Expertise in carrying out effective searches cannot be ruled out, as this can have an effect on the time one takes to locate the desired information. Since half of the respondents took more than 5 minutes, it is clear that there is a need for training of students on the effective search techniques in order for them to find the information quickly.

10. Conclusion

Understanding search behaviour is an important component for libraries, as it establishes the basis upon which they can tailor their information literary programmes as well as services. This study has established that there is no one way in which to search for information, users search for information in a way that is comfortable and easier for them, and indeed respondents in this study found Google search engine as the easiest. The conclusion one draws from the study is that: one does not need to know the intricacies of the basics of searching each and every database but that one needs to have the skills to search interface metasearch engines such as Google that can harvest information from other databases and aggregate the results for the user. It is therefore important that designers of various subject databases take cognisance of the fact that metasearch engines are very appealing as they become a one stop space for the user to search for information. Further, one would argue that students seem to prefer using Google to other databases not only for its user friendliness but because it is a familiar search engine. So this calls for librarians at thr UNZA to design information literacy programmes for students aimed at introducing the e-journals databases and to teach the required information search skills to the users, with emphasis on metasearch engines. We reiterate what Vilar and Zumer (2011) say that better

Online search behaviour

	Frequency	Valid %	Cumulative %
<i>Valid</i>			
Less than 5 minutes	32	50.0	50.0
5-10 minutes	31	48.4	98.4
10-30 minutes	1	1.6	100.0
Total	64	100.0	
<i>Missing</i>			
System	1		
Total	65		

Table V.
Time taken to locate information in the databases

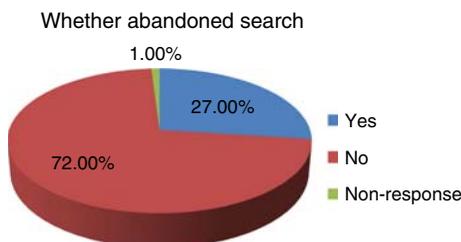


Figure 7.
Whether abandoned search midway

access to technology and more powerful search tools have not brought with it better information literacy skills.

The revelation of this study that respondents were aware of the availability of the database has implications on the generalisation of the results due to the fact that by virtue of them studying LIS, they could be more aware than those that did not train in LIS. This does not give a clear picture of the general awareness among the student population, but gives us librarians areas that we can focus on to facilitate a good and effective web search experience for our students, a web experience that is tailored for an academic excellence. Further research needs to be conducted on the extent to which the students in other fields of study are aware of the databases that the library subscribes to so that effective marketing strategies can be put in place. This study has brought to light the fact that libraries are not the centre of information seeking and therefore strategies need to be developed, proactively educating searchers in more sophisticated search techniques and demonstrating the utility of their database products. Librarians should also be engaged in lobbying electronic resources publishers to create databases with more appealing user interfaces and superior functionality.

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