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Date 17th September, 2012

**The use of electronic journal articles by academics at
Mzuzu University, Malawi**

by

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ABSTRACT

Purpose

The purpose of this study was to investigate academics' use of scholarly electronic journal articles at Mzuzu University and assess the factors influencing their behaviour.

Methodology

A questionnaire was sent out to all academics which was followed up with interviews with Deans of Faculties in order to get more insight into the use of electronic journals by academics. Then, follow-up questions were deployed using electronic mail for clarification of some of the answers.

Findings

The most significant findings from this study showed that most academics had a general knowledge of the electronic journals and this did not vary with education. There was no significant difference between gender and searching skills. However, there were some major barriers to access. These included: teaching responsibilities; a lack of ICT and telecommunications, unreliable power supply, and access to journals was restricted to the campus.

Research Limitations

During the period of data collection, most of the academics were on holiday as the university was not in session. It was also difficult to monitor data collection due to the cost of travelling to Malawi. This limited the number of responses. In addition, face-to-face interviews would have added depth to the study through observation of behaviour and extensive probing. However, this was not possible due to the cost of returning to Malawi.

Impact

This study will influence management decisions within the library at Mzuzu University with regard to the provision of support. It will also provide guidance for other institutions experiencing a similar context.

Originality

Although similar research initiatives have been carried out, this study is different in that it focuses on the information behaviour of academics at Mzuzu University.

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LIST OF ABBREVIATIONS

ACU	Association of Commonwealth Universities
ATICS	African Tertiary Institutions Connectivity Study
CBUC	Consortium of Academic Libraries of Catalonia
eIFL	Electronic Information for Libraries
eJUST	Electronic Journal User Study
FAO	Food and Agricultural Organisation
ICT	Information and Communication Technology
INASP	International Network for the Availability of Scientific Publications
IP	Internet Protocol
MALICO	Malawi Library and Information Consortium
MTL	Malawi Telecommunications Limited
RIN	Research Information Network
SADC	Southern African Development Community
SARUA	Southern African Regional Universities Association
SPSS	Statistical Package for the Social Sciences
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VSAT	Very Small Aperture Terminal
WHO	World Health Organisation

CHAPTER 1: INTRODUCTION

1.1 Background to study

The advent of information technology has given rise to the development of Internet and the World Wide Web. This development then drove information centres, libraries and academic institutions to new methods of providing information. The use of information technology for scholarly publication is now commonplace all over the world. Academic communities in Africa are part of this transformation due to information technology and libraries in Africa have witnessed tremendous changes in terms of collection development in the form of electronic journals.

1.2 Electronic Journals

Scholarly information is now distributed through various kinds of information formats. Although printed resources are still very important in the research field, electronic resources have become popular as they bring information directly to the desktop. The majority of the sources of information, especially, the journals are now available on electronic media like the Internet.

Electronic journals have been defined in several ways by several authors. Rietz, (2004) defined electronic journals as a digital version of printed journals. Tomney & Burton (1998) defined electronic journals as one which: publishes original scholarly writings; peer reviewed or edited; and is available in, although not exclusively, in electronic form. Note that in the context of this study, electronic journals are peer-reviewed scholarly publications. These journals can be accessed via electronic transmission. Studies have documented the introduction of electronic journals. Tenopir et. al. (2003) described the trend of electronic journals as “evolutionary process”. There has been a gradual increase in the use of electronic journals and electronic journals have therefore become an important information format as they are published, distributed and accessed electronically.

Access to electronic journals is generally provided either by publishers or through their aggregators. Electronic journals possess many added features including full text search, hypertext links, multimedia and graphics. Electronic journals offer many advantages such as: they take no physical space, they are accessible at any time, and they can be accessed from almost any workstation that can connect to the institution's network (Maxymuk 2004). The university scholarly communities are used to depend on the information found in their libraries for research and teaching purposes. Speedy publication and availability on the desktop are the key advantages that attract researchers to electronic journals. Although electronic journal do not take up shelving space, they do require a computer network infrastructure that itself has cost and space implications.

It is evident that electronic journals are used by the scholarly community and libraries are part of the development of scholarly communication. Institutions which are well resourced, academic environments which are well provided with a variety of information sources, systems and services are likely to have high usage of electronic journals. There is also evidence that electronic journals are underutilised by many academics due to low level of research activities (Harle 2010), hence the need for this study to investigate the use of electronic journal articles by academics and to explain why usage may be low.

The purpose of this study was to develop an understanding of the factors that influence the successful use of electronic journals and share this knowledge with other institutions that use electronic journals in order to help facilitate change.

1.3 Background to Malawi

Malawi is a landlocked country in southeast Africa that was formerly known as Nyasaland. As of 2010, the population was estimated at 14 million with the majority living in rural areas. The economy is based on agriculture and the major foreign exchange earner is tobacco as the main export crop. Although agriculture is the largest employer, most of the food consumed is imported. Small cultivators and subsistent farmers cultivate maize, rice, potatoes, cassava, banana and vegetables.

The country is divided into 28 districts and four cities within four regions. English is the official language. Most Malawians communicate informally using Chichewa (local language) and formally in English. Malawi has an 8-4-4 education system (8 years of primary, 4 years of secondary and 4 years of tertiary) and has several private universities and two public universities; University of Malawi and Mzuzu University.

1.4 Background to Mzuzu University

Mzuzu University is the second public university in Malawi and is located in the Northern region of Malawi, some 328 km away from the capital city Lilongwe. It was enacted by the Parliament of Malawi in May 1997 and admitted its first degree students in January 1999 (Mzuzu University 2010). The mission is to provide high quality education, training, research and complementary services to meet the technological, social and economic needs of individuals and communities in Malawi. Mzuzu University has about 164 academic staff, 2003 students including both undergraduates and postgraduates. There are five faculties, two centres and twenty-two departments which are under the management of the university; Faculty of Education, Faculty of Environmental Science, Faculty of Information Science and Communications, Faculty of Health Sciences and Faculty of Hospitality Management and Tourism (Mzuzu University 2010). Table 1 below shows the number of staff and students at Mzuzu University.

Table 1. Staff and student population by faculty

	Faculty of Education	Faculty of Environmental Sciences	Faculty of Information Science and Communications	Faculty of Health Sciences	Faculty of Hospitality Management and Tourism
No. of staff	80	34	10	17	9
No. of students	942	348	236	194	140

Source: Mzuzu University 2012.

1.5 Electronic Journals in Malawi

Initiatives have been taken in Malawi in order to have access to electronic journals. The main initiative of access to electronic databases and electronic journals is by the Malawi Library and Information Consortium (MALICO). MALICO was established in 2003 with a mission of combining talents and resources from organisations to promote and deliver library and information services for Malawi and the global community. Facilitating access to electronic journal articles in international databases was one of its objectives. MALICO provides access to a large number of electronic data sources. A list can be found at <http://www.malico.mw>. There are several partners who assist in the process and give consortia in low income countries heavily subsidized or donor funded access to a wide range of electronic resources. Such partners are INASP, eIFL, WHO, FAO, UNEP, and UNESCO. At one point, one of the major constraints to accessing electronic journals was slow internet speed. MALICO benefited from eIFL pilot project to upgrade speed through deployment of VSATs at four MALICO sites including Mzuzu University. Currently, some institutions in Malawi have migrated from VSAT connections to fibre optic network through the Malawi Telecommunication Limited (MTL).

1.6 Electronic Journals at Mzuzu University.

Access to electronic resources is one of the major changes at Mzuzu University. It is more than eight years now since Mzuzu University Library joined Malawi Library and Information Consortium (MALICO) which facilitate access to electronic journal articles in international databases. Mzuzu University Library provides access to electronic journals and databases with the aim of providing up-to-date and relevant information resources; promote effective utilization of those resources; and facilitate rapid access to information held within and in remote places through conventional and electronic means. The main objective of the library is to support teaching, learning and research activities in the university. A list of electronic journal databases can be found at <http://www.mzuni.ac.mw>.

It is not clear whether the academics at Mzuzu University make use of the electronic journal articles and to what extent. No study has ever been carried to find out the use of electronic journals by academic members of staff at Mzuzu University.

This study intended to provide insight to the information behaviour of Mzuzu University academics on the use of electronic resources in particular, scholarly electronic journal articles and the factors influencing the academics behaviour on the use of electronic journal articles. It further focussed on electronic journals accessed by users on their own as well as with the help of the library.

1.7 Aims and Objectives

1.7.1 Aim

The overall aim is to investigate the use of scholarly electronic journal articles by academics at Mzuzu University and assess the factors that influence their behaviour.

1.7.2 Objectives

- To ascertain how academics information behaviour vary by faculty.
- To identify the common electronic sources used by academics to access electronic journal articles.
- To determine the purpose for using scholarly electronic journal articles.
- To assess whether the academics have the necessary skills and knowledge in using the scholarly electronic journal articles.
- To determine the barriers encountered by the academics when using the scholarly electronic journal articles.
- To assess the factors influencing the academics behaviour on the use of electronic journals.

1.7.3 Research Questions

The research will answer the following questions:

- Do academics use scholarly electronic journals and what are the common sources they use?
- How often are the electronic journals used?
- Is there any meaningful correlation between use of electronic journal and gender, age, and faculty?
- What are the reasons for using electronic journals articles?
- What are the barriers in using electronic journal articles?

1.8 Scope

The study is limited to academics from five Faculties, two Centres and the Library. The data generated by this study was gathered from 77 respondents out of 164 academics at Mzuzu University.

1.9 Structure of this report

This report is divided into six chapters. Chapter one provides the background of this study and addresses the aim, objectives and research questions. Chapter two integrates the literature reviews written by other authors and is divided in six sections. Chapter three, sets out the methodology of the research. In addition, it describes how these methods were applied and highlights the objectives of this study. Chapter four presents the results of the data gathering and provides an analysis of the data and presents the key findings. Chapter five discusses the findings. Finally, Chapter six concludes and makes recommendations for Mzuzu University management, library and gives suggestions for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature on the use of electronic journal articles by academics. There has been thorough research undertaken on use of electronic journal articles by academics by many different scholars and researchers, in numerous different contexts. Some of this previous research will now be explored.

2.2 Access to electronic journals

Use of electronic resources has become most popular in all higher learning institutions, especially the use of scholarly electronic journals. Scholarly electronic journals are accessed using different methods and channels. For example, some journals are accessed through open access and others through subscription by institutions and while others through gateways like Google. A study by Raza & Upahyay (2006) on the usage of electronic journals by researchers in Aligarh Muslim University, showed that 38.36 percent of the respondents locate and access electronic journals through publishers' websites, 5.76 percent locate and access through links for electronic databases, 46.15 percent through consortium, whereas 67.30 percent locate and access through search engines.

Researchers in sub-Saharan Africa highlighted poor access to electronic journals as a hindrance to their work. This led to a study carried out by Association of Commonwealth Universities (ACU) in four African countries (Malawi, Kenya, Rwanda and Tanzania) which found out that due to access initiatives and partnerships between libraries and publishers, it was clear that academics and students in east and southern Africa and across the wider continent have an impressive range of high-quality peer-reviewed electronic journals available to them, including many of the leading journals from major international publishers. This offers great potential for both research and teaching. However, getting the electronic journals used in day-to-day research and teaching activities of universities remains a

challenge. In the same survey, it was found out that it is evident that connectivity is steadily beginning to improve while good, reliable high-speed broadband connections are still not assured in all countries or in all parts of each country. However, the challenge lies in influencing change in attitudes and behaviours surrounding technology access and the uses to which it is put. Providing access to electronic journals is not enough, libraries, in partnership with academic departments, also need to influence the behaviour and approach of their users to ensure usage. Substantial barriers to electronic resources access and use such as research culture lie beyond the library, but in the research activities and cultures of faculties and departments (Harle 2010).

2.3 Information behaviour of academics on use of electronic journals

Research on electronic resources and their use by different demographic groups in an institution establishes an important foundation for selecting and providing effective library holdings and services (Zhang, Ye & Liu 2011). A number of surveys have been carried out on the information behaviour of academics on the use of electronic resources in academic communities. Several factors have been found to be associated with the use of electronic resources by academics like age, sex, profession, and subject discipline. Howard, Rainie & Jones (2002, p.45) found that people with different socio-demographic characteristics look for different content online. Their review of a survey research on internet use found significant differences in use between men and women, young and old, those with different race and ethnicity, and those of different socio economic status.

A study by Tahir, Mahmood & Shafique (2010, p.133) on the use of electronic information resources and facilities by humanities scholars found that a large number of humanities scholars are not far from modern electronic technology. Most of them are regular users of the internet. However, humanities scholars have fewer skills to use new technology. In addition, the study further revealed that electronic technology had a profound impact on their information seeking activities, although for their teaching and research purposes, the humanists still depend on print resources available in the libraries. It is necessary to know why academics still

depend on printed resources for their teaching and research. More research is needed to establish why academics could still be more interested in using print resources in their teaching and academic than electronic resources.

The first studies carried out during the 1990s made it clear that electronic journals were here to stay. In an exhaustive review of the literature, Tenopir (2003) analysed the results of over 200 studies of the use of electronic resources published between 1995 and 2003. The conclusion of her review was that electronic resources had been rapidly adopted in academic spheres, though scholars' behaviour tended to vary according to discipline. However, a study of factors that affect information seeking behaviour of academic scientists by Niu & Memminger (2011), researchers were asked about the preferences for searching electronically versus traditionally through print and it was revealed that 96.3 percent prefer searching online over searching through print media. Similarly, a survey on the use of print and electronic journals by the academic staff of the universities belonging to the Consortium of Academic Libraries of Catalonia (CBUC), revealed that a high proportion of teaching and research staffs were aware of the collections of electronic journals and there was an increasing preferences for electronic resources in preference to printed materials. The results showed that 76 percent of the respondents prefer the electronic format over the printed format when both formats are accessible. The results also confirm the importance of discipline and age as explanatory factors in the use of electronic journals with younger scholars and those working in the sciences being the most active users (Borrego et.al. 2007, p. 69). Similarly, a study by Bar-Ilan & Fink (2005) on a case study of the science library users at the Hebrew University on preference for electronic format of scientific journals revealed that users of all ages have switched to the electronic format not only in terms of usage but also preference. The major finding was that more than 80 percent of the respondents frequently use and prefer electronic format, irrespective of their rank or age. However, many studies have shown an inverse relationship between electronic journal usage and age whereby the older the academic member is, the less he or she prefers the electronic format over the printed one (Tenopir 2003). Similarly, Friendlander (2002, p. 37) found that more women than men use e-journals in their research and use electronic sources more than men most or all of the time.

A descriptive and exploratory study by Voorbji & Orgering (2006) on the use of electronic journals by Dutch researchers revealed that scientists and social scientists appeared to prefer the electronic version, while the humanities researchers overwhelmingly preferred the printed version. The questionnaire included the statement “if I have to choose between electronic and printed version of the same journal, I would strongly prefer the electronic version”. Forty-six percent of the scientists agreed or strongly agreed with the statement, while 25 percent disagreed or strongly disagreed. According to the study by Tenopir (2003), a user’s discipline and institutional context strongly affect the use of electronic resources.

Brennan et. al. (2002, p. 521) explored the habits of early adopters of electronic journals at the University of Illinois at Chicago. The study found that enthusiastic acceptance of electronic journals has changed the participants’ habits. Most claimed that they visit the library less often and read more than in the print era. Most participants reported using generic databases. Similarly, Davis (2004) reached a similar conclusion using a different approach after analysing data of how academics at Cornell University accessed electronic journals published by American Chemical Society. The results were that the majority of referrals originated from generic Web searchers, mainly Google.

Researchers seek and use information in very different ways. It is noted that users in research-intensive universities behave differently from those in less intensive ones where by those in research-intensive universities, are more likely to enter via different gateways. A study by Research Information Network (2011) on assessing the patterns of the their use, value and impact of e-journals by researchers in universities and research institutes in the UK revealed that researchers across all discipline use gateway services, with use particularly high in the life sciences but notably lower in economics. It was also indicated that researchers across all disciplines make use of the advanced search facilities available on gateway services, much more than they do on publisher platforms. The techniques used in advanced searching were also found to have some notable disciplinary differences. For example, historians tend to use more words in their search strings. In the same study it was revealed that three-fifths and four-fifths of researchers across all six disciplines use e-journals ‘most’ or ‘every’ working day. Life scientists are the most

likely and historians least likely to use them every day. But when they are online, historians spend more time on each session.

Dilek-Kayaoglu (2008) reported a survey on the use of electronic journals by faculty at Istanbul University. Respondents were asked how frequently they use printed or e-journals. The results showed that 75.6 percent and 64.1 percent of respondents were frequent and very frequent users of e-journals, respectively. When cross-tabulating the frequency of the use of e-journals according to gender, age, academic rank and discipline, only age and discipline were statistically associated with the frequency of use. The percentage of respondents that were frequent users of e-journals was evenly distributed among all age groups.

Another analysis of journal usage on OhioLink showed the immense popularity of the search engine among users compared to alphabetic or subject lists of journals (Nicholas et. al. 2006). However, search engines are seen as the primary resources to begin an information search and information seekers do not completely rely upon search engines but will also use their own personal networks to find information they need. Academics are likely to turn to co-workers, colleagues and professionals (Connaway & Dickey 2010).

It is evident that usage is enhanced where awareness levels are high and training is provided. A survey by Gathoni (2011) on monitoring and evaluation of electronic resources in academic and research institutions in Kenya, highlighted that the majority of the respondents (66 percent) who were trained, indicated that training had enhanced their access and retrieval skills, were thus able to do with much ease, with 45 percent noting a marked improvement in academics output in form of increased research output and 42 percent alluded that electronic resources training has facilitated better referencing skills.

The creative use of electronic information and new media are required to provide support for the intellectual stage of information processing. Users have accepted the new electronic environment, but need better information literacy support. Libraries in the electronic information environment need to combine their tradition and experience in information provision and knowledge organization with the new

possibilities for creative knowledge sharing, use and production (Steinerova & Susol 2005).

Similarly, users expect support in problem understanding and formulation as well as in navigating access through information sources. In addition, users trust libraries and information systems and services that have put emphasis on easily accessible documents, immediate use of information and clear topic arrangements. These are important factors for planning and design of systems, products, services, and also for information literacy (Steinerova 2005, p. 153). A study by Brown, Lund & Walton (2007) on the use of electronic journals by academic staff and researchers at Loughborough University revealed that there was modest need for training. Forty eight percent of the respondents indicated that they would appreciate training in managing electronic journals references and 40 percent locating full text from references. Across the three faculties only 30 percent wanted training in using electronic journals for current awareness and on retrieving electronic journal references.

Although, a number of studies shows that electronic journals have been accepted by academics, the level of acceptance show differences according to discipline. However, discipline or subject domain is not the only factor that affects the use of electronic journals. The availability of electronic journals, the age and the academic rank of the academics should be added to the factors. A study by Zhang, Ye & Liu (2011, p. 72), on the use of electronic resources at seven universities in Wuhan, China found out that users' demands vary greatly due to the difference in age, education level, and profession. The users' discipline correlates with the literature services they need, knowledge service types and the time in which they search. The result showed that 81.45 percent of the users search the literature for scientific research, 46.67 percent uses it for self-development, and 33.8 percent for teaching.

2.4 Use of electronic journal articles

Electronic journals are changing the nature of scholarship by increasing access to research materials. A survey by Chirra (2009) found out that information available in electronic resources have proved to be a great asset to many of the respondents. And they have been influenced on their research efficiency, in changing the nature of scholarship and allowing research scholars to find relevant materials they would not have otherwise found. From the survey, 73 percent felt they can get faster access to information, 50 per cent felt they have expedited the research process while 29 percent felt that they have improved professional competency. A survey by Nicholas et. al. (2010) on researchers' use and information seeking behaviour found out that journals are extremely important for most scholars in terms of research and teaching. The findings revealed that 92 percent rated peer-reviewed journal articles as very important, eight percent important, 0.5 percent not very important and one percent with not at all important. The survey further revealed that the purpose of use of electronic journals was uniform across discipline with 71 percent of the interviewees mentioned that they use electronic journals for academic research.

A study on the use of electronic journals by faculty at Istanbul University, respondents were asked the reasons for using electronic journals and were requested to choose one option among always, mostly, occasionally and never. It was revealed that 67.5 percent of the respondents use electronic journal for research, 49.2 percent use them for keeping himself or herself updated on the subject field, 28.5 percent for browsing core journals, and 16.9 percent for teaching "always" (Dilek-Kayaoglu 2008).

Academics use electronic journals for both teaching and research activities. A survey by Borrego et. al. (2007) discovered that respondents consulted electronic journals for both research and teaching. However, access to electronic journals may improve the quality of research but to carry out the actual research is not easy at the local level (Rosenberg, 2008).

2.5 Barriers to use of electronic journal articles

A number of studies have mentioned a number of barriers encountered by academics when using electronic resources. Lack of computers (Siddique & Ali 2010; Gathoni et. al. 2011), limitations of connectivity, searching skills, unfriendly interfaces, lack of time and limited publicity (Gathoni et. al. 2011; Borrego et. al. 2007; Chirra & Madhusudhan 2009; Raza & Upahyay 2006). A study by Sangowusi (2003) on problems of accessing scholarly publications by Nigerian scientists revealed that only 32.8 percent of respondents owned a personal computer. Search and discovery skills are often under-developed. Many researchers are unable to find and download what they need and many are not aware of the resources available to them. A study by Tahir, Mahmood & Shafique (2008) revealed several factors in information seeking through electronic resources. Respondents were asked to mention the problems faced by them while seeking information using electronic resources. The results showed that 90 percent mention that information is scattered in too many sources, 87 percent due to the information explosion, 87 percent electronic resources are too expensive, 79 percent lack of time, 74 percent non availability of electronic resources, 71 percent lack of training to use the electronic resources, 71 percent lack of computer hardware or software, 68 percent lack of technical support and 35 percent language barriers. Others are unfamiliar with the key publications in their field or lack of subscriptions in the particular research field (Bar-Ilan, Peritz & Wolman 2003; Dilek-Kayaoglu 2008). An American study indicated that reluctance of some academics to use electronic journals is simply due to the lack of respected electronic journals on their field (Lenares 1999). Similarly, a study by Brown, Lund & Walton (2007) on the use of electronic journals by academic staff and researchers at Loughborough University revealed that the main barrier to access of electronic journals is the lack of journal subscriptions with 60 percent of the respondents often encountering the problem.

A survey by ACU in four African countries (Malawi, Kenya, Rwanda and Tanzania), revealed that internet connectivity and bandwidth differed significantly across the four study universities. At Chancellor College in Malawi which relies on a VSAT (satellite) link, the situation is considerably worse. Many respondents to the survey commented that poor connectivity, including slow speeds, dropping connections, and

related problem of intermittent power supply, frustrates their attempts to access electronic resources. The problem of bandwidth and connectivity means that actually accessing and downloading materials is also not always possible. Half of the universities covered by Tanzania review reported that slow connection speeds and unreliable connections caused significant problems in accessing available literature. The survey further revealed that respondents were not aware on how they would access the electronic journals, lack of skills and knowledge on how to access or use electronic journals. It was reported that others use trial and error approach which was proved very unrealistic and unsuccessful (Harle 2010). Musoke & Kinengyere (2008) agreed that poor connections and insufficient bandwidth often means that journal articles cannot be downloaded and he noted that 'when users do literature searches and/or try to download articles but find the internet down, some of them give up'.

A study by Pullinger (1999) on academics and the new information environment: the impact of local factors on use of electronic journals found out that the major problems for users are knowing and remembering how to access a journal when it is firewalled by password, non-availability of desired information and hardware and software are major obstacles in using electronic resources and facilities (Tahir, Mahmood & Shafique 2008, p. 133). Researchers are also constrained by high fees that have to be paid in order to gain access to literature. Lack of funds especially through foreign exchange and other infrastructure problems, makes it impossible to access the necessary literature (Sangowusi 2003, p. 132). This applies when individuals are subscribing to electronic journals on their own. On the other hand, a study by Research Information Network (2011) revealed that researchers are frustrated when they find that their university do not have the necessary subscription, or they are asked for a password they do not have, or that they are asked to pay for a download.

A study by Agaba (2005) on the assessment of the utilization of Makerere University electronic journals, found that several factors affect utilization of electronic information resources. The results shows that 57 percent of the respondents cited inadequacy of the existing facilities, 25.3 percent cited slow speed or poor bandwidth, 20.3 percent poor sensitization or limited publicity and 17.7per cent limited

Information and Communication Technology. Some respondents further mentioned some factors including location of some faculties, irrelevance of databases to their discipline, limited subscription to databases, and limited accessibility to databases through use of passwords. In addition, ICT facilities are relatively underdeveloped in African universities. Funding has typically been limited, both for initial capital and investments and for on-going maintenance and system development. A survey by African Tertiary Institutions Connectivity Study (ATICS), revealed that computers are shared by an average of 55 people in African universities; while Southern African Regional Universities Association (SARUA) gives better figures for the Southern African Development Community (SADC) region, with an average of 40 students (full-time and part-time) and 2 teaching staff per computer (Gakio 2006). In many cases, few PCs are available in the library, which has a particular bearing on their use for accessing scholarly information. Manda (2008) reported that University of Dar es Salaam Library had 32 PCs available to serve entire student population in 2004. In many instances, poor internet access means students and academic staff alike are forced to use private internet cafes. (Willinsky et. al. 2005).

Furthermore, a 2003 survey by International Network for the Availability of Scientific Publication (INASP) on journal access programmes in African University Libraries identified some problems with journal access. The main challenges was that some journals were not easy to use, either because the interfaces were poorly designed or because technical issues slowed or even prevented access. The results further showed that the content of some of the programmes was an issue, with a lack of full-text articles, inadequate numbers of journal providers and narrow range of resources (INASP 2005).

A study by Evans & Zarnosky (2000) revealed that electronic resources systems can fail as a result of inadequate power supplies, waiting for downloads, waiting for a server to accept your query or being abruptly cut off in mid-session are sources of frustrations in accessing electronic resources.

A study by Research Information Network (RIN) on researchers and discovery services reported that researchers were largely happy with access to information discovery tools but that access to full text electronic journals needs improvement (Research Information Network 2006).

2.6 Benefits of use of electronic journals

Researchers find it more convenient and effective to work away from the office or at home. Time on-campus and during the day is spent dealing with students and administration, with relatively little time for research. But 24/7 access, from anywhere in the world where the internet is available, has removed the barriers to working effectively beyond university and normal working day. It was also revealed that there was a much stronger relationship between high levels electronic journal expenditure by libraries and high levels of use. And high levels of expenditure and use are associated with success in research outcomes (RIN 2011).

A study by Olle & Borrego (2010) revealed that the speed and convenience of the electronic accessibility of journals allows scholars to save time on physical library visits, time which they can invest in carrying out more research.

A study by Egberogbe (2011) on the use and impact of electronic resources at the University of Lagos indicated that majority of lecturers preferred to use electronic resources in comparison to traditional resources with 66 percent of them considered electronic resources as time saving, 59.1 percent considered it easy to use, whereas 46.5 percent considered it more useful.

The first eJUS (electronic journal user study) survey investigated the impact of electronic journals upon research activities. Sixty percent of all respondent felt that electronic journals did affect their research practice. Of those, 98 percent agreed or strongly agreed that electronic journals shorten time spent on articles retrieval or visiting the library, 70.6 percent strongly agreed that e-journals usage increase the number of papers they read outside their primary discipline, 69.4 percent indicated that they exchanged more articles with colleagues, because electronic journals make distribution of articles easier and less costly, 40.2 percent reported that they publish more papers because electronic journals make accessing good quality papers faster and easier (Stanford University 2002).

2.7 Summary

This literature review shows that though a lot of research has been carried out in different areas of the world on information behaviour and use of electronic resources by academics, there is still relatively little research that has been conducted on the use of electronic journals by academics, particularly in Malawi except for a study conducted by Harle 2010. The difference between the current study and Harle's study was that the current study investigated the information behaviour of academics on the use of electronic journal articles and assesses factors influencing their behaviour, while Harle's study explored the many interrelated issues surrounding researchers' access to peer reviewed journals and other scholarly materials whereby strengths and weaknesses, problems and successes, challenges and opportunities were highlighted.

It is evident that in the 'south' there are still barriers to access, in particular physical access (networks, bandwidth, PCs etc.). But also there is an indication that people would benefit from training in how to use the electronic sources effectively, and information about what is available. The issue of relevance and coverage of research in Africa and about Africa and developing country context may also be a factor. However there is insufficient research into this aspect of use or non-use. Whereas in the 'north' these electronic sources are widely accepted and used, although variation does occur among different age groups and disciplines. It is evident that even their academic staff do benefit from training. Librarians in academic institutions would like to see far greater usage of the electronic resources that are available.

The following chapter deals with research methodology, i.e. how research was conducted and how the data was gathered and analysed.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The literature review, largely based on secondary sources, explained the information behaviour of academic staff and researchers in using electronic journals and barriers encountered when using electronic journals.

This chapter describes and explains the methodology deployed in this study. The aim of the study was to investigate the information behaviour of academics on the use of electronic journal articles and assess the factors that influence the academic community's usage of electronic journals, at Mzuzu University. The chapter covers the research design, research methods, data collection instruments and implementation of the methods.

3.2 Research Design

Research design provides the means by which data is collected, analysed and categorised (Bryman 2008, p.31). It is, therefore, a framework for the generation of evidence that is suited both to a certain set of criteria and to the research question in which the investigator is interested. The choice of research design reflects decisions about the priority being given to a range of dimensions of the research process.

There are different types of research designs including; experimental design, cross-sectional or survey design, longitudinal design, case study design and comparative design (Bryman 2008, p. 35).

3.2.1 Cross-sectional design

A survey research comprises a cross-sectional design which entails collection of data on more than one case and at single point in time in order to collect a body of

quantitative or quantifiable data in connection with two or more variables which are then examined to detect patterns or association (Bryman 2008, p. 44; Lawal 2009, p.73). This study used a cross-sectional design as information was gathered from a sample of the population at one point in time. A longitudinal design was not considered appropriate since the study was carried out for the first time at Mzuzu University. However, if follow up research was carried out in subsequent years to try and determine the effects of any changes implemented as a result of this research then the study would become longitudinal in nature.

In this study, a descriptive survey method was chosen as the best method to collect data from the respondents as it allows for a situation to be described and trends and patterns within a population identified that could then be generalised to the wider population. (Pickard 2007, p. 96). It also gives respondents a chance to answer the same questions enabling differences and commonalities in response to be identified, the relative incidences, distribution and interrelations of naturally occurring variables (Neuman 2007, p. 168; Connaway & Powell 2010, p.78). According to Connaway and Powell (2010, p.107), a survey research is useful in determining the present status of a given phenomenon and in this case to see the extent to which academics use electronic journal articles. However, a survey completed by the respondents only provides data on what a person or organisation says, and this may differ from what the respondents actually does (Bryman 2004, p. 43).

In order to achieve the aims and objectives of the study, a combination of quantitative and qualitative nature of research was used. Quantitative research usually emphasises quantification in the collection and analysis of data while qualitative research usually emphasises words rather than quantification in the collection and analysis of data (David & Sutton 2004, p. 35). In this study, the qualitative data, collected via interviews and email enabled a better understanding of the quantitative survey data and the reasons for people responses. It also helped to some extent to validate the questionnaire responses.

3.2.2 Research methods

A research method is simply a technique for collecting data. There are various data collection techniques. Among others are questionnaires, interviews, observations

and diaries. For the purpose of this study, self-administered questionnaires and semi-structured interviews were used.

3.2.3 Quantitative data collection

Creswell (2003, p.18) defined quantitative research as an inquiry into a social or human problem, measured with numbers, and analysed with statistical procedures. Steinerova (2005, p.153) states that “quantitative methods can form a starting point for studying typologies of human information behaviour.” In this study, quantitative methods were used to gather statistical data on the demographics and information behaviour of the academics. In order to collect the main bulk of the research data, a questionnaire was used which addressed the objectives one to five stated in chapter one as follows:

1. To ascertain how academics information behaviour vary by faculty.
2. To identify the common electronic sources used by academics to access electronic journal articles.
3. To determine the purpose for using electronic journal articles.
4. To assess whether the academics have the necessary skills and knowledge in using electronic journal articles.
5. To determine the barriers encountered by academics when using the electronic journal articles.

3.2.3.1 A questionnaire as a data collection method

Questionnaires are the most widely used data collection technique that is normally distributed through the post, online or self-delivered. Usually, a questionnaire consists of a number of questions and the respondent has to read the instructions and questions, and then record their answers. A distinction in questionnaires is made between open and closed questions. An open question asks the respondent to formulate his or her own answer, whereas a closed question asks the respondent to pick an answer from a given number of options (Bryman 2004, p.145).

In this study, a structured questionnaire was used. This type of method is relatively cheap to produce and distribute, and can be conducted by a single researcher. It is

relatively flexible in that it can be used to collect a wide range of data in a number of different circumstances, it is an effective way to measure behaviour, and can be used to reach a very large number of people. (Connaway & Powell 2010, p.147; Nueman 2007, p.186; Moore 2006, p.120). This approach assisted the gathering of mainly quantitative data, but also some qualitative data due to a small number of open questions, from the academic members of staff.

One other advantage of the questionnaire is that the questions are all presented in a consistent format and style and there is less scope for bias to be introduced by the researcher when interpreting the data. Linked to this, is the fact that surveys are impersonal and can be anonymised and avoid some of the problems that can develop during the interaction between an interviewer and a respondent. The questionnaire can also be completed at the respondents' own pace, and the respondents can, if so desired, look through the whole questionnaire before committing themselves to anything.

However, questionnaires have some disadvantages; for instance, it is a one-way communication that generally does not allow respondents to clarify answers or the interviewer probe for more information, thereby compromising the quality of responses. In addition, some people do not always complete and return questionnaires, causing low response rate. Different respondents can complete the questionnaire weeks apart or answer the questions in a different order than that intended by the researcher. The researcher cannot observe the respondent's reactions to questions, physical characteristics, or the setting. Incomplete questionnaire can also be a serious problem. With this in mind, qualitative data gathering was also employed through the use of interviews with the respondents.

3.2.3.2 Questionnaire distribution

For the purpose of this study, a printed or paper questionnaire was chosen for the primary distribution method as it was felt that the benefits of this method outweighed the downsides. Although questionnaires are considered to have low response rate, a paper questionnaire was able to be distributed by hand to the respondents, through

a colleague at Mzuzu, which should increase the response rate due to more personal involvement. This was done by a colleague on behalf of the researcher because the researcher was unable to return to Malawi to distribute it herself. Having a record of who had received the questionnaire also made it easier to follow up. In addition, questionnaires were chosen because they can be effective, and the response rate may be high for an educated target population that has a strong interest in the topic (Nueman 2007, p.186).

However, by using the paper questionnaires, the data had to be manually entered into the web based software for the analysis of the results which was time consuming. An electronic survey was not conducted due to connectivity issues and the lack of ICT at Mzuzu University.

3.2.3.3 Sampling

Mzuzu University has five different faculties. The potential population for this study was approximately 164 academic members of staff. The questionnaire was distributed to all the academic staff from all the five faculties, two centres and library who were currently present at the university during questionnaire distribution. From this method of distribution a total of 130 paper questionnaires were distributed to academics and 77 were returned, giving a response rate of 59 percent. One questionnaire was excluded from the results as it was incomplete. The respondents submitted the questionnaire to their departmental secretaries or the researcher's representative at Mzuzu University during the period of research.

3.2.3.4 Questionnaire design

The questionnaire design was constructed in the form of a semi-structured questionnaire (which can be found as Appendix A). It consisted of mainly closed questions which limit respondents' answers to predetermined selections, as they are easy to answer (Connaway & Powell 2010) and with a few open questions. It was thought that this would help to increase response rates as respondents would not have to think about their answers in too much depth which can sometimes

discourage respondents if the questionnaire appears as if it is going to take a long time to complete. Another advantage to closed questions is that the responses are easily comparable amongst respondents as the responses are all standardised. The questions included in the questionnaire intended to elicit two major types of information from the subject. Firstly, to elicit demographic that could provide a basis for analytic and relational study. Secondly, information on current behaviour with regards to use of electronic journal articles.

3.2.2.5 Pilot study

In order to test the validity of the questionnaire and clarify some ambiguities, the original questionnaire constructed was pretested. The questionnaire was sent online to six academic members of staff for their thoughts and opinions on the layout, design and ease of completion. The feedback was generally positive. However, there were some suggestions to change some of the questions as they were found not to be clear. The question on preferences between electronic and a printed journal was amended in order to be clearer. After amendments, the questionnaires were printed and distributed to the respondents by hand.

3.2.4 Qualitative data collection

According to Creswell (2007, p. 40), qualitative approach is an inquiry process for understanding a social or human problem based on building a complex, holistic picture, formed through words and reporting detailed views of respondents. The qualitative research style is flexible and encourages slowly focusing on the topic throughout a study (Neuman 2007, p. 86). In addition, qualitative research empowers people to tell their stories and hear their voice (Creswell 2007, p. 40). Qualitative research was selected as a means that could be used to evaluate the current level of electronic journal use by academic members of staff and the potential future developments, more especially on the part of academic libraries. Qualitative data gave an insight into the academics' feelings, attitudes and opinions about the use of electronic journals articles. This helped to get a better understanding of the quantitative data gathered via the questionnaire. In this study,

qualitative research technique used included interviews via Skype (a chat, voice, video call software application) and questions sent by email.

3.2.4.1 Interviews as a data collection method

Qualitative research attempts to describe occurrences found in verbal narratives of the participants (Gorman & Clayton 2005, p. 5). Qualitative techniques including interviews, focus group sessions, diarying and observation were considered. Focus group and observations were inappropriate due to the need to be physically present and the cost of returning to Malawi. It was thought that diarying would be unsuccessful due to commitment this entails from the respondents and the time it would take to analyse the data. Semi-structured interviews were used to gather narrative data. The researcher believed that semi-structured interviews would be appropriate for use in the study as a clear list of questions could be developed. These interviews gave an opportunity to probe and allow new questions to be explored during the interviews as a result of what the interviewees has said. This assisted gathering data which could have been missed using the questionnaire. Two types of interview were considered, these were face-to-face and telephone interview. The distance and cost of travel were barriers to selecting face-to-face interviews. However, telephone interviews are a popular survey method because 95 percent of the population can be reached by telephone (Neuman 2007, p. 189). In this study, Internet based telephone interviews were employed using Skype.

However, interviews in general have higher costs, limiting interview length and are time consuming compared to questionnaires. They also need co-operation of the participants and fewer respondents can be involved than via a questionnaire. In addition, internet interviews raise some legal and ethical issues (Pickard 2007, p. 78), in that the use of an interviewer reduces anonymity that could affect responses and may introduce potential interviewer bias.

Since not everyone could be interviewed, only Deans of faculties were interviewed from the five faculties of the university to get more insight into the challenges and influence on the use of scholarly electronic journal articles by the academics.

3.2.4.2 Interview design

A total of five interviews were carried out using Skype. Skype interviews were used as this was more convenient for the interviewees to devote the necessary time. A set of questions were prepared and pre-tested with one lecturer. The interview questions can be seen in Appendix B.

As the interviews progressed some questions were adapted slightly or interviewees were prompted if it was felt they did not understand the question, occasionally additional questions were asked following comments introduced by the interviewees which allowed for as maximum amount of information as possible to be generated from the interviews.

3.2.5 Electronic Survey

Electronic mail based surveys are generally defined as survey instruments that are delivered through electronic mail applications over the internet. E-mail based surveys are generally seen as being delivered more cheaply, easy to return and faster than traditional paper and pencil surveys. However, confidentiality issues may decrease return rate (Jansen, Corley & Jansen 2007, p. 4) and access to ICT may limit participation. However, in order to get clarifications of the responses to the questionnaire, follow up open questions were deployed using an electronic mail survey sent to some of the academics. This assisted to clarify some of the answers given by the respondents. Respondents were asked if they would like to be contacted through electronic mail beforehand.

3.2.6 Mixed methods

Mixed methods research involves collecting, analysing and mixing both quantitative and qualitative data in a single study or series of studies (Creswell & Clack 2007, p. 5). The merger of quantitative and qualitative attempts to provide a comprehensive analysis of the research problem. By mixing the datasets, the researcher provides a

better understanding of the problem than if either dataset had been used alone (Creswell & Clark 2010).

The use of both quantitative and qualitative approaches were therefore used to enable an in depth study on the use of electronic journal articles by academics. Triangulation was therefore possible using different but complementary data on the same topic. Individually both quantitative and qualitative methods have their limitations, as does any research methodology or technique. Gorman & Clayton et. al. (2005) states the benefits of using a mixed method approach as that it improves the quality of research that will be carried out, by enabling validation and expanding information gathered by the researcher. Mixed methods research also provides strengths that offset the weaknesses of both quantitative and qualitative research, provides more comprehensive evidence for studying a research problem, and helps answer questions that cannot be answered by quantitative or qualitative approaches alone. (Creswell & Clark 2007, p.11).

3.3 Data analysis

Data analysis involves “working with data, organising it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned and deciding what you will tell the other.” (Connaway & Powell 2010, p. 224). The quantitative data gathered from the academics was tabulated, and then analysed using the Statistical Package for the Social Sciences (SPSS) software. SPSS is a widely used computer programme that allows quantitative data to be managed and analysed (Bryman 2004, p. 244). The SPSS was used to create and analyse the data set. The use of this software gave an insight as to how central, broad or diverse the spread of the data was and how closely or distantly certain features were related. It was also used to indicate whether relationships exist and the degree to which the facts might have co-occurred. (Connaway & Powell 2010, p. 261). In addition, it was used to indicate whether the data was meaningful or not and allowed the researcher to draw conclusions. Descriptive statistics were generated from the data set. Frequency distribution on all variables on the questionnaire was done to get the overall picture of how respondents’ responded to each question on

the survey instrument. Cross tabulations were made to show relationships between the demographic data collected and other variables that could serve to illuminate further findings. The Spearman Correlation Coefficient (Spearman's r) was conducted on several variables to further investigate the major variables that were related to the research questions and to allow for the imbalance in number of respondents from the different faculties i.e. whether there was really a correlation or not.

3.4 Ethical approval

An ethical clearance form was completed to ensure that all ethical requirements were adhered to within the study. There was no problem with this as all respondents did not fall into any vulnerable categories. The research did not force people to become respondents and participants gave informed consent freely. Secondly, permission for the research was sought from Mzuzu University through a letter. Privacy played a large part of this research since it was necessary to keep all responses of the paper questionnaires confidential as well as comments made during interviews.

3.5 Limitations

The study was limited in several ways. There were limitations associated with using the questionnaire as a survey method, these included: it was difficult to assess the truthfulness of respondent's feedback; it was also difficult to monitor the data collection because of distance and lack of funds to travel to Malawi. Also, during the period of data collection using questionnaire, most academic members of staff were on holiday as the university was not in session resulting in a lower response rate than expected. Data collection using Skype interviews was not easy due to poor internet connectivity. Due to background noise in one interview, for example, made the interview take more time than expected.

3.6 Summary

This chapter has explained the detail of the methodology used to conduct the study and the research design was discussed under the topics of cross-sectional design, quantitative data collection, qualitative data collection and mixed methods. This study included elements of exploratory, descriptive and explanatory research. It was exploratory because the study could indicate the direction of further research. It was descriptive, as it described how electronic journal articles are used and who used them. Lastly, explanatory, as the research looked for causes and reason, for example, it helped to indicate why academic members of staff do not use electronic journals. In the following chapter, the researcher will then tabulate and analyse the data collected.

CHAPTER 4: FINDINGS

4.1 Introduction

The aim of the study was to investigate the information behaviour of academics and their use of scholarly electronic journal articles and assess the factors influencing their behaviour. The questionnaire was distributed to all the academics of Mzuzu University and interviews were conducted with the Deans of Faculty. A total of 130 questionnaires were distributed and 77 were returned, giving a response rate of 59 percent.

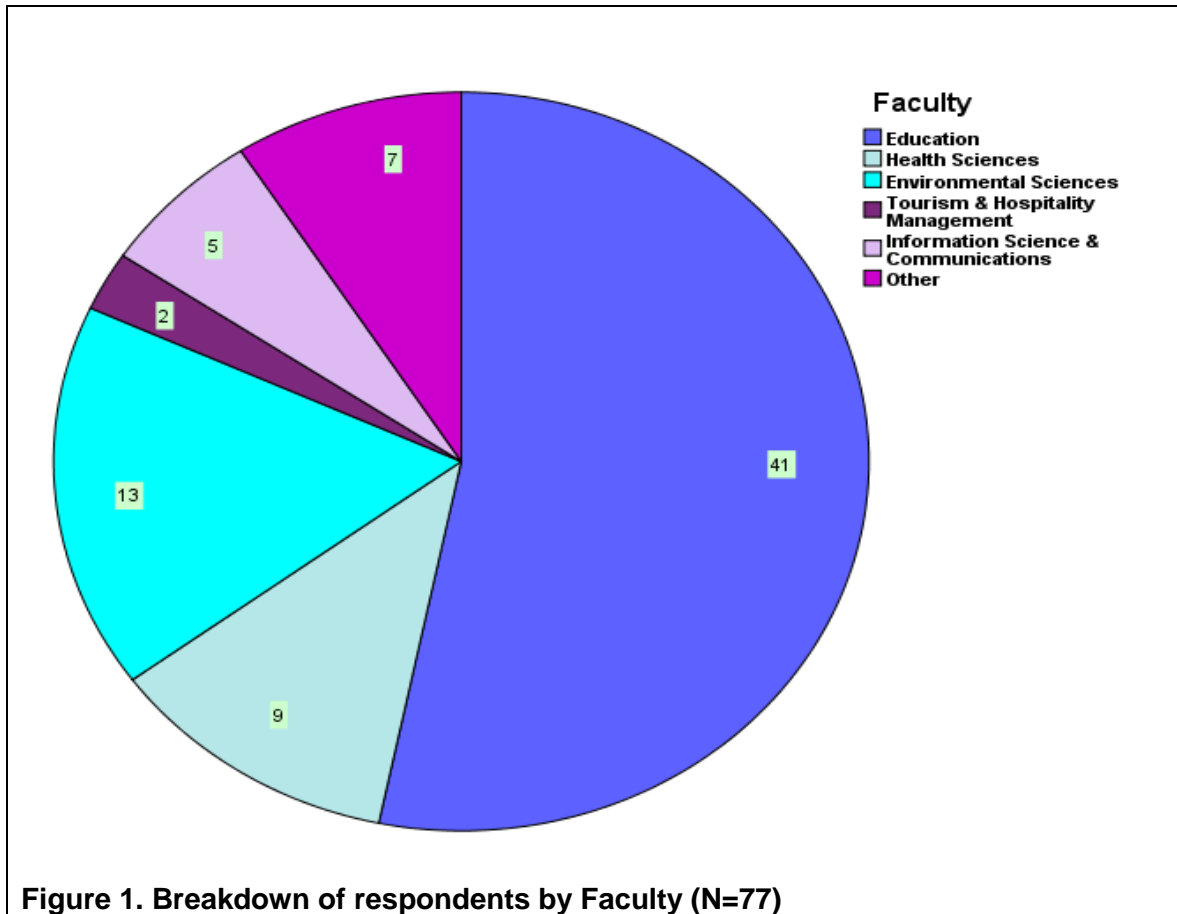
This chapter presents and analyses the data gathered from the survey, interviews and electronic survey. A descriptive and analytical method was employed to analyse, interpret and report factual information regarding the use of electronic journal articles by academics at Mzuzu University. The study relied on quantitative and qualitative data, and data collected from the questionnaire, interviews and e-survey was examined in detail.

4.2 Questionnaire results

4.2.1 Demographics of respondents

4.2.1.1 Faculty

Some general information was collected about the respondents for cross-tabulation purposes. Respondents were required to indicate their Faculty. They were given options to choose from the five faculties of the university. The purpose of this question was to identify the respondents by their faculty, which would then help to determine if there were any differences in the use of electronic journals by faculties.



There were more than half of the responses from the Faculty of Health Sciences, Faculty of Education, and Faculty of Information Science and Communications. Figure 1 above shows the distribution of responses and 41 were received from the Faculty of Education representing (51%) of the total number of the faculty; 13 were received from the Faculty of Environmental Sciences representing (38%); 9 were received from the Faculty of Health Sciences representing (52%); 5 were received from the Faculty of Information Science and Communications representing (50%); 2 were received from the Faculty of Tourism and Hospitality Management representing (22%); and 7 representing (50%) from others including Centre of Security Studies, Centre of Open and Distance Learning, and the Library.

4.2.1.2 Department

The respondents were asked to indicate the department which they belonged to. The purpose of asking this question was to determine whether all departments were represented in the study.

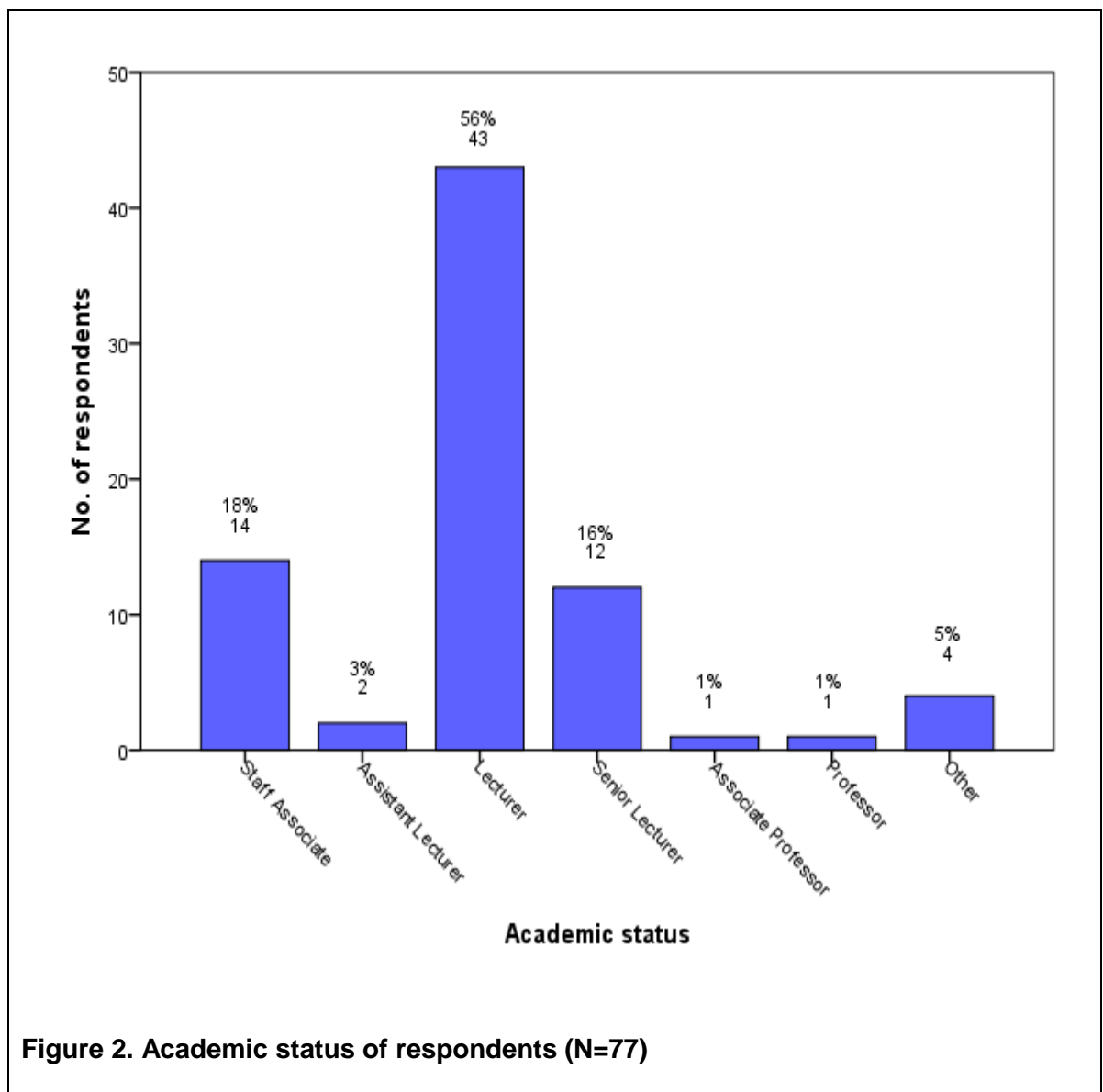
Table 2. Departments' representation of the academic respondents

Department	No. of Responses	Percent (%)
Biological Sciences	6	8
Biomedical Sciences	4	5
Chemistry	4	5
Education and Teaching Studies	5	6
Fisheries	2	3
Geography	3	4
History	3	4
Hospitality Management	1	1
Land Management	3	4
Languages and Literature	10	13
Library and Information Science	3	4
Mathematics	5	6
Nursing and Midwifery	4	5
Optometry	2	3
Physics	3	4
Renewable Energy Technologies	5	6
Theology and Religious Studies	2	3
Tourism	1	1
Water Resources Management	2	3
Other Academic Departments		
Centre for Open & Distance Learning	2	3
Centre for Security Studies	1	1
Library	6	8
Total	77	100%

Table 2 above indicates that 19 out of the 22 departments were represented. The department of Information and Communication Technology (ICT), Forestry, and Management were not represented. The majority of respondents 10 (13%) were from department of Languages and Literature. This could be due to large proportion of members of staff in the department.

4.2.1.3 Academic Status

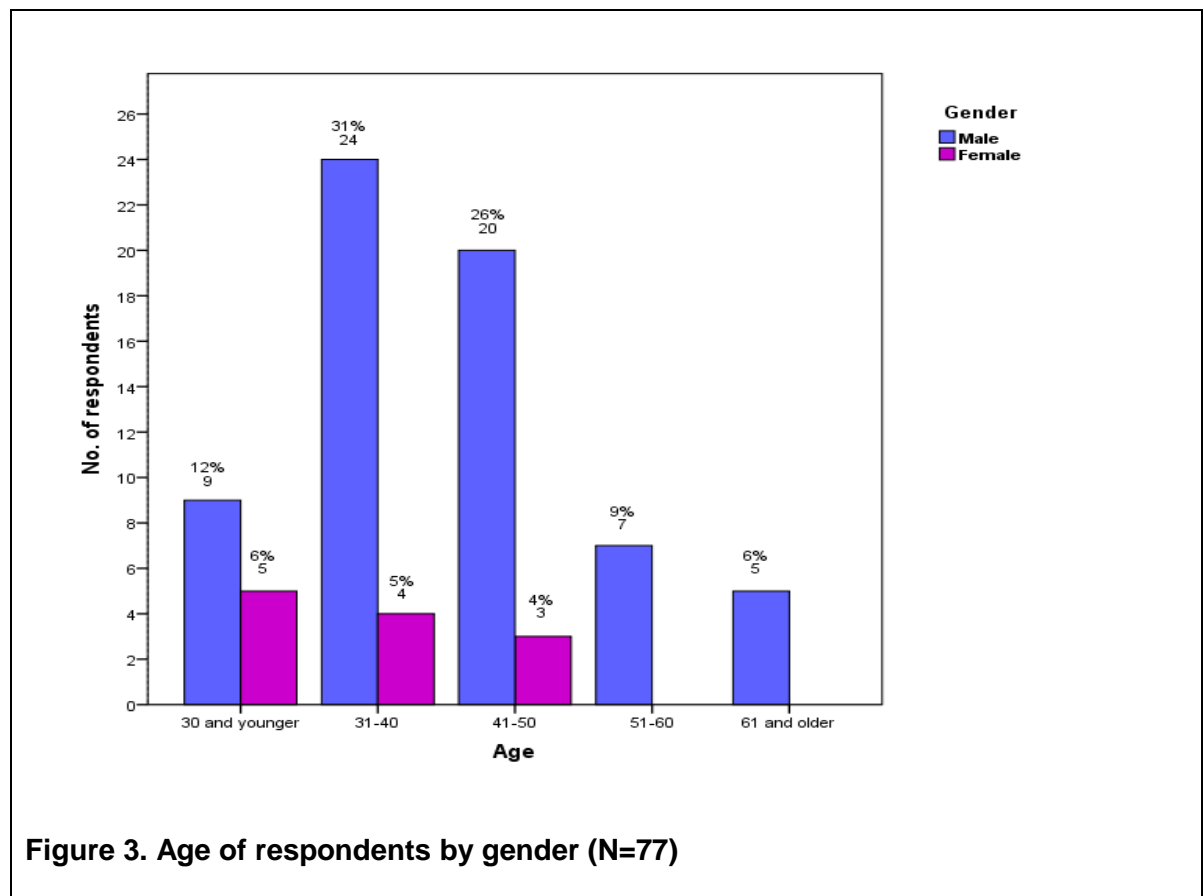
The respondents were required to indicate their Academic Status. The purpose of asking this question was to determine if there is any difference on the use of electronic journal articles and academic status of the respondents. The majority of the respondents were of the rank of lecturer. Figure 2 below shows that out of 77 respondents, 14 (18%) were Staff Associate (trainee level with first degree), 2 (3%) Assistant Lecturer, 43 (56%) Lecturer, 12 (16%) Senior Lecturer, 1 (1%) Associate Professor and 1 (1%) Professor. All ranks were represented in the study.



4.2.1.4 Gender and Age

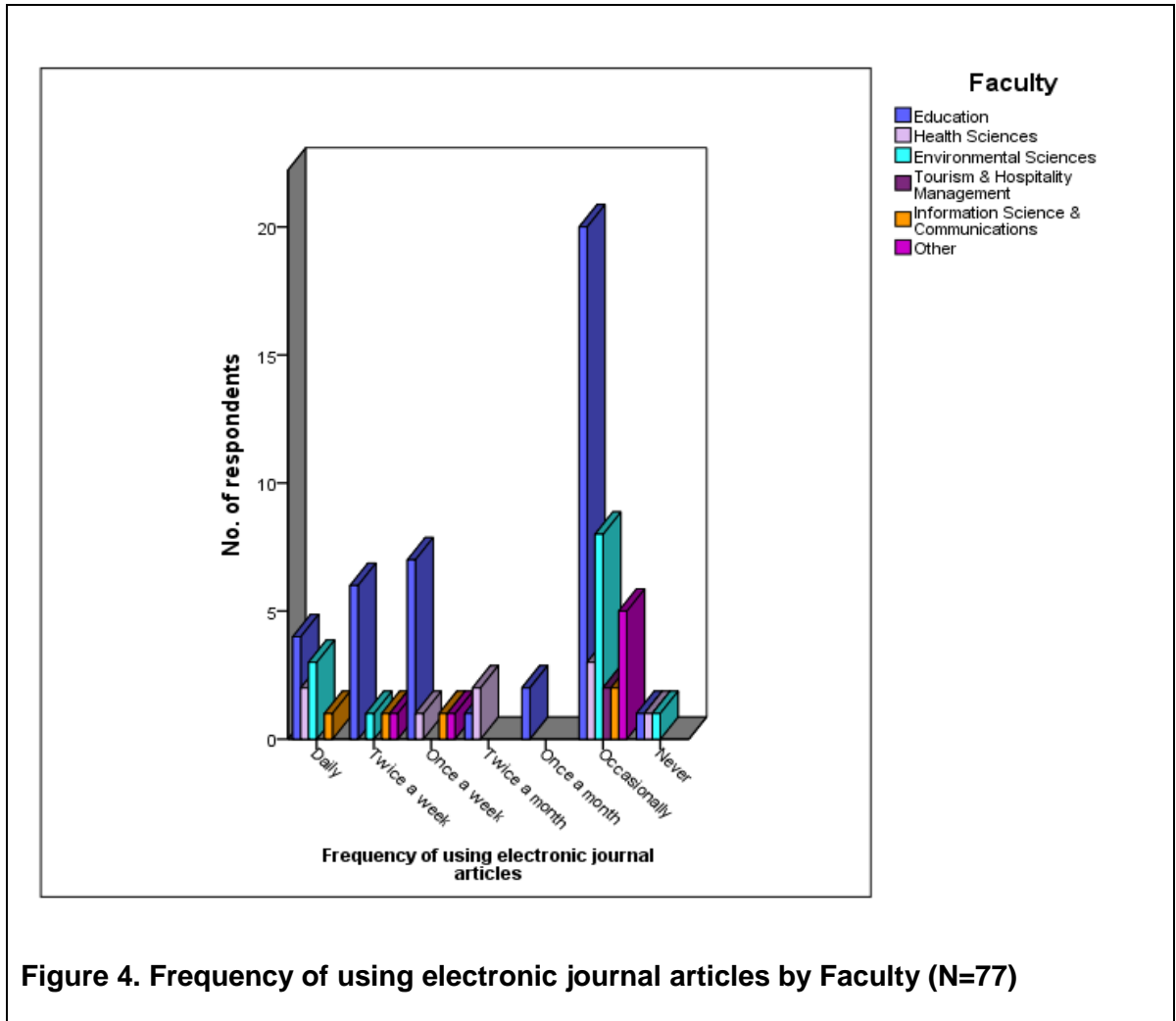
Respondents were asked to state their gender and age. There were 77 respondents, out of which, 65 were male respondents representing 84% and 12 were females representing 16% of the total number of respondents. The percentage of male respondents reflects the gender imbalance within the University.

Figure 3 below shows that the highest number of the respondents was males in the following age distribution: 9 (12%) ageing 30 and below, 24 (31%) ageing between 31-40, 20 (26%) ageing 41-50, 7 (9%) ageing 51-60 and 5 (6%) ageing 61 and above. The number of female respondents was in the following distribution: 5 (6%) ageing 30 and younger, 4 (5%) ageing 31-40, and 3 (4%) ageing 41-50. The sample lacked a representation of females of the ages of 51 and above.



4.2.2 Use of electronic journals

4.2.2.1 Frequency of using electronic journal articles by faculty



Respondents were asked to indicate how often they used electronic journal articles. 74 (96%) indicated that they used electronic journals and 3 (4%) indicated that they had never used electronic journals. Although the majority of academics used electronic journals, the difference was on the frequency of use. Figure 4 above shows the frequency of use of electronic journal articles by academics. Larger proportion of academics used electronic journal articles occasionally i.e. less than once a month. However, 13% did use daily and 13% once a week. The important part is that all faculties did use electronic journals and with the least being those who used once a month 2 (3%).

4.2.2.2 Correlation on frequency of using electronic journal articles and faculty

The majority of the respondents were from the Faculty of Education. However, the results, as shown in Table 3 below, indicate that there was no significant correlation between frequency of use of electronic journal articles and faculty ($\rho=.076$, $N=77$, $p=.511$, two-tailed)

Table 3. Spearman's correlation on frequency of using electronic journals and faculty

			Frequency of using electronic journal articles	Faculty
Spearman's rho	Frequency of using electronic journal articles	Correlation Coefficient	1.000	.076
		Sig. (2-tailed)	.	.511
		N	77	77
	Faculty	Correlation Coefficient	.076	1.000
		Sig. (2-tailed)	.511	.
		N	77	77

4.2.2.3 Frequency of using electronic journal articles by region where educational qualifications were obtained

Respondents were asked to indicate the region where they obtained their educational qualifications. The assumption was that academics who obtained their educational qualifications in Europe and America use electronic journals more. There was clear indication that all respondents used electronic journal articles despite the region where they obtained their educational qualifications. Table 4 below shows that the majority (9.6%) who used electronic journals daily obtained their qualifications in Africa. This also reflects the proportion of academics educated in Africa who accounted for over 70% of overall usage. Although 4.1% of respondents who obtained their qualifications in Europe did use electronic journals daily, but this did not seem to have had an impact.

Table 4. Cross-tabulation of frequency of using electronic journals and region where qualifications were obtained

		Region where qualifications were obtained ^a				Total
		Africa	Europe	Asia	North America	
Frequency of using electronic journal articles	Daily	7 9.6%	3 4.1%	0 .0%	1 1.4%	10 13.7%
	Twice a week	7 9.6%	2 2.7%	0 .0%	1 1.4%	8 11.0%
	Once a week	10 13.7%	1 1.4%	0 .0%	1 1.4%	10 13.7%
	Twice a month	1 1.4%	1 1.4%	0 .0%	2 2.7%	3 4.1%
	Once a month	1 1.4%	1 1.4%	0 .0%	0 .0%	2 2.7%
	Occasionally	30 41.1%	12 16.4%	3 4.1%	8 11.0%	38 52.1%
	Never	1 1.4%	1 1.4%	0 .0%	1 1.4%	2 2.7%
Total	57 78.1%	21 28.8%	3 4.1%	14 19.2%	73 100.0%	

Percentages and totals are based on respondents.

- a. Dichotomy group tabulated at value 1.
- b. N=73 (4 did not indicate the region)

4.2.2.4 Ways used to access electronic journal articles

Respondents were asked to indicate the ways which they used to access electronic journal articles. They were required to indicate how often they used the ways. They were required to select between often, sometimes and never. The distribution of the respondents who used home computers is skewed to the left as shown in Figure 5c below indicating that a high number of respondents often used home computers. The distribution of respondents who used Office computers, Library computers and Cyber café to locate electronic journal articles showed at least a normal distribution indicating that a high number of respondents used on average Office, Library and Cyber cafe computers as shown in Figure 5a, 5b, and 5d below.

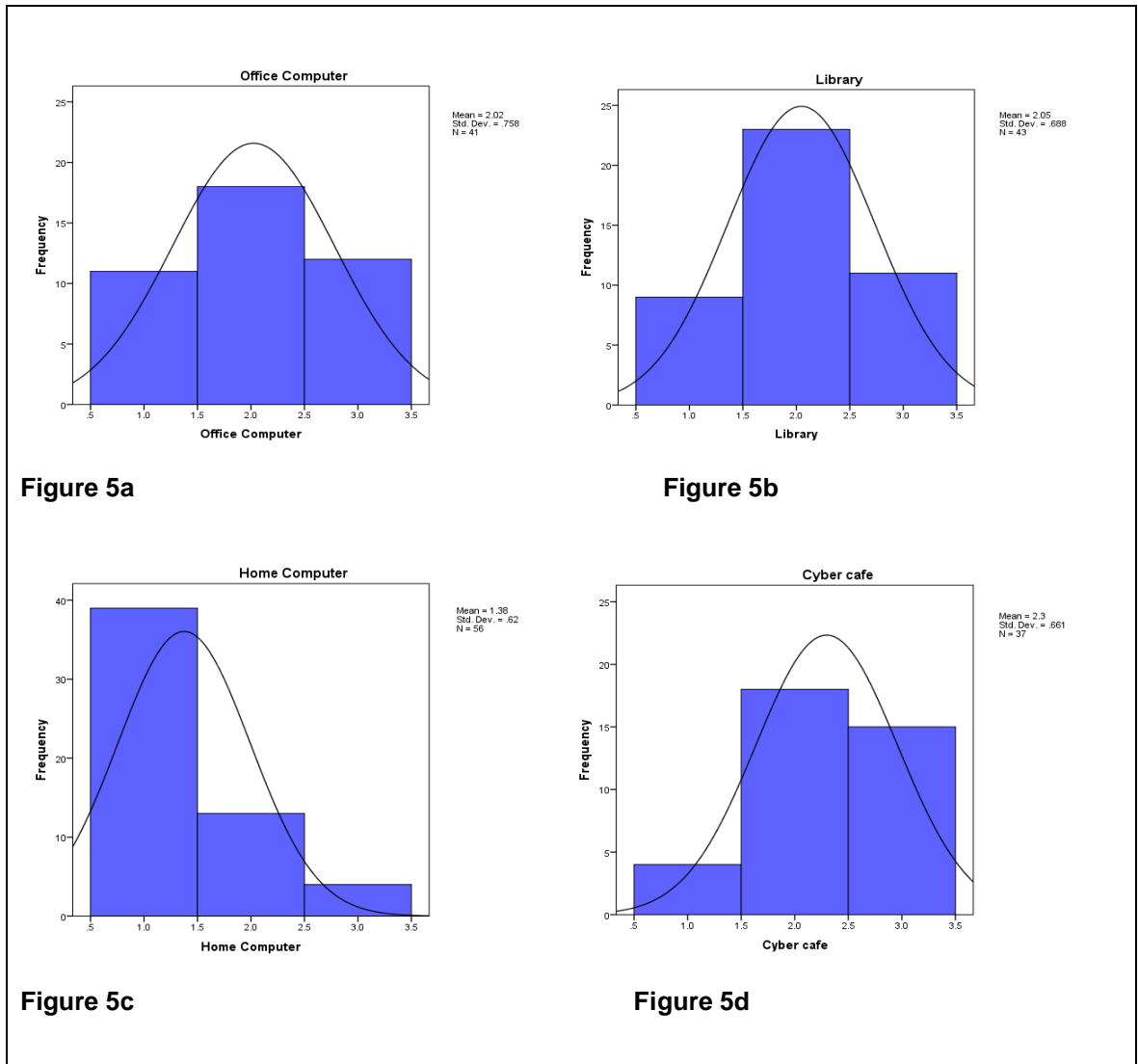


Figure 5. Ways used to access electronic journal articles

4.2.2.5 Tools used to locate electronic journal articles

Respondents were asked to indicate tools used to locate electronic journal articles. They were required to select between often, sometimes and never on the tools used to locate electronic journal articles. It is also interesting to note the importance given to Open Access journals as shown in Figure 6c below. This could be because of the nature of the materials that they are easy to find. The majority of respondents used a search engine to locate electronic journals. Figure 6c below shows high number of respondents who selected often, indicating that most of the respondents used a search engine often.

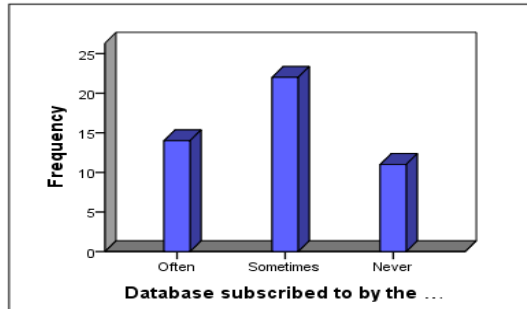


Figure 6a

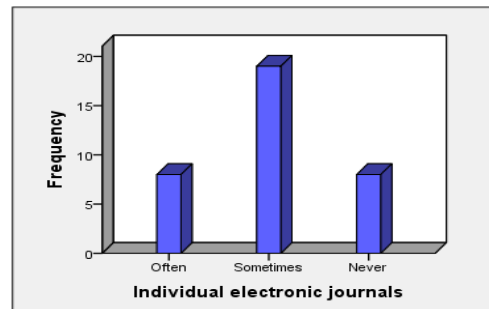


Figure 6b

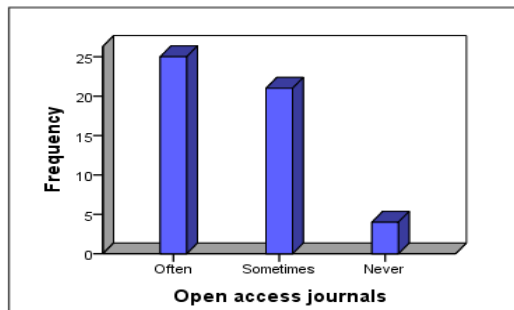


Figure 6c

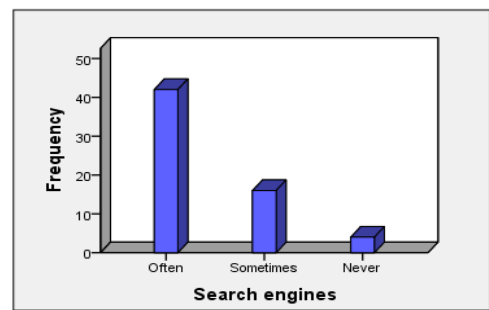


Figure 6d

Figure 6. Tools used to locate electronic journal articles

4.2.2.6 Sources used to access electronic journal articles

Respondents were asked to indicate sources which they used to access electronic journal articles. Table 5 below shows that the majority of respondents 27 (40.9%) used African Journals Online and 24 (36.4%) used JSTOR. This could be due to high number of respondents from the Faculty of Education which is humanities biased. Respondents used a range of sources subscribed by the University (see Table 5). The study further revealed that some academics used other sources including Google scholar and individual sources subscribed through professional bodies.

Table 5. Frequency of sources used to access electronic journal articles

		Responses		Percent of Cases
		N	Percent	
Sources used to access electronic journal articles ^a	African Journals Online	27	17.6%	40.9%
	Cambridge Journals	7	4.6%	10.6%
	EBSCO Host	15	9.8%	22.7%
	Edinburgh University Press	5	3.3%	7.6%
	Royal Society of Chemistry	1	.7%	1.5%
	University of Chicago	2	1.3%	3.0%
	Institute of Physics	3	2.0%	4.5%
	HINARI	10	6.5%	15.2%
	OARE	6	3.9%	9.1%
	AGORA	10	6.5%	15.2%
	Bio-one	3	2.0%	4.5%
	Nature	2	1.3%	3.0%
	JSTOR	24	15.7%	36.4%
	Emerald	11	7.2%	16.7%
	Sage	4	2.6%	6.1%
	Wiley Interscience	7	4.6%	10.6%
	Palgrave-Macmillan	4	2.6%	6.1%
Other	12	7.8%	18.2%	
Total	153	100.0%	231.8%	

a. Dichotomy group tabulated at value 1.

4.2.2.7 Preference between electronic and printed journals

Respondents were asked to indicate preference between electronic and printed journals. The majority of respondents 43 (56%) preferred electronic journals and 34 (44%) preferred printed journals as shown in Figure 7 below.

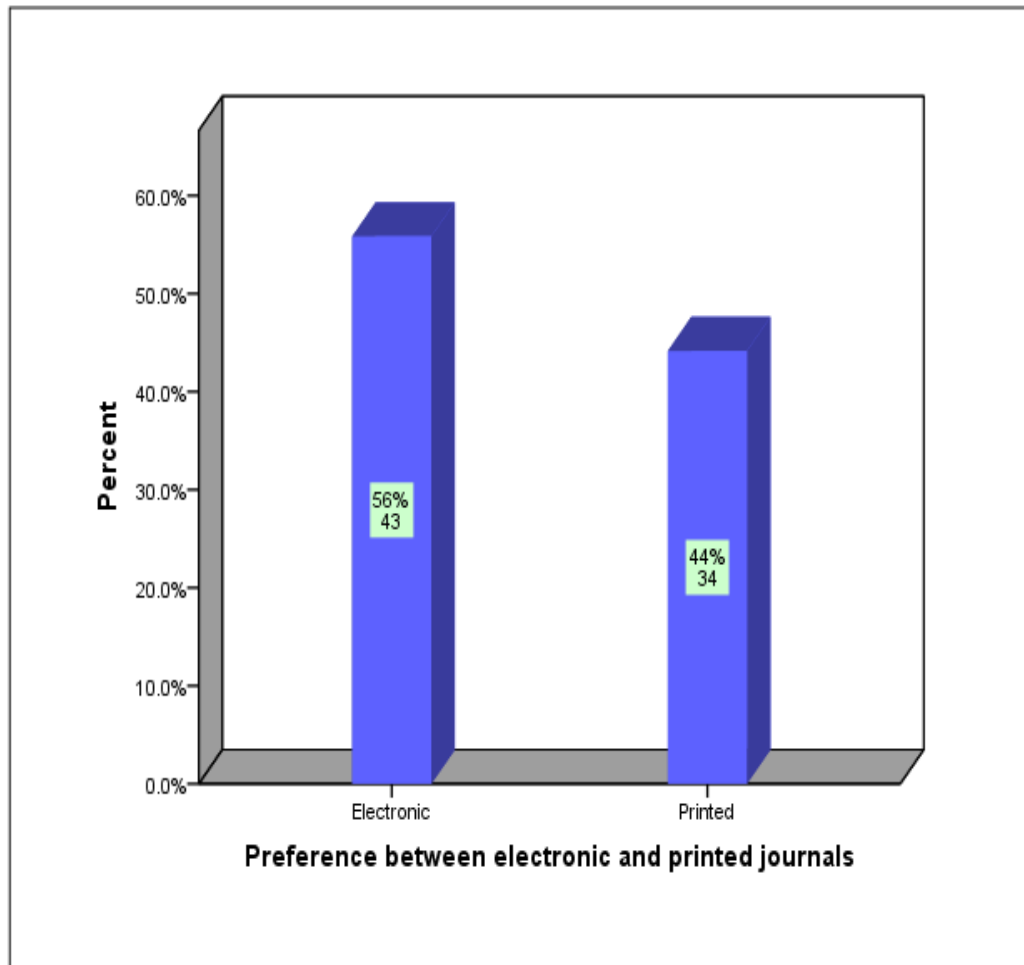
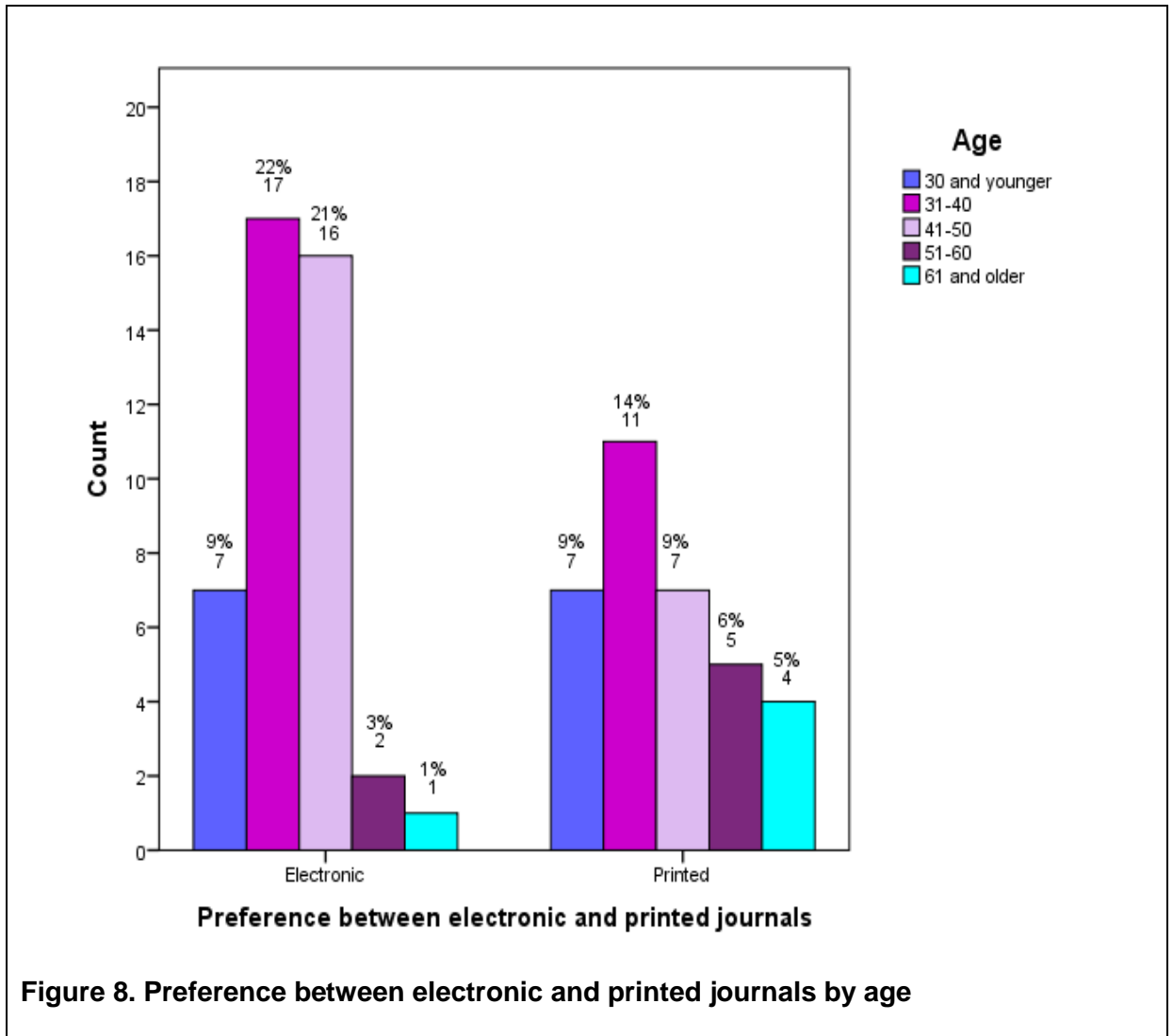


Figure 7. Preference of using electronic journals

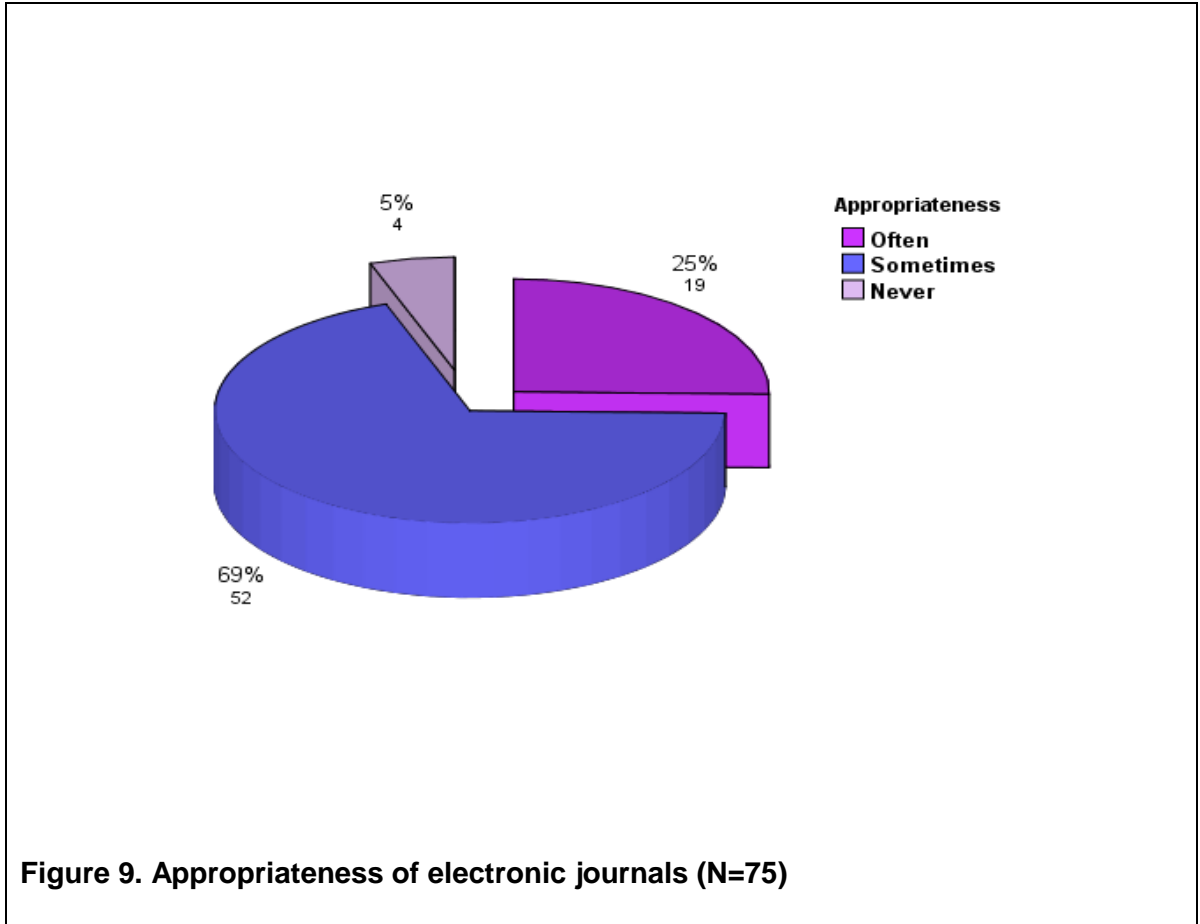
4.2.2.8 Preference of using electronic journals by age

The majority of age group who preferred electronic journals were of ages between 31-40 years. Figure 8 below shows that 17 (22%) preferred electronic journals compared to 11 (14%) of the same age group who preferred printed journals. All age groups preferred electronic journals although the lowest percentage of age group who preferred electronic journals were of the age between 61 and above.



4.2.2.9 Appropriateness of electronic journals

Respondents were asked if they got the necessary articles when they used electronic journals. Figure 9 below shows that the majority of the respondents 52 (69%) indicated sometimes they get the necessary articles. This could be due to lack of knowledge of the sources available. 19 (25%) indicated often, 4 (5%) indicated never and two respondents skipped the question.



4.2.2.10 Purpose of using electronic journal articles

Table 6. Frequency of purpose of using electronic journal articles

		Responses		Percent of Cases
		N	Percent	
Purpose of using electronic journal articles ^a	Teaching	55	30.6%	73.3%
	Research	65	36.1%	86.7%
	Seminars/Writing papers	30	16.7%	40.0%
	Publishing articles/books	23	12.8%	30.7%
	Other	7	3.9%	9.3%
Total		180	100.0%	240.0%

a. Dichotomy group tabulated at value 1.

b. N=73 (4 skipped the question)

Respondents were asked to indicate the purpose of using of electronic journals. Table 6 above show that the majority of respondents 65 (86.7%) indicated that they used electronic journal articles for research purposes; 55 (73.3%) for teaching and the least 30 (40%) for seminars and papers; many users did appear not to understand the difference between seminars/writing papers and publishing articles. The study further revealed that some academics used electronic journal articles for general knowledge.

4.2.2.11 Purpose of using electronic journal articles and Academic Status

Table 7. Cross-tabulation of purpose of using electronic journal articles and academic status

		Purpose of using electronic journal articles ^a					Total
		Teaching	Research	Seminars/ Writing papers	Publishing articles/ books	Other	
Academic Status	Staff	11	9	2	0	2	13
	Associate	14.7%	12.0%	2.7%	.0%	2.7%	17.3%
	Assistant	2	2	1	0	0	2
	Lecturer	2.7%	2.7%	1.3%	.0%	.0%	2.7%
	Lecturer	33	38	19	16	2	42
		44.0%	50.7%	25.3%	21.3%	2.7%	56.0%
	Senior	7	11	6	7	1	12
	Lecturer	9.3%	14.7%	8.0%	9.3%	1.3%	16.0%
	Associate	1	1	0	0	0	1
Professor	1.3%	1.3%	.0%	.0%	.0%	1.3%	
Professor	1	1	1	0	0	1	
	1.3%	1.3%	1.3%	.0%	.0%	1.3%	
Other	0	3	1	0	2	4	
	.0%	4.0%	1.3%	.0%	2.7%	5.3%	
Total		55	65	30	23	7	75
		73.3%	86.7%	40.0%	30.7%	9.3%	100.0%

Percentages and totals are based on respondents.

a. Dichotomy group tabulated at value 1.

Respondents were asked to indicate their academic status. The assumption was that academics who are senior in rank use electronic journals for a broad range of

purposes. Table 7 above shows that the majority of academics who selected electronic journals for the purpose of publishing articles and books, were of the Lecturer and Senior Lecturer rank and academics that were senior in rank (Associate Professor and Professor) indicated that they did not select purpose of using electronic journals as for publishing articles/books, which was surprising. This could be due to the amount of teaching and administration they have to do.

4.2.2.12 Learning how to use electronic journals and support needed

Table 8. Cross-tabulation of learning how to use electronic journals and support needed to use electronic journals

		Support needed to use electronic journals ^a			Total
		Searching skills	Knowledge of sources available	Other	
Learning how to use electronic journals ^a	Friends/Colleagues	14 20.3%	17 24.6%	3 4.3%	25 36.2%
	Self-taught	13 18.8%	18 26.1%	7 10.1%	30 43.5%
	Search engines	6 8.7%	11 15.9%	2 2.9%	15 21.7%
	Formal Course/Training	13 18.8%	16 23.2%	7 10.1%	27 39.1%
Total		34 49.3%	41 59.4%	14 20.3%	69 100.0%

Percentages and totals are based on respondents.

a. Dichotomy group tabulated at value 1.

Respondents were asked to indicate how they learnt how to use electronic journals and the support they needed to use electronic journals. The majority of respondents 18 (26.1%) who learned how to use electronic journals through self-taught showed higher percentage need for support in terms of knowledge of the sources that were available, as shown in Table 8 above.

4.2.2.13 Pearson chi-square test on gender and support needed

Table 9 and 10 below shows the Pearson chi-square test on gender and support needed on searching skills and knowledge of the sources available respectively. The purpose was to see if there was any difference between gender and the support needed on the use of electronic journal articles. The results show that there was no significant difference between gender and support needed on the searching skills and knowledge of the sources available.

$\chi^2 (1, N=77) = .082, df= 1, p= .774$ and $\chi^2 (1, N=77) = .197, df=1, p=.657$ respectively.

Table 9. Pearson chi-square test on gender and support needed on searching skills

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.082 ^a	1	.774
Likelihood Ratio	.083	1	.774
Linear-by-Linear Association	.081	1	.776
N of Valid Cases	77		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.45.

Table 10. Pearson chi-square test on gender and supported needed on knowledge of the sources available

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.197 ^a	1	.657
Likelihood Ratio	.196	1	.658
Linear-by-Linear Association	.194	1	.659
N of Valid Cases	77		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.30.

4.2.2.14 Methods used when searching for electronic journals

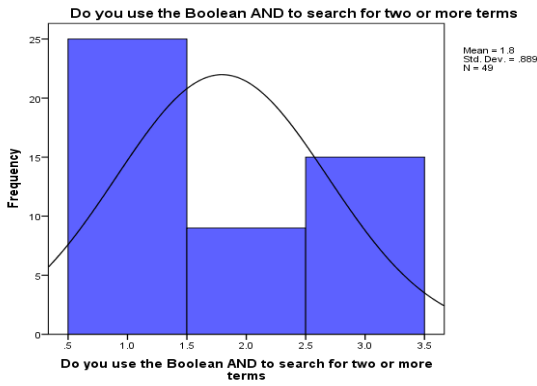


Figure 10a

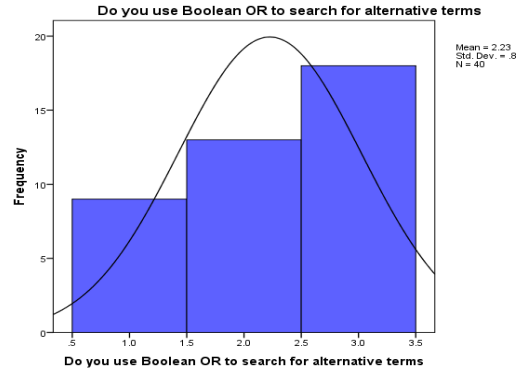


Figure 10b

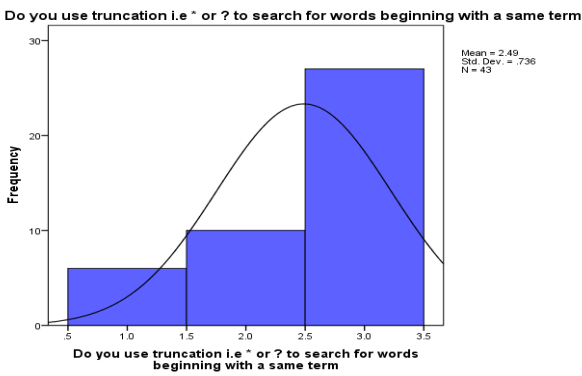


Figure 10c

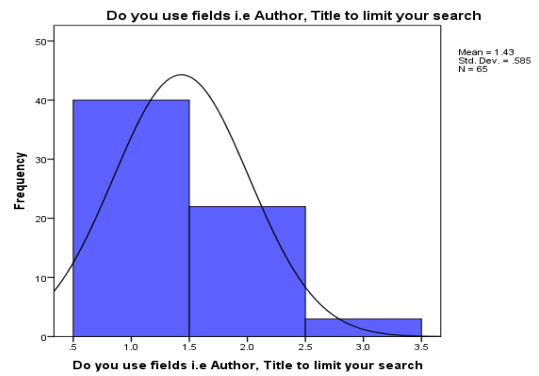


Figure 10d

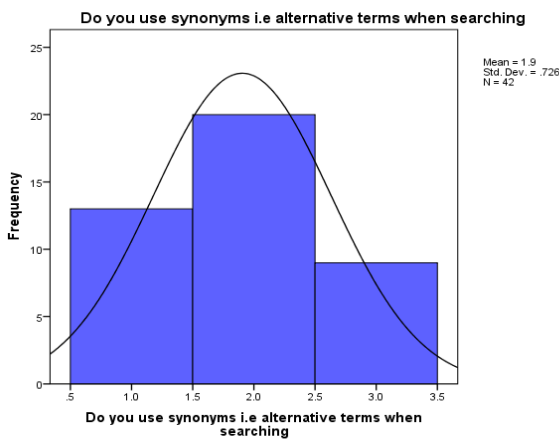


Figure 10e

Figure 10. Methods used when searching for electronic journal articles

Respondents were asked to indicate the methods they used when searching for electronic journals. They were required to indicate how often they used the methods. They were to select between often, sometimes and never.

Figure 10d above shows that the distribution of respondents is skewed to the left indicating that high number of respondents often used fields like Author, Title when searching for electronic journals. Figure 10b and 10c shows distribution of respondents is skewed to the right indicating high number of respondents never used truncation and Boolean OR when searching for electronic journals. This indicates a need for training since these commands are useful when searching for information. Figure 10a and 10e shows at least a normal distribution of respondents. Although Figure 10a shows a normal distribution, high number of respondents often used Boolean AND.

4.2.2.15 Benefits from access to electronic journals

Respondents were asked to indicate how they benefited from accessing electronic journals. Majority of the respondents indicated that access to electronic journals stimulated their teaching and research. Some of the comments made by respondents were fairly predictable.

“Easy to access”

“Up-to date research materials”

“Enhances my research efforts”

“Help me prepare for my classes/ my teaching has improved”

“They broaden my knowledge”

“I get relevant information for my teaching and research publications”

A few number of respondents indicated that they had never benefited from accessing electronic journals. Some of the reasons respondents made for not benefiting include;

“because of the work I do I have no time, if I had more time available. I could make more use of them”

“the benefit is very minimal because of poor internet access”

4.2.2.16 Problems encountered when using electronic journal articles

Respondents were asked to indicate the problems they encounter when using electronic journal articles. Table 11 below shows that the highest percentage of the respondents 72 (94.7%) indicated slow internet as a problem. Not easy to use was indicated as the least problem with 3 (3.9%) of respondents. In addition, some respondents indicated that access to the actual internet connection is a problem. As shown above time was also a limiting factor. This is probably due to the staff student ratio and teaching load.

Table 11. Frequency of problems encountered when using electronic journal articles

	Responses		Percent of Cases	
	N	Percent		
Problems encountered when using electronic journal articles ^a	Intermittent electricity	47	19.2%	61.8%
	Lack of personal computer	12	4.9%	15.8%
	Slow internet	72	29.4%	94.7%
	Difficult to read from screen	9	3.7%	11.8%
	Lack of training	16	6.5%	21.1%
	Not easy to use	3	1.2%	3.9%
	Lack of journals in my discipline/field	26	10.6%	34.2%
	Unaware of electronic journal services	16	6.5%	21.1%
	Access to good journal articles restricted to campus only	37	15.1%	48.7%
	Other	7	2.9%	9.2%
Total	245	100.0%	322.4%	

a. Dichotomy group tabulated at value 1.

4.3 Interview Results

In order to get more insight into the challenges and influence on the use of electronic journals and a better understanding of the quantitative data gathered via questionnaire, interviews were conducted.

This section, presents the results from the interviews. Five interviews were conducted via Skype with the Deans of Faculty from the Faculty of Education, Faculty of Environmental Sciences, Faculty of Health Sciences, Faculty of Information Science and Communications and Faculty of Tourism and Hospitality Management. All interviewees were represented by codes A, B, C, D and E.

Issues regarding the use of electronic journals became clearer when interview data was analysed. The interview section was divided into subsections that discussed the general overview of the use of electronic journal articles by members of staff from various faculties, support needed, problems encountered and influence of electronic journal.

4.3.1 Use of electronic journals

Interviewees were asked to indicate how frequently they used electronic journal articles and all interviewees indicated that they used electronic journal articles frequently. Interviewees A, B, C, and E revealed that a quite number of academics in their faculty were using electronic journals although they might not know the extent. One respondent revealed that;

“A few departments in the faculty are doing projects so they use electronic journals for information”. (Interviewee A)

Interviewee E, however, revealed that although some academics use electronic journals, the majority still use books.

“Most of the people are not involved in research so it is basically teaching so they rely on books most of the time”. (Interviewee E)

4.3.2 Access to electronic journal articles

Major important part of the use of electronic journals is access to the electronic journals. The interviewees were asked how they access electronic journals. Interviewee A, C, D and E indicated that they access electronic journals using office computers and personal laptops. Interviewee B, however, revealed that some members of the faculty do not have office computers but they rely on personal laptops.

“Most members of the faculty have personal laptops.” (Interviewee B)

Interviewee A, C, D and E revealed that access to internet is through both universities wired and wireless connection and personal connections through use of dongles (A broadband wireless adapter). Interviewee A and B revealed that apart from using their own personal dongles, some departments in their faculties do not have internet connection and they have to rely on the wired library connection using their own laptops because it is where one could get reliable connection.

4.3.3 Sources used to access electronic journals

The interviewer wanted to find out the sources used by academics in accessing electronic journals. All Interviewees indicated that they used sources subscribed by the library and those that are free. One respondent indicated that Google scholar was one of the sources used to access electronic journal articles. Interviewee E indicated that individual journals were used through links with colleagues in South Africa and Interview A and C indicated that they subscribe to journals offered by professional bodies. All interviewees showed that they used a range of sources.

4.3.4 Support needed to access electronic journals effectively

Interviewees were asked to indicate the support they had received from the university. All Interviewees revealed that they had received support from the library through training sessions and this was helpful. One respondent confirmed;

"I know some members have been trained by the library but I am not sure of who".
(Interviewee E)

Interviewee A and D indicated that there was need for further support. They requested for continuation of information literacy programmes including searching skills. Interviewee E indicated that would need support on how to make good use of electronic journals and how to access and search for relevant journal articles.

4.3.5 Benefits of electronic journals

All Interviewees revealed that they preferred electronic journal articles compared to print. Interviewees were asked to mention some of the benefits of electronic journals. Interviewee A, D and E indicated that the benefit of electronic journals as that one is able to get current material. One respondent stated;

"Electronic journals are up to date, you can access right away on the internet while printed you might get them after six months." (Interviewee A)

Interviewee B revealed that with electronic journals one can access specific areas like abstracts as it covers the main points of a piece of writing, and provided links to other important material. Interviewee C and E indicated that they are easy to access and store information.

4.3.6 Influence of electronic journals

Interviewees were asked to mention how electronic journals have influenced them. Interviewee A, B and D revealed that electronic journals have influenced academics' teaching and research.

"Especially when you are doing research and you want to find out what others have done and identify gaps. And also in teaching you teach current information in the world". (Interviewee A)

“it has helped me to know what is going on in a specific area in my field of research that has been done by other distinguished scholars” (Interviewee B)

Interviewee C and E, however, revealed that electronic journals were important for writing articles and getting published. One respondent commented;

“there is some influence especially for publishing for instance, a number of members of staff are publishing who are relying of electronic journals”. (Interviewee C)

One respondent, however, revealed that there were some challenges with publishing.

“If you want to publish you have to pay something. Funding to publish is a bit of a challenge at Mzuzu University”. (Interviewee A)

However, it is possible that there were opportunities for publishing that did not involve a fee.

4.3.7 Problems encountered when using electronic journals

Interviewee A and C revealed that to get access to internet connection is a challenge. Interviewee C, D and E indicated that internet connectivity was a challenge. Some staff did not have computers. Interviewee A

revealed that very few had their own personal laptops. One respondent commented;

“internet connectivity is always up and down. The wireless network is not working in some areas”. (Interviewee E)

Another respondent stated;

“to download an article takes too long”. (Interviewee C)

Interviewee B had this to say;

“the distance of the offices to the library makes people to be lazy to go to the library because most of time you feel am I going to get the support considering the level of internet connectivity we have”. (Interviewee B)

Interviewee A revealed that there were few sources which were relevant and had this to say;

“We need to pay for other sources. We have very few sources in my field which are up to date and which are very helpful”. (Interviewee A)

From the interviews, all interviewees indicated that internet connection is a problem.

4.4 E-survey Results

In order to get clarifications of the responses to the questionnaire, follow up questions were used. In this section, results from the e-mail survey of academics will be described. Ten follow up questionnaires were sent to 10 academics in order to follow up on their answers after completing a questionnaire in particular on use and access to electronic journals.

4.4.1 Use of electronic journals

Respondents were asked to give reasons why they preferred printed journals and some of the responses include;

“I find it difficult to read on a computer screen and the campus wireless network does not work in our offices.”

“They are easily accessible without electricity or internet blockage”

“I feel being harassed by technology because each time I try to use technology I find technology delaying me because the internet connection is not reliable in the university”

4.4.2 Access to electronic journals

Respondents who indicated that they had never used office computer were asked to indicate if they had an office computer and internet connection. Most respondents indicated that they did not have office computers and internet connection. One respondent further commented;

"I can only access internet when am in the library".

From the e-survey, the majority of respondents cited internet connection as a problem to access electronic journals. As a result they tended to use their own internet connection. This was further exacerbated by the lack of access to electronic journals off campus.

4.5 Summary

The chapter analysed the results from the questionnaire, interviews and follow up electronic survey. Issues of use, benefits and challenges of using electronic journal articles have been tabulated. Use of electronic journal articles by academics showed that:

- Academics had general knowledge of electronic journals.
- General knowledge of electronic journals did not vary with education.
- There was no significant difference between gender and searching skills.
- There is need for support and training.
- Major barriers were;
 - Teaching responsibilities and a lack of time for research
 - Lack of ICT
 - Lack of telecommunications
 - Lack of reliable power
 - Restriction of access to good journals on campus
 - Lack of journals in their field/discipline

In the following chapter, the findings are discussed.

CHAPTER 5: DISCUSSION

5.1 Introduction

The aim of this chapter is to discuss issues that emerged through the data analysis and findings presented in chapter 4, which were obtained from the academic respondents. The study had sought to investigate the information behaviour of academics and their use of electronic journals and assess the factors influencing their behaviour. The findings from this study suggest that most of the academics had general knowledge of the electronic journals and that general knowledge of electronic journals does not vary with education. There was no significant difference between gender and searching skills, because some need support and training. The major barriers reported are teaching responsibilities, lack of ICT, lack of telecommunications, lack of reliable power and access to good journals restricted to campus only. The chapter covers the discussion of research findings using research objectives of the study.

5.2 Demographics

The inconsistency in the number of staff from different faculties, departments, academic status, gender, and age was caused by the lack of uniform numbers of staff in each faculty and department. Thus Faculty of Education had more representation because it was the largest faculty in the university. However, it was found that gender, age, academic status, and discipline had little impact on searching behaviour. Although there was a slight indication that older staff valued printed sources more. This finding contradicts the findings of Bar-Ilan & Fink (2005) who stated that users of all ages have switched to the electronic format.

5.3 Level of electronic journal use by academics

5.3.1 Use of electronic journals

The study revealed that the majority of the respondents had general knowledge of electronic journals. Larger proportion of respondents use electronic journals occasionally i.e. less than a month. This finding differs with a study by Research Information Network (2011) who revealed that three-fifth and four fifth of researchers across all disciplines in universities and research institutes in UK use electronic journals 'most' or 'every' working day. However, there was an indication that their infrequent use of electronic journals could be due to other problems which they encounter when using electronic journals including access to electronic journals. Poor access to electronic journals is hindrance to academics work. Although Harle (2010) indicated that availability can no longer be claimed as the primary problem. However, at Mzuzu University it was evident that access was a significant issue due to internet connectivity and the lack of computers. Nevertheless, it may be true that, as Harle (2010) suggests that academics' knowledge of sources available may have had an impact. There is need instead to consider the ways in which available journals are not being accessed and used. This implies that, to some extent, had it not been that there was no access problems, electronic journals could have been used more. There is need to solve access problems if high usage is to be realised.

The study further revealed that academics use of electronic journals does not vary with where educational qualifications were obtained as shown in Table 2. There was no significant difference on the use of electronic journals and region where qualifications were obtained. Analysing further the frequency of use of electronic journals according to faculty, gender, age, academic status, indicated that there was no correlation on the frequency of use of electronic journals and faculty which respondents belong to, indicating that academics use of electronic journals does not vary with faculty, gender, age and academic status. This finding differs with Dilek-Kayaoglu (2008) and Tenopir (2003) who revealed that age and discipline were

statistically associated with frequency of use. This implies that electronic journals are accepted by all academics regardless of where educational qualifications were obtained and discipline. This could be due to the fact that advantages of electronic journals outweigh print electronic journals.

Results emanating from this study further reflect that the academics prefer electronic than print journals despite age and gender. Previous studies also showed a favourable attitude towards electronic journals. Bar-Ilan, Peritz & Wolman (2003) indicated that users find electronic journals indispensable than printed journals. Bar-Ilan & Fink (2005) and Niu and Memminger (2011) found out that users of all ages have switched to the electronic format not only in terms of usage but also preference. This shows that more academics are comfortable with technology irrespective of age. On the other hand, the results disagree with a study by Friendlander (2002) who found that more women use electronic journals in their research more than men, whereas in this study, gender had no effect on the use of electronic journals.

5.3.2 Access to electronic journals

It was noted that respondents use home computers more in order to access electronic journals than other ways of accessing electronic journals i.e. office computers. It was also noted that respondents use search engines often in locating electronic journal articles. This concurs with Raza & Upahyay (2006) who revealed that the majority of respondents use search engines to locate and access electronic journals. From further analysis of the data, there was an indication that respondents who use home computers often also use search engines often when locating electronic journals. This could be attributed to the fact that since most of the respondents use their own computers, they could not access other electronic journals i.e. databases subscribed by the library due to IP authentication and as a result they would opt for search engines. This implies that access on the campus only contribute to low use of electronic journals. There is need to ensure that access should not be restricted to campus only.

5.3.3 Purpose of using electronic journals

As an institution of higher learning, multiple suggestions were given to respondents as to the purpose of using electronic journals. Teaching and research was included as it appears in the mission statement of the institution and is supported by the findings. This finding supported those of Nicholas et. al. (2010) which revealed that journals were extremely important for most scholars in terms of research and teaching. This is not surprising since teaching and research are the core activities of the academics. Publishing was also included as an option to select as purpose of using electronic journals. The low score for publishing articles/books by Associate Professors and Professors could be attributed to age of respondents, the demands of teaching and administration. This implies that there is no publishing culture among academics. It is therefore indicated that staff do need assistance with publishing, for example, where to publish articles. Financial barriers were also cited. However, there may be other alternatives that academics are not aware of.

5.3.4 Sources used to access electronic journals

A large number of respondents use African Journals Online database as a source to access electronic journal articles. This implies that, to some extent, academics prefer local journals than journal articles published in international databases. This could be an indication that there are few local articles published in international databases or that international journals due to their European and North American coverage are not perceived as relevant. This concurs with Harle (2010) in the study of access to research in east and southern African universities who revealed that coverage of top 20 titles in business studies and economics appeared to be US focused. The fact that respondents use local journals i.e journals published in Africa means that the library has a lot of work to market the sources available. Therefore, there is need for more awareness on the sources that are available especially in international databases and how, if this is the case, they can benefit academics in Malawi. There is also a need to facilitate easy access to local journals and publication, possibly through the institutional repository.

5.4 Skills and knowledge of electronic journals

The study revealed that the majority of respondents realise the value of electronic journals. This could be the reason some academics use electronic journals daily. This implies that, to some extent, the information literacy programmes offered by the library had an impact. However, the fact that the majority of respondents taught themselves to use electronic journals indicates that there is need for support to highlight the sources available, problem understanding and formulation, and how to use the systems to access and find relevant articles. The study further revealed that there was no statistical association between gender, age, academic status, discipline and searching skills. There was an indication that training was required in the use of the retrieval systems due to the low number of respondents who used truncation and the Boolean OR when searching.

5.5 Barriers to using electronic journals

The major barriers in this study, on the use of electronic journals were teaching responsibilities i.e. a lack of time; lack of ICT; poor telecommunication; an unreliable power supply and that access of high quality journals were restricted to campus only, unless academics paid for access independently.

The fact that the institution is of a higher learning, most of the respondents have teaching responsibilities. This contributed to low usage of electronic journals. One interviewee stated that most academics are not involved in research and primarily are involved in teaching and rely on books most of the time. This implied that respondents have little time to use electronic journals. This would also lead to a lack of research activities which in turn is likely to lead to low use of electronic resources, which results in a lack of use of electronic journals, a 'vicious' cycle.

The majority of the respondents were not satisfied with the ICT infrastructure. A large proportion of the respondents had no access to computers and as a result, they rely on their own personal laptops and a 'dongle' to access the internet. This finding supports those of Gathoni et. al (2011), Tahir, Mahmood & Shafique (2008)

and Siddique & Ali (2010) which revealed that the lack of computers was one of problems faced by respondents in academic institutions in Kenya, University of Punjab, Pakistan and Jawaharlal Nehru University when seeking information. This was especially the case when access to databases, subscribed to by the library, required IP authentication. There is therefore a need to increase the number of computers for staff.

From the e-survey results, respondents who had indicated that they do not have computers also indicated that they do not have internet connection in their offices. This finding concurs with Harle (2010) who revealed that the Chancellor College at the University of Malawi, which relied on VSAT (satellite) link, had significant access problems. Poor connections and insufficient bandwidth often means that journals either cannot be downloaded or it is extremely slow (Musoke & Kinengyere 2008) and data could be lost. Academics are likely therefore to be forced to use private internet cafes, where they would not be able to access databases subscribed by the library. This could also contribute to low research activities and may be a reason why printed journals were an important resource. Therefore, there is need to improve internet connectivity.

This study found, as did Evans & Zarnosky (2000) in University of Agriculture, Nigeria, who highlighted the need for an adequate power supply. A lack of unreliable power supply is a significant barrier to using electronic journals. This finding concurs with (Harle 2010) who revealed that unreliable power is the major barrier to using electronic journals in Central and East Africa. Therefore, there is need to improve power supply if electronic journals are to be used effectively.

Access to good journals restricted to campus only is one of the barriers to electronic resources. This is evident in the high percentage of respondents who indicated that access should not be restricted to campus only. This meant that academics were unable to access electronic journals subscribed by the library in their homes due to IP authentication restriction as time on-campus is spent dealing with students and administration, with little time for research. This was often the only occasion where they had the time to do independent study. Therefore, there is need to provide remote access to electronic journals if high usage is to be realised.

It was also further revealed that lack of journals in their discipline/field is a barrier. This finding disagrees with Harle (2010) who revealed that academics and students in east and southern Africa and across the wider continent have an impressive range of high-quality peer-reviewed electronic journals available to them. This could be due to lack of knowledge of the sources available. This indicates a need for awareness raising and the marketing of the sources available. However, this could also indicate a lack of sources that cover research and developments in Africa and other developing countries. However, it is not clear from this research or other research the extent that this is a problem or influences academics use of electronic journals.

5.6 Summary

This chapter discussed the results gathered from the questionnaire, interviews and e-survey. It became evident that use of electronic journals at Mzuzu University faces access problems which need to be addressed. The information obtained from this chapter was used to draw conclusions and recommendations which were presented in the following chapter.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The study sought to investigate the information behaviour of academics on the use of electronic journal articles. The aim of this study was to investigate the information behaviour of academics on the use of scholarly electronic journal articles by academics at Mzuzu University and assess the factors that influence their academics behaviour.

The research questions that were addressed in this study were:

- Do academics use scholarly electronic journals and what are the common sources they use?
- How often are the electronic journals used?
- Is there any meaningful correlation between use of electronic journals and gender, age, academic status and faculty?
- What are the reasons for using electronic journals articles?
- What are the barriers in using electronic journal articles?

These are discussed below. The aim of this chapter is to give conclusions of the findings, recommendations and suggestions for future research.

6.2 Conclusion

6.2.1 Information behaviour of academics on the use of electronic journal

Use of electronic journals is not new. Although majority of respondents had general knowledge of electronic journals, the level of electronic journal use has been found to be low as majority of the respondents use electronic journals occasionally i.e. less than once a month. This was reflected by the frequency of the use of electronic journal articles. When required to select their preference between electronic and

print journals, the majority selected electronic and the majority of respondents felt that electronic journals provide up to date information, which shows their attitude towards electronic journals and that they will be used more than the print, in future. Respondents who displayed negative attitude towards the use of electronic journals said they prefer print journals because they found difficult to read on a screen. However, the study was not aimed at comparing the two types of media but does indicate a reason for preferring hard copy.

The low level of usage was shown when respondents were asked to select sources used to locate electronic journal articles and the low percentage of sources, especially databases, subscribed to by the library.

Electronic journals have been accepted by all academics at Mzuzu University and there was no difference among academics in the various faculties in their use of electronic journals in terms of where they were educated; gender; age; academic status and the use of electronic journals. However, how to increase usage is a challenge. Several factors have been mentioned which inhibit the use of electronic journals, including teaching responsibilities, a lack of ICT, a lack of telecommunications and a lack of reliable power.

6.2.2 Sources used to access electronic journal articles

The common sources used by academics in accessing electronic journals articles are African Journals Online database. It is evident that the majority prefer local publications. However, there was a general knowledge of the sources which are subscribed to by the library. This was reflected in respondents` selection of all databases. However, there are other sources such as Google Scholar which are used to access most of the free journals. A lack of local content could be a significant contributing factor to low usage of electronic journals since most of the publications are from the 'north'. However, this deserves further investigation. Local Repositories are likely to play a vital role in providing access to local content and encouraging publication of local material.

6.2.3 Purpose of using electronic journal articles

Teaching and research are the major purposes of using electronic journals. This was reflected by the majority of respondents who indicated that they use electronic journals for teaching and research. However, a low response with regard to publishing indicated that the majority of academics are not publishing. It was interesting to note that even academics who are senior in rank are not publishing. This was reflected in the results and where Associate Professors and Professors did not indicate publishing as one of the purposes of using electronic journal articles. This could be due to administrative and teaching responsibilities. This would also mean that it is difficult for senior staff to set an example with regard to research and publication.

6.2.4 Skills and knowledge in using electronic journals

Majority of respondents had a general knowledge of electronic journals in terms of realising the value of electronic journals. This is reflected in the high percentage of awareness of the benefits. The results showed no relationship between use of electronic journals and searching skills in terms of gender, age, academic status and faculty. However, larger proportion of respondents who did need support in searching skills. This was reflected in the lack of use of commands such as truncation and the Boolean OR, furthermore the majority of respondents were self-taught and would probably benefit from more systematic training.

6.2.5 Barriers encountered in using electronic journal articles

According to the study, the major barriers encountered when using electronic journals are teaching responsibilities, lack of ICT, lack of telecommunications, lack of reliable power supply, access to good journals restricted to campus only and lack of journals in their discipline/field. This was reflected in the high percentages of respondent's selection of the barriers. There is an increase in demand for teaching due to the teacher student ratio, where there are a large number of students and an inadequate number of teaching staff i.e. Faculty of Information Science and

Communication which has 1:24 teacher student ratio (Mzuzu University 2012). This contributes to low electronic journal usage levels since it leaves little time for research. It also makes it unlikely for student to engage in independent, project based, learning where they are expected to use journal articles.

Positive efforts have been made by INASP and other international organisations to provide access to electronic journals. Mzuzu University therefore needs to improve in the provision of ICT and telecommunications in order to reduce the many challenges associated with the use of electronic journals.

6.3 Limitations

- The use of a questionnaire had some limitations because it was difficult to assess the truthfulness of the respondent's feedback.
- The cost of travelling to Malawi was a limitation. It was difficult to monitor the data collection. The amount of responses may have been influenced by physical presence, which would have improved the validity of the study.
- The study would have benefited from the use of face-to face interviews rather than online telephone interviews due to poor internet connectivity. The face-to face would have added the depth of the research since observation of behaviour and extensive probing could have been used.

6.4 Recommendations

6.4.1 Provision of ICT and Telecommunications

- Provision of ICT equipment i.e computers to academics will enhance effective use of electronic journals. This can be done by buying computers for academics.

- Provision of high speed broadband internet connection for enhancing the download process. This can be done by connecting to the undersea fibre optic cables via Mozambique. This can be done in collaboration with other institutions or as a regional project.
- Provision of campus wide internet connection to improve access.

6.4.2 Training

Awareness, training campaigns, and support in problem understanding with regard to electronic sources that are available. Such awareness and support can be enhanced through the following means:

- Regular information literacy programmes.
- Regular workshops to promote the usage of electronic journals.

6.4.3 Funding

Subscribe to sufficient number of electronic journals. Top management need to increase its financial support in this service as more journals are needed in other disciplines. This can also assist in the development of the institutional repository and digitising of local materials in the library.

6.4.4 Reliable power

Provision of reliable power supply. This can be done by involving the Department of Energy Studies of the university on solar system.

6.4.5 Provision of remote access

Provision of remote access to electronic journals can increase use and capitalise of academics time as they can read appropriate articles anywhere. This can be done by providing a remote access server which can assist in providing remote access of electronic journals.

6.4.6 Teaching and Learning Techniques

Teaching and learning techniques should be improved in order to create some time for other academic work, including research and publication. Top management should assist in lessening the demands of teaching and provide creative ways in teaching and learning that help academics deal with the large numbers of students.

6.4.7 Electronic publishing

- The scholarly community should be encouraged to publish in electronic journals. This will turn improve their use and understanding of electronic journals.
- There is need for information for academics to know where they can publish in order to make contribution to the world and increase local publications.

6.5 Future Research

There are areas for possible future research which are:

- A comprehensive longitudinal survey on the use of electronic journals conducted after the subjects have received further training on their use and telecommunications have improved.
- A study on the relationship between usage and research output.

- A study on whether a lack of local content has an impact of academics' use of electronic journals.

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Appendix A

Questionnaire for Academics

The use of electronic journal articles by academics at Mzuzu University, Malawi.

My name is Lizzie Malemia. I am a postgraduate student for the M.A/MSc Information and Library Management programme at Loughborough University. I am doing research on “The use of electronic journal articles by academics at Mzuzu University”. Please assist me by completing the following questionnaire. **All information collected will remain confidential.**

Note: In this context, electronic journal articles are research articles which have been peer reviewed and are scholarly in nature.

Instructions:

Please tick the appropriate boxes and fill in the appropriate spaces.

Section A – Knowledge and Skills

1. How often do you use electronic journal articles?

- Daily
- Twice a week
- Once a week
- Twice a month
- Once a month
- Occasionally
- Never

2. Which of the following ways do you use to access the electronic journal articles?

	Often	Sometimes	Never
Office computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Home computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyber café	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Please specify other ways)			

3. Which of the following tools do you use to locate electronic journal articles?

	Often	Sometimes	Never
Databases subscribed to by the library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individual electronic journals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open access journals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Search engines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Please specify other tools)			

4. Which of the following sources do you use to access electronic journal articles? (Tick all that are appropriate)

- | | |
|---|----------------------------------|
| <input type="checkbox"/> African Journals Online (AJOL) | <input type="checkbox"/> Bio-one |
| <input type="checkbox"/> Cambridge Journals | <input type="checkbox"/> Nature |
| <input type="checkbox"/> EBSCO Host | <input type="checkbox"/> JSTOR |
| <input type="checkbox"/> Edinburgh University Press | <input type="checkbox"/> Emerald |
| <input type="checkbox"/> Royal Society of Chemistry | <input type="checkbox"/> Sage |
| <input type="checkbox"/> University of Chicago Press | |
| <input type="checkbox"/> Wiley Interscience | |
| <input type="checkbox"/> Institute of Physics (IOP) | |
| <input type="checkbox"/> Palgrave-Macmillan | |
| <input type="checkbox"/> Health InterNetwork Access to Research Initiative (HINARI) | |
| <input type="checkbox"/> Online Access to Research in the Environment (OARE) | |
| <input type="checkbox"/> Access to Global Online Research in Agriculture (AGORA) | |

- Other
(Please specify other sources)

5. Which do you prefer, between electronic and printed journal articles?

- Electronic
- Printed

6. Do you get the necessary or appropriate electronic journal articles?

- Often
- Sometimes
- Never

7. For which of the following purposes do you use electronic journal articles?

- Teaching
- Research
- Seminars/Writing papers
- Publishing articles/books
- Other
(Please specify)

8. How did you learn to use electronic journals?

- Friends/colleagues
- Self-taught
- Search engines
- Formal course/training
- Other
(Please specify)

9. Which of the following methods do you use when searching for electronic journals?

	Often	Sometimes	Never
Do you use the Boolean AND to search for two or more terms?			
Do you use Boolean OR to search for alternative terms?			
Do you use truncation i.e the use of * or ? to search for words beginning with a same term e.g child*?			
Do you use fields i.e. Author, Title to limit your search?			
Do you use synonyms i.e alternative terms when searching?			

10. What kind of support do you need in order to use electronic journal articles effectively?

- Searching skills
- Knowledge of sources available
- Other

(Please specify)

Section B – Benefits and Barriers in using electronic journal articles

11. Are you aware that electronic journals (tick boxes appropriately)

- a. Only provide full text? Yes No
- b. Only provide abstracts? Yes No
- c. Provide both abstract and full text? Yes No
- d. Provide up-to-date articles? Yes No
- e. Links to other articles? Yes No
- f. Provide good graphics? Yes No
- g. Provide choice of format? Yes No
- h. Provide access to back issues? Yes No

- i. Provide 24/7 availability? Yes No
- j. Provide access from different locations on campus Yes No

12. How do you benefit from access to electronic journal articles?

.....

.....

.....

.....

**13. What are the problems you encounter when using electronic journals?
(Tick all that are appropriate to you)**

- Intermittent electricity
- Lack of personal computer
- Slow internet
- Difficult to read from screen
- Lack of training
- Not easy to use
- Lack of journals in my discipline/field
- Unaware of electronic journal services
- Access to good journal articles restricted to campus only
- Other
(Please specify)

Section C – Demographics

14. Which Faculty do you belong? (tick appropriately)

- Education Tourism and Hospitality Management
- Health Sciences Information Science and Communications
- Environmental Sciences Other
(Please specify).....

15. Which is your Department?

.....

16. What is your area of specialization?

.....

17. What is your academic status?

- | | |
|---|--|
| <input type="checkbox"/> Staff Associate | <input type="checkbox"/> Senior Lecturer |
| <input type="checkbox"/> Assistant Lecturer | <input type="checkbox"/> Associate Professor |
| <input type="checkbox"/> Lecturer | <input type="checkbox"/> Professor |
| <input type="checkbox"/> Other | |

(Please specify)

18. In which of the following regions did you get your qualifications?

- Africa
- Europe
- Asia
- South America
- North America
- Other

(Please specify)

19. Are you male or female?

- M F

20. What is your age?

- 30 and younger
- 31 – 40
- 41 – 50
- 51 – 60
- 61 and older

21. Is there anything else you would like to say about the availability and access to electronic journal articles?

.....
.....
.....
.....

Would you be happy to be contacted for further participation into this research e.g. a follow up email? If yes, please provide your e-mail address below.

E-mail:

Thank you very much for your cooperation in completing this questionnaire. Please send it back to your **Departmental Secretary**.

Appendix B

Interview Questions with Deans of Faculty

Introduction

Thank you for agreeing to this interview today. My name is Lizzie Malemia and I am studying M.A/MSc Information and Library Management programme at Loughborough University. This interview forms part of my Masters dissertation focusing on the use of electronic journal articles by academics at Mzuzu University. This interview will take around 30 minutes and will be recorded for research use only. All responses will be treated with confidentiality.

Interview Questions

1. a. Do you use electronic journal articles?
b. How often?
c. Do you have any knowledge of the use of electronic journals by members of the faculty?
2. a. How do you access the electronic journal articles?
b. Do members in the faculty have office computers?
3. a. Which sources do you use to access electronic journal articles?
b. Do you have other sources special for the faculty or for departments?
4. How do you compare electronic to printed journal articles?
5. a. What kind of support have you ever had in your faculty for effective use of electronic journal articles?
b. Was it useful?

6. What kind of support would you need to use the electronic resources effectively?

7.
 - a. What influence do electronic journals have in your Faculty?
 - b. Have they opened a new area for you? For example, have they led you to do more research or publish?

8.
 - a. What challenges do you encounter in accessing electronic journals?
 - b. Do members of staff in your faculty have internet connection?
 - c. What would be your suggestions on the way forward as the result of the challenges?

Thank you very much for your cooperation in responding to my questions.