

***THE INTERNET AS A RESOURCE FOR RESEARCH, TEACHING AND
LEARNING: A COMPARATIVE STUDY BETWEEN THE UNIVERSITY OF
ZIMBABWE AND THE UNIVERSITY OF ZULULAND***

BY

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2002

Declaration

I declare that this study is my original work and has not been presented for the award of a degree at any other university.

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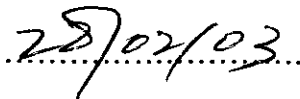
Tinashe Mugwisi

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Date



Supervisor



Date

Dedication

This work is dedicated to my late father, PR Mugwisi (1934-2000) for the many years he spent in the classroom.

Acknowledgements

I would like to thank my supervisor, Professor DN Ocholla, for his guidance and critical comments throughout this study.

Special thanks also go to staff in the Department of Library and Information Science, colleagues, especially Onyancha Bosire for helpful comments and suggestions.

I would also like to thank my colleagues at the University of Zimbabwe Library for helping with the distribution of questionnaires.

Lastly, I would like to thank my family for their understanding throughout my absence from home.

Abstract

The Internet has been described as a collection of sprawling computer networks that link millions of computers used by tens of millions of people all over the world (Leedy 1997:66). From an initial few hundred computers, the Internet has grown exponentially enabling users to communicate with each other and share information. Libraries have embraced the Internet in order to deliver improved services and extend and expand the scope of what they offer. The purpose of this study was to explore and examine, through a comparison, the use of the Internet for teaching, learning and research by academics and students at the Universities of Zimbabwe and Zululand. It was also to explore how their libraries could contribute towards achieving this aim. The survey method was largely used in which both qualitative and quantitative data was collected. Two sets of questionnaires were distributed, one to academics and students, and the second to professional librarians in the two institutions. Interviews were also conducted with IT divisions. Data was then analysed using the SAS programme and Microsoft Excel.

The study found out that there were high computer and Internet skills among the respondents, both among academics and students, and librarians. The Internet was used in both institutions, for study and work purposes. Among the resources used, e-mail and the web were the most used by the majority of respondents. The study found out that there was no recognisable difference between Internet use and academic discipline, between and within the two institutions. This was contrary to studies in literature reviewed where Sciences were found to use the Internet more than Humanities. No significant differences were also noticed when Internet use was analysed by level of study and status of faculty academics. The study however established that the Internet had changed the information seeking behaviour of the majority of respondents in all categories. There was evidence of use of others services like telnet, electronic journals and other library OPACs by librarians for work purposes. There was however a poor link between librarians and their users with regards to use of Internet resources. The study also highlighted rather similar problems facing the two institutions in terms of Internet accessibility. Access was a major concern, due to inadequate provision of computers and existing connection to the Internet. The need for more formalised training in the use of Internet resources and the creation of awareness among academics and other potential

users were also highlighted. Despite these problems, the study revealed that there is a great potential for Internet use and appreciation among academic librarians and users in the two institutions. Recommendations were put forward, among them, the need for management in the two institutions to make resources, both financial and materially available in order to sustain Internet use programmes and initiatives that are already in place.

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Abbreviations

ARPA	Advanced Research Projects Agency
AVU	Africa Virtual University
CELI	Continuing Education: Libraries and the Internet
DARPA	Department of Advanced Research Projects Agency
DATAD	Database of African Theses and Dissertations
INASP	International Network for the Availability of Scientific Publications
NSU	Networking Services Unit (University of Zululand)
OPAC	Online Public Access Catalogue
PERI	Programme for the Enhancement of Research Information
SBIGs	Subject Based Information Gateways
SIDA	Swedish International Development Agency
TCP/IP	Transmission Control Protocol/Internet Protocol
UZIMB	University of Zimbabwe
UNIZUL	University of Zululand

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CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction and conceptual setting

The Internet has been described variously as the “premier network of networks,” as “everyone’s computers connected,” or most graphically, as an “unmanaged web of computer plasma (Bane & Milheim 1995:1). These definitions have been evolutionary, changing with time to describe the added functions integrated into the computer networks. The Microsoft Press computer users’ dictionary (1998:190) defines the Internet as the world-wide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. Perry and Schneider (1999:HTML 1.4) have defined the Internet as a structure made up of millions of interconnected computers whose users can communicate with each other and share information. The physical connection of the Internet uses fibre optic cables, satellites, phone lines and other telecommunication media. Since its inception over thirty years ago, it has grown from just a few computers to a huge network of hundreds of thousand of computers serving millions of users the world over.

In the 1960s, the US Department of Defence (DOD) became very concerned about the possible effects of a nuclear attack on its computing facilities, realising that the weapons of the future would require powerful computers for co-ordination and control (Perry and Schneider 1999:WEB 1.7). The Advanced Research Projects Agency (ARPA) was tasked with this responsibility hence the Internet as it is known today was known as ARPAnet. ARPA is today known as DARPA, Department of Advanced Research Projects. DARPA’s research was being put to test in the 1990s during the Gulf war. According to Manger (1995:2), Western attempts to destroy the Iraq network and cut the vital links were made extremely difficult by the fact that the robust TCP/IP protocol simply bypassed nodes that had been hit or put out of action in order to reconnect the network. The general public did not use the Internet much until after the development and

proliferation of the World Wide Web in the early 1990s. According to the Electronic Frontier foundation, by 1996 there was a 100% penetration of the Internet in US universities. Bane & Milheim (1995:1) predicted that in view of the current growth rate then, there would be 300 million users by 1999, 750 million by 2000 and 1.5 billion by 2001. Today, the Internet has since expanded to include business, health, industry, education, home use, and many other fields.

What is needed in order for one to connect to the Internet? Manger (1995:5) gives four basic system requirements for the home computer users:

- Telephone line
- Modem device (this allows the telephone to communicate with a remote computer via the telephone network)
- An Internet account provided by a service provider.

For larger organisations, connection is usually through a dedicated line that is connected to a local area network to which users are then connected. Such has been the phenomenal growth of the Internet and its impact and use in research, teaching and learning is the subject of this research.

A number of surveys have been conducted on the use of Internet in research, as given in the bibliography. In their study, Lazinger, Bar-Ilan and Paritz (1997:508) divide these studies into three categories: Firstly, studies on Internet use by information professionals, secondly, studies on Internet use in the general population, and finally studies on Internet use among college or university faculty members. Another important category that needs to be listed is the student one. The first-ever nation-wide quantitative survey of academic staff use of the Internet (Applebee, Clayton, Pascoe and Bruce, 2000) was conducted in Australia. While some studies have focused on all aspects of the Internet, others have focused on individual aspects of it. For example, studies by Bell (1997) and Harter (1998), focused on electronic journals, while Johnston (2001:3) looked at the implications of 'e-learning' for the custodians of the information resources required to support teaching and learning among other studies.

Any user whose computer is connected to the Internet can join the worldwide Internet community, and any person with an informational requirement can use the Internet to this end. With minimal training, most people can quickly perform searches and get information on their screens that would have required them to take a trip to a large research library a few years ago (Neuman 2000:462). Using the Internet provides a fast and relatively cheap form of communication widely accessible from any location, and a variety of new services for both the academic researcher and the student. Students invariably require access to all sorts of information during their studies and the Internet can be used for just this purpose (Manger 1996:4). Access to on-line databases, on-line public access catalogues (OPACs) and other institutional resources are among such benefits.

Scholarly communication has been a major benefit of Internet development both in terms of finding resources and communicating results. As Neuman (2000:462) points out, searching a vast quantity of information electronically has always been easier than manual search and the Internet greatly expands the amount and variety of source materials. This is so mainly due to the indexing practices where for example, electronic systems provide post-coordinated searching compared to the manual systems, which is pre-coordinated. Zhang (2001), Garoufallou (1999) and Bell (1997) have shown that among academics, there was consistent evidence of the use of email, the World Wide Web and discussion groups in order to communicate and disseminate research results. Because Internet communication goes beyond geographical boundaries, Australian academics formerly isolated due to their distance from the rest of the world can now communicate easily and exchange views with other researchers world wide. Communication between academics and publisher is also taking new dimensions albeit slowly. Studies by Bell (1997), Harter and Kim (1996) and Harter (1998), indicate a positive development among academics towards more acceptance of electronic publishing and electronic journals. Previously, manuscripts to publishers used to be sent via snail mail, i.e. regular postal mail; today these can be sent as attachments to electronic mail. The speed in communication thus helps to reduce the publishing process because changes can be communicated easily between publishers and scholars.

African scholars and their institutions have been embracing these new technological developments through their own individual efforts or through participating in regional and international projects. The International Network for the Availability of Scientific Publications (INASP), and the Continuing Education: Libraries and the Internet (CELI) funded by INASP and SIDA respectively are only a few of such projects that have supported the introduction of Internet resources in academic libraries in Africa. The potential role and use of the Internet in provision of information services for both research and study in South Africa's tertiary institutions is no longer a highly debatable issue (Kaniki:1999). In his study, Kaniki looked at the Internet usage among academic professional librarians of the universities of Durban Westville, Natal and Zululand. Ocholla (1999) looked at the information seeking behaviour of academics in relation to productivity of academics in South African universities. This study looked at among other resources usage of the Internet and online databases for research and teaching purposes. Current literature points at studies in Europe, Australia, Israel and the USA. This study looks at the Internet in teaching and research in the African context with specific reference to the universities of Zimbabwe and Zululand.

1.2 Contextual setting

This section provides background information of the two institutions under study. This includes information on staff and infrastructural development.

1.2.1 University of Zimbabwe

The University of Zimbabwe was established in 1957 as the then University College of Rhodesia and Nyasaland during the Federation of Rhodesia and Nyasaland, which was comprised of Nyasaland (now Malawi), Northern Rhodesia (now Zambia) and Southern Rhodesia (now Zimbabwe). Over the years, it became known as the University of Rhodesia becoming the University of Zimbabwe when the country attained its independence in 1980. The University of Zimbabwe has ten faculties (Arts, Agriculture, Commerce, Education, Engineering, Law, Medicine, Science, Social Studies and Veterinary Science). There are 1268 academic posts, of which only 944 are filled. The current student enrolment stands at 10500.

The University Library consists of the Main Library and six branch libraries, five of which are on the main campus. These are the Law Library, the Map Library, the Education Library, the Veterinary Science Library and the Institute of Development Studies Library. The sixth is the Medical Library, which is housed at the Medical School at Parirenyatwa Hospital complex, about 8km off the main campus. The Main Library contains about 75% of the total collection of nearly 510 000 volumes. The library has a staff complement of 92, 26 of them professional librarians and 3 professionals in the IT Division of the library, i.e. 1 Information and Communication Technology Manager and 2 Systems analysts. The library is semi-automated using the INNOPAC library management system and retrospective conversion of records is currently a major exercise for the Main Library and its branches. Other modules like Acquisitions, Serials and Circulation are being implemented. A web-based Online Public Access Catalogue (OPAC) is available <http://uzlibsys.uz.ac.zw> with access to subject gateways.

1.2.1.1 Facilities at the University of Zimbabwe networks

Kaniki (1999) discloses that to effectively integrate the Internet into library and information services assumes that Internet facilities are available within an institution and library. The University of Zimbabwe provides computing services to students and staff through computer laboratories in the Computer Centre, departmental laboratories, the library and administrative offices. The Computer Centre is responsible for the network infrastructure and computer laboratories although it does not have direct control of some of the departmental laboratories.

- **Student laboratories**

The Computer Centre has two laboratories for students, one for undergraduates with 60 workstations and the other for post-graduates with 7 workstations. Academic departments have own laboratories that students can access, e.g. the Electrical Engineering department has 3 laboratories. Equipment ranges from 486 computers to the current. It is estimated that there are 900 workstations in student laboratories on campus. Given the student population of approximately 10500, this gives a ratio of 12 users to a workstation.

- **PC's for staff**

The Computer Centre has one laboratory for staff with about 13 workstations. Staff also has access to departmental laboratories and some have their office computers connected to the Internet.

- **PC's in the Library**

There are about 20 workstations in the Main Library and 10 in the Medical Library. The computers in the Library are current with 128MB RAM, 20GB HD and 21 inch monitors.

- **Training laboratories**

The Computer Centre has a laboratory with 20 Internet ready computers that are used mainly for training purposes. Other equipment in the laboratory includes LCD projector, printing facilities, scanning equipment, software, photocopying, laminating and binding.

- **Internet Access**

The University of Zimbabwe as an institution is an Internet Service Provider (ISP) and pays lower rates than commercial services. The Internet access bandwidth was initially 512Kbps, upgraded to 2MB in March 2002. All laboratories in the Computer Centre have access to e-mail and the Internet. There are approximately 2100 workstations connected to the Internet in the whole university system. Currently, the University offers free and unlimited access to the Internet to both students and staff.

- **Campus Network**

A computer network is being installed on the main campus based on communication via fibre optic technology. The Campus Wide Network aims to connect all faculties, departments and Institutions. The network will extend to the Medical School, 8km off the main campus via a high-speed communication link.

The University of Zimbabwe can be accessed on the Internet on: <http://uzlibsys.uz.ac.zw/>

1.2.2 University of Zululand

The University of Zululand is situated about 142km north of Durban and 19km south of Empangeni off the N2 National Road on the Kwa-Zulu Natal north coast (University of

Zululand 2002). The University was established in 1959 in accordance with the Extension of University Act of 1959 (Act no. 45 of 1959), to provide higher education to people who belong to the Zulu national group. Actual operations began in 1960 with 41 students, 14 lecturers and two faculties of Arts and Education (University of Zululand 1999:1). It was officially opened in 1961 as the University College of the University of Zululand under the auspices of the University of South Africa obtaining full autonomy in 1970 in terms of the University of Zululand Act of 1969 (Act no. 43 of 1969). It became known as the University of Zululand (Zondi 1991:10). Other faculties established were Science (1961), Law (1964), Commerce and Administration (Economics and Political Science) and Theology (1971).

Established in 1960, the University of Zululand Library has grown from an initial collection of +6000 (University of Zululand Calendar, 1978 as cited by Biyela 1988:39) to the current 250 000 volumes. The new library building, officially opened in 1987 consists of 7 levels, 4 are upper levels, ground and 2 basement levels. There is a staff complement of 33 of which 13 are professional librarians including subject librarians (Annual report 2000). The library is fully automated using the URICA Integrated system with recent developments of a Web-based Online Public Access Catalogue (OPAC) and provides access to on-line databases via Sabinet, Nexus and EBSCOhost. The library can be accessed on: <http://www.uzulu.ac.za/library>

1.2.2.1 Facilities at the University of Zululand Networks

The University of Zululand provides computer services to staff and students in different locations on campus. The Network Services Unit is responsible for the overall computing services, which include computer laboratories, Internet access and network infrastructure. The University also has a strategic partnership with Hewlett Packard (South Africa) established in 2000 with the donation of equipment for two labs with Pentium III500, 64MB RAM 19 inch monitors computers plus a server room containing NetServer LH4, two NetServer E60s and a management server (University of Zululand, 2000, NSU news, Para 2).

- Student laboratories

The university has approximately 350 workstations in 5 student laboratories ranging in size from 20 to 150 workstations with a projected expansion of 100-150 machines in 4 laboratories in the library (University of Zululand, 2000, 10 FAQ's about UNIZUL Website, Para 1). The capacities of each laboratory are given in table one below.

LOCATION	SEATS	Workstation Configuration	Other facilities
New PC Lab room 1	152	Celeron 300 32 MB RAM 2.1 GB HD 14" SVGA monitor Windows NT4.0 workstation	Data projector with simultaneous display on two projection screens, wireless microphone system, white board
New PC lab room 2	40	HP Vectra PIII500 64MB RAM 6.4GB HD 19" monitor Windows NT4.0 workstation	Data projector, white board
New PC lab room 3	52	HP Vectra PIII500 64MB RAM 6.4GB HD 19" monitor Windows NT4.0 workstation	Data projector, whiteboard
Library Basement	64	Pentium 133 32MB RAM 2.1 GB HD 14' SVGA monitor Windows NT4.0 workstation	Data projector, whiteboard
D-Block lab	20	Celeron 300 32 MB RAM 2.1 GB HD 14" SVGA monitor Windows NT4.0 workstation	Whiteboard only

Table 1 University of Zululand students' laboratory facilities

Source: <http://www.uznet.uzulu.ac.za/layout/NSU/facilities.html>

- Staff laboratories

The academic and administrative staff at the University uses approximately 500 PC's connected to the campus network. Machines range from 486 to the current.

- **Internet Access**

The university has a 128Kbps access to the Internet via the TENET/Uninet hub router located at the University of Natal. This is due to be replaced with a 786Kbps access to the TENEX/SAIX backbone (University of Zululand, 2000, NSU facilities, Para 2). All computers have access to the Internet, but not all users have access to the Internet. All staff members have own e-mail address and access to the Internet. While all students have access to e-mail address, access to the Internet is limited. Access for students is subject to usage quotas based on traffic volumes and time of day discounts. Students are given a usage quota per registered module that requires use of the Internet (University of Zululand, 2000, NSU facilities, Para 3). The university has plans to introduce a pre-paid “pay as you go” system for students wishing to have additional Internet access above their academic requirements.

- **Servers**

The university has several servers for students and staff and for specific functions. This means that if one server is down, other functions are not disrupted.

- **Campus Network**

The campus wide network is currently being re-designed with a standard fast ethernet switched backbone feeding to departmental level 10 base-T hubs. The network runs on fibre optic cables.

- **Future plans**

While the issue of providing network connections to student hostels have been discussed, the university recognises that not many students have access to their own computers. The university considers providing dial-up access from the hostels via the University switchboard. This was, however, not in the immediate plans. (University of Zululand, 2000, 10 FAQ's about UNIZUL Website, Question 9).

1.3 Statement of the problem

Ten years ago few academics anywhere in the world walked into an office with an institutionally provided computer sitting on their desk, let alone one connected to countless millions of potential information sources and resources (Applebee, Clayton,

Pascoe and Bruce 2000:141). Life was undoubtedly simpler for academics in the “good old days” for research practice it was clear where to go and find literature: the library. Life was simpler for libraries too, which could think in terms of “holdings” for the particular disciplines and of their constituencies (Lally 2001:80). These two quotations above illustrate scholarly traditions and technological change. To the academics, computers are increasingly becoming part of teaching resources, for communicating via e-mail and to access electronic information resources. For the librarians and other information professionals, what are the implications for the anticipated change in information use by academic users including students? The Internet has changed the way information is created and disseminated and the library will no longer remain as the only place where information can be sought. Information sources are no longer confined to the library nor will the library remain a holding place. Resources can now be accessed remotely from different locations and in different formats. Problems are bound to arise with these changes, with some users readily accepting the new technological changes and others resisting. The extent of use of these resources differs among institutions and this study seeks to establish how both students and academics in the two institutions under study are using the Internet as a source of research. The University of Zimbabwe was chosen for comparison with the University of Zululand due to work and study experiences of the researcher. The researcher works for the former and undertook the study at the latter institution. Geographically, the two institutions differ and so is their level of economic development, which was considered to have some influence on the funding policies of the two institutions.

1.4 Motivation of the study

The researcher's interest in the subject of the Internet and electronic resources in libraries came as a result of participating in Internet and related workshops and projects at the University of Zimbabwe. The researcher is involved in the library automation project, digitisation of theses and abstracts, Subject Based Information Gateways projects and training both staff and students in the use of these information technology applications and resources. While the resources are potentially available, there is need to clearly understand how effectively and efficiently they are exploited. This study will help

evaluate projects made at the University of Zimbabwe and by way of comparison, also look at approaches taken by the University of Zululand.

1.5 Aim of the study

The aim of this study is to explore, and examine through a comparison, the use of the Internet for teaching and research by staff and students at the Universities of Zimbabwe and Zululand and to explore how their libraries can or should adapt to these changes.

1.6 Research objectives

In fulfilling the aim of the study, the following objectives were pursued:

- To determine the link between Internet use and academic discipline, e.g. Science, Engineering, Agriculture, Arts, Social Sciences, Medicine, etc.
- To determine the link between Internet use and level of study, e.g. undergraduate, post-graduate, etc.
- To determine the link between Internet use and status of faculty academics e.g. junior lecturer, lecturer, senior lecturer, professor, etc.
- To examine the level of Internet use by Librarians in the two institutions and its impact on students and academic users.
- To determine the general availability of electronic information in the two universities.
- To examine the information literacy programmes available in the two universities and how such programmes contribute towards Internet use and appreciation.
- To examine the Internet policies at the two universities.

1.7 Research questions

According to Friedrich (Generating and Developing Research Questions 2000, Para 2) a research question is an interrogative statement that asks, "What relation exists between two or more concepts or constructs?" He gives three criteria of a research question as follows:

- It expresses a relation between two or more concepts of constructs
- It is stated clearly and unambiguously in question form

- It implies possibilities of empirical testing.

This study seeks to answer the following research questions on Internet use by academics, students and librarians:

- Does academic discipline affect Internet use among students and academics?
- Does the level of study of students influence their frequency of use of the Internet?
- Does faculty status have any influence on Internet use?
- What Internet resources are mostly used by academics, students and library staff and for what purpose?
- What factors impede the effective use of Internet by students and academics?
- What can Librarians do to maximise the use of the Internet resources by students and academics?

The detailed questions are reflected in appendix A and B.

1.8 Significance of the study

The Internet has revolutionised library services and scholars, researchers and students can now access information in the many formats available. The University of Zimbabwe Library recently embarked on an automation exercise using the INNOPAC library management system. A Campus-Wide-Network project has been completed and it is hoped that the university community and outsiders will be able to access electronic resources in the library via the Internet. Parallel to the above developments, the University Library is currently participating in some regional and international projects on the use of electronic information, providing access to full-text databases and e-journals. These include the African Virtual University (AVU) digital library, EBSCO, the African Digital Library, the African Journal On-line, Internet Resources for Teaching and Research (link resources and Subject Based Information Gateways or SBIGs), Healthnet and the Database of African Theses and Dissertations (DATAD). The outcome of this study will help the two institutions in planning and improving the service delivery in libraries with regard to electronic resources. By knowing the patterns of Internet use, and

through recommendations the libraries in the two institutions will be in better position to provide their services more effectively.

The study will also be of significance to research, learning and teaching because it is expected that the academic community would be sensitised to the important role played by the Internet and electronic resources as sources of information. If academic administrators realise the importance of e-sources, it is hoped that more resources would be allocated to sustain them. According to Ashcroft (2002:178) if universities invest in these (electronic) resources sometimes at the expense of hard copies, it is vital that their users are aware of and utilise these resources in order to establish a return on investment. This study would then help contribute to the growing literature on Internet and academic research, more specifically in Africa where little has been written on the subject.

1.9 Scope and limitations

The research was limited to the Universities of Zimbabwe and Zululand. At the University of Zimbabwe, only the main campus and the Medical school was included in the research. The research excluded colleges of the university's recently established Chinhoyi and Masvingo degree programme campuses because some do not have Internet connection and are not directly linked to the Central Computing services at the main campus. The second reason for their exclusion is the distance from the main campus; Masvingo for example is 300 km from the main campus. At the University of Zululand, only the main campus at Ongoye was considered in the study. By not including all colleges and campuses, it was hoped that the population under study would be manageable in terms of size. The population was comprised of members of faculty, undergraduate and postgraduate students and professional librarians. The survey of academics cut across all teaching departments available in the locations discussed above.

The Internet is a broad subject that would be difficult to study in one research project. This study looks at the Internet from an information point of view, i.e. information sources and resources available on the Internet and their use for academic purposes. Resources like electronic journals, online databases, subject gateways and services like e-mail, the web, and telnet were investigated in the academic context. The researcher

cannot claim to be an Internet expert, but has experience with the Internet from the users' point of view. Experiences with web designing have been mainly in providing content and evaluating links to include in the web pages.

Differences in the academic calendars of the two institutions have meant that the distribution of questionnaires and the research in general could not be done simultaneously in the two institutions. The academic year at the University of Zimbabwe runs from August to June, while the University of Zululand runs from February to December.

1.10 Definition of terms

- Academics refer to the teaching and research members of the university community, from the level of junior lecturer to professor.
- Electronic resources refer to information resources available in electronic format.
- Electronic journals are those journals accessed electronically via the Internet.
- 'Information literacy' can be defined as the ability to access, evaluate and use information from a variety of formal and informal sources (Behrens, Olen and Machet (1999:16).
- Internet' refers to the worldwide collection of networks and gateways that use the same TCP/IP suite of protocols to communicate with one another (*Microsoft press computer users dictionary* 1998:190).
- ISP acronym for Internet Service Provider refers to a business that supplies Internet connectivity services to individuals, businesses and other organisations (Internet refers to the world-wide collection of networks and gateways that use the same TCP/IP suite of protocols to communicate with one another (*Microsoft press computer users dictionary* 1998:196).
- Postgraduate students refer to the category of students who have obtained a first degree and are working towards a postgraduate Diploma, an Honours degree, a Masters degree or a Doctoral degree.

- ‘Scholarly’ and ‘academic’ mainly refers to research, writing and ideas produced at universities and colleges by faculty members. This may be extended to include graduate students and other researchers affiliated to non-academic institutions.
- Software refers to computer programs; instructions that make hardware work.
- Subject based information gateways (SBIGs) are Internet-based services designed to help users locate high quality information that is available on the Internet. They are quality controlled and are built by subject and information specialists (Place1999 International collaboration on Internet subject gateways, Para 6).
- Undergraduate students refer to the category of students who are still working towards attaining their first degree.

1.11 Dissemination of results

According to Ocholla (1999:141) possession of information without dissemination is useless and that research is not complete until it is disseminated. Results of this study will be disseminated through the libraries of the two institutions by making copies available in their respective theses collections. Results will also be disseminated through seminars, conferences, and internal workshops. In order to reach a much more wider audience, it is intend that the findings will be published in major journals.

1.12 Structure of the dissertation

Preliminaries

Chapter one	<p>Introduction</p> <p>This covers the introduction and conceptual setting, statement of the problem, motivation of the study, aim and objectives of the study, significance of the study, hypotheses and definition of terms.</p>
Chapter two	<p>Literature review</p> <p>Chapter two covers literature reviewed from books, journal articles and Internet resources. Literature was reviewed according to each category of users, i.e. academics, students and librarians.</p>

Chapter three	Research methodology This chapter looks at how the research was carried out and covers sections on the research method, study population, data collection techniques, validity and reliability, pilot study, data collection procedures, and data analysis.
Chapter 4	Presentation and analysis of findings: academics and students This chapter presents an analysis of data from the questionnaires distributed to students and academics.
Chapter 5	Analysis and interpretation of data: librarians This chapter provides an analysis of data from the questionnaires distributed to librarians.
Chapter 6	Discussion of findings This chapter discusses the results of findings from Chapter 4, which looked at responses from academics and students, and Chapter 5, which looked at responses from librarians.
Chapter 7	Summary, recommendations and conclusion This last chapter provides the summary, recommendations and conclusions based on the research findings.

Appendices

References

1.13 Summary

This chapter has covered the introduction and conceptual setting and the contextual setting in which background information on the two universities were discussed including the level in infrastructural development and connectivity. Other topics covered include the statement of the problem, motivation of the study, aim of the study, research objectives and research questions, significance of the study, scope and limitations and definition of terms. This study was not technical in detail, but presented Internet use from an information point of view, i.e. use of Internet information resources as they apply to research, teaching and learning. Literature has shown that studies from Africa on this topic are few, it is hoped that this study will contribute towards filling this gap.

The next chapter looks at literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

A literature review is based on the assumption that knowledge accumulates and that we learn from and build on what others have done (Neuman 2000:445). The author identifies four goals of a literature review, which are:

- To demonstrate a familiarity with a body of knowledge and establish credibility.
- To show the path of prior research and how a current project is linked to it.
- To integrate and summarise what is known in an area.
- To learn from others and stimulate new ideas.

This chapter provides a conceptual framework and a review of related studies. Factors influencing Internet use and evaluation of Internet resources are also discussed.

2.2 Conceptual framework

Concepts are ideas expressed as symbols or definitions (Neuman 2000). The Internet as a concept has been dealt with in part, in Chapter one. What follows is an analysis of Internet related concepts. By providing specific meaning to terms and conceptual definitions ambiguity or vagueness is avoided in the course of the research. The purpose is to elucidate and bring specific meaning to terms as they are used in this research.

2.2.1 Internet based electronic resources

The term Internet-based electronic resources or e-sources can be broadly defined to include sources that are available via web browsers, file transfer protocol (ftp), gopher, telnet, mailing list, electronic mail (e-mail), and other network tools or protocols which could be self publications or electronic journal articles (Zhang 2001:629). According to Bell (1997) electronic information embraces information technology (IT), electronic publishing; digital, virtual or electronic libraries; bibliographic and full-text data

(including journals) in electronic forms; Online Public Access Catalogues (OPACs); World Wide Web pages and discussion lists.

Text resources that are available on the Internet include dictionaries, encyclopaedias, thesauruses, glossaries and other reference works. Resources range in quality, from low to very high. While some of them are free, for example Encyclopaedia Britannica <http://www.britannica.com>, many of the best resources on the web require subscriptions (Perry and Schneider 1999:WEB 5.26). Some full-text copies of works that are no longer under copyright are examples of quality resources. A more detailed criterion of evaluating Internet based electronic resources is explained in section 2.4 of this chapter.

Electronic information is available in different formats or file types. Format is the arrangement of data within a document file that typically permits the document to be ready or written by a certain application (Microsoft press computer users' dictionary: 149). ASCII format is the plain text or text only file. Web documents are presented in Hypertext Mark-up Language or HTML. Images on the web are available as GIF or JPEG. GIF, which stands for Graphics Interchange Format, allows for compressing small or medium sized files and can store up to 256 colours. JPEG, which stands for Joint Photographic Experts Group, is a newer format that stores more than 16 million colours. The MIDI format, i.e. Musical Instrument Digital Interface is used in controlling devices that create and read musical information. Streaming transmission is a new technique used to transmit both sound and video files. Audio files are transmitted using the WAVE format (Perry and Schneider 1999).

2.2.2 Internet services

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

- **Electronic mail (e-mail)**

Electronic mail may mean short text messages sent between individuals, but it is also used to define the electronic distribution of complete documents, composed of text, data,

images and other forms of information (Dewey 1989:2). Electronic mail messages are generally delivered in a matter of seconds regardless of the geographical location of the receiver. An e-mail message can be sent to an individual or to many e-mail addresses or individuals simultaneously. The history of the e-mail can be traced back to 1972, when an ARPANET researcher, Ray Tomlison wrote the first programme that could send and receive messages over the net (Perry and Schneider 1999). Today the e-mail is used to communicate in business and across fields and is the most popular feature of the Internet. Its impact as source of research and teaching is explained in section 2.3 of this chapter.

- Telnet

Telnet is an Internet service that allows users to connect from their system to a remote electronic system (Diaz 1994:7). Once connected, one's computer becomes a terminal in that system. It also allows users to login into their accounts from remote locations. Services available via telnet include remote databases, information servers and Online Public Access Catalogues (OPACS), for example Library of Congress catalogue. Telnet connections or logins present problems when the remote server is down because then one cannot connect to that server. The advent of the World Wide Web has led to a reduction in usage of some of the services.

- File Transfer Protocol (FTP)

FTP or file transfer protocol is one of the several services built in and supported by the Internet suite protocols. It is the programme of transferring files from one computer that is connected to the Internet to another computer that is connected to the Internet (Perry and Schneider 1999:WEB 6.2). FTP allows for transfer of large documents, software and other multimedia information sources like images, maps and sound.

- Listservs

Listserv lists are electronic discussion lists that are supported by a special software application called LISTSERV. It facilitates one-to-many communication and is also a general-purpose file server (Benson, 1995:195). Listservs have been formed on a wide variety of special topics which users subscribe to, for example there are listservs for

music interest, and for groups interested in specific software programmes e.g. INNOPAC, CDS-ISIS, or simply cataloguers sharing their experiences over the Internet. Messages sent to the list are redistributed simultaneously to all subscribers on the list.

- News Groups

The news feature is like a huge bulletin board on which people post messages and comments for others to react to and add further bits of information and insights (Leedy 1997:67). Although similar to a listserv, the major difference is that when one joins or subscribes, e-mail messages are not automatically deposited into one's account. One has to go to the news group to read the messages.

- Gopher

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

- Veronica

Acronym for Very Easy Rodent Oriented Netwide Index to Computerised Archives is a service that allows users to search all menu levels of Gopher sites (McGills 1994:25). Veronica was designed to search gopher sites as a whole without having to go into sites individually.

- World Wide Web (www, or web)

The World Wide Web is a subset of the computers on the Internet that are connected to each in a specific way that makes those computers and their contents easily accessible to all computers in that subset (Perry and Schneider 1999:WEB 1.4). According to Leedy (1997), the www is the most popular and fastest feature on the Internet and for most

people, the reason why they use the Internet. In the 1990's, the WWW quickly became the most used tool for accessing information via the Internet and there was a rapid explosion of materials which were being made available (Cooke 1999:12). The web is fairly easy to follow or use even to one with little or no computer background, mostly because of its 'point and click' navigation features.

Tim Berners-Lee developed the World Wide Web with the help of researchers at the European Laboratory for Particle Physics, (CERN) research laboratories in Switzerland. The main objective behind the CERN was to enable researchers and scientists to share data in a very easy way. This was done through the development of hypertext documents, described by Perry and Schneider (1999:HTML 1.5) as an electronic file that contains elements that one can select, usually by clicking a mouse to open another document. Hypertext allows one to navigate backwards and forwards within one document or to move from document to document by clicking links. The World Wide Web has two components. The web server, which is the computer that stores the web document that users access, and the web browser, which locates documents on the server anywhere in the world (Perry and Schneider 1999).

2.2.3 Internet browsers and search tools

2.2.3.1 Browsers

In order to access the Internet web, one needs a browser. The web browser is a software programme that accesses the web document and displays its contents on the user's computer (Perry and Schneider 1999:HTML). Browsers can either be text-based; for example Lynx browser found on UNIX machines or can be graphical. The most popular graphical browsers are Netscape navigator and Microsoft Internet Explorer and to a lesser degree now, Mosaic.

2.2.3.2 Search tools

Web search tools include search engines, meta-search engines, directories and other search resources.

- Search engines

Search engines are by far the largest and most frequently used tools for searching information on the web (Chowdhury and Chowdhury 2001:153). These vary in size, coverage of databases and functionality (Mettrop & Nieuwenhuysen 1999:329). A search engine searches in a single database at a time. Examples of search engines are Google, Excite, and Altavista. Search engines offer many advantages over traditional information services. Sue and Chen (1997:74) give among these advantages as: the ability to automatically gather, index and abstract documents from geographically dispersed servers; databases give access to millions of web pages and they include different data types such as bibliographic, full-text and multimedia information. However, search engines will not always retrieve relevant documents. Search engines index documents differently and use different syntax to retrieve data; i.e. commands vary across different search engines. The bigger the Internet, the more important becomes the role of World Wide Web search engines in retrieving information.

- Meta search engine

A meta search engine is a tool that combines the power of multiple search engines (Perry and Schneider 1999:WEB 4.13). A meta search engine searches several engines all at once. While this may be its major advantage, meta-searches tend to be less exhaustive in that the searches are posted to a number of engines within a short period and may not necessarily cover whole databases. Examples of meta search engines are Dogpile, Metacrawler and Metafind.

- Directory

A directory is a listing of hyperlinks to web pages that is organised into hierarchical categories (Perry and Schneider 1999:WEB 4.8). The difference between directories and search engines is that while search engines are machine indexed, directories are indexed by people, who select pages or links to include in the directory. Directories vary in terms of size and their approaches to organising information resources, and they provide much smaller search output than the major search engines (Chowdhury and Chowdhury 2001:153). Yahoo is one example of a web directory.

- **Subject Based Information Gateways (SBIGs)**

These are subject entrances (clearing houses) to quality assessed Internet resources. They are a catalogue of records that describe Internet resources and offer links to the resources (Belgum and Jean 1999). They are also known as virtual libraries, gateways, digital collections, cyber libraries, and so on (Bradley, as cited in Chowdhury and Chowdhury 2001:50). Subject gateways are quality controlled and are often constructed by information specialists or librarians. SBIGs may also refer to subject portals. Examples of European initiatives are: SOSIG (Social Sciences), EEVIL (Engineering), OMNI (Biomedical information), BIZ/ED (Business, Economics and Education), ADAM (Arts, design, architecture and media). More information on these projects can be found on <http://www.rdn.ac.uk>, <http://www.desire.org> or <http://www.inasp.org>. In subject gateways, each resource is described briefly and classified under a subject heading (Place 1999).

2.3 Related studies

Information as a concept has been defined variously and in different contexts. Davies gives two quotations from literature on the definition of information:

As some principle governing the human capacity to process fragments that are meaningless in isolation into a coherent and meaningful whole for the receiver and is extended to include all possible sources, and

As the process in which an informant's cognitive structures are encoded and transmitted to an information seeker, who perceives the coded messages, interprets them and learns from them. Davies (2000:56)

Kebede (2000:157) notes that information is understood or conceptualised as composed of content, and non-content in complementary fashion. Accordingly, content are the ideas or concepts, while non-content are the physical carrier or forms in which the ideas and concepts exist, which could be print or electronic. Mizzaro (1996:233) defines information as a pair representing the difference between two knowledge states, clarifying the distinction among data, knowledge and information. According to Mizzaro, the definition of information is subjective since it has been defined in various contexts.

2.3.1 Information seeking and information use

Several studies have been conducted under the topics of information seeking and information use in the Library and Information Science. Information facilities such as libraries, electronic and print resources exist to provide information to users as and when required. The effectiveness of such facilities depends on the extent to which their system characteristics correspond with the situation of the user and how much the potential user of these facilities is willing and able to make use of these facilities or services (Kunz, Rittel, Schwuchow 1976:9). In order to make users effectively exploit these resources, it is necessary that librarians or information scientists understand the information needs and information seeking behaviour of their users.

2.3.1.1 Information seeking and information need

Information need and information-seeking processes depend on tasks. The tasks impose information requirements that must be met if the task is to be completed (Kebede 2000:161). Mizzaro (1996:241) defines information need as when an individual does not possess the 'right' knowledge for solving a problem (or reach an aim) and thus need some additional information to reach an adequate knowledge state. Ingwersen, in Mizzaro (1996:241) proposes three fundamental types of information needs:

- Verification need (when the user knows the bibliographic data of the needed document)
- Conscious topical need (when the user needs information about a topic that he knows well)
- Muddled topical need (the user needs information about a topic he does not know very well)

Ingwersen (2000:206) notes that individual perceived needs may change regularly during searching especially where needs may be ill defined owing to lack of appropriate background knowledge. This necessitates re-examining search strategies and in the cases of web searching may be as a result of following new links or hyperlinks emerging in the document during searching. Information seeking and information need are hence assumed to be a dynamic process of cognition by the individual searcher in which the retrieval system, the intermediary functionality and the socio-organisational situation are

the crucial components of the contextual process (Ingwersen 2000:206). Applicable to the current research, the Internet as a source and the computers, search tools and the resources become the crucial components.

In order to look at the Internet as a resource of academic research, teaching and learning, and the implications on the different users, the survey population has been classified according to their needs as follows:

- Academics
- Students
- Librarians (Information professionals).

2.3.2 Internet use

This section looks at Internet use by academics, students and librarians. Within each subgroup, the use and perceived importance of various Internet resources is discussed.

2.3.2.1 Internet use by academics

The circumstances of scholarly communication are changing as a result of advances in telecommunications, the advent of computer networks and the World Wide Web, the availability of digital libraries and the transition from print to electronic publishing (Borgman in Jacobs 2001:1122). Studies have focused on the Internet as a whole or on specific aspects with regard to scholarly communication, for example Lazinger, Bar-Ilan and Peritz (1997) looked only at e-mail use among academics. Studies have also been limited to specific geographical locations, for example Applebee, Clayton, Pascoe and Bruce (2000) looked at Australian academics while Voorbij (1999) surveyed Dutch academic users.

The purposes of using the Internet vary among users. Voorbij (1999) conducted a survey on searching scientific information on the Internet among students and academics in the Netherlands and the majority of members of the academic community (students and lecturers) were found to use the Internet for work and study purpose, while the majority of faculty assistants using the Internet were preparing dissertations. Researchers were

found to use the Internet more than faculty members. Applebee et al (2000) conducted a similar study on Australian academic use of the Internet. The study sought to identify frequency and use of Internet by academics within specified disciplines. They found that the Internet was used mostly for research, teaching, publication and community service. Lazinger, Bar-Ilan and Peritz (1997) also conducted a survey on Internet use by faculty members at the Hebrew University in Israel. The majority of respondents reported using the Internet in the conduct of their academic business. Zhang (2001) was more specific by surveying use of Internet based electronic resources by LIS scholars in USA. Again her study revealed a high usage of the Internet between library and Information scholars surveyed.

Variations exist in Internet use between and within disciplines. In the Dutch academic survey, Voorbij (1999) found significant differences in Internet use among disciplines of the respondents. The highest use by discipline was in Science followed by Social Sciences, with Humanities last. Lazinger, Bar-Ilan and Peritz (1997) made similar observations. Science reported a highest followed by Agriculture, Social Sciences and Humanities, in that order. The results were further analysed by status of faculty and their academic discipline. There were more lecturers in Science using the Internet compared to Humanities-Social Sciences group. Associate professors from Science used the Internet more than those in Humanities-Social Sciences group. The same pattern emerged with more professors in Science using the Internet compared to those in Humanities/Social Sciences category. Lally (2001) concurs with the above observations and adds that the advent of the Internet has had rapid impact on Science based disciplines where academics are more familiar with the technology, while academics in Humanities and Social Sciences have been slower to take up the new technology.

Ocholla (1999) looked at the information-seeking behaviour of academics in relation to productivity of academics in South African universities with particular reference to the University of Zululand. Among the stated aims of the study was to identify the type of information resources frequently used by academics by discipline. A list of 34 information sources was provided from which academics were to choose 10 in order of

priority. The author concluded that academic discipline and status determined academic information seeking behaviour. The study revealed that journals, dissertations and theses, conference literature and research reports were highly used. Theology rated the Internet (100%) as an important source together with journals and books. Unlike in other literature reviewed, this is one situation where a non-Science discipline has placed high importance on Internet resources. The study also indicated that there was significant use of the Internet in providing information on a given topic; gain knowledge on the existence of information sources and for correspondence.

Given the Internet use patterns described above, it would be interesting to observe how long the respondents above had been using the Internet. . The impact of length of time on Internet use was investigated by Kaminar (1997) cited in Zhang (2001:630). Kaminar established that long-time Internet users were not necessarily those who were using a larger number of network services intensively but individuals with a higher perceived Internet expertise tended to use a wider variety of network services in a more intensive way. Kaminar also adds that Internet use is related to how useful individuals perceive the network to be. Voorbij (1999), found that the majority of respondents surveyed had more than one-year experience using the Internet, of which 30% of actual users had less than one year of Internet use. The majority of respondents in Lazinger, Bar-Ilan, and Peritz (1997) also indicated having more than one-year experience of Internet use.

Literature reviewed shows that academics were using Internet services differently both by status and when results were analysed by discipline. E-mail was the most popular service. According to Klobas & Clyde (2001), there are currently more than three billion messages passing through the Internet every day. Zhang (2001), in her study found that the majority used e-mail both at work and home with more use in the former. Voorbij (1999) found that 80% of respondents in his study used the e-mail mostly to participate in discussion groups while Applebee et al (2000) had different results from others that have been reviewed in this chapter. E-mail was not used extensively by Australian academics with the majority averaging once a week to communicate with colleagues on different campuses. For those who used e-mail, it was found most useful for research, teaching and

publication. Lazinger, Bar-Ilan, and Peritz (1997) analysed how academics at Hebrew University were using the e-mail by discipline. Both faculties of Humanities and Social Sciences (HumSoc) and Science and Agriculture (ScieAgr) were found to use e-mail extensively for research purposes. In the social use category, Humanities and Social Sciences were also found to use e-mail more than Science and Agriculture while interdepartmental use and correspondence was low in both groups. On time spent on e-mail by academic discipline, Humanities and Social Sciences were found to spend more time on the Internet than Science and Agriculture. Applebee et al (2000), found that academics in Management, Administration and Commerce were more frequent international users of e-mail while those in Science used it more for research and publishing. Arts and Humanities communicated more with professional colleagues. When e-mail use was analysed using other variables, Lazinger, Bar-Ilan, and Peritz et al (1997) found that although the majority of faculty used computer mediated communication, younger faculty members and female faculty members made significant high use of the service. Other studies that have looked at e-mail use among academics include Bell (1996), Bane & Milheim (1995) and Lally (2001) with results showing no significant differences from surveys discussed above

Search engines were reportedly being used in studies by Zhang (2001), Kibirige and DePalo (1999), primarily as starting and points to get electronic resources via the Internet. In the Dutch academic survey, Google and Yahoo were the most popular. The web provides a lot of information some of which is of no significance to academics. The web can be used to search factual information to more general topics and keeping abreast of new developments in one's own discipline. Quoting one academic respondent Voorbij (1999:604) wrote 'there is a huge amount of information on the Internet, a simple search retrieves hundreds of hits, 99% of which are useless.' Among Dutch academics surveyed, the web was reported to be most useful for research, personal use and teaching. Correlation was observed between perception of skill among academics in Australia and perceived usefulness of the web in teaching, research and publication.

The scholarly journal has served as the primary medium of scholarly communication among scientists and scholars for more than three centuries and has remained essentially the same in form and function since its inception (Harter 1998:507). While the function has indeed remained the same, i.e. to communicate research, the format of the scholarly journal is changing. As Zhang (2001:628) observes, the Internet and related new technologies have had a great impact on scholarly communities. They are changing the ways in which scholars seek information, communicate with each other, conduct research and distribute research results. Electronically available scholarly journals of outstanding quality are increasingly being made available via the Internet (van der Walt 1995:56). The author goes further to point out that the scientific value of these journals indicates that the scholarly community can no longer ignore their existence. Studies by Bell (1997), Voorbij (1999), Harter (1998), Harter and Kim (1996), note that the impact of electronic journals among academics was still low possibly due to the reserved attitudes towards publishing on the Internet. Zhang (2001:629) writing on the reasons of non-acceptance of electronic journals points out that, understanding of the influence of electronic journals on scholarship is still not well developed, and at this stage, from available research it is difficult to determine if the majority of scholars are really interested in electronic publishing. Bell (1997:12) concurs with this view that more authors will have to view e-journals as legitimate publication vehicles before e-journals can assume a significant role in scholarly communication.

2.3.2.2 Internet use by students

Computer use by students and how it affects their Internet usage is widely discussed. Computers are increasingly becoming part of the education system and information management process. Students have different levels of Internet use; some use computers and the Internet more because their course modules require them to do so, while others do so for leisure and other purposes. Studies by Ray and Day (1998) show that students are increasingly expected to use electronic resources while at university. According to Kibirige and DePalo (2000), computers and electronic resources have accentuated the undergraduate's mesmerization process in the seeking process. In order to effectively utilise this growing range of electronic resources, students must acquire and practise the

skills necessary (Ray and Day 1998). Information skills training thus becomes a necessity aimed at all users and potential users. Users will have varying abilities and as Ashcroft (2002:177) explains the process is unpredictable in terms of traditional hierarchy of learning, some undergraduates have high information technology skills while some senior academics prefer to keep computer use to a strict minimum. How then have students learnt or are learning to use the Internet and its related resources? Ray and Day (1998) in their survey found out that the majority of students had learnt to use the Internet through trial and error. An equally high number had also learnt from fellow students. Instruction from library staff, self taught and external courses were the other means cited. The authors concluded that if academics promoted the use of electronic resources, this would increase students' attitudes towards acquiring better skills.

Having considered the importance of computers and the Internet to students, it is important to consider how they access these facilities in their institutions. Access as already defined above is in two aspects, the physical availability of computer hardware and software, and the number of points from where individuals can make use of these resources. Studies by Ray and Day (1998), and Perry, Perry and Hosack-Curlin (1998) have shown that in most cases, students have access to computers and network connections within academic institutions, with a lesser percentage having its own access. Perry, Perry and Hosluck-Curlin (1998)'s study was, however, unique in that it further explored computer access and age of the student. The study revealed that more senior students had their own computers than their junior counterparts. There was also evidence of student sharing personal computers besides using those provided by the institutions. Students had, therefore, more than one point of accessing computer services. Liew, Foo and Chennupati (2000) had a 100% access rate in their study on electronic journals and graduate students.

Electronic mail is by far the most popular service used by students on the Internet. Peer correspondents and communication with lecturers were among the uses cited. However Jefferies and Hussain (1998) found out that where students sent messages to lecturers via e-mail, they usually made a follow-up with the lecturer to check if the message was

received. Students in the literature reviewed also used electronic journals. Studies by Perry, Perry and Hosack-Curlin (1998) sought to identify three issues with regard to journal use by graduate students at Nanyang University in Singapore. These were usage of journals, preferred format and expectations. The majority of students had used electronic journals, including the electronic versions of print journals. Unlike in other literature reviewed in this chapter, this is one survey where distinction has been made between electronic journals and the electronic version of print journals, which many libraries are already subscribing to. The majority of students were found to have a higher preference for electronic medium over print format. Compared to other studies on electronic journals among academics (Harter and Kim 1996, Zhang 2001), this seems to confirm that although electronic journal use is comparatively low, there is a significant recognition and importance placed on them. Electronic resources and e-journals in particular are favoured because of their ability to provide hyperlinks to additional related information that is usually current. Ray and Day (1998) concluded that functionality of an electronic journal was of paramount importance to students while organisation and presentation were of secondary importance.

The OPACs provide records of library holdings and their physical locations and it would be expected that they be used more frequently for such purposes. However, two studies reviewed show variations on this. Liew, Foo and Chennupati (2000) found out that the majority of students used the OPAC, while Ray and Day (1998), on the other hand, had 46% of students surveyed using the OPAC. The results were not satisfactory to the authors because they felt that the students could not understand the meaning of OPAC and that if this had been explained, different results would perhaps have emerged.

2.3.2.3 Internet use by librarians

The Internet has affected library activities and changed the ways in which librarians operate. Information sources are becoming more available in other formats other than the traditional print medium like CD-ROM, Online databases, and multi-media and electronically via the Internet. According to Edwards and Walton (2000), these changes have seen libraries move from being holdings of information sources in-house, to

electronic access to remote sources. Saeed, Asghar, Anwar & Ramzan (2000) provide the following summary of services available to librarians via the Internet; reference, cataloguing, classification, document delivery services, access to online databases and journals, electronic mail and online public access catalogue (OPACs). According to Chisenga (1996:111) the principal objective of academic and research libraries is to provide information services that would support the academic and research programs of their parent institutions. Inadequate library and information facilities negatively affect research and teaching. The author observes that the Internet has given library and information professionals opportunities to access information from remote databases and has enabled them to share resources. This has in turn helped them improve their service delivery to their clientele. Chisenga (1996:111) observes that libraries were using the Internet for the following purposes:

- Electronic communication purposes

Use has been mainly in interlibrary loan requests, sending orders for new acquisition, receiving and responding to reference questions from users and participating in discussion groups especially professional association like IFLA.

- Collection development activities

Publishers are increasingly advertising on the Internet and libraries are using such data more and more compared to the publishers' catalogues. Ordering can thus be done electronically.

- Access to Library catalogues

Librarians are able to access remote catalogues for Inter-library loan purposes and to help them in their cataloguing and classification. The researcher as Head of Cataloguing finds this particularly true because the majority of new entries to the university catalogues are downloaded from other libraries with classification relying mostly on the Library of Congress catalogues.

- Access to remote electronic databases

Libraries access remote databases through subscriptions or to those available free of charge like Medline.

- Electronic publishing

Libraries and other institutions are setting up web sites to broadcast their services and facilities. This includes library hours, rules and regulations and staff lists.

- Provision of reference services

By accessing information from different web sites available over the Internet, librarians are able to answer specific reference questions. Dictionaries, thesauruses, atlases, and encyclopaedias are available on the Internet to help with reference. Some are even available at no cost e.g. <http://www.dictionaries.com>, <http://www.thesaurus.com> /

Ashcroft and McIvor (2001) view the role of the librarian as changing with the advent of the Internet and in particular the electronic journal. Job title changes have already been implemented in some libraries for serials librarian. City University Library (UK) has changed job title to Electronic Information Systems Manager and the University of London library has changed to Electronic Library Project Officer. Both jobs required among other qualifications, experience in information networks. Rusch-Feja (1996) predicted the changing roles of librarians and job titles from being simply librarians to Network specialists and System designers. The above examples confirm what has already emerged in surveys on the need for librarians to embrace more computer technical skills in order to meet new challenges in their work environments. Voorbij (1999), Lazinger, Bar-Ilan, and Peritz (1997), Applebee et al (2000), Zhang (2001) have shown that with the advent of new technologies in libraries, librarians have or will assume the role of trainers. The information seeking behaviours of users are bound to change and librarians have to train users on how to use the new resources. Bruce and Clayton (1999:171) view librarians as stakeholders in the development of new technologies that are well positioned to exploit benefits of new information networks. Once they become trainers, they help academics become better Internet users and bring recognition to themselves and the profession. Elder and Miller (1998:34) concur by adding that while the information superhighway offers new opportunities for independent researched study, the amount of information requires those using it to have a high level of information skills. Such skills may include instructing users in the use of search and retrieval tools.

Studies have been conducted on the impact the Internet has had on the services provided by libraries and how librarians have responded to it. Kaniki (1999) looked at Internet use and training needs of staff of the eastern seaboard Association of Libraries (eSAL) consortium, KwaZulu-Natal. The author examined the awareness of Internet usage among academic professional librarians of the Universities of Durban Westville, Natal and Zululand of KwaZulu Natal province. He points out that although academics may not be fully aware of the full potential they can derive from the Internet, they are, however, becoming aware of the Internet through the publicity it is getting in the media. This will eventually bring pressure on academic libraries in South Africa to provide Internet based information services. Kaniki's studies focused on Internet usage by information professionals. Although focusing on a specific province of South Africa, by comparing Historically Advantaged Institutions (HAI's) and Historically Disadvantaged Institutions (HDI's), the studies help establish the usage in South African universities in general.

Abdoulaye and Majid (2000) conducted a survey on the use of the Internet among forty reference librarians in Malaysian academic libraries, while Saeed, Asghar, Anwar and Ramza (2000) surveyed Internet use in university libraries in Pakistan. These studies highlight the issues of skills and access among librarians. Half of the libraries surveyed in the Pakistan study did not have access to computers and Internet connections, with some libraries having only one terminal. Computer skills ranged from good to excellent in the Malaysian study while library staff provided 96% of technical support in the Pakistan study. This ability to attend to technical problems could be the result of librarians having the technical skills or provision of IT personnel in the library structure who are always at hand to attend to problems.

E-mail was considered a positive development among librarians in the study by Garoufallou (1999), for it had facilitated and enhanced the exchange of professional knowledge, communication and awareness with colleagues around the world. Participation in subject-based listservs was listed as one of uses of e-mail. Use of e-mail among librarians was also popular among Pakistan librarians.

The www was also found to be the most used facility on the Internet by Greek academic librarians. This was attributed to the development of modern web browsers like Netscape that have made navigating the Internet much easier than before. The ability to provide hyperlinks was also mentioned as an influencing factor. Unlike in the other surveys on Internet use by librarians, Garoufallou's survey (ibid) highlighted the participation of librarians in the building of Internet web pages. Librarians were involved in writing contents and collection of links that were incorporated in the web pages.

The use of electronic journals among librarians was not evident in the literature reviewed. However, examples are drawn for the Greek study, which was more comprehensive in its approach. There is a very high non-use of electronic journals, news and newsletters among Greek librarians, (62%). As in the academic surveys discussed above, Greek librarians did not believe in the importance of electronic journals compared to the print version. Among the reasons for their non-use was language barrier; there are few Greek e-journals, and most titles are in English. Lack of training among librarians and lack of will for continuous personal awareness was also sighted. Like in the study by Saeed, Asghar, Anwar and Ramzan (2000), lack of money to buy equipment and lack of staff to train on the use of new technologies were some of the problems affecting Greek academic librarians. Garoufallou (1999) concludes that there is a positive attitude by librarians toward electronic information.

Olson (1995:188) in an earlier survey on Australian academic libraries had found very little use of FTP among librarians. Garoufallou (1999:307) writing four years later found that FTP and telnet were popular among surveyed librarians at 78% and 66% respectively. Similar observations were made in Saeed, Asghar, Anwar and Ramzan (2000) in which FTP and telnet were used in five libraries in their study.

While the extent and purpose of use of services was not obvious in some studies, Abdoulaye and Majid (2000) revealed that the Internet was used more for reference followed by collection development and technical services, which incorporates cataloguing.

2.3.3 Factors influencing Internet use

The use of the Internet as a research tool has been seen as a positive development as shown in the previous section of this chapter. This section looks at factors affecting use of the Internet by academics, students and librarians.

2.3.3.1 Accessibility

The importance of access to information has been a concern emerging from the literature reviewed in this chapter. Studies by Voorbij (1999), Bell (1997), Perry, Perry and Hosack-Curlin (1998), Applebee et al (2000) and Zhang (2001) have looked at how access affects use of different Internet resources. The following is a summary of the access types as they impact on use of electronic resources.

- In order to use the Internet, one needs to have access to a network connection and hardware. Connection can be through dial-up, dedicated line or satellite. Poor telecommunication services may affect negatively the use of the Internet. Time is lost while trying to connect as well as downloading. Lack of computers also affects the delivery of Internet services, as this is a basic requirement. Where people have inadequate hardware resources, they may not feel the need to use that service.
- Number of access points available to the individual affects their frequency of use of the Internet. As already indicated in the literature reviewed, some users had access in their academic environment, at home and in the public library.
- Access to the right software affects how users view documents. File formats are changing and software upgrades become necessary on regular basis. Documents maybe pdf, jpeg, or require frames to view. Where appropriate software is not available, this may affect the extent to which users may view a document.
- User registration and complicated logins are common occurrences when using the Internet. These apply to services where one has to pay to use, as well as those that are free like yahoo mail, hotmail and other free databases.

2.3.3.2 Special knowledge and technical skills

In order to use computers and the Internet effectively, it is essential that one be computer literate. Computer skills are necessary for one to use the keyboard and related functions

and increase one's speed especially where there are time restrictions on terminal use. Training is, therefore, necessary if users are to effectively use resources because raising computer literacy could stimulate use. According to Applebee et al (2000), where an academic considers himself/herself a beginner, competent user or expert, it has some bearing on the perception that the academic has on usefulness of Internet services for a particular role. For librarians, required knowledge of databases and other online resources, retrieval languages and skills are important if they are to help users to effectively use electronic resources. In a study by Garoufallou (1999), librarians indicated that they participated in web designing and evaluating sources for inclusion in the local library web pages. In smaller institutions, librarians may be required to maintain the web server, and produce web pages for the whole institution. According to Ford, Moss and Miller (2001:1049) we urgently need to increase our knowledge of factors that influence the effectiveness of Internet based information seeking, knowledge of more fundamental and enduring factors that can help us improve people's Internet retrieval in depth and lasting. Scholars with a higher perceived ability to use the Internet tend to use electronic resources more and frequency of use of resources is affected by ability to use the Internet. As shown from the study by Abdoulaye and Majid (2000), reference librarians with higher computer skills tended to use the Internet more frequently.

2.3.3.3 Quality of electronic resources

The quality of electronic information is a major concern among Internet users. According to Kibirige and DePalo (2000) five basic elements are often required in the electronic resources that academic information seekers desire: accessibility, timeliness, readability, relevance and authority. The Internet excels in the first three, but depending on where the information is gathered, it may not be so reliable when it comes to the last two. The content of any information resource should be accurate, consistent and authoritative. Self-publishing is prevalent on the web. There is no quality control and the accuracy of data depends on the author. Lack of peer-review is sighted by academics as a reason for non-use and for not publishing electronically. Academics believe it is stricter in print journals than in e-resources. There is, however, a further argument that the peer-review process can be exported to electronic environments. According to Zhang (2001) having

authorities publish high quality articles on the Internet might boost the confidence of other potential Internet publishers.

2.3.3.4 Organisation of e-resources

Concerns about the difficulty of finding information on the Internet cannot be over emphasised with scholars calling for the organisation of e-resources. These initiatives have been taken and are in progress with projects like Electronic Library (eLib), Digital Library (dLib), RDN, INASP that have undertaken to create subject based gateways of Internet resources. The use of search engines present problems because search engines do not cover all web pages hence the differences in results. This might be the case because documents change and deleted materials may appear as available.

2.3.3.5 Ephemeral and migratory nature of e-resources

Taylor (1999) in Zhang (2001:645) writes that it has been estimated by a number of Internet specialists that a web year is six to nine weeks. One of the uses of scholarly publications is to disseminate knowledge and for others to make reference to what has been published in their respective disciplines. Lack of permanence is a major disadvantage of electronic resources. Documents maybe moved across servers and will require pointers to the new locations. Where this is not done, documents are simply lost on the Internet. "*Error 404, URL not found*" is a common occurrence among Internet users where the location of a document has moved and is no longer available on a given site. These changes make citing e-resources difficult.

2.3.3.6 Social norms

The introduction of the Internet as a new channel for scholarly communication poses challenges of rebuilding the order lines of scientific communication (Zhang 2001:631). Acceptance has been viewed as one of the reasons affecting implementation of change in organisations. People are not usually sure of how the new system will affect the status quo. Lancaster (1995) conducted a survey on the attitudes in academia towards feasibility of and desirability of networked scholarly publication. His major conclusion was that academic administrators did not consider the academic community well equipped to

undertake an enterprise of that kind and would not give it high priority in the allocation of university resources.

According to Ocholla (1999:121) academics are given tenure, are promoted to higher ranks, and are assigned to teach more advanced classes, receive salary increases, and boost their academic status and prestige because of research that reflects a high degree of information exploitation and use. Studies have shown that academics are reluctant to publish electronically because they are not sure if their institutions would recognise them for the purposes described by Ocholla above. Citing reasons for not publishing electronically, one lecturer quoted by Bell said “it is not advisable at the moment in my career to do that. I am still trying to publish in prestigious places” (Bell 1997:17). The other reason for lack of interest among academics was that there are too few titles available in some subject areas. One respondent in Voorbij (1999) retorted, “come to me when all my journals are available electronically.”

2.3.3.7 Academic discipline

Academic discipline is associated with significant variations in the extent to which academics find various Internet services useful (Applebee et al (2000). Disciplinary differences in both academics and students are evident from literature reviewed. Although literature reviewed did not indicate if there were inequalities in access among disciplines, in their study, Jefferies and Hussain (2000) cite the fact that students surveyed were all computer science majors and therefore, had unlimited access to both computers and the Internet.

2.3.3.8 Individual differences

According to Ford, Miller and Moss (2001:1049) different individuals seek and process information using very different strategies and that different strategies may be more or less effective for different people in different contexts. From literature reviewed, studies have shown how age for example affects Internet use or type of services used, e.g. Perry, Perry & Hosack-Curlin (2001) on email use and age, Zhang (2001) on gender and use of

search engines. Other individual differences discussed in literature include Internet use and experience, skills and individual perceptions on use.

2.4 Evaluating Internet information resources

The easy of publishing via the Internet has resulted in users being increasingly faced with an unimaginable quantity and variety of sources of potential interest to them (Cooke 1999: 7). This, according to the author has been due to advances in computer networking, which has resulted in many advantages in terms of accessing and dissemination information. Evaluation of Internet resources is necessary for academic and research purposes and helps to alleviate some of the shortcomings characteristic of Internet resources. This section focuses on providing criteria on which academics, students and librarians could use when evaluating resources.

2.4.1 Authority

The author or sources of information should show some evidence of being knowledgeable, reliable and truthful (Harris 1997). Factors to consider include biographical information about the author, which helps to shed light on the qualifications, experience and related publications. The author's position or current status, contact details such as email, postal address, phone are also important evidence to support the authoritativeness of documents found on the Internet. The domain name or originating URLs is also a pointer to the publisher of the document. For educational and research materials, .edu and .ac are used, e.g. <http://www.uzulu.ac.za> for the University of Zululand, and <http://library.albany.edu> for the University of Albany Libraries. Evidence of quality control involves information presented from organisations and peer-reviewed sources like books and journals (SOSIG 2002, Smith 1997, Kapoun 1997, Edwards 1998).

2.4.2 Accuracy

The Internet has become a prime marketing and advertising tool, it is advisable to look at the motivation the author has for placing the information on the net. The information must not reflect one-sided views that do not acknowledge opposing views or respond to

them as this is evidence of lack of accuracy (Harris 1997). The resource or document should show evidence of citations, i.e. bibliographies or references should be clearly indicated and traceable. Check for grammar and any spelling mistake (SOSIG 2002, Kapoun 1997, Phillips 2001).

2.4.3 Timeliness

According to Harris (1997), some work is timeless, like classical novels, philosophical works like *Plato* and *Aristotle*. Other works have a limited useful life because of advances in disciplines. Time sensitiveness should relate to frequency of update (SOSIG 2002). Technological information, science, medicine conference details, timetables are examples of information requiring frequent updating. It is important to check the date when the material was created and when it was last updated.

2.4.4 Uniqueness

It is important to verify if the material or resource is primary or secondary or shows any relationship to other works. It is also important to verify if the information or resource is available in other forms, e.g. CD-ROM or print. If the resource is derived from other formats, does it have all the features of the original (SOSIG 2002, Smith 1997)?

2.4.5 Comprehensiveness

Any source that presents conclusions or that claims to (explicitly or implicitly) give a full and rounded story should reflect the intentions of completeness and accuracy (Harris 1997). It is important that the work covers what it states to do. According to the SOSIG (2002) criteria, to judge comprehensiveness begins with the title is it informative? Is an abstract given and is there a purpose stated? The content page can help to evaluate depth of coverage.

2.4.6 Access

Some web documents require additional software in order for one to view the full document and any accompanying graphics or tables. According to Kapoun (1998), evaluate how much one would miss if one did not have the right software. Some sites

require passwords and licences, e.g. electronic journals and online databases. Before recommending them check that the licences covers all users (Edwards 1998).

2.4.7 Design and appearance

User friendliness of a resource is an important criterion in evaluating Internet resources, as it is important in evaluating printed material. Just like a book would have a contents page and an index, a good site or resource should be laid out clearly and logically with well-organised subsections. The links should be clearly labelled and should provide for navigation within the document, e.g. *Back, Home, Go to top*. Links to remote sites should be active, dead links may discourage use of a resource (SOSIG 2002, Smith 1997)

2.5 Summary

This chapter has looked at the Internet services as they apply to the study. It has also looked at how these services are utilised by the three categories of users under investigation in this research, i.e. academics, students and information professionals. Problems affecting use of Internet resources have also been discussed with reference to the three categories above. The chapter has also reviewed related studies and surveys that have been carried out, which are relevant to this study in many ways.

Firstly, concepts related to the study have been explained based on literature, which help the researcher and readers to gain some understanding of the Internet and its related terms. Various Internet services have been described and their applicability towards research, teaching and learning has been highlighted. Secondly, by reviewing related studies, the researcher has been able to compare the different methodologies used and how these could be applied to the current study. Although these studies were mostly drawn from Europe and other developing countries, effort was made to draw studies from developing countries. Examples from South East Asia, Pakistan, Malaysia and South Africa's Kwa-Zulu-Natal helped in this respect. Literature reviewed has also served as pointer on the extent of use of the Internet and its related services by academics, students and librarians in supporting teaching, learning and research in institutions of higher learning. By analysing use by category of user and type of resources, the researcher has

been able to establish trends and patterns and see how similarities and differences could be drawn as this is a major component of the research.

What emerged from literature, which the current study attempted to address, is the non-use of subject based information gateways (SBIGs). Most of the literature dwelt on resources that institutions and individuals are subscribing to, e.g. electronic journals. Issues of access, which the current study attempts to address where, mentioned quite significantly in literature and the researcher hopes that lessons could be drawn for comparison purposes. Problems of connectivity experienced in Asia, for example, would most likely be the same with those in the area under study since their economies and infrastructural development are similar.

The next chapter is concerned with research methodology.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The purpose of this chapter is to explain how the research was conducted. In keeping with the aims and objectives of the study, the chapter is organised under the following sections: introduction, research method, study population, data collection instruments, pilot study, data analysis, problems encountered or constraints and conclusion.

3.2 Research method

Both qualitative and quantitative approaches were used in the study. According to Creswell in Leedy (1997:104), quantitative study is an inquiry into a social or human problem based on testing theory composed of variables, measured with numbers and analysed with statistical procedures in order to determine whether the predictive generalisations of the theory hold true. Examples of quantitative studies include experiments, survey research, content analysis and existing statistics. Creswell in Leedy (1997:105) defines qualitative study as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture formed with words, reporting detailed views of informants and conducted in a natural setting. Examples of qualitative studies include field research and comparative historical. Interviews were conducted using both techniques described above.

3.2.1 The survey method

According to Leedy (1997:191) the survey method deals with a situation that demands the technique of observation as the principal means of data collection. Observation is used in this context to mean 'looking' into the problem that has been done through the use of questionnaires and other research instruments. Phillips (1985:292) gives the definition of observation as the act of noting phenomena, often with instruments and recording it for scientific or other purposes. In the survey method, data is collected from a group or

population that has been carefully chosen, clearly defined and specifically delimited to set precise parameters for ensuring discreteness to the population (Leedy 1997:191). According to Neuman (1997:31) a survey researcher asks people questions in a written questionnaire (which can be mailed or hand delivered), or during an interview then records answers. In a survey research, the researcher uses a sample, or smaller group of selected people but generalises results to a larger group. In this study, questionnaires were distributed to academics, students and library personnel. Interviews were conducted with senior administrators in the library and Computer services departments to elicit their views on the current state of IT provision within the two universities.

3.3 Study population

The University of Zimbabwe and the University of Zululand comprised the study population in this research. Within the two institutions, academic staff, students and library staff were considered. Ten faculties were included in the study from the University of Zimbabwe. These are Agriculture, Arts, Commerce, Education, Engineering, Law, Medicine, Science, Social Studies and Veterinary Science. At the University of Zululand, all six faculties were included in the study but limited to departments available at the main campus at Ongoye. In the libraries, only professional librarians were included in the study. In total, the combined study population for the two institutions was 16255. Since there were large numbers of people in the two institutions, it became necessary to reduce the size to manageable levels.

3.3.1 Sampling procedures

A sample is a smaller representation of a large whole, that is a section of the population selected from the latter in such a way that they are representative of the universe of population (Saravanavel 1991:117). The process by which the sample (subsets of the population) is drawn from the population is known as sampling. Sampling can be divided into two major categories, i.e. probability sampling and non-probability sampling. According to Stoker (1989:103) in probability sampling procedure, each element of the population has a known positive probability of being selected as an element of the

sample. Leedy (1997:205) adds that in probability sampling, the researcher can specify in advance that each segment of the population will be represented in the sample. This procedure was applied in this study to ensure that all elements of the population under study were represented. As already indicated above, the population under study falls into different strata, i.e. by rank or status as in the case of academics and by level of study, in the case of students. In order to achieve adequate representation of each sub-group in the population, stratified random sampling was used. According to Nation (1997:163) stratified sampling procedure is based on population characteristics in which efforts are made to ensure that the sample mirrors the population and that the sample and the population are parallel. For purposes of this study, these are professors, associate professors, senior lecturers, lecturers and junior lecturers (referred to as teaching assistants). In the student category, these are undergraduates, honours, masters and doctoral. In the librarians' category, only professional librarians were considered. After the population has been divided into strata, the researcher draws a sample from each population. By having each category represented, it ensures that the population is not biased because of inequality in any of the sub-populations (Leedy 1997:214).

3.3.2 Sample size and sample frame

Sample size depends largely on the degree to which the sample population approximates the qualities and characteristics of the general population. According to Leedy (1997:210), the larger the sample, the smaller the amount of sampling error to be expected. However, a larger sample does not guarantee good results if it is not representative. The author goes on to say that for a large population of above 5000, population size is almost irrelevant and a sample size of 400 is adequate. This view is supported by Peter (1994:76), who says that for a population size of more than 10000, the recommended sample size is up to 370. This study falls within that range. A sample frame, on the other hand, refers to a list of population elements from which a sample can be drawn. In this study, the sample size for academic was calculated at 20%, students at 3%, while all professional librarians in the two institutions were investigated that is 10 professional librarians from the University of Zululand and 26 from the University of

Zimbabwe. The student population was considered to be homogeneous hence 3% was considered adequate. Tables 2 and 3 below give a breakdown of academics by faculty and by status in the two universities. Tables 4a and 4b give a breakdown of students by faculty and level of study at the universities of Zimbabwe and Zululand respectively. A total of 49 questionnaires were distributed to academics at the University of Zululand, while 182 were distributed at the University of Zimbabwe. In the student category, 316 were distributed at the University of Zimbabwe while 136 were distributed at the University of Zululand.

Sample frame and sample size by University and faculty

Table 2a: University of Zimbabwe N= 182

FACULTY	SAMPLE FRAME (SF)	PERCENTAGE (%)	SAMPLE SIZE (SS)
AGRICULTURE	72	20	15
ARTS	148	20	31
COMMERCE	29	20	06
EDUCATION	92	20	18
ENGINEERING	70	20	14
LAW	32	20	06
MEDICINE	167	20	33
SCIENCE	161	20	32
SOCIAL STUDIES	95	20	19
VETERINARY SCIENCE	38	20	08
TOTAL	904	20	182

Table 2b: University of Zululand N=49

FACULTY	SAMPLE FRAME (SF)	PERCENTAGE (%)	SAMPLE SIZE (SS)
ARTS	86	20	17
COMMERCE & ADMINISTRATION	31	20	7
SCIENCE & AGRICULTURE	70	20	14
LAW	6	20	1
EDUCATION	43	20	9
THEOLOGY	3	20	1
TOTAL	239	20	49

Table 3a: Sample frame and sample size by status- University of Zululand

Status	Agriculture		Arts		Commerce		Education		Engineering		Law		Medicine		Science		Social Studies		Vet Science		Total	
	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF
Professor	1	4	1	3	0	1	0	2	0	1	0	2	2	11	1	6	1	3	1	3	7	36
Assoc Prof	1	4	1	5	0	0	1	5	1	5	1	3	4	21	1	5	1	5	0	1	11	54
Snr Lecturer	3	15	4	18	0	1	3	16	2	8	0	2	6	32	4	18	2	8	0	0	24	118
Lecturer	9	44	19	94	5	25	14	68	10	52	4	21	19	96	19	93	11	57	6	29	116	579
R/Fellow	0	1	0	0	0	0	0	0	0	1	0	0	1	3	0	1	0	1	0	1	1	8
T/Assistant	1	4	6	28	0	2	0	1	1	3	1	4	1	3	8	38	4	21	1	4	23	108
Total	15	72	31	148	5	29	18	92	14	70	6	32	33	167	33	161	19	95	8	38	182	904

Table 3b: Sample frame and sample size by status- University of Zululand

Status	Arts		Commerce & Administration		Science & Agriculture		Law		Education		Theology		Total	
	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF	SS	SF
Professor	3	13	1	3	2	12	0	1	1	5	1	2	7	36
Assoc. Prof	2	9	1	3	1	5	0	0	0	1	0	0	4	18
Snr Lecturer	4	21	2	9	5	23	1	4	3	13	0	1	15	71
Lecturer	8	41	2	12	5	26	0	1	5	23	0	0	20	103
T/Assistant	0	2	1	4	1	4	0	0	0	1	0	0	2	11
Total	17	86	7	31	14	70	1	9	9	43	1	3	49	239

Table 4a: Students by faculty and level of study

Status	Agriculture	Arts	Commerce	Education	Engineering	Law	Medicine	Science	Social Studies	Vet Science	Total
Undergraduates	532	1434	928	442	817	362	1257	1160	1795	127	8854
Postgraduates	117	174	249	533	81	4	207	135	208	4	1712
Total	649	1608	1177	975	898	366	1464	1295	2003	131	10566

Table 4b: Students by faculty and level of study- University of Zululand

Status	Arts	Commerce & Administration	Science & Agriculture	Law	Education	Theology	Total
Undergraduates	1221	911	1115	298	434	1	3980
Postgraduates	207	38	62	6	195	22	530
Total	1428	949	1177	304	629	23	4510

3.4 Data collection instruments

According to Neuman (1997:30) every researcher collects data using one or more techniques, and that some techniques are more effective when addressing specific kinds of questions or topics. Several methods or instruments exist and their use depends on type of information sought. This study employed the use of questionnaires, interviews, observation and existing records for both content analysis and existing statistics.

3.4.1 The questionnaire

Questionnaires come in many shapes and sizes, from postcards to be filled in by the respondents to multi-page documents to be filled in by the interviewer or the respondents (Hoinville and Jowell 1989:26). The questionnaires were distributed using different methods in order to maximise response. The second method used was to distribute questionnaires through the faculty and departmental offices. The secretaries were asked to distribute to members concerned. This method was found useful especially with post-graduates students whose list was not readily available. The third method used was through the computer laboratories where the users were conducting searches. In the case of librarians, these were distributed and collected through colleagues in both institutions.

Two questionnaires were constructed and distributed during the research. The first questionnaire was designed for the academics and students, while the second questionnaire was designed for library personnel. The need for separate questionnaires was due to anticipated differences in use of the Internet by the two groups. Librarians would use the Internet primarily to help users get information while the academics and students would have other uses besides that of scholarly use. Some questions were considered not applicable to librarians. The questionnaire for academics and students was divided into three sections. Section one contained questions on personal details of the respondents. Section two contained questions on Internet access and use of Internet services, while section three covered questions on the importance of Internet resources on academic research and teaching. The questionnaire for librarians was divided into two sections. The first section contained questions on personal details of the respondent.

Section two covered questions relating to Internet access and use of Internet services. Respondents were asked to indicate purposes of use, separating personal use from work related use. This enabled the researcher to get information on when services were used to assist users.

3.4.1.1 Factors to consider in questionnaire construction

According to de Vaus (1986:70) questionnaires are the most widely used survey data collection technique. It is important that they be well constructed in order to elicit the most appropriate information from the respondents. Neuman (1997:233) provides a guideline of things to avoid if one is to come out with a good questionnaire:

- Avoid jargon, slang and abbreviations. The vocabulary and grammar should be targeted to the audience.
- Avoid ambiguity, confusion, and vagueness. Confusion causes inconsistencies in how different respondents assign meaning to and answer questions. Questions should be specific with non-use of indefinite words.
- Avoid emotional language and prestige bias. Words with strong emotional connotations can influence how respondents answer questions. Avoid associating a statement with prestigious person or group because respondents may answer on the basis of their feeling to that person or group.
- Avoid double-barrelled questions. A double-barrelled question consists of two or more questions joined together which makes the respondent's answer ambiguous.
- Avoid leading questions. Leading questions can make the respondents aware of answers the researcher wants which might not necessarily be a representation of their views.
- Avoid asking questions that are beyond the respondents' capabilities. Asking something that few respondents know frustrates respondents and produces poor quality responses.
- Avoid false premises. A better question clearly asks the respondent to assume a premise is true, and then asks for a preference.

- Avoid asking about future intentions. Respondents answer specific concrete questions that relate to their experiences more reliably than they do about questions beyond their immediate experiences.
- Avoid overlapping or unbalanced response categories. Make response categories or choices mutually exclusive, exhaustive and balanced.

It is important to note that the way data are to be analysed affects what information is needed and the method by which the questionnaire is to be administered affects what type of questions can be asked (de Vaus 1986:71).

3.4.2 Interview

According to Fowler (1995:105) using interviews to ask questions and record answers is a common part of measurement procedure. Interviews can be structured, i.e. using questionnaire type format and including closed form questions. They can also be semi-structured. The semi structured interview goes beyond the structured interview by probing beyond the asked questions in order to obtain additional information and seek clarification on matters that might arise from the answers given. Interviewing involves much more than asking questions. Planning the interview schedule is just as important as in the questionnaire approach. The questions of the interview should be carefully planned and worded accurately. For purposes of the study, interviews were conducted with IT personnel in the libraries and University computing services in order to solicit their views and the institutional positions on matters of policy regarding the use of the Internet in the two universities. It was noted that some of the information required would not have ordinarily come out from the questionnaire.

3.4.3 Content analysis

Content analysis is a technique for gathering and analysing the content of text. The content refers to meaning or any message that can be communicated while the text is anything written or spoken that serves as a medium of communication (Neuman 1997:273). Libraries create records with information, which can be analysed in this way.

This information includes searches conducted from on-line databases by either librarians or the users. This information might also reflect sources used which is important in establishing use trends of the different resources constituted in this study. Where users complete forms or booking sheets in order to use Internet services, these provide valuable information on the level of study, degree programme, duration of use and purpose of use. These were analysed in the two universities.

3.4.4 Existing statistics

In existing statistics research, the researcher locates a source of previously collected information, often in the form of government reports or previously conducted surveys (Neuman 1997:32). Periodic reports (daily, weekly, monthly and annual) produced in libraries provide valuable statistics considered in this research. These include the total number of registered users in any given academic year, total number of users by service in the library, e.g. Internet users or trends of users' issues by subject. Automated library systems like INNOPAC provide various statistical options on use of library resources.

3.5 Pilot study

Validity is concerned with the soundness, the effectiveness, of measuring the instruments (Leedy 1997:32). It refers to how well the conceptual and operational definitions mesh with each other (Neuman 1997:141). It is concerned with the precision with which the instrument measures the problem being investigated. Reliability deals with an indicator's dependability. If one has a reliable indicator or measure, it gives one the same result each time the same thing is measured (Neuman 1997:138). The author further points that perfect validity and reliability are virtually impossible to achieve but are ideals researchers strive for.

At some stage in the design process, the questionnaire should be subject to a field test. According to Schnetler (1989:87) the pilot study or pre-testing affords the researcher the following opportunities:

- Determine time taken to administer the questionnaire
- Obtain feedback from the respondents regarding any problems with the questionnaire
- Discover problems related to the questionnaire and any of the questions that can arise during completion.

The researcher can then refine wording, ordering, layout order and prune the questionnaire to manageable length.

A pilot study was carried out using respondents from the University of Zululand, namely, the academics, students (undergraduates and postgraduates) as well as professional librarians. One set was distributed to twenty users in the academic category and four in the professional librarian's category. The following is a breakdown by category:

2 Professors; 2 Senior Lecturers; 4 Lecturers

2 Ph.D. students; 2 Masters students; 4 Honours students; 4 Undergraduate students

2 Senior Librarians; 2 Assistant Librarians.

3.5.1 Results of the pilot study

As already indicated above, the purpose of the pilot study was to test the research instruments before going to the field. It emerged that certain questions were not clearly interpreted by the respondents or overlapped. These were restructured or merged, especially from the librarians' questionnaire. For example, the questions on access and location of computer and the Internet were reduced from four to two. The section describing the use of telnet, file transfer protocol and Subject Based Information Gateways (SBIG's) was also not clear with the librarians. As a result, footnotes were provided in the questionnaire defining briefly the three terms. The question on proposed recommendations on Internet accessibility was added to both questionnaires.

The response rate was 83% of all questionnaires distributed. All respondents (100%) had access to a computer and the Internet. In the students' category, all had access to a computer and the Internet in the computer laboratories, with doctoral students having additional access to both facilities in the offices. All academics that responded indicated

having access to a computer and the Internet in their offices with 80% having access to both services at home. E-mail was the most popular service used (100%) by academics, students and librarians. All respondents reported having sufficient computer and Internet skills although there were indications for need for further training, as one respondent put it, "there is always something new to learn." Speed of access and timeliness were cited as the major advantages of the Internet with 100% of the respondents indicating that the Internet was important to their study or work purposes. It was important to note that the librarians were quite senior in terms of length of service in the profession, ranging from 7 to 25 years, all with Internet experience of more than 5 years. Such variables were analysed against the various Internet services for the three categories of users being investigated in this research.

3.6 Data collection procedures

Data collection procedures are procedures followed in collecting data during the research process. Two sets of questionnaires were prepared, one for academics and students and the other for library personnel. These were pre-tested in order to identify areas of weakness, which needed to be improved on before the researcher went into the field. The questionnaires were then distributed electronically as e-mail attachments in Microsoft word. The second lot was distributed through faculty offices, the computer laboratories and through colleagues. Collection of questionnaires was also done through the same distribution offices. In the case of e-mail replies, these were downloaded using Microsoft word and marked accordingly.

Interviews were conducted with personnel responsible for IT in the universities and in the libraries. The main purpose was to solicit information on policy matters, which would not have been adequately addressed in the questionnaire. The interviews were also meant to follow up on current projects undertaken by the two institutions, which were reflected as *on going on the universities' web pages*. These included issues on campus wide networks and general upgrading.

3.7 Data analysis

Data was organised according to specified categories in order to establish the total number of returned questionnaires. This was done by institution and by category of users, that is, academics, students and librarians. Academic and students questionnaires were further divided into sub-categories according to faculty, status and level of study. The *Statistical Analysis Software (SAS system)* and *Microsoft Excel* were used to analyse the data.

3.8 Problems encountered

In order to effectively distribute questionnaires, it was important that the researcher obtained figures on the total number of students and academics in the two universities. While it was relatively easy to get such statistics from the University of Zimbabwe, it was not so easy with the University of Zululand. Firstly, the total number of registered students was not readily available and the researcher was referred to five offices before finally securing an appointment with the Information Technology Division who promised to make the data available within one week. There were variations in the total number of students registered at the University of Zululand, both from official sources. Besides, the figures provided by InfoTech, according to the Dean of students (Newsletter 2002:1), there were more than 5500 registered students in the first semester. The staff list was also not readily available and the researcher had to count from the names provided in the University Calendar for 2002. The researcher failed to get assistance from the NSU in order to distribute electronic questionnaires to both staff and students. Permission was sought to broadcast the questionnaire to all registered users on the University of Zululand e-mail servers and no reply ever came. This affected the research process because only respondents at the University of Zimbabwe could be contacted that way. This gave the University of Zimbabwe an unfair advantage over the University of Zululand in terms of responses. The other problem encountered at the University of Zimbabwe was that questionnaire distribution coincided with final examinations so it was difficult to get students and lecturers to complete the questionnaires.

3.9 Summary

This chapter has looked at how the research was conducted. The research instruments were discussed, more specifically the questionnaire, its construction and factors to avoid if one is to come up with a good questionnaire. The research instruments were pre-tested in order to assess weaknesses and faults before going into the field. Although the pilot study was done on a small scale, preliminary findings showed that e-mail was the most popular service. Problems encountered before and during the field were also highlighted. The major problems encountered were getting the actual number of registered students and a complete staff list for the University of Zululand, and questionnaire distribution at the University of Zimbabwe which was done close to examination time.

The next chapter looks at presentation and analysis of data from the questionnaires distributed to students and academics.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA - ACADEMICS AND STUDENTS

4.1 Introduction

The purpose of this chapter is to present and analyse data collected from the questionnaires distributed to academics and students. The questionnaires were distributed to respondents in the two institutions as follows: in the students' category, 316 questionnaires were distributed at the University of Zimbabwe, 51 administered to post-graduate students. A total of 136 questionnaires were distributed to students at the University of Zululand. In the academic category, 182 questionnaires were administered at the University of Zimbabwe and 49 at the University of Zululand. The distribution was done based on the sample sizes of 3% in the student category and 20% in the academic category as shown in the previous chapter on research methodology.

4.2 Responses from academics and students

The questionnaire was structured into three sections. Section one required respondents to give their personal details, section two looked at Internet access and use of Internet services while section three looked at the importance of Internet resources.

4.2.1 Institutional affiliation

The first question in section one required respondents to indicate their institutional affiliation. This was important for separating responses of the University of Zimbabwe from those of the University of Zululand. This distinction formed the basis for comparing services in the two institutions under study. The question targeted at 182 academics at the University of Zimbabwe and 49 from the University of Zululand. In the student category, 316 students were targeted at the University of Zimbabwe against 136 at the University of Zululand. In the academic category, the response rate at the University of Zimbabwe was 36% compared to 61% from the University of Zululand. This represents an overall response of 42% in this category. In the undergraduate group, the response was 63% for the University of Zimbabwe

compared to 82% from the University of Zululand. The overall response was 69% in this category. In the postgraduates group, the response rate was 35% for the University of Zimbabwe compared to 71% from the University of Zululand, bringing the overall response in this category to 44%. The low response rate from the University of Zimbabwe could be attributed to the fact that questionnaires were sent a month before end of year examinations were about to commence. It became difficult at some point to track the questionnaires, as lectures were no longer in progress and students studied for their end of year examinations from different locations. The researcher had not anticipated this. In addition, the political environment prevailing then, caused some disruptions, which affected the University calendar. Table 5 below gives a summary of the findings.

Table 5: Institutional affiliation

Questionnaires	Academics				Students				Total				Overall total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Administered	182	100	49	100	317	100	136	100	499	100	185	100	684	100
Received	66	36	30	61	185	58	110	81	251	50	140	76	391	57

2.2 Faculty

Respondents were asked to indicate which faculty they belonged to. The purpose of this question was to help separate, for analysis purposes, the use of Internet resources by faculty, and present a comparison between the two institutions. The response rate from the University of Zimbabwe by faculty were: Engineering 83%, Vet Science, 25%, Agriculture 51%, Science 42%, Social Studies 71%, Medicine 35%, Arts 41%, Education 66%, Law 44% and Commerce 40%. The overall response rate for the University of Zimbabwe was 51%. The response rate for the University of Zululand by faculty indicates that Commerce and Administration was highest with 83%. Others were Science & Agriculture 74%, Arts 78%, Education 64%, Law 80%, and Theology 50%. The overall response rate for the University of Zululand was 76%. The detailed analysis is shown in Figures 1a and 1b below.

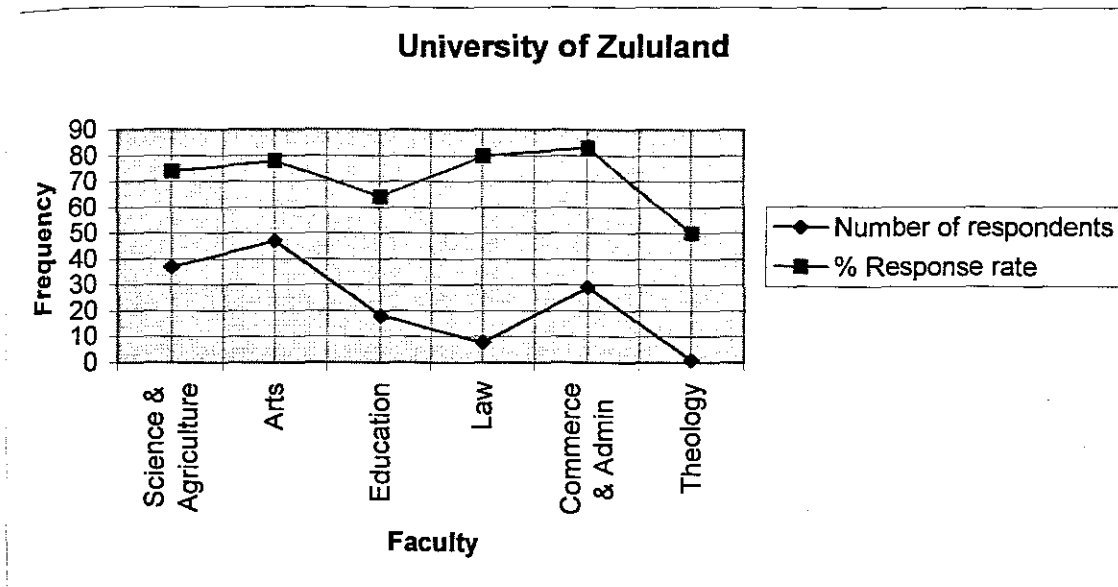


Figure 1a: Responses by faculty- University of Zululand

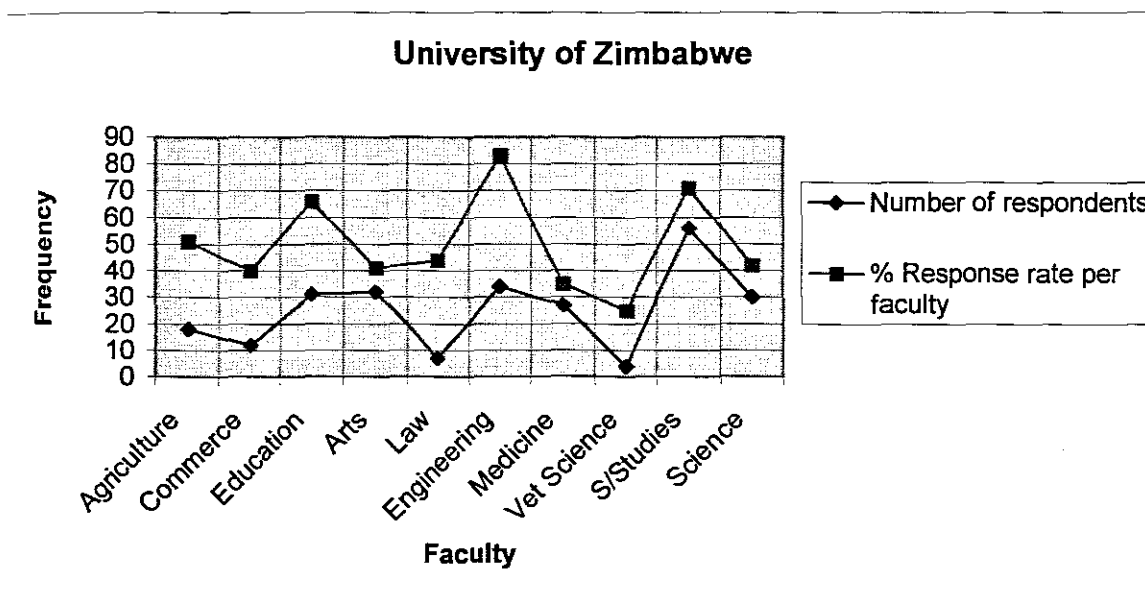


Figure 1b: Responses by faculty: University of Zimbabwe

2.3 Department

The respondents were also required to show their departmental affiliation. This was done to make sure that all departments were equally represented in the study population. However, some respondents felt that the question was getting a little specific and this would be a breach of confidentiality. In total, there are 80 teaching departments in the 10 faculties

selected from the University of Zimbabwe and about 50 from the University of Zululand. Of these, 238 (68%) were from the University of Zimbabwe while 112 (32%) were from the University of Zululand. The reason for the high response rate from the University of Zimbabwe was because there were more faculties (10) compared to University of Zululand with (6). Because most departments exist in both universities, e.g. English, History, etc, this significantly reduces the overall number expected from the two institutions. There were 350 responses 79 departments. A total of 41 (10%) did not respond to this question.

4.2.4 Academic status and level of study

Respondents were also asked to indicate their status. This was necessary in order to separate academics from students and within the categories, to identify the level of study for students and rank for academics. Students had 4 options to choose from, i.e. undergraduates, graduate students i.e. Honours, masters, and doctoral. Academics had 6 options to choose from which were, professor, associate professor, senior lecturer, and lecturer, research fellow and teaching assistant. The question targeted 391 respondents of which 251 (64%) were from the University of Zimbabwe and 140 (36%) from the University of Zululand. There were 66 (26%) responses received in the academic category from the University of Zimbabwe of which 5 (8%) were professors, 2(3%) associate professors, 7 (11%) senior lecturers, 42 (64%) lecturers, 8 (12%) teaching assistants and 2 (3%) research fellows. The breakdown by faculty is shown in Table 6a below. On the other hand, there were 30 (21%) academics from the University of Zululand in the following categories: 5 (17%) professors, 1 (3%) associate professors, 9 (30%) senior lecturers, 14 (47%) lecturers and 1(3%) research fellow. The breakdown by faculty is shown in Table 6b below. In the student category, there were, 18 (35%) responses for postgraduate students from the University of Zimbabwe, all at masters' level although there was one doctoral student from the faculty of Veterinary Sciences who was also a research fellow. Because of his dual status, he was analysed as a research fellow. From the 12 postgraduate responses from the University of Zululand, 4 (4%) were doctoral students, 4 (4%) masters, and 4 (4%) Honours. The summary by institution and faculty is shown in Tables 7a and 7b below.

Table 6a Academic status by faculty: University of Zimbabwe

Academic status	Agriculture		Commerce		Education		Arts		Law		Engineering		Medicine		Veterinary		Social Studies		Science		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Professor	1	33	1	75	1	10	-	-	-	-	-	-	1	8	1	50	-	-	-	-	5	8
Assoc. Prof.	-	-	-	-	1	10	-	-	-	-	-	-	1	8	-	-	-	-	-	-	2	3
Senior Lecturer	1	33	-	-	-	-	1	14	-	-	1	13	2	17	-	-	-	-	2	20	7	11
Lecturer	1	33	1	25	8	80	6	86	-	-	5	63	6	50	-	-	8	67	7	70	42	64
Teaching Assistant	-	-	-	-	-	-	-	-	-	-	2	25	1	8	-	-	4	33	1	10	8	12
Research Fellow	-	-	-	-	-	-	-	-	-	-	-	-	1	8	1	50	-	-	-	-	2	3
Total	3	100	1	100	10	100	7	100	0	0	8	100	12	100	2	100	12	100	10	100	66	100

Table 6b: Academic status by faculty: University of Zululand

Academic status	Science & Agriculture		Commerce & Admin		Education		Theology		Arts		Law		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Professor	1	10	1	20	-	-	-	-	3	25	-	-	5	17
Assoc. Prof.	-	-	1	20	-	-	-	-	-	-	-	-	1	3
Senior Lecturer	4	40	-	-	1	33	-	-	4	33	-	-	9	30
Lecturer	4	40	3	60	2	66	-	-	5	42	-	-	14	47
Teaching Assistant	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Research Fellow	1	10	-	-	-	-	-	-	-	-	-	-	1	3
Total	10	100	5	100	3	100	0	0	12	100	0	0	30	100

Table 7a: Level of study by faculty: University of Zimbabwe

Level of study	Agriculture		Commerce		Education		Arts		Law		Engineering		Medicine		Veterinary		Social Studies		Science		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Doctoral students	-		-		-		-		-		-		-		-		-		-		-	
Masters students	-		2	18	8	38	1	4	-		-		2	13	-		3	7	2	11	18	10
Undergraduates	15	100	9	82	13	62	24	96	7	100	26	100	13	87	2	100	41	93	17	89	167	90
Total	15	100	11	100	21	100	25	100	7	100	26	100	15	100	2	100	44	100	19	100	185	100

Table 7b: Level of study by faculty: University of Zululand

Level of study	Science & Agriculture		Commerce & Admin		Education		Arts		Theology		Law		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Doctoral students	-		1	4	-		3	9	-		-		4	4
Masters students	1	4	-		2	13	1	3	-		-		4	4
Honours students	1	4	-		-		2	6	1	100	-		4	4
Undergraduates	25	93	23	96	13	87	29	83	-		8	100	98	89
Total	27	100	24	100	15	100	35	100	1	100	8	100	110	100

4.2.5 Age

Respondents were asked to indicate the age category to which they belonged. One of the questions posed in the research objectives was whether seniority/age did affect the use of Internet resources. In the academic category, responses from the University of Zimbabwe showed that 9 (14%) of the respondents were above 50 years of which 4 (44%) were professors, 1 (11%) associate professor, 3 (33%) senior lecturers and 1 (1%) lecturer. 23% of the respondents were in the 40-50 age group, 16% in the 36-40 year category, while the highest was 18 (27%) in the 31-35 age group. Table 8a shows the distribution by status within the various age groups. Comparatively, responses from the University of Zululand showed a similar pattern with 9 (30%) of the academics being above 50 years, 3 (33%) being professors, 1 (11%) associate professor, 3 (33%) senior lecturers and 2 (22%) lecturers. The highest figure of 14 (47%) was in the 41-50 years age group, with 2 (14%) being professors, 6 (43%) senior lecturers, and another 6 (43%) being lecturers. The rest were 1 (3%) in the 31-35 years age group and 4 (13%) below 30 years. Table 8a shows the distribution by status and age group. In the student category, 119 (64%) of the respondents from the University of Zimbabwe were in the 21-25 years age group, with 18 (10%) in the 26-30 years category. There were 4 (2%) students in the 41-50 age group. Comparatively, there were 59 (54%) students in the 21-25 age group at the University of Zululand, of which 57 (97%) were undergraduates. Table 8b gives the summaries by level of study.

Table 8a: Age distribution by institution and academic status

Age (years)	Academic status																											
	Professor				Assoc Prof				Snr Lecturer				Lecturer				T/Assistant				R/Fellow				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-25	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	4	50	-	-	-	-	1	100	5	8	-	-
26-30	-	-	-	-	-	-	-	-	-	-	-	-	5	12	3	21	2	25	-	-	2	100	-	-	9	14	4	13
31-35	-	-	-	-	-	-	-	-	1	14	-	-	16	38	1	7	1	13	-	-	-	-	-	-	18	27	1	3
36-40	-	-	-	-	-	-	-	-	-	-	-	-	9	21	2	14	1	13	-	-	-	-	-	-	10	15	2	7
41=50	1	20	2	40	1	50	1	50	3	43	6	67	10	24	6	43	-	-	-	-	-	-	-	-	15	23	14	47
>50	4	80	3	60	1	50	1	50	3	43	3	33	1	2	2	14	-	-	-	-	-	-	-	-	9	14	9	30
Total	5	100	5	100	2	100	2	100	7	100	100	100	42	100	14	100	8	100	-	-	2	100	1	100	66	100	30	100

Table 8b: Age distribution by institution and level of study

Age (years)	Level of study																			
	Undergraduates				Postgraduate Honours				Masters				Doctoral				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<20	25	15	24	24	-	-	-	-	-	-	-	-	-	-	-	-	25	14	24	22
21-25	118	71	57	58	-	-	1	25	1	6	1	25	-	-	-	-	119	64	59	54
26-30	16	10	12	12	-	-	2	50	2	11	1	25	-	-	3	75	18	10	18	16
31-35	3	2	4	4	-	-	1	25	8	44	1	25	-	-	-	-	11	6	6	5
36-40	3	2	1	1	-	-	-	-	5	28	1	25	-	-	1	25	8	4	3	3
41=50	2	1	-	-	-	-	-	-	2	11	-	-	-	-	-	-	4	2	-	-
>50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	167	100	98	100	-	-	4	100	18	100	4	100	-	-	4	100	185	100	110	100

4.2.6 Gender

The respondents were asked to state their gender. The gender distribution in the two groups was analysed as follows. In the academic category, the University of Zululand had 19 (63%) males and 11 (37%) females while the University of Zimbabwe had 48 (74%) males against 17 (26%) females. In the student category, there were 117 (63%) males and 68 (37%) at the University of Zimbabwe compared to 53 (49%) males and 56 (51%) females from the University of Zululand. The following figures illustrate distribution by institution.

Gender: by status and level of study

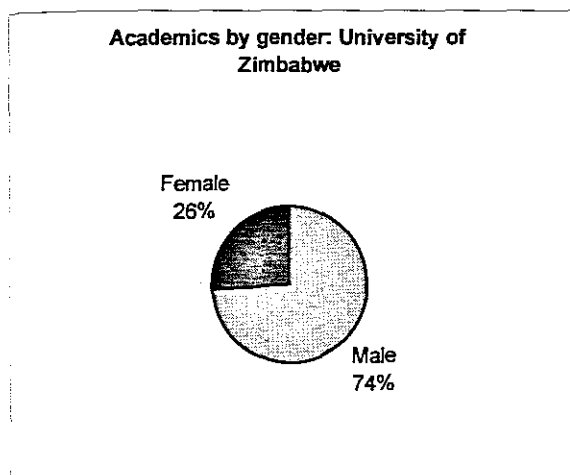


Figure 2a

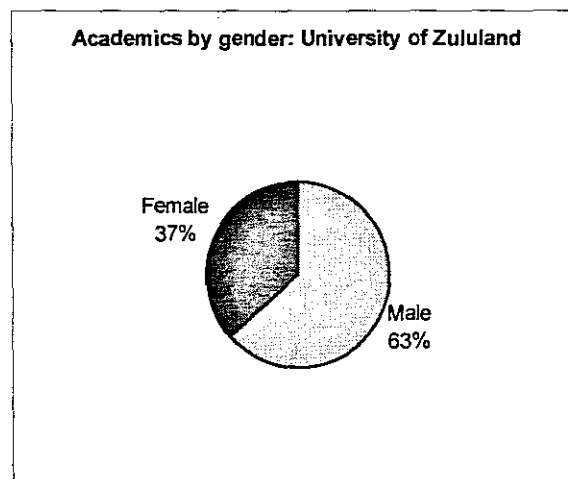


Figure 2b

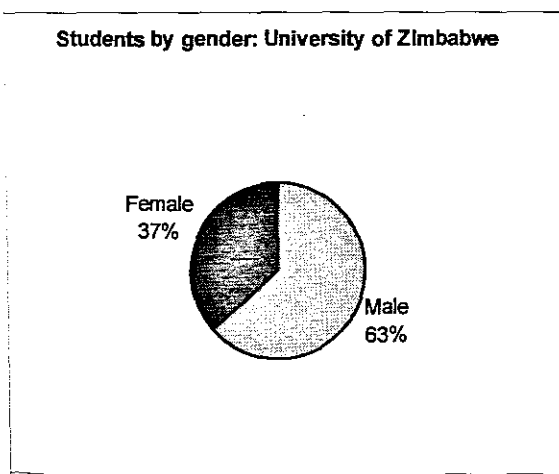


Figure 2.c

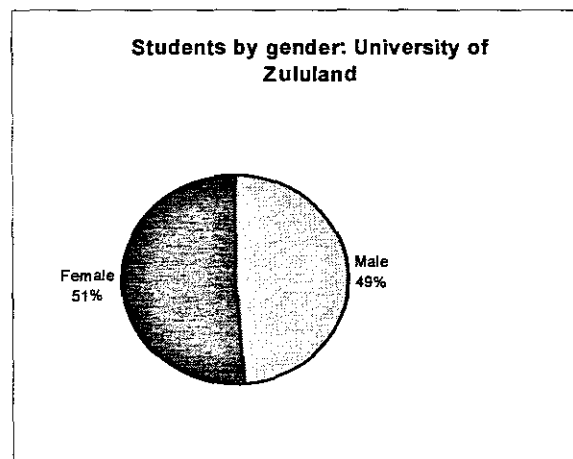


Figure 2.d

4.2.7 Computer access

This item required respondents to indicate if they had access to a computer or not. For those who did, they were asked to indicate where such access was available. Respondents were asked to select from six options provided, which were, in one's office, shared access in the office, in the computer laboratories on campus, at home or indicate no access. Respondents were also given the option for other locations other than those specified. The question was meant to explore whether respondents had multiple access to computers. A total of 390 (99.7%) responses were received of which 251 (64%) were from the University of Zimbabwe while 139 (36%) were from the University of Zululand. The responses were analysed by institution and by status. From the 66 academic responses from the University of Zimbabwe, only 2 (3%) indicated that they did not have access to a computer. The rest indicated having access with high scores on multiple access being 14 (21%) in the computer laboratories, 13 (20%) in the office and 12 (18%) having access both at home and in the office. There were 6 (9%) academics that reported having shared access in the offices. Similar trends were observed from the University of Zululand where in the academic category, 11 (37%) had access in the office, 12 (40%) having access at home and in the office while 4 (13%) reported having no access. Unlike in the cases experienced at the University of Zimbabwe, there were no academics sharing office computers from the University of Zululand. In the student category from the University of Zimbabwe, from the 18 postgraduate respondents, 2 (11%) had no access, while 10 had access in the computer laboratories, 1 (6%) had access in the office, 2 (11%) had access in the laboratories and at home. In the undergraduates' category, 127 (77%) respondents had access to a computer in the computer laboratories, 17 (10%) in the laboratories and at home, and 9 (5%) at home. There were 9 (5%) respondents who indicated having no access to a computer. Responses from the University of Zululand¹ indicate that 9 (75%) postgraduates, had access in the computer laboratories, 1 (8%) in the office while 1 (8%) had no access, while undergraduates recorded the highest number for no access with 23 (24%) while 64 (66%) had access in the computer laboratories. Table 9 gives a comparative distribution of access for the two institutions.

¹With effect from August 2002, the University of Zululand offered 100% computer and Internet access to all registered students

Table 9: Access to a computer

Access	Academics				Postgraduates				Undergraduates				Total				Overall Total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Office	13	20	11	37	1	6	1	8	-	-	-	-	14	6	12	9	26	7
Computer labs	14	21	1	3	10	56	9	75	129	77	64	66	153	61	74	53	227	58
Shared office	6	9	-	-	-	-	-	-	2	1	-	-	8	3	-	-	8	2
Home	2	3	1	3	2	11	-	-	9	5	5	5	13	5	6	4	19	5
No access	2	3	4	13	2	11	1	8	9	5	23	24	13	5	28	20	41	11
Office & Home	12	18	12	40	-	-	-	-	-	-	-	-	12	5	12	9	24	6
Office and labs	4	6	-	-	1	6	1	8	-	-	2	2	5	2	3	2	8	2
Own office & share	3	5	-	-	-	-	-	-	-	-	-	-	3	1	-	-	3	0.7
Labs and Home	2	3	-	-	2	11	-	-	17	10	3	3	21	8	3	2	24	6
Labs share office & Home	1	2	-	-	-	-	-	-	-	-	-	-	1	0	-	-	1	0.25
Office labs & home	1	2	1	3	-	-	-	-	1	1	-	-	2	1	1	1	3	0.7
Labs & shared office	2	3	-	-	-	-	-	-	-	-	-	-	2	1	-	-	2	0.5
Share office & home	4	6	-	-	-	-	-	-	-	-	-	-	4	2	-	-	2	0.5
Total	66	100	30	100	18	100	12	100	167	100	97	100	251	100	139	100	390	100

4.2.8 Access to the Internet

Respondents were asked to indicate if they had access to the Internet and where they were accessing it. Options to choose from were similar to those provided in 8 above. There was also an option to indicate other locations and this was meant to take care of those respondents who were accessing the Internet from Cafes, etc. The question was targeted at 250 respondents from the University of Zimbabwe and 138 from the University of Zululand. In the academic category, 20 (30%) of respondents from the University of Zimbabwe indicated having access in their offices while 30 (45%) had access in the computer laboratories and 4 (6%) from home. 3 (5%) respondents indicated having no access to the Internet while 4 (6%) had access from the office and at home. 14 (47%) academics from the University of Zululand indicated having access in their offices with 1 (3%) accessing from the laboratories and 10 (33%) with dual access from home and the office. 4 (13%) did not have access to the Internet. Among the postgraduates, responses from the University of Zimbabwe show that 11 (61%) had access in the laboratories, 2 (11%) from their offices while 2 (11%) did not have access. There were significant differences with undergraduates from the two institutions where 14 (8%) respondents from the University of Zimbabwe indicated having no access to the Internet compared to 46 (48%) from the University of

Zululand. Of those who had access, there were 141 (85%) from the University of Zimbabwe against 42 (44%) from Zululand. In total, there were 19 (8%) respondents who did not have access to the Internet from the University of Zimbabwe compared to 50 (36%) from the University of Zululand. Also in terms of access, 182 (73%) had access from computer laboratories at the University of Zimbabwe compared to 52 (38%) from the University of Zululand. This represented 60% of total responses. Table 10 below provides a summary of the results.

Table 10: Access to the Internet

Access point	Academics				Postgraduates				Undergraduates				Total				Overall Total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Office	20	30	14	47	2	11	1	8	-	-	-	-	22	9	15	11	37	10
Computer labs	30	45	1	3	11	61	9	75	141	85	42	44	182	73	52	38	234	60
Home	4	6	1	3	1	6	-	-	5	3	-	-	10	4	1	1	11	3
No Access	3	5	4	13	2	11	-	-	14	8	46	48	19	8	50	36	69	18
Other	-	-	-	-	1	6	2	17	1	1	4	4	2	1	6	4	8	2
Office & labs	2	3	-	-	1	6	-	-	-	-	2	2	3	1	2	1	5	1
Office & home	4	6	10	33	-	-	-	-	-	-	-	-	4	2	10	7	14	4
Labs and home	3	5	-	-	-	-	-	-	4	2	2	2	7	3	2	1	9	2
Labs and other			-	-	-	-	-	-	1	1	-	-	1	0	-	-	1	0.25
Total	66	100	30	100	18	100	12	100	167	100	96	100	250	100	138	100	388	100

At this point of the questionnaire, respondents who had indicated that they had no access to a computer [4.2.7] and no access to the Internet [4.2.8] were instructed that they had finished completing the questionnaire and did not need to proceed answering the rest of the questions. The logic was that since access to both facilities was central to this research, and they did not have, they could not proceed to indicate how they were using Internet services, which was required in the remaining sections of the questionnaire. The number of respondents who did not have access to the Internet at the University of Zimbabwe was 19 (8%) and 50 (36%) from the University of Zululand. The maximum numbers of respondents were, therefore, reduced to 232 (92%) from Zimbabwe and 92 (66%) from Zululand, being the total number of those expected to have Internet access.

4.2.9 Computer skills

The respondents were required to indicate their level of computer skills on a scale of five, ranging from poor to excellent. The question was targeted at 316 respondents, 225 (71%) from the University of Zimbabwe and 91 (29%) from the University of Zululand. The results indicated that there were few respondents whose computer skills were considered poor. The majority indicated to be from above average to excellent, for example, 89 (40%) indicated having enough skills from the University of Zimbabwe compared to 27 (30%) from the University of Zululand. In the 'poor' category, there were 20 (9%) from the University of Zimbabwe with 8 (9%) from the University of Zululand. Analysed by status, the highest numbers with poor computer skills were 2 (13%) postgraduates from The University of Zimbabwe and 7 (13%) from the University of Zululand. Table 11 below gives a summary of the results

Table 11: Computer skills by academic status and institution

Computer skills	Status																	
	Academics				Postgraduates				Undergraduates				Total				Overall Total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		N	%
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Excellent	5	9	3	12	3	19	-	-	8	5	7	13	16	7	10	11	26	8
Very good	19	34	7	27	-	-	3	27	23	15	13	24	42	19	23	25	65	21
Good	13	23	4	15	2	13	6	55	43	28	13	24	58	26	23	25	81	26
Enough	16	29	11	42	9	56	2	18	64	42	14	26	89	40	27	30	116	37
Poor	3	5	1	4	2	13	-	-	15	10	7	13	20	9	8	9	28	9
Total	56	100	26	100	16	100	11	100	153	100	54	100	225	100	91	100	316	100

4.2.10 Internet skills

Respondents were required to indicate their perceived level of Internet skills on a scale ranging from poor to excellent. The purpose of the question was to give indication on the levels of Internet literacy among the respondents in the two institutions. Analysis was done firstly by status of academics, postgraduates and undergraduates. The question was targeted at 319 respondents, 232 (73%) from the University of Zimbabwe and 87 (27%) were from the University of Zululand. Undergraduates did show some high levels of Internet skills with only 18 (12%) from the University of Zimbabwe and 11 (22%) from the University of Zululand indicating 'poor'. Academics also indicated a similar trend with 7 (11%) from the

University of Zimbabwe and 1 (4%) from the University of Zululand indicating 'poor' Internet skills. Table 12a below gives a summary of the results by status and by institution.

Table 12a: Internet skills by status and institution

Internet skills	Status																	
	Academics				Postgraduates				Undergraduates				Total				Overall Total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Excellent	6	10	3	12	2	13	-	-	20	13	8	16	28	12	11	13	39	12
Very good	18	29	9	35	1	6	3	30	21	14	7	14	40	17	19	22	59	18
Good	18	29	3	12	-	-	3	30	50	33	11	22	68	29	17	20	85	27
Enough	14	22	10	38	10	63	4	40	44	29	14	27	68	29	28	32	96	30
Poor	7	11	1	4	3	19	-	-	18	12	11	22	28	12	12	14	40	13
Total	63	100	26	100	16	100	10	100	153	100	51	100	232	100	87	100	319	100

Having compared academics with students, the second analysis looked at Internet skills by level of academics. In the level of professor, 5 (50%) indicated having 'very good' to 'excellent' skills, 60% from the University of Zululand and 40% from the University of Zimbabwe. Among senior lecturers, responses from the University of Zimbabwe showed skills ranging from 'poor' to excellent while 4 (50%) from the University of Zululand had 'very good'. Apart from 5 (13%) lecturers from the University of Zimbabwe who indicated 'excellent', the remaining academics chose 'very good' and below. These results are shown in Table 12b below.

Table 12b: Internet skills by level of academics

Skills	Level of academic																											
	Professor				A/Prof				Snr Lecturer				Lecturer				R/Fellow				T/Assistant				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Excellent	-	-	2	40	-	-	-	-	1	14	1	13	5	13	-	-	-	-	-	-	-	-	-	-	6	10	3	12
V. Good	2	40	1	20	-	-	1	100	2	29	4	50	11	28	3	25	1	50	-	-	2	25	-	-	18	29	9	35
Good	-	-	-	-	1	50	-	-	2	29	1	13	10	26	2	17	1	50	-	-	4	50	-	-	18	29	3	12
Enough	3	60	2	40	-	-	-	-	1	14	2	25	10	26	6	50	-	-	-	-	-	-	-	-	14	22	10	38
Poor	-	-	-	-	1	50	-	-	1	14	-	-	3	8	1	8	-	-	-	-	2	25	-	-	7	11	1	4
Total	5	100	5	100	2	100	1	100	7	100	8	100	39	100	12	100	2	100	-	-	8	100	-	-	63	100	26	100

4.2.11 Training needs

Respondents were required to indicate whether they needed training in computer skills, Internet skills or both. Respondents could also indicate 'none' where they did not require any training. This question followed closely on 4.2.9 and 4.2.10 above and was meant to highlight the training requirements of those with below average skills. The question was targeted at 314 respondents, 230 (73%) from the University of Zimbabwe and 84 (27%) from the University of Zululand. The analysis was carried out by institution and by faculty. 59 (26%) respondents required computer training from the University of Zimbabwe of which Social Studies had the highest requirement with 14 (24%). In comparison, 13 (15%) required computer training from the University of Zululand with 6 (46%) coming from the faculty of Arts. In the category of those who did not require training, there were 31 (13%) from the University of Zimbabwe with the highest 8 (26%) from the faculty of Science. By comparison, there were 13 (15%) respondents from the University of Zululand who did not need any training, of which 6 (46%) were from the faculty of Science and Agriculture. Respondents requiring computer and Internet training were high in both institutions, with the University of Zimbabwe having 117 (51%) against 45 (54%) from the University of Zululand. Tables 13a and 13b give a summary of the results.

Table 13a: Training requirements by faculty- University of Zimbabwe

Training requirements	Faculty																					
	Engineering		Vet Science		Agriculture		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Computer skills	8	24	-	-	6	35	8	28	14	29	3	15	10	32	6	22	2	29	2	17	59	26
Internet skills	1	3	1	25	3	18	1	3	3	6	4	20	5	16	2	7	-	-	3	25	23	10
Computer & Internet	19	56	3	75	5	29	12	41	27	55	10	50	13	42	17	63	5	71	6	50	117	51
None	6	18	-	-	3	18	8	28	5	10	3	15	3	10	2	7	-	-	1	8	31	13
Total	34	100	4	100	17	100	29	100	49	100	20	100	31	100	27	100	7	100	12	100	230	100

Table 13b: Training requirements by faculty: University of Zululand

Training requirements	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce & Admin		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Computer skills	4	18	6	16	-	-	1	33	2	12	-	-	13	15
Internet skills	3	14	7	19	-	-	1	33	2	12	-	-	13	15
Computer & Internet	9	41	20	54	3	75	1	33	11	65	1	100	45	54
None	6	27	4	11	1	25	-	-	2	12	-	-	13	15
Total	22	100	37	100	4	100	3	100	17	100	1	100	84	100

4.2.12 Length of Internet use

Respondents were asked to indicate how long they had been using the Internet. This question was meant to provide a measurement on the period the respondents have been using Internet services distinguishing the experienced from the novices. The options ranged from recent (under 6 months) to more experienced, which was 5 years and above. The question targeted 314 respondents, 230 (73%) from the University of Zimbabwe and 84 (23%) from the University of Zululand. The results indicate that 58 (25%) of respondents from the University of Zimbabwe had been using the Internet for between 1 to 2 years compared to 18 (21%) from the University of Zululand in the same category. For the relatively new users, i.e. those with less than 6 months of Internet use, there were 27% from the University of Zululand compared to 20% from the University of Zimbabwe, while more experienced users were 11% from the University of Zimbabwe compared to 14% from the University of Zululand. The responses were also analysed by faculty within each university. The results indicate that there are users with varying levels of Internet experience in almost each and every faculty, with no significant differences between Arts and Humanities and Pure Sciences within one institution and between the two universities. Tables 14a and 14b below give a summary of the findings.

Table 14a: Length of Internet use by faculty: University of Zimbabwe

Length of Internet use	Faculty																					
	Engineering		Vet Science		Agric.		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<6months	2	6	-	-	2	12	1	3	15	31	6	30	2	6	17	63	-	-	1	8	46	20
6months-1year	5	15	-	-	4	24	4	14	8	16	3	15	10	32	4	15	2	29	6	50	46	20
1-2 years	13	38	2	50	4	24	6	21	13	27	3	15	10	32	3	11	2	29	2	17	58	25
2-3 years	5	15	2	50	3	18	7	24	9	18	3	15	3	10	-	-	2	29	-	-	34	15
3-4 years	5	15	-	-	2	12	3	10	2	4	4	20	1	3	-	-	1	14	2	17	20	9
>5 years	4	12	-	-	2	12	8	28	2	4	1	5	5	16	3	11	-	-	1	8	26	11
Total	34	100	4	100	17	100	29	100	49	100	20	100	31	100	27	100	7	100	12	100	230	100

Table 14b: Length of Internet use by faculty: University of Zululand

Length of Internet use	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce & Admin		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<6months	6	27	6	16	2	50	1	33	8	47	-	-	23	27
6months-1year	4	18	5	14	-	-	-	-	1	6	1	100	11	13
1-2 years	1	5	11	30	1	25	2	67	3	17	-	-	18	21
2-3 years	4	18	4	11	-	-	-	-	-	-	-	-	8	10
3-4 years	3	14	8	22	-	-	-	-	1	6	-	-	12	14
>5 years	4	18	3	8	1	25	-	-	4	24	-	-	12	14
Total	22	100	37	100	4	100	3	100	17	100	1	100	84	100

4.2.13 How one learnt to use the Internet

Having indicated how experienced they were in using the Internet, respondents were asked to indicate how they had learnt to use the Internet. There were several options given from which respondents could choose more than one depending on circumstances as shown in Table 15. This question was analysed by institution and by status. The question targeted 315 respondents of which 231 (73%) were from the University of Zimbabwe and 84 (27%) from the University of Zululand. The majority of respondents in the two institutions had learnt to use the Internet through self-study with 85 (37%) from the University of Zimbabwe and 23 (27%) from the University of Zululand. Second for Zululand was in-house course offered by

the university with 17 (20%) of which 15 (31%) were undergraduates. Analysed by status, 3 (60%) of professors from the University of Zululand indicated having learnt through self-study while in a similar category from the University of Zimbabwe, 2 (40%) had learnt through colleagues. Table 15b shows that in-house courses by the university and library seem to have played an insignificant role for academics from the University of Zululand as none chose these options, from lecturer up to professor. Comparatively, a similar situation was reflected at the University of Zimbabwe where none of the senior lecturers up to professor chose the library option. The majority of academics who chose multiple options were in the lecturer category, who seemed to have benefited from other options with 5 (13%) having learnt through in-house course offered by the university and 1 (3%) from the library training. There were no respondents from the University of Zululand who indicated having learnt through library training compared to 3 (1%) from the University of Zimbabwe. Tables 15a and 15b give a summary of the results.

Table 15a: Learning to use the Internet: University of Zimbabwe

Method	Professor		Assoc Prof.		Snr Lecturer		Lecturer		R/Fellow		T/Assistant		Postgraduates		Undergraduates		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Self study	1	20	1	50	5	83	20	51	1	50	4	50	6	38	47	31	85	37
From Colleagues	2	40	-	-	-	-	5	13	-	-	3	37.5	5	31	53	35	68	29
In-house course -University	-	-	-	-	-	-	5	13	-	-	-	-	3	19	6	4	14	6
In-house course -Library	-	-	-	-	-	-	1	3	-	-	1	12.5	1	6	-	-	3	1
Continuing education	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	4	6	3
Colleagues + University in-house	-	-	-	-	-	-	1	3	-	-	-	-	-	-	8	5	9	4
Self study + University in-house	1	20	1	50	1	17	2	5	-	-	-	-	-	-	3	2	8	3
Self study + colleagues + university in-house	-	-	-	-	-	-	3	8	-	-	-	-	-	-	1	1	4	2
Self study + colleagues	1	20	-	-	-	-	2	5	1	50	-	-	1	6	29	19	34	15
Total	5	100	2	100	6	100	39	100	2	100	8	100	16	100	153	100	231	100

Table 15b: Learning to use the Internet: University of Zululand

Method	Professor		Assoc Prof.		Snr Lecturer		Lecturer		Postgraduates		Undergraduates		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Self study	3	60	1	100	4	50	4	33	3	30	8	17	23	27
From Colleagues	-	-	-	-	1	12.5	3	25	1	10	7	15	12	14
In-house course -University	-	-	-	-	-	-	-	-	2	20	15	31	17	20
In-house course -Library	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Continuing education	-	-	-	-	-	-	-	-	-	-	4	8	4	5
Colleagues + University in-house	-	-	-	-	-	-	-	-	-	-	2	4	2	2
Self study + University in-house	-	-	-	-	1	12.5	-	-	-	-	1	2	2	2
Self study + colleagues + university in- house	-	-	-	-	-	-	-	-	-	-	6	13	6	7
Self study + colleagues	2	40	-	-	2	25	5	42	4	40	5	10	18	21
Total	5	100	1	100	8	100	12	100	10	100	48	100	84	100

4.2.14 Time spent on the Internet

Respondents were asked to indicate the time they spend on the Internet per week for study or work purposes. The purpose of this question was to help determine the extent to which the Internet was being used for work and study purposes. The question was analysed in four fold, firstly by academic status, secondly by level of academics, thirdly, by faculty and lastly, by gender. The item targeted 308 respondents, 227 (74%) from the University of Zimbabwe and 81 (24%) from the University of Zululand. The highest number of users spent under 1 hour in both institutions with 76 (33%) of respondents from the University of Zimbabwe, of which 53 (70%) were undergraduates, 6 (8%) postgraduates and 17 (22%) academics, and 25 (31%) from the University of Zululand with a distribution of 17 (68%) undergraduates, 2 (8%) postgraduates and 6 (24%) academics. The number of undergraduate users decreased as the number of hours increased, from 53 (<1 hour) to 16 (>5 hours) for the University of Zimbabwe and 17 (<1 hour) to 2 (>5 hours) for the University of Zululand. For users spending more than 5 hours per week, there were 35 (15%) from the University of Zimbabwe compared to 7 (9%) from the University of Zululand. By status, there were 17 (48%) academics, 26 (6%) postgraduates and 16 (46%) undergraduates from the University of Zimbabwe with 5 hours or more compared to 4 (57%) academics, 1 (14%) postgraduate and 2 (29%) undergraduates from the University of Zululand. Table 16a summarizes the results.

Table 16a: Time spent on the Internet per week by institution and academic status

Time	Academic status																	
	Academics				Postgraduates				Undergraduates				Total				Overall total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<1 hour	17	27	6	24	6	38	2	22	53	36	17	36	76	33	25	31	101	33
1-2 hours	15	24	5	20	5	31	5	56	36	24	13	28	56	25	23	28	79	26
2-3 hours	6	10	6	24	2	13	-	-	27	18	11	23	35	15	17	21	52	17
3-4 hour	8	13	4	16	1	6	1	11	16	11	4	9	25	11	9	11	34	11
>5 hours	17	27	4	16	2	13	1	11	16	11	2	4	35	15	7	9	42	14
Total	63	100	25	100	16	100	9	100	148	100	47	100	227	100	81	100	308	100

While academics were compared with students above, the second analysis was done by level of academics. 92% of professors (full and associate) from both universities indicated spending 3 hours and below per week on the Internet. Senior lecturers from the University of

Zimbabwe spent more than 3 hours per week compared to their counterparts from the University of Zululand by 58% and 38% respectively. A similar trend was also observed among lecturers, where 51% spent from the University of Zimbabwe spent more than 3 hours while 54% from the University of Zululand spent 2 hours and below. The results are summarised in Table 16b below.

Table 16b Time spent on the Internet by level of academics

Time	Level of academic																			
	Professor				A/Prof				Snr Lecturer				Lecturer				R/Fellow			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<1 hr	-	-	1	20	1	50	1	100	3	43	2	25	10	26	2	18	-	-	3	38
1-2 hrs	4	80	1	20	-	-	-	-	-	-	-	-	9	23	4	36	-	-	2	25
2-3 hrs	1	20	3	60	-	-	-	-	-	-	3	38	4	10	-	-	-	-	1	13
3-4 hrs	-	-	-	-	-	-	-	-	2	29	-	-	5	13	4	36	1	50	-	-
>5 hrs	-	-	-	-	1	50	-	-	2	29	3	38	11	28	1	9	1	50	-	-
Total	5	100	5	100	2	100	1	100	7	100	8	100	39	100	11	100	2	100	-	-

The third analysis was done according to faculty. The purpose was to establish which faculties were using the Internet more than the others. The same numbers of respondents were considered as in the analysis by status per week above. In the 1 hour and less category, there were 76 (33%) respondents from the University of Zimbabwe of which 18 (25%) were from Social Studies followed by Education with 13 (17%) with Arts being third with 10 (13%). By comparison, the University of Zululand had Commerce and Administration with 9 (36%) followed by Arts, 8 (32%) and Science 7 (28%). In the category of 5 hours and above, the faculty of Engineering at the University of Zimbabwe was top with 11 (31%) followed by Science with 23 (28%) with least being Commerce, Medicine and Vet Science with 1 (3%) each. On the other hand, Science & Agriculture, and Commerce & Administration were tied with 2 (29%) each with the least being Education with 1 (14%) in the 5 hours category. A comparison between faculties within and between institutions indicate that most users spent less than 2 hours per week except Engineering which had 11 (32%) of faculty responses spending more than 5 hours per week. Tables 16c and 16d give the summary of results by faculty

Table 16c: Time spent on the Internet per week by faculty: University of Zimbabwe

Time	Faculty																					
	Engineering		Vet Science		Agriculture		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<1 hour	5	15	-	-	7	41	7	25	18	38	9	45	10	32	13	48	3	50	4	33	76	33
1-2 hours	7	21	2	50	4	24	7	25	8	17	5	25	7	23	9	33	2	33	5	42	56	25
3-5 hours	7	21	1	25	1	6	4	14	10	21	3	15	7	23	1	4	-	-	1	8	35	15
4 hours	4	12	-	-	3	18	2	7	5	10	2	10	5	16	2	7	1	17	1	8	25	11
5 hours	11	32	1	25	2	12	8	19	7	15	1	5	2	6	2	7	-	-	1	8	35	15
Total	34	100	4	100	17	100	28	100	48	100	20	100	31	100	27	100	6	100	12	100	227	100

Table 16d: Time spent on the Internet per week by faculty: University of Zululand

Time	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce & Admin		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<1 hour	7	33	8	22	-	-	1	33	9	53	-	-	25	31
1-2 hours	3	14	12	33	3	75	1	33	4	24	-	-	23	28
2-3 hours	6	29	10	28	-	-	1	33	-	-	-	-	17	21
3-4 hour	3	14	4	11	-	-	-	-	2	12	-	-	9	11
>5 hours	2	10	2	6	1	25	-	-	2	12	-	-	7	9
Total	21	100	36	100	4	100	3	100	17	100	-	-	81	100

Fourthly, time spent on the Internet was analysed according to gender. From the 227 responses from the University of Zimbabwe, 154 (68%) were males and 73 (32%) females, while there were 43 (53%) males and 38 (47%) females from the University of Zululand. The results indicate that men spent more hours on the Internet than their female counterparts in both universities, except for the 3-4 hour usage where there were 56% females compared to 44% males for the University of Zululand. Table 16e below gives a summary of the results.

Table: 16e: Time spent on the Internet by gender.

Time	Male				Female				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%
<1 hour	52	34	12	28	24	33	13	34	76	33	25	31
1-2 hours	36	23	12	28	20	27	11	29	56	25	23	28
2-3 hours	21	14	10	23	14	19	7	18	35	15	17	21
3-4 hours	19	12	4	9	6	8	5	13	25	11	9	11
4-5 hours	26	17	5	12	9	12	2	5	35	15	7	9
Total	154	100	43	100	73	100	38	100	227	100	81	100

4.2.15 Purpose of Internet use

Respondents were asked to indicate the purposes for which they used the Internet. 4 options were given, and these were, teaching, learning and research, while the fourth option required respondents to indicate purposes other than those already specified. This item targeted at 298 respondents, 217 (73%) from the University of Zimbabwe and 81 (27%) from the University of Zululand. 120 (55%) of respondents across all faculties from the University of Zimbabwe indicated using the Internet for research purposes and 36 (17%) for learning compared to 27 (33%) each for research and learning from the University of Zululand. The highest response for research were Social Studies (26%) followed by Arts (18%) at the University of Zimbabwe and Arts (48%) followed by Science & Agriculture (22%) at the University of Zululand. 23 (11%) respondents from the University of Zimbabwe indicated using the Internet for all purposes, i.e. teaching, learning and research compared to 7 (9%) from the University of Zululand. For respondents who chose research and learning, the faculty of Engineering, University of Zimbabwe was highest with 9 (29%) while for the University of Zululand; Arts scored the highest with 8 (50%). Tables 17a and 17b below give a summary of results from the two institutions.

Table 17a: Purpose of using Internet by faculty: University of Zimbabwe

Purpose	Faculty																					
	Engineering		Vet Science		Agriculture		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Research	10	32	1	25	11	69	12	41	31	70	7	35	22	73	14	54	4	80	8	67	120	55
Learning	6	19	1	25	3	19	9	31	6	14	4	20	1	3	4	15	-	-	2	17	36	17
Teaching and research	1	3	-	-	-	-	1	3	-	-	2	10	3	10	-	-	-	-	-	-	7	3
Research & Learning	9	29	1	25	1	6	4	14	4	9	4	20	2	7	3	12	1	20	2	17	31	14
Teaching, Research and Learning	5	16	1	25	1	6	3	10	3	7	3	15	2	7	5	19	-	-	-	-	23	11
Total	31	100	4	100	16	100	29	100	44	100	20	100	30	100	26	100	5	100	12	100	217	100

Table 17b: Purpose of using the Internet by faculty: University of Zululand

Purpose	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce & Administration		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Research	6	30	13	35	1	25	2	67	4	25	1	100	27	33
Learning	6	30	10	27	1	25	1	33	9	56	-	-	27	33
Teaching and research	-	-	3	8	-	-	-	-	1	6	-	-	4	5
Research & Learning	6	30	8	22	2	50	-	-	-	-	-	-	16	20
Teaching, Research and Learning	2	10	3	8	-	-	-	-	2	13	-	-	7	9
Total	20	100	37	100	4	100	3	100	16	100	1	100	81	100

4.2.16 Internet browsers used

This item required respondents to indicate which browsers they were using, with an option to choose more than one depending on the respondents' circumstances. There were 305 responses from the two institutions, 225 (74%) and 80 (26%) from the University of Zululand. The results indicate that 57 (71%) of respondents from the University of Zululand use Netscape, which is 19% of overall responses. On the other hand, 199 (88%) of respondents from the University of Zimbabwe use Internet Explorer, which represent 65% of overall responses. Respondents did not have much influence on the type of browser to use as reflected in the results because the two institutions use specific browsers on their Internet computers.

4.2.17 Internet services used and frequency

This question required respondents to indicate how often they used Internet services. A list of the various Internet services was provided from which respondents were asked to indicate against a frequency table also provided. Nine services were provided, which included email, subject gateways, OPACs and online databases. An option to indicate other services other than those already indicated was also made available. The frequency ranged from daily use 5 to never 1. There were varying numbers of responses per service as indicated in the totals. E-mail was the most used service in the two institutions with 93 (42%) and 41 (56%) respondents using it daily at the University of Zimbabwe and University of Zululand respectively. Second in the daily used services was 'own library OPACs' with 74 (40%) for the University of Zimbabwe while for the University of Zululand it was the World Wide Web with 35 (46%). E-mail was again the most popular service used in the weekly usage in both universities. The least used services at the University of Zimbabwe were: downloading software indicated by 118 (65%) responses followed by other library OPACs with 102 (57%) responses. Electronic journals were surprisingly the least used Internet service by respondents from the University of Zululand with 32 (53%) responses followed by other library OPACs with 26 (56%) responses. There was a significant concentration of respondents who indicated that they sometimes used the different services. However, the results show that apart from the web, e-mail and own library catalogues, other services were not as frequently used. Table 18 provides a summary of the findings.

Table 18: Frequency of use of Internet services

Service	Frequency of use																							
	Daily				Weekly				Monthly				Sometimes				Never				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
World Wide Web	59	29	35	46	58	29	24	32	4	2	1	1	44	22	13	17	36	18	3	4	201	100	76	100
E-mail	93	42	41	56	66	30	19	26	13	6	1	2	33	15	10	14	15	7	2	3	220	100	73	100
Discussion list/ newsgroups	14	8	6	11	22	13	10	18	12	7	6	11	40	24	14	25	82	48	20	36	170	100	56	100
Own library OPAC	74	40	7	11	54	30	14	21	8	4	9	14	32	17	22	33	15	8	14	21	183	100	66	100
Other library OPAC	7	4	2	4	16	9	6	11	12	7	6	11	42	23	17	30	102	57	26	46	179	100	57	100
Online databases	7	4	3	5	26	14	10	17	18	10	8	14	49	27	21	36	80	44	16	28	180	100	58	100
Electronic journals	5	3	1	2	25	14	7	12	20	11	9	15	86	47	11	18	46	25	32	53	182	100	60	100
Subject based information gateways	11	6	1	2	29	16	8	16	17	9	3	6	48	27	20	39	76	42	19	37	181	100	51	100
Downloading software	4	2	2	3	21	12	7	12	9	5	6	10	30	16	26	43	118	65	19	32	182	100	60	100

4.2.18 Importance of Internet services

Respondents were asked to indicate how important the services on 4.2.17 above were for their work or study purposes. The question was analysed in two ways. The first analysis was by service used and by institution. There were variations in the number of responses received for each type of service. A total of 287 responses were received on the importance of e-mail, 216 (75%) from the University of Zimbabwe and 71 (25%) from the University of Zululand. Among the services considered not important by respondents from the University of Zimbabwe was other library OPACs with 84 (48%) responses followed by discussion list/news groups with 75 (45%) responses. By comparison, own library OPACs and downloading software were found to be not important by respondents from the University of Zululand with 25 (50%) and 24 (44%) responses respectively. Internet services considered being very important by respondents from the University of Zimbabwe were own library OPACs with 99 (57%) responses and e-mail, with 113 (52%) responses while the web and e-mail were considered very important by respondents from the University of Zululand with 45 (58%) and 40 (56%) responses respectively. It is important to note that other services were considered important by respondents from both institutions as shown in the summary of results in Table 19a below.

The second analysis was done by perceived importance of service and status. Because of the many services listed, this analysis by status was limited to the World Wide Web, which was considered to be central to all the other services provided. A total of 272 responses were received on the perceived importance of the World Wide Web from the two institutions of which 195 (72%) were from the University of Zimbabwe and 77 (28%) coming from the University of Zululand. The web was considered to be very important by respondents from both institutions with 81 (42%) of total responses from the University of Zimbabwe and 45 (58%) of total responses from the University of Zululand. 32 (16%) of respondents from the University of Zimbabwe saw the web as not important for their work or study purposes which represents 6 (11%) of academic respondents, 2 (17%) postgraduates and 24 (19%) undergraduates compared to 4 (5%) from the University of Zululand, representing 1 (4%) academics and 3 (7%) of undergraduates. Table 19b gives a summary of the results.

Table 19a: Importance of Internet services by institution

Service	Importance of service for work or study															
	Not important				Important				Very important				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
World Wide Web	32	16	4	5	81	42	28	36	81	42	45	58	195	100	77	100
E-mail	31	14	5	7	72	33	26	37	113	52	40	56	216	100	71	100
Discussion list/ newsgroups	75	45	6	11	74	45	28	52	16	10	20	37	165	100	54	100
Own library OPAC	15	9	25	50	60	34	13	26	99	57	12	24	174	100	50	100
Other library OPAC	84	48	18	35	63	36	19	37	29	16	15	29	176	100	52	100
Online databases	70	39	8	13	78	44	32	53	31	17	20	33	179	100	60	100
Electronic journals	76	42	14	25	62	34	24	44	44	24	17	31	182	100	55	100
Subject based information gateways	65	38	12	24	60	34	25	50	47	27	13	26	172	100	50	100
Downloading software	69	39	24	44	63	36	16	30	46	26	14	26	178	100	54	100

Table 19b: Importance of the World Wide Web by status and institution

Importance of World Wide Web	Academic status															
	Academics				Postgraduates				Undergraduates				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Not important	6	11	1	4	2	17	-	-	24	19	3	7	32	16	4	5
Important	15	28	8	33	6	50	3	30	60	47	17	40	81	42	28	36
Very important	33	61	15	63	4	33	7	70	45	35	23	53	81	42	45	58
Total	54	100	24	100	12	100	10	100	129	100	43	100	195	100	77	100

4.2.19 Purpose of e-mail use

Respondents were asked if they were using electronic mail among other services in 4.2.17. This item sought to explore further the purposes for which they were using e-mail. The options provided included peer correspondence, corresponding with lecturers, and for the academics and those who were publishing. There was an option to indicate corresponding with editors and for conference purposes. The question attracted 298 responses from both institutions, 221 (74%) from the University of Zimbabwe and 77 from the University of Zululand. Communicating with colleagues received the highest rating of 102 (46%) from the University of Zimbabwe of which 82 (80%) were undergraduates. This compares with 9 (12%) in the same category from the University of Zululand of which 5 (56%) were postgraduates. Analysis by status reflects multi-purpose usage of e-mail among academics in the two institutions. From the 66 academic responses from the University of Zimbabwe, 12 (19%) indicated using e-mail for all the first 5 options provided. 4 (6%) indicated communicating with colleagues and editors. By comparison, 3 (12%) of academic responses from the University of Zululand indicated using all the first 5 options provided and a high 6 (23%) for communicating with colleagues, lecturers, editors and conference purposes. Postgraduates in both institutions were mostly communicating with colleagues and lecturers although 7% and 10% from the universities of Zimbabwe and Zululand respectively indicated among the multiple answers that they were also communicating with editors. Table 20 below gives a summary of the results.

Table 20: Purpose of using e-mail: by institution and status

Purpose of Using E-mail (Corresponding with ...)	Status																	
	Academics				Postgraduates				Undergraduates				Total				Overall Total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Overall Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Colleagues	11	18	1	4	9	60	5	50	82	57	3	7	102	46	9	12	111	37
Students	-	-	-	-	-	-	2	20	9	6	6	15	9	4	8	10	17	6
Lecturers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Editors	1	2	-	-	-	-	-	-	-	-	-	-	1	0.45	-	-	1	0.3
Conference papers & notices	-	-	1	4	-	-	-	-	-	-	-	-	-	-	1	1	1	0.3
All the above	12	19	3	12	-	-	-	-	-	-	-	-	12	5	3	4	15	5
Colleagues + lecturers	2	3	2	8	1	7	1	10	7	5	4	10	10	5	7	9	17	6
Colleagues + conference notices	5	8	-	-	-	-	-	-	-	-	-	-	5	2	-	-	5	2
Colleagues + lecturers+ conference notices	5	8	5	19	-	-	-	-	-	-	-	-	5	2	5	6	10	3
Colleagues + students + editors	2	3	-	-	-	-	-	-	-	-	-	-	2	1	-	-	2	1
Colleagues + students + editors+ conferences	5	8	-	-	-	-	-	-	4	3	-	-	9	4	-	-	9	3
Colleagues+ editors + conferences	3	5	3	12	-	-	1	10	-	-	-	-	3	1	4	5	7	2
Colleagues + editors	4	6	-	-	-	-	-	-	-	-	-	-	4	2	-	-	4	1
Colleagues + students	-	-	-	-	2	13	-	-	33	23	1	2	35	16	1	1	36	12
Colleagues + students + lecturers	-	-	-	-	2	13	-	-	7	5	10	24	9	4	10	13	19	6
Colleagues + students + conferences	1	2	2	8	-	-	-	-	-	-	-	-	1	0.45	2	3	3	1
Colleagues + students + lecturers + conferences	3	5	1	4	-	-	-	-	-	-	1	2	3	1	2	3	5	2
Colleagues + lecturers + editors + conferences	5	8	6	23	-	-	-	-	-	-	-	-	5	2	6	8	11	4
Colleagues + students + lecturers + editors	3	5	2	8	1	7	1	10	-	-	1	2	4	2	4	5	8	3
Students + lecturers	-	-	-	-	-	-	-	-	2	1	15	37	2	1	15	19	17	6
Total	62	100	26	100	15	100	10	100	144	100	41	100	221	100	77	100	298	100

4.2.20 Access to electronic journals

This item was reinforcement to what had already been asked in 4.2.17, the difference being that it required respondents to indicate the use of e-journals in their own subject areas. The responses were analysed by institution and by faculty as it was hoped that this would also give indications titles available by subject areas within faculties. The question attracted 241 responses from the two institutions, 170 (71%) from the University of Zimbabwe and 71 (29%) from the University of Zululand. 120 (71%) of respondents from the University of Zimbabwe indicated having access to electronic journals compared to 29 (41%) from the University of Zululand. The highest responses by faculty from the University of Zimbabwe were Social Studies with 26 (15%) of overall responses, which was 76% of total responses in the faculty followed by Education with 17 (10%), which was 71% of total responses in the faculty. By comparison, Arts was highest at the University of Zululand with 16 (23%) of overall responses, which was 50% of total responses from the faculty followed by Science & Agriculture with 6 (9%) of overall responses representing 35% of total responses from the faculty. The results show that at least all the faculties in the two universities did have access to electronic journals although the actual numbers varied. There were more respondents with access to e-journals at the University of Zimbabwe (71%) than the University of Zululand; (59%) majority of whom did not have access. Tables 21a and 21b summarize the results by institution and by faculty.

Table 21a: University of Zimbabwe

Access to e-journals	Faculty																					
	Engineering		Vet Science		Agriculture		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	16	62	2	100	12	75	14	64	26	76	13	81	12	55	17	71	2	100	6	100	120	71
No	10	38	-	-	4	25	8	36	8	24	3	19	10	45	7	29	-	-	-	-	50	29
Total	26	100	2	100	16	100	22	100	34	100	16	100	22	100	24	100	2	100	6	100	170	100

Table 21b: University of Zululand

Access to e-journals	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce & Admin		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	6	35	16	50	1	33	1	33	5	33	-	-	29	41
No	11	65	16	50	2	67	2	67	10	67	1	100	42	59
Total	17	100	32	100	3	100	3	100	15	100	1	100	71	100

4.2.21 Number of e-journals accessed in own subject area

This item provided a follow up to 4.2.20 above. Respondents were asked to indicate the number of electronic journals they were accessing via the Internet, with the options to choose from: one, two three and more than four. There were 145 responses from both institutions of which 118 (81%) were from the University of Zimbabwe and 27 (19%) from the University of Zululand. The results show that while 241 respondents indicated having access to electronic journals in 4.2.20 above only 145 (60%) indicated the number of journals they were accessing. The possible reason for this is that some respondents were not sure on the exact number of e-journals they were accessing. Results indicate that 58 (49%) of respondents from the University of Zimbabwe have access to at least one e-journal, 31 (26%) having access to 2 journals, 4 (3%) with access to 3 journals and 25 (21%) accessing more than 4 journals. By comparison, 9 (33%) of respondents from the University of Zululand had access to at least one e-journal, 7 (26%) accessing 2 journals, 3 (11%) having access to 3 journal titles with 8 (30%) having access to more that 4 electronic journal titles. Analysed by faculty, in the category of 4 titles and above, the faculty of Medicine had the highest response with 6 (24%), which was 43% of total responses in the faculty followed by Engineering and Science with 4 (16%) each in the same category being 27% and 31% of total responses in the faculties respectively. The faculty of Arts at the University of Zululand was highest with 4 (50%), which was 27% of total responses in the faculty followed by Commerce & Administration with 2 (25%) being 50% of total responses in the faculty. Tables 22a and 22b below give a summary of the results by institution and by faculty.

Table 22a: Number of journals accessed by faculty- University of Zimbabwe

Number of journals accessed	Faculty																					
	Engineering		Vet Science		Agriculture		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
One	7	47	-	-	7	58	6	46	14	64	4	29	6	40	11	65	2	100	1	17	58	49
Two	4	27	2	100	3	25	2	15	5	23	4	29	6	40	2	12	-	-	3	50	31	26
Three	-	-	-	-	-	-	1	8	1	5	-	-	1	7	1	6	-	-	-	-	4	3
More that four	4	27	-	-	2	17	4	31	2	9	6	43	2	13	3	18	-	-	2	33	25	21
Total	15	100	2	100	12	100	13	100	22	100	14	100	15	100	17	100	2	100	6	100	118	100

Table 22b: Number of journals accessed by faculty- University of Zululand

Number of journals accessed	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce & Admin		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
One	2	33	5	33	-	-	1	100	1	25	-	-	9	33
Two	1	17	4	27	1	100	-	-	1	25	-	-	7	26
Three	1	17	2	13	-	-	-	-	-	-	-	-	3	11
More than four	2	33	4	27	-	-	-	-	2	50	-	-	8	30
Total	6	100	15	100	1	100	1	100	4	100	-	-	27	100

The second analysis looked at the number of journals accessed by academics. Results showed that professors had access to 3 and above e-journal titles with 75% from the University of Zimbabwe accessing more than 4 titles, while 63% of senior lecturers from both institutions had access to more than 4 e-journals. From the level of lecturer and below, the majority of respondents had access to 2 journal titles and below. This is shown in Table 2c below.

Table 22c: Number of e-journals accessed by level of academics

Number of e-journals accessed	Level of academic																											
	Professor				A/Prof				Snr Lecturer				Lecturer				R/Fellow				T/Assistant				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
One	1	25	-	-	-	-	-	-	1	25	1	25	11	42	1	20	1	50	-	-	2	33	-	-	16	37	2	18
Two	-	-	-	-	-	-	-	-	1	25	-	-	5	19	3	60	1	50	-	-	3	50	-	-	10	23	3	27
Three	-	-	1	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	9
Four	3	75	1	50	1	100	-	-	2	50	3	75	10	38	1	20	-	-	-	-	1	17	-	-	17	40	5	45
Total	4	100	2	100	1	100	-	-	4	100	4	100	26	100	5	100	2	100	-	-	6	100	-	-	43	100	11	100

4.2.22 Use of search engines

Respondents were asked to indicate if they were using any search engines. Although this question was meant to provide background to the next question, it was probably misunderstood. There were 303 responses, with 223 (74%) from the University of Zimbabwe and 80 (26%) from the University of Zululand. 50 (17%) respondents from the University of Zimbabwe indicated that they did not use search engines against 15 (5%) from the University of Zululand. One respondent, a professor made a comment on how else information could be sought on the Internet without using search engines. To this question, one would have probably made reference to telnet, gopher and veronica. Although some are no longer popular, they provide some of the means of information retrieval. The next question indicates which search engines were used.

4.2.23 Type of search engines used

A list of search engines was provided from which to choose from, with an option to indicate additional search engines that were not on the list. The purpose was to evaluate which search engines users were most familiar with and provided room for multiple answers. Search engines form the basis of Internet searching and usually preferences vary among users. A total of 231 responses were received from the two institutions, 165 (71%) from the University of Zimbabwe and 66 (29%) from the University of Zululand. Google was the most used search engine by respondents from the University of Zimbabwe with 119 (72%) followed by Yahoo with 99 (60%) respondents. Results indicated the reverse for the

University of Zululand where Yahoo was the most used search engine with 40 (61%) responses followed by Google with 36 (55%) responses. Hotbot was the least used search engine by respondents from the University of Zimbabwe with 140 (85%) never using it. Comparatively, Northern Light was the least used search engine by respondents from the University of Zululand with 58 (88%) never using it. No respondent indicated using other search engines other than those provided in the list. No specific reason could be attributed to this, but speculatively, respondents did not want to probably commit themselves a lot to what was not in the questionnaire. Tables 23a and 23b provide a summary of the results.

Table 23a: University of Zimbabwe

Frequency of use	Search engine													
	Google		Altavista		Excite		Northern Light		Hotbot		Lycos		Yahoo	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Always	119	72	20	12	6	3.6	2	1.2	5	3	15	9	99	60
Sometimes	40	24	40	24	24	15	9	5.5	20	12	31	19	61	37
Never	6	4	105	64	135	82	154	93	140	85	119	72	5	3
Total	165	100	165	100	165	100	165	100	165	100	165	100	165	100

Table 23b: University of Zululand

Frequency of use	Search engine													
	Google		Altavista		Excite		Northern Light		Hotbot		Lycos		Yahoo	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Always	36	55	15	23	6	9	2	3	4	6	4	6	40	61
Sometimes	28	42	25	38	16	24	6	9	10	15	15	23	18	27
Never	2	3	26	39	44	67	58	88	52	79	47	71	8	12
Total	66	100	66	100	66	100	66	100	66	100	66	100	66	100

1.2.24 Search options

This last item on search engines required users to indicate which search options they used when conducting searches. Advanced search options would usually indicate that the user was more familiar with Internet searching than probably those using simple search. The question attracted 256 responses, 187 (73%) from the University of Zimbabwe and 69 (27%) from the University of Zululand. Contrary to the earlier assertion that advanced searches were synonymous with searching familiarity, 90 (48%) of respondents from the University of Zimbabwe indicated using simple search option with 33 (18%) using advanced features and

64 (34%) using both simple and advanced options. Similarly, responses from the University of Zululand show that 31 (45%) respondents preferred simple search option, 7 (10%) using advanced search and 31 (45%) using both simple and advanced options. The results are tabulated in Table 24 below.

Table 24: Internet search options

Institution	Search engine options							
	Simple search		Advanced search		Both		Total	
	N	%	N	%	N	%	N	%
University of Zimbabwe	90	48	33	18	64	34	187	100
University of Zululand	31	45	7	10	31	45	69	100
Total	121	47	40	16	95	37	256	100

The following section looks at the importance of Internet resources as perceived by the respondents. Most of the questions required individual opinion apart from where options were provided and respondents had to select from. Questions requiring individual opinions were, therefore, not quantitatively analysed but presented as summaries highlighting the views expressed by the respondents.

4.2.25 Finding information on the Internet

Respondents were required to indicate whether they always found what they want when using the Internet by answering with a 'yes' or a 'no'. The purpose of this item was to measure satisfaction among the respondents. This was analysed by institution and by status. The question was targeted at 306 respondents, 223 (73%) from the University of Zimbabwe and 83 (27%) from the University of Zululand. 103 (46%) of respondents from the University of Zimbabwe indicated always finding information sought while 120 (54%) indicated in the negative. Comparatively, 42 (51%) of respondents from the University of Zululand indicated always finding information sought while 41 (49%) did not. When the question was analysed by status, the majority of academics in the two institutions indicated that they did not always find what they were looking for on the Internet. These were 38 (62%) from the University of Zimbabwe and 14 (54%) from the University of Zululand. Excluded in the table below, when results were analysed according to the level of academics,

60% of all professors and 100% of associate professors from both institutions indicated they did not always find information sought. With the exception of senior lecturers from the University of Zimbabwe (67%) and lecturers from the University of Zululand (58%), the majority of all the other levels of academics indicated not always finding information sought, being 60% of all academic respondents. In the postgraduates' category, 10 (67%) of respondents from the University of Zimbabwe indicated finding what they were looking for while 4 (44%) from the University of Zululand did not. Table 25 below gives a summary of the results.

Table 25: Finding information sought on the Internet: by institution and by status

Finding information sought	Status																	
	Academics				Postgraduates				Undergraduates				Total				Overall Total	
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	23	38	12	46	10	67	4	44	70	48	26	54	103	46	42	51	145	47
No	38	62	14	54	5	33	5	56	77	52	22	46	120	54	41	49	161	53
Total	61	100	26	100	15	100	9	100	147	100	48	100	223	100	83	100	306	100

4.2.26 Importance of Internet information for work or study

Respondents were asked to indicate their perceived importance of Internet information for study or work purposes. There were 304 responses from the two institutions, 222 (73%) from the University of Zimbabwe and 82 (27%) from the University of Zululand. 126 (56%) of respondents from the University of Zimbabwe found the Internet very important, 89 (40%) said it was important while 9 (4%) said it was not important. The same pattern was observed from the University of Zululand where 56 (68%) said it was very important, 17 (21%) found it important, while 9 (11%) said it was not important. In the category that found the Internet very important, responses from the University of Zimbabwe show that the faculty of Arts had the highest number of responses with 23 (19%) followed by Social Studies with 22 (18%) while those from the University of Zululand also indicate that Arts was highest with 29 (35%) followed by Science and Agriculture with 15 (18%). The results indicate that the majority of respondents in both institutions regarded the Internet as important. Tables 26a and 26b below show the results of faculty responses by level of importance.

Table 26a: Importance of Internet for work or study- University of Zimbabwe

Importance	Faculty																					
	Engineering		Vet Science		Agriculture		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very important	18	55	1	25	11	65	15	54	22	47	12	60	23	77	15	58	-	-	7	64	124	56
Important	12	36	3	75	6	35	12	43	22	47	8	40	7	23	11	42	4	67	4	36	89	40
Not important	3	9	-	-	-	-	1	4	3	6	-	-	-	-	-	-	2	33	-	-	9	4
Total	33	100	4	100	17	100	28	100	47	100	20	100	30	100	26	100	6	100	11	100	222	100

Table 26b: Importance of Internet for work or study- University of Zululand

Importance	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce & Admin		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very important	15	68	29	78	2	50	3	100	7	47	1	100	56	68
Important	6	27	6	16	2	50	-	-	2	13	-	-	17	21
Not important	1	5	2	5	-	-	-	-	6	40	-	-	9	11
Total	22	100	37	100	4	100	3	100	15	100	1	100	82	100

Secondly, analysis was done according to the level of academics. The purpose was to establish how academics were using or considered the Internet important for their work. It was considered that importance placed on e-resources would influence use by students at all levels. The question targeted 88 respondents, 62 (70%) from the University of Zimbabwe and 26 (30%) from the University of Zululand. In the category of professors 100% of respondents from the University of Zimbabwe considered the Internet to be important compared to 80% from the University of Zululand. 17% and 13% of senior lecturers from the University of Zimbabwe and Zululand respectively did not consider the Internet to be important. Table 26c below provides a summary of findings.

Table 26c: Importance of the Internet for work or study by level of academics

Importance of Internet for work or study	Level of academic																											
	Professor				A/Prof				Snr Lecturer				Lecturer				R/Fellow				T/Assistant				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very important	2	40	2	40	-	-	1	100	3	50	5	63	29	74	11	92	-	-	-	-	4	50	-	-	38	61	19	73
Important	3	60	2	40	2	100	-	-	2	33	2	25	10	26	1	8	2	100	-	-	3	38	-	-	22	35	5	19
Not important	-	-	1	20	-	-	-	-	1	17	1	13	-	-	-	-	-	-	-	-	1	13	-	-	2	3	2	8
Total	5	100	5	100	2	100	1	100	6	100	8	100	39	100	12	100	2	100	-	-	8	100	-	-	62	100	26	100

4.2.27 Assistance provided by library staff

This item required respondents to indicate how often they received assistance from library staff with regards to the use of Internet resources. The purpose of this question was to help analyse how librarians were actively participating in assisting users in using Internet resources. Assistance rendered would also help point out the levels of information literacy programmes provided by the institutions. There were 302 responses from both institutions of which 223 (74%) were from the University of Zimbabwe and 79 (26%) from the University of Zululand. 126 (57%) of respondents from the University of Zimbabwe indicated that they never get assistance from subject librarians or other library staff compared to 48 (61%) from the University of Zululand. Analysed by faculty, 28 (88%) of respondents from the faculty of Agriculture, University of Zimbabwe indicated that they did not get assistance from library staff with Medicine being the least with 6 (30%). Science & Agriculture was highest among different faculties from the University of Zululand with 18 (82%) while Theology was the least in terms of not getting assistance with 1 (100%). The faculties of Arts in both institutions had the highest percentages in the 'sometimes category' with 14 (47%) and 14 (38%) for the University of Zimbabwe and University of Zululand respectively. The results indicate that the majority of respondents were not getting any assistance from library staff with regards to the use of Internet resources in both institutions. Tables 27a and 27b give a summary of results.

Table 27a: Getting assistance: University of Zimbabwe

Getting Assistance	Faculty																					
	Engineering		Vet Science		Agriculture		Science		Social Studies		Medicine		Arts		Education		Law		Commerce		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Often	2	6	-	-	-	-	1	4	6	13	7	35	3	10	3	12	1	17	4	33	27	12
Sometimes	2	6	1	25	4	24	9	32	16	33	7	35	14	47	10	38	3	50	4	33	70	31
Never	28	88	3	75	13	76	18	64	26	54	6	30	13	43	13	50	2	33	4	33	126	57
Total	32	100	4	100	17	100	28	100	48	100	20	100	30	100	26	100	6	100	12	100	223	100

Table 27b: Getting assistance: University of Zululand

Getting Assistance	Faculty													
	Science & Agriculture		Arts		Education		Law		Commerce		Theology		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Often	2	9	3	8	1	25	2	67	4	33	-	-	12	15
Sometimes	2	9	14	38	2	50	-	-	1	8	-	-	19	24
Never	18	82	20	54	1	25	1	33	7	58	1	100	48	61
Total	22	100	37	100	4	100	3	100	12	100	1	100	79	100

4.2.28 Type of assistance provided

For those respondents who indicated that they received some assistance from library staff, this question required them to indicate how they were assisted. This question attracted varying responses with some showing appreciation to the assistance provided by librarians and some dismissing librarians as being less helpful. The following summary highlights some of the comments raised by respondents from the two institutions:

- 'Searching Medline database and other Internet web sites' (Medical Library)
- 'Faculty librarian updates department of latest e-journals, sites and e-learning centres very often'
- 'Locating information'
- 'Information on new e-journal titles, usually those which are on trial'
- 'Copying information onto a diskette'
- 'Downloading information from the Internet'
- 'Never bothered to ask'
- 'They are useless, I know more than they do' (Senior lecturer)

In the student category, assistance was mainly on how to use electronic databases and locating information required in answering specific assignments or research topics. However, the majority of students who indicated getting assistants from library staff were from the University of Zimbabwe than Zululand as supported by results in 4.2.27 above. Perhaps the reason is that there are more Internet facilities for students in the University of Zimbabwe library than there are in the University of Zululand library.

4.2.29 Influence of Internet on information seeking

Respondents were requested to indicate if their information seeking pattern or behaviour for both library and other information resources had changed in any way by using the Internet. The answers were either 'yes' or 'no'. There were 296 responses from the two institutions, 221(75%) from the University of Zimbabwe and 75 (25%) from the University of Zululand. The responses were analysed separately by academic status and by level of study. In the academic category, there were 83 responses, 60 (72%) from the University of Zimbabwe and 23 (28%) from the University of Zululand. 43 (73%) of respondents from the University of Zimbabwe indicated that the Internet had changed their information seeking behaviour compared to 17 (74%) from the University of Zululand. By academic status, among professors, 3 (60%) from the University of Zimbabwe indicated that the Internet had changed their information seeking behaviour compared to 3 (75%) from the University of Zululand. The same pattern was observed among lecturers where 76% and 90% for the University of Zimbabwe and Zululand respectively. Table 28a provides a summary of results for the academic category.

Responses were also analysed by institution and level of study. There were 213 responses from students in the two institutions. 161 (76%) were from the University of Zimbabwe of which 15 (9%) were postgraduates and 52 (24%) were from the University of Zululand of which 19% were postgraduates. 94 (58%) of students from the University of Zimbabwe indicated that the Internet had changed their information seeking behaviour, of which 11 (12%) were postgraduates compared to 32 (62%) from the University of Zululand, of which 5 (16%) were postgraduates. Table 28b gives a summary of the results.

Table 28a: Effect of Internet on information seeking behavior: by institution and academic status

Change in Behaviour	STATUS																											
	Professor				Assoc Prof				Snr Lecturer				Lecturer				R/Fellow				T/Assistant				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	3	60	3	75	1	50	-	-	5	83	5	63	28	76	9	90	-	-	-	-	6	75	-	-	43	72	17	74
No	2	40	1	25	1	50	1	100	1	17	3	38	9	24	1	10	2	100	-	-	2	25	-	-	17	28	6	26
Total	5	100	4	100	2	100	1	100	6	100	8	100	37	100	10	100	2	100	-	-	8	100	-	-	60	100	23	100

Table 28b: Effect of Internet on information seeking behavior: by institution and level of study

Changed in Behaviour	Status											
	Postgraduates				Undergraduates				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	11	73	5	50	83	57	27	64	94	58	32	62
No	4	27	5	50	63	43	15	36	67	42	20	38
Total	15	100	10	100	146	100	42	100	161	100	52	100

4.2.30 How the Internet has influenced information seeking

If the answer in 4.2.29 above was 'yes', respondents were asked to indicate how this had changed. The purpose of this question is self-explanatory. The following is a summary of how the Internet had changed information-seeking patterns by institution:

University of Zimbabwe:

- 'The library is no longer subscribing to some important journals, so access to Medline via the Internet becomes the only alternative'
- 'I tend to get more current information on the Internet'
- 'I only go to the library for old articles and books which I cannot find on the Internet'
- 'I use the Internet as a first option (at times references) then relevant print sources where relevant'
- 'I can search for information on home computer and not necessarily being physically in the library'
- 'I do not go to the library as often as I used to do'
- 'I have not been to the library in the last 10 months (History Lecturer)'

University of Zululand:

- 'Availability of current online text reduces time spent searching'
- 'Quicker access to information without having to physically leave your office'
- 'Have resorted to the Internet because quite often the library does not have current journals'
- 'The Internet is more convenient in that it allows independent research with wider options'
- 'Most information sought can be found in a short space of time'
- 'I get every information I want on the Internet (student)''

The above comments indicate that information seeking has changed in the following areas: availability, access, timeliness and dependability.

4.2.31 Importance of Internet based resources

This item required respondents to indicate how important information resources on the Internet were in fulfilling specific purposes, namely, searching factual information, finding

general information on a topic, and keeping abreast with developments in own subject or discipline. This was measured against a three variable scale of ‘not important’, ‘important’ and ‘very important’. The number of responses varied with each purpose for both universities. In the category of searching for factual information there were 203 responses from the University of Zimbabwe of which 107 (53%) indicated that the Internet was important while 7 (3%) felt it was not. There were 76 responses from the University of Zululand and 53% felt the Internet was important for searching for factual information. The same pattern was also observed in finding general information in which 53% and 51% felt it was important for the University of Zimbabwe and Zululand respectively. In the last category of keeping abreast with developments in own subject area, 8% felt it was not important for the University of Zimbabwe compared to 12% from the University of Zululand. The results show that the Internet is regarded as important when searching for information for different purposes and in different subject areas. Table 29 provides a summary of the results.

Table 29: Perceived importance of Internet for specific purposes by institution

Perceived importance	Purpose											
	Searching factual information				Finding general Information				Keeping abreast with developments in own subject area			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%
Not important	7	3	2	3	3	2	2	3	17	8	9	12
Important	107	53	40	53	110	53	38	51	76	37	29	39
Very important	89	44	34	45	93	45	35	47	111	54	36	49
Total	203	100	76	100	206	100	75	100	204	100	74	100

4.2.32 Comparison between print and electronic resources

Respondents were asked on how they compared electronic sources of information against print sources of information. The purpose of the question was to find out the general preferences of the respondents between print and e-sources. The following is a summary of their comparison.

- ‘Electronic resources are easier and more accessible’
- ‘Electronic sources are more flexible, easier to use and more accessible’

- ‘Electronic sources are immediate and faster while print sources are sometimes not available in the library’
- ‘Electronic sources are more up to date compared to print and are easier to use’
- ‘Electronic sources are increasingly becoming important sources of information’
- ‘Electronic sources are globally current and vast but better read when printed while print sources are limited but easy to browse’
- ‘Electronic sources are cheaper but journals in my subject area (Mathematics) are still mainly in print’
- ‘Electronic sources are good, cheap and easily accessible if one is connected’
- ‘Electronic sources are more current but lack depth found in print’
- ‘Electronic sources are superior but print resources more dependable’
- ‘Internet sources are faster to access although at times information can be doubtful’
- ‘Most Internet information is flowery and sketchy, unlike print’
- ‘Electronic resources are user friendly and require less space (physical) to store’
- ‘Print sources are rather static, new research is published regularly in electronic sources which stimulates discussion and further research’
- ‘Print sources are more reliable than e-sources because of editorial policies’
- ‘Print sources are far better referenced’
- ‘One still prefers print sources although it is far easier to get information from the Internet’
- ‘Print sources usually are full-text while electronic resources provide mostly abstracts’
- The two resources complement each other and that each had its own advantages and disadvantages.

What the above responses demonstrate is that electronic sources are preferred more in terms of accessibility, print sources are seen generally as more dependable in terms of quality. Respondents from the two institutions generally shared the responses highlighted.

4.2.33 Problems affecting Internet use

Respondents were requested to indicate factors that they considered affected the use of the Internet in their respective institutions. There were similarities in the answers submitted from the two institutions. These are summarized below:

- **Connectivity**

This was a major concern mostly from the University of Zimbabwe although a few other respondents from the University of Zululand did highlight it as well. The Internet was considered to be very slow which affected the speed of accessing Internet information as well as downloading searching search results.

- **Computers**

The computers were also considered to be too few and at times too old to handle certain Internet files. Some information, especially from electronic journals is available as pdf documents, which require special software, which either was not available or could not be supported by certain machines. This also contributed to the congestion on the Internet. This shortage of computers was also creating overcrowding as people jostled to make booking in the mornings. To quote one respondent from the University of Zimbabwe: ‘ the ratio of computers per student is unacceptable, it makes Internet based assignments difficult to give.’

- **Training**

Lack of adequate training was an issue raised by the majority of respondents from the University of Zimbabwe and University of Zululand. This was extended to include library staff, to quote one respondent ‘library staff lack excellent computer skills to teach users and yet they should be in the forefront.’

- **Awareness**

Respondents were concerned with the lack of publicity on the benefits of the Internet and other electronic resources. According to one respondent from University of Zululand, ‘management lack knowledge on the importance of the Internet which makes it difficult to integrate it as part of the teaching process.’

- **Access**

A major concern raised by both staff and student from the University of Zululand concerned the issue of accessibility. The Internet was not available to all registered students until the beginning August 2002. Only those students who take modules that require them to use the Internet could be registered to use the Internet. This greatly disadvantages students who might wish to carry out independent research on the Internet, who may not necessarily be taking Internet related modules as part of the curriculum. This concern was blamed on poor management policy. To quote one academic from University of Zululand: 'management does not see the importance of the Internet to students.' Another concern raised from the University of Zululand was that the computer laboratories were not always accessible because they are also used for classes. There was also concern that some laboratories with faster machines were reserved for certain classes (Hydrology, Library and Information Science and Communication Science), while other students were asked to use the laboratory with 'slower machines.'

- **Cost**

The costs of subscribing to electronic resources were seen as greatly prohibitive by the academics from both institutions. While some resources are freely available, these lack quality. Academics may be interested in certain journal titles available on free trial, but once the trial period lapses, they find that the institution cannot meet the subscription costs. Concern was raised on why librarians should market these services when there is no long-term benefit.

- **Quota allocation**

This issue was raised by more than 90% of the students from the University of Zululand. The quota allocation is a system where by each registered student's Internet account is credited with a certain amount of money, which they could use to access the Internet each term. Once this money is exhausted, then one cannot access the Internet. Students complained that this amount should be increased from what ever figure it is currently on, to a more manageable figure.

- **Booking system**

Respondents in the student category heavily criticized the current booking system in place at the University of Zimbabwe. Concern was raised that some students falsified their identities and booked themselves several times on one computer. Many times the librarians on the help desk did not check to see what the students were doing on the Internet, resulting in some serious researchers being disadvantaged while others continue to play games and communicate through emails. The 45 minutes allocated per session was also considered too short especially when the Internet is slow.

- **Technical support**

Respondents, especially from the University of Zimbabwe complained of lack of technical support, especially at night. At times the machines are switched off and passwords are not readily available to bring back connection. The same applies to connections elsewhere on campus, for example, one respondent complained that the Computer Centre had told him that staffs were writing examinations and there was no one to provide immediate help.

4.2.35 Recommendations

Having gone through the questionnaire and completing the relevant sections accordingly, the respondents were asked to provide their recommendations on effective Internet accessibility. This was a more open question in which respondents could provide what they felt should help improve the use of the Internet in their respective institutions. As in the questions above, these were summarized as follows:

- **Equipment/Computers**

The biggest challenge facing the two institutions is the shortage of equipment, more specifically computers to connect to the Internet. Respondents recommended that more computers be allocated to the computer laboratories, the library and academic offices so that more people could have access without necessarily causing congestion in those areas that are connected. The academics recommended that there be separate facilities for students and them because at times they find themselves queuing for the same computers. The majority of academics called for authorities to provide computers to every lecturer's office. There was

also a request to provide cheaper printing facilities that would enable researchers to download and print searches. Respondents from the University of Zimbabwe strongly recommended that they be allowed to save searches on 'A' drive in the library, a facility that is currently not available.

- **Access**

There was a request for the provision of access to the Internet to all registered students regardless of whether they were taking Internet related modules (especially from the University of Zululand). Secondly, there is need to boost access to the Internet by providing more connections in the computer laboratories, the libraries, lecturers' offices. Access should also be extended to halls of residents. Thirdly, the laboratories should extend opening hours and if possible up to 24 hours a day.

- **Training**

The universities should provide more training on computer and Internet use to all categories of users in order to effectively use the facilities available. To quote one professor in Science: 'training is needed for lecturers on how to put information on the Internet for students, which should be done by competent staff.' At the University of Zimbabwe, academics called on Librarians to improve on computer skills if they are to positively help students. The respondents recommended that training be in the form of short courses, which if possible should be made compulsory to all new students. Manuals should also be readily available.

- **Cost**

The respondents strongly recommended that more funds should be allocated towards sustaining subscriptions to electronic journals and other electronic resources. Currently there are very few subscriptions to e-journals and online databases which students and academics would want to access. There was no need for the authorities to market services that they would not sustain in the long run.

- **Connectivity**

The current Internet speed or bandwidth in the two institutions was seen as too slow and needs to be upgraded to achieve high speed. Once this is achieved the Internet should be available with minimum disruptions as is currently the case.

- **Quota allocation**

The quota system currently in place at the University of Zululand was seen as a deterrent and should be scrapped to provide more funds per quota per student. The current allocations were seen as inadequate.

- **Booking system**

The booking system in place at the University of Zimbabwe Library needs to be changed or closely monitored to avoid a monopoly by few students. A more stringent mechanism should be put in place that allows librarians and help desk staff to monitor those abusing the service, which includes games and non-academic use.

- **Technical support**

There was a further request for technical support in the computer laboratories and library, especially at the University of Zimbabwe during the night and on weekends. The duty Librarian should also provide passwords when required.

- **Marketing**

Despite the shortcomings associated with subscription, there is need to market the services currently being provided and create awareness on what is available before money could be spent on further subscriptions. One concern raised by librarians in their responses was that students do not find it useful to cite e-resources because some academics did not recognize them. At the same time the academics are saying that due to the current shortage of funds to purchase new books, e-sources should be promoted/marketed.

4.3 Interviews

Interviews were conducted with the Information & Communication Technology Manager at the University of Zimbabwe Libraries and the acting Systems Librarian in the University of Zululand Libraries. Due to some technicalities beyond the scope of the researcher, the interview with people from NSU, University of Zululand could not take place. The department, however, responded to the questions that had been sent ahead of the scheduled interview. This section looks at the responses from the ICT Manager, University of Zimbabwe, who provided responses on behalf of the University Computing Services, to which he is a member and the responses provided by NSU. Responses from the Systems Librarian are discussed in the next chapter. The purpose of the interviews was to find out more on the universities' policies on Internet and to follow up on some of the projects that were current at the time early in the research.

The first question looked at whether there were any policies governing the use of Internet in the two universities. It emerged that both universities did have policy documents governing Internet usage. The *'User compliance policy for users of computer facilities at the University of Zimbabwe'* is a document produced by the University Computer Committee. Among the guidelines stated include: acceptable use of University computer resources, things to do and not do, which include the transmission of offensive e-mail messages and hacking among other things. The document also provides a summary of the main laws of the country that could be violated by abusive computer usage. The *'University of Zululand Computer Networks/Systems Acceptable use and access policy'* is an emerging document produced by the Computer Laboratory Management Committee and provides guidelines to students, academics and other university staff on acceptable use of computing services in the university. The document is available on <http://www.uzulu.ac.za/AUP/policy.html>

Secondly, the researcher wanted to find out how far the two universities had gone in implementing projects that were in the preliminary stages or running, early in the research. The campus wide network project at the University of Zimbabwe was reported to be nearing completion with the backbone now in place and 85% cabling done in the whole university. On Internet usage, statistics on bandwidth utilization by server could, however, not be made

available. The TENET connection was reportedly completed, commissioned and upgraded at the University of Zululand and with a bandwidth of 1216Kbps. The next TENET upgrade would provide separate Internet connectivity to Umlazi campus. On the prepaid quota system, the department indicated that all registered students would have access to the Internet on a quota allocation beginning of third term (August 2002) after which they would be required to pay for access once they exhaust their allocations.

The last question was on the problems faced by the universities in providing an effective and efficient Internet service. The main problem highlighted from the University of Zimbabwe was the shortage of foreign currency, which affected the operations of the postal and telecommunications authority, especially with regard to provide adequate bandwidth to all Internet users. On the other hand, the major problem affecting the University of Zululand was the shortage of manpower with technical Internet and web development skills. This creates backlogs in most areas resulting in client frustration. The division has seen its role change from merely providing Internet access, assuming new responsibilities in providing web-based applications for student registration, online prospectus and timetables, which have not been met with enough skills development.

4.4 Summary

This chapter has looked at the analysis of responses from academics at students from the two universities. The responses were all analysed by institution and by status of respondents or faculty depending on what was being highlighted in the question. The chapter has also looked at how the different Internet services and resources were being used in the two institutions and by which category of users. Emerging from the analysis is that e-mail, the web and online public access catalogues are the most popular Internet services used in the two universities. The results have also shown that all faculties surveyed were using the Internet and related resources.

The next chapter looks at presentation and analysis of data from the questionnaire sent to librarians.

CHAPTER FIVE

PRESENTATION AND ANALYSIS OF DATA - LIBRARIANS

5.1 Introduction

Librarians help users access library resources, both print and electronic in many ways. Subject orientation is the most common in which users are shown how to use resources specific to their subject areas. Traditionally, this has been limited to print sources of information. The advent of electronic resources or multimedia formats presents new dimensions for both librarians and library users. In some institutions, training in the use of the Internet and computer skills is done with the conjunction of computer departments while in others, this might solely be the responsibility of library staff. The aim of this chapter is to present and analyse data collected from the questionnaire distributed to librarians from the two institutions under study. The questionnaires were distributed to professional librarians in the positions of Assistant Librarian and above and those acting in such positions, although the researcher felt that in some instances duties overlap and other categories of staff find themselves heavily involved in using electronic resources for work purposes. A total of 36 questionnaires were distributed, 10 to the University of Zululand staff and 26 to the University of Zimbabwe.

5.2 Responses from librarians

The purpose of the questionnaire was to investigate how librarians use the Internet and what they do in assisting users exploit Internet and other related electronic resources. The questionnaire complements responses from academics and students analysed in the previous chapter. The analysis follows the format presented in the questionnaire.

5.2.1 Institutional affiliation

This item required respondents to indicate which institution they belonged to for the purpose of helping separate responses by institutional affiliation. This question targeted 36 librarians 10 (28%) at University of Zululand and 26 (72%) from the University of

Zimbabwe. The overall response rate was 25 (69%). An institutional analysis shows that the response rate for the University of Zululand was 9 (90%) and 16 (74%) for the University of Zimbabwe. No significant reasons can be attributed to the non-response from the two institutions.

5.2.2 Designation

The item required librarians to indicate their designation, which was necessary in helping the researcher to establish their position in the organizational structure. The question targeted the 25 respondents. Responses from the University of Zimbabwe show 1 (6%) Deputy Librarian, 3 (19%) Sub-Librarians/Senior Librarian, 4 (25%) Senior Assistant Librarians/Librarian, 8 (50%) Assistant Librarians, of whom 2 (22%) were in acting capacity. Responses from the University of Zululand indicate 1 (11%) Deputy Librarian, 1 (11%) Senior Librarian and 7 (78%) Librarians. The responses indicate that various grade of professional librarians were represented.

5.2.3 Department

Closely associated with the status or position, the department in which one worked would have some influence in the way librarians used the Internet and how they would complete the rest of the questionnaire. Some departments may not require constant interaction with patrons on daily basis and may not expose such librarians to certain demands from patrons. The analysis indicates that all the major departments of the two libraries were represented. These include those working in the background, such as Acquisitions and Cataloguing and those with constant interaction with users such as Reference/Readers Services and Faculty and Subject Librarians. The highest responses were from Faculty/Subject Librarians in both institutions with 3 (34%) for the University of Zululand Library and 4 (25%) for the University of Zimbabwe. Table 30 below gives an analysis of the findings.

Table 30:Departmental responses by institution

Department	University of Zululand		University of Zimbabwe	
	N=9	%	N=16	%
Acquisitions	1	11	1	6
Circulation	1	11	1	6
Inter-loans	1	11	1	6
Reference/Readers services	1	11	3	19
Librarian's office	1	11	1	6
Special Collections	1	11	2	13
Faculty/Subject Librarians	3	34	4	25
Cataloguing	-	-	2	13
Periodicals	-	-	1	6
Total	9	100	16	100

5.2.4 Length of service in library

Respondents were asked to indicate their length of service in a library environment. The purpose of this question was to provide an indication on how experienced the librarians were in a library environment, which could also help explain patterns of use of certain library resources. There were 24 responses, 16 (67%) from the University of Zimbabwe Library and 8 (33%) from the University of Zululand Library. Responses from the University of Zimbabwe show that the majority 6 (38%) had between 5 and 10 years experience in the library and 1 (6%) being the longest serving with between 20 and 25 years experience. Responses from the University of Zululand Library indicate that the majority of respondents, 3 (38%) had between 10-15 years experience in the library and 1 (12.5%) being the longest serving with more than 35 years experience in the library. The results indicate that the respondents are experienced enough to be able to understand the operations required in a library. Table 31 overleaf gives a summary of length of service by institution.

Table 31: Length of service in a library by institution

Length of service	University of Zimbabwe		University of Zululand		Total	
	N	%	N	%	N	%
<5 years	1	6	-	-	1	4
5-10 years	6	38	1	13	7	29
10-15 years	4	25	3	38	7	29
15-20 years	4	25	2	25	6	25
20-25 years	1	6	1	13	2	8
25-30 years	-	-	-	-	-	-
>35 years	-	-	1	13	1	4
Total	16	100	8	100	24	100

5.2.5 Length of service in current position

Respondents were asked to indicate the length of service in current position as a follow-up to the length of service in the library environment. The purpose of this question was to establish how familiar the librarians were in the areas they were working in. Familiarity with resources in a given area assumingly would positively influence the use of such resources. If for example, one has been in a position for under one month, their knowledge of resources in the given subject area might not be the same as one who has spent more years in current position. The question attracted 23 responses, 15 (65%) from the University of Zimbabwe and 8 (35%) from the University of Zululand. Responses from both institutions show that the majority of respondents had less than 5 years in their current positions with 10 (67%) of respondents from the University of Zimbabwe and 7 (88%) of respondents from the University of Zululand. 1 (7%) respondent from the University of Zimbabwe had between 5-10 years while the remaining 4 (27%) had between 10-15 years in current position.

5.2.6 Qualifications

Respondents were asked to indicate their qualifications. The purpose of this question was to establish the general level of academic qualifications of librarians in the two university libraries. The question attracted 24 responses 16 (67%) from the University of Zimbabwe and 8 (33%) from the University of Zululand. Four categories of qualifications emerged from the survey, which are: masters, honours in library science, degree in librarianship or

postgraduate diploma in library science and undergraduate diploma. 2 (25%) of respondents from the University of Zululand had master's degree and 5 (62.5%) had honour in library science, which is equivalent to first year of master's degree, and 1 (12.5%) with postgraduate diploma. There was a 100% response from the University of Zimbabwe to this question. 4 (25%) indicated having masters qualifications, 10 (63%) had either a degree in library science or a postgraduate diploma in library science. The remaining 2 (13%) had a Diploma and a Higher National Diploma respectively. These were in acting positions.

5.2.7 Age

This item required respondents to indicate their age. Given the sensitivity that might be associated with such questions, the question did not require specific ages but to indicate in which range they fell in. This question together with 5.3.5 and 5.3.6 above were important in helping the researcher have an idea about the group (composition, etc) that were dealt with in the survey. The analysis for the two institutions indicate that 1 (4%) were in the 21-30 age group, 9 (36%) were in the 31 to 39 age group, 10 (40%) were in the 40-49 age group, while 5 (20%) were in the 50 and above age group. Figure 3a and 3b below indicate analysis by institutions.

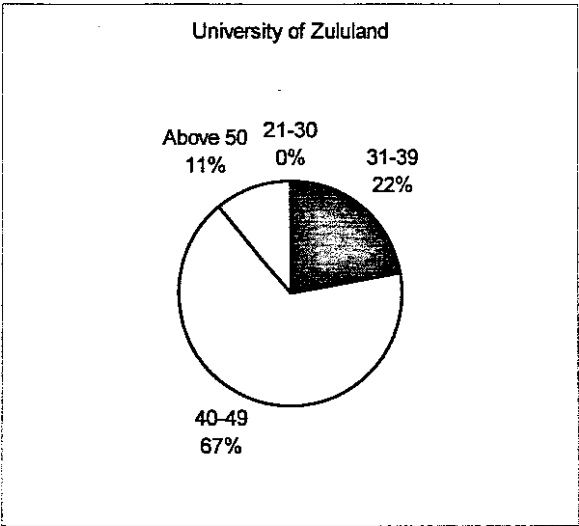


Figure 3a

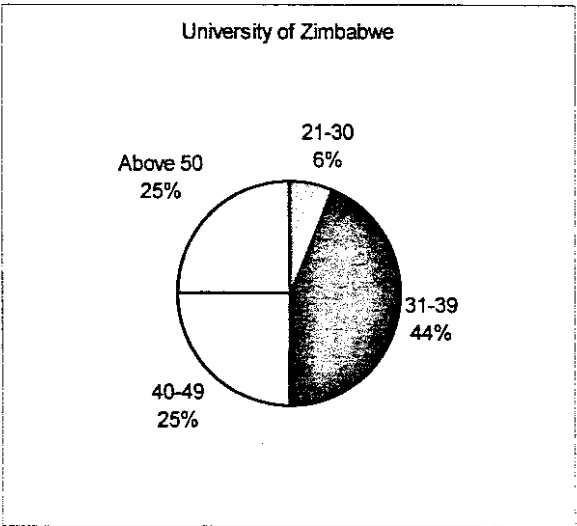


Figure 3b

5.2.8 Gender

This item required respondents to indicate their gender. As an extension to 5.3.4-5.3.7 above, the question was meant to help the researcher to establish the gender composition of the population under study. In total, 17 (68%) of the respondents were female against 8 (32%) male respondents. Further analysis by institution indicates that at the University of Zululand, 8 (89%) were female against 1 (11%) male. At the University of Zimbabwe, 9 (56%) of the respondents were female compared to 7 (44%) male. The results indicate that there are more female librarians in the professional category than male librarians.

5.2.9 Access to a computer

Respondents were asked to indicate if they had access to a computer and where such access was available. Options available included one's office, the university laboratories, and home access and shared access. There was a 100% response to this question from both institutions. The results indicated that 12 (75%) of respondents from the University of Zimbabwe Library had access to a computer in the office, 3(19%) had shared access in the office while 1 (6%) indicated having access in the office and at home. Similarly, responses from librarians at the University of Zululand showed that 8 (89%) had access to a computer in the office and 1 (11%) indicated having access both at home and in the office. There was no shared access from University of Zululand. The results indicate that the majority of librarians in the two institutions have more access to a computer in the office.

5.2.10 Access to the Internet

The question required respondents to indicate if they had access to the Internet and where such access was available. Options to choose from were similar to question 9 above. The purpose of this question was to assess Internet accessibility by librarians in the two institutions, which is a central to this research. Access affects the frequency use and non-use of Internet resources. There was a 100% response to this question. Results indicate that 14 (88%) of respondents from the University of Zimbabwe indicated having access to the Internet in the office compared to 8 (89%) from the University of Zululand. 6% and 11% of the respondents had access from home and in the offices from the University

of Zimbabwe and University of Zululand respectively. 6% of respondents from the University of Zimbabwe indicated having access in the offices and from other locations. The results show that librarians have more access to the Internet from the office in both institutions and that every respondent had access.

5.2.11 Computer skills

Respondents were required to indicate their perceived level of computer literacy. The options available ranged from poor to excellent. The purpose of this question was to establish how competent respondents were, especially since they were expected to help and train users as in using computers. The question attracted 25 (100%) responses. Results show that 11 (44%) of total responses considered their skills to be very good, 8(50%) from the University of Zimbabwe and 3 (33%) from the University of Zululand. 9 (36%) good, and 3 (14%) with enough skills to enable them to work. No respondents considered their skills poor from both institutions. The breakdown is shown in the analysis by designation. The analysis by designation shows that the Deputy Librarians considered their skills as good. In the Assistant Librarian category, 6 (75%) considered their skills to be very good, all being from the University of Zimbabwe. Table 32 below gives a summary of the findings.

Table 32: Computer skills by designation

Computer skills	Designation															
	Deputy Librarian				Sub/Senior Librarian				Senior Assistant/Librarian				Assistant Librarian			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Excellent	-	-	-	-					-		1	14	1	12.5	-	-
Very good	-	-	-	-	1	33			1	25	3	43	6	75	-	-
Good	1	100	1	100	2	67	1	100	1	25	2	29	1	12.5	-	-
Enough					-	-			2	50	1	14	-	-	-	-
Poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	100	1	100	3	100	1	100	4	100	7	100	8	100	-	-

5.2.12 Internet skills

Having indicated their computer skills above, respondents were asked to indicate how competent they were with the Internet. The question attracted 100% response from both

institutions. 40% of the respondents felt that their Internet skills were good while 24% considered their skills to be excellent. There was a similar trend with the previous question, where none of the respondents indicated that their skills were poor. The results indicate that librarians in both institutions are competent Internet users whose skills could help them assist library users efficiently. Table 33a below provides a summary of the findings.

Table 33a: Internet skills by institution

Internet skills	University of Zimbabwe		University of Zululand		Overall total	
	N	%	N	%	N	%
Excellent	4	25	2	22	6	24
Very good	6	38	1	11	7	28
Good	5	31	5	56	10	40
Enough	1	6	1	11	2	8
Poor	-	-	-	-	-	-
Total	16	100	9	100	25	100

Further analysis was done on Internet skills by designation. 50% of Assistant Librarians considered their Internet skills to be excellent while 36% of the total responses reported that were in the senior grades of Senior Assistant/Librarian and Sub/Senior librarian indicated that their Internet skills were good. What is evident from the results is that librarians showed more Internet skills compared to computer skills. Table 33b illustrates how the respondents rated their skills.

Table 33b: Internet skills by designation

Internet skills	Designation															
	Deputy Librarian				Sub/Senior Librarian				Senior Assistant/Librarian				Assistant Librarian			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Excellent	-	-	-	-	-	-	-	-	-	-	2	29	4	50	-	-
Very good	1	100	-	-	1	33	-	-	-	-	1	14	4	50	-	-
Good	-	-	1	100	2	67	1	100	3	75	3	43	-	-	-	-
Enough	-	-	-	-	-	-	-	-	1	25	1	14	-	-	-	-
Poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	100	1	100	3	100	1	100	4	100	7	100	8	100	-	-

5.2.13 Training needs

Having qualified their computer and Internet skills above, respondents were asked to indicate if they required any training in computer and Internet skills. The response rate was 100% from both institutions. 6 (38%) from the University of Zimbabwe indicated that they required only computer skills with none from the University of Zululand. 4 (16%) required Internet skills only 3 (75%) from the University of Zimbabwe and 1 (25%) from the University of Zululand. The findings revealed that the majority 12 (48%) of respondents from both institutions required both Internet and computer training 4 (33%) from the University of Zimbabwe and 8 (67%) from the University of Zululand. It was rather ironical that many had actually indicated in the previous question that their skills were good. 3 (12%) indicated that they did not require any computer or Internet training, all from the University of Zimbabwe.

5.2.14 Length of use of the Internet

This question required respondents to indicate the length of time they have been using the Internet. The purpose of this question was to evaluate Internet experience among librarians in the two institutions and also for further reference when it came to resources used. The results indicate that 100% of the respondents had more than 2 years experience using the Internet. Results also indicate that 17 (68%) of respondents from both institutions have more than 5 years of Internet usage, 11 (65%) from the University of Zimbabwe and 6 (35%) from the University of Zululand. This was followed by 5 (20%) with 3-4 years Internet experience of which 80% were from the University of Zimbabwe and 20% from the University of Zululand. Only 3 (12%) of the respondents indicated having between 2 and 3 years of using the Internet, 2 (67%) being from the University of Zululand.

5.2.15 How one learnt to use the Internet

This last question on Internet access and skills measurement required respondents to indicate how they had learnt to use the Internet. The options given were, in-house course offered by the employer, learning from colleagues, self taught and other. The results indicate that 68% of the librarians had learnt to use the Internet through self-study. The

second highest option was in-house course offered by the library with 64%, being 62% and 67% of total responses from the University of Zimbabwe and Zululand respectively. 13% of respondents from the University of Zimbabwe indicated that they had learnt to use the Internet through other methods, which were listed as continuing education Table 34 below gives a summary of the findings.

Table 34: Learning to use the Internet

Method	Institution					
	University of Zimbabwe		University of Zululand		Total	
	N	%	N	%	N	%
In-house course offered by the University	4	25	5	56	9	36
In-house course offered by the library	10	62	6	67	16	64
Self taught	12	75	7	78	17	68
From colleagues	6	38	5	55	11	44
Other	2	13	-	-	2	8

5.2.16 Internet access in the Library

Internet access in the library, in this research, was considered in two perspectives. Firstly, having dedicated computers or laboratories from where students could access the Internet, and any other means of access, e.g. from the subject librarians’ office where patrons would get assistance. This question required respondents to indicate if there were facilities in the libraries to provide Internet services to academic staff and students. This question was analysed in two parts. The first part looked at Internet access to all students in the two libraries while the second part looked at provision of Internet to all academics. There were variations in the responses given, even by respondents in the same institution. Responses from the University of Zimbabwe for example, show that 13 (81%) indicated providing Internet access to all students while 3 (19%) answered that there was no Internet access to students. On providing Internet to academics, 12 (80%) indicated providing such access while 3 (20%) indicated not providing such service with one not answering. This could be due to the fact that some Branch libraries do not have computers specifically set-aside for Internet access compared with the Main library. In such circumstances, librarians offer assistance from their office computers. At the University of Zululand, 4 (50%) indicated providing access to students while the same

numbers indicated not providing accesses to students. One respondent did not provide an answer to this part of the question. On providing access to academics, 5 (56%) of respondents from Zululand indicated Internet access while 4 (44%) indicated not providing such access. The reasons for this discrepancy could be that in the absence of terminals dedicated to Internet searching in the library, access is usually through subject librarians. Those who indicated not providing access to students and academics maybe those working in background offices like Acquisitions and Cataloguing. It is interesting to note, however, that in total, 17 (71%) of the respondents indicated that they provided access to the Internet to both students and academics while 7 (29%) indicated not providing this service from the 24 respondents who answered this question.

5.2.17 Internet services used and purpose

Respondents were asked to indicate which Internet services they were using and for what purpose. A list of the services was provided to choose from with an option to provide multiple purposes. Brief definitions of telnet and file transfer protocol were provided as footnotes to the table. The question attracted 100% response from both institutions. The question attracted 100% response from both institutions. Telnet and other library catalogues were the most used services for work purposes by respondents from the University of Zimbabwe with 81% while other library catalogues, telnet and electronic journals were the most used services by respondents from the University of Zululand with 78% and 67% respectively. Electronic mail was, however, the most used service for personal and work purposes by respondents from institutions with 88% from the University of Zimbabwe and 67% from the University of Zululand. The least used services by respondents from the University of were file transfer protocol and discussion groups with 19% while for the University of Zululand, 56% indicated never using discussion lists/news groups. Table 35 overleaf provides a summary of the findings.

Table 35: Internet services used and purpose

Services	Work purpose				Personal use				Work & Personal				Never				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
E-mail	1	6	3	33	1	6	-	-	14	88	6	67	-	-	-	-	16	100	9	100
World-Wide-Web	4	25	4	44	-	-	-	-	12	75	5	56	-	-	-	-	16	100	9	100
Telnet	13	81	6	67	-	-	-	-	1	6	1	11	2	13	2	22	16	100	9	100
File transfer Protocol	8	50	5	56	2	13	-	-	3	19	2	22	3	19	2	22	16	100	9	100
Discussion lists/newsgroups	5	31	3	33	1	6	-	-	7	44	1	11	3	19	5	56	16	100	9	100
Other Library OPACs	13	81	7	78	-	-	-	-	3	19	2	22	-	-	-	-	16	100	9	100
Electronic journals	11	68	6	67	2	13	-	-	3	19	3	33	-	-	-	-	16	100	9	100
Others, please specify	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

5.2.18 Frequency of use of services

Having indicated which resources they were using, respondents were asked to indicate how often they used those resources. The frequency of use ranged from daily, weekly, monthly, sometimes and never. The question attracted 25 (100%) responses from both institutions although the actual responses per question varied. Responses show that e-mail and the WWW were used daily by 100% respondents. The results also indicate that although resources like telnet, electronic journals and other library OPACs were the most used for work purposes in question 17 above, there were not used by many every day. Table 36 overleaf gives a summary of the findings.

5.2.19 Preference of source in answering reference questions

Respondents were asked to indicate which source they preferred first between printed and electronic when answering a reference enquiry. The overall responses from the two institutions indicate that 16 (64%) preferred the Internet compared to 6 (24%) who preferred print sources as their first choice. Although this question was specific on what was preferred first, 3 (12%) of the respondents indicated that they preferred both sources depending on the reference question asked. An analysis by institution shows that 11 (69%) of respondents from the University of Zimbabwe preferred the Internet compared to 5 (55%) from University of Zululand. 5 (31%) respondents from the University of Zimbabwe indicated preference to print sources compared to 1 (11%) from the University of Zululand while 3 (33%) respondents indicated preference to both sources from the latter.

Table 36: Frequency of use of Internet services

Services	Daily				Weekly				Monthly				Sometimes				Never				Total			
	Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul		Uzimb		Unizul	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
E-mail	16	100	9	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	100	16	100
World-Wide-Web	16	100	9	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	100	16	100
Telnet	2	13	5	56	5	31	1	11	-	-	-	-	7	44	1	11	2	13	2	22	16	100	16	100
File transfer Protocol	1	6	1	11	5	31	1	11	2	13	-	-	5	31	5	56	3	19	2	22	16	100	16	100
Discussion lists/newsgroups	4	25	-	-	4	25	1	11	-	-	-	-	5	31	3	33	3	19	5	56	16	100	16	100
Other Library OPACs	6	38	3	33	6	38	1	11	-	-	1	11	4	25	4	44	-	-	-	-	16	100	16	100
Electronic journals	3	19	3	33	5	31	3	33	3	19	-	-	5	31	3	33	-	-	-	-	16	100	16	100
Others, please specify	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

5.2.20 On-line databases used

Respondents were asked to indicate which online databases they used and whether they were full text or abstracts. Two examples were given in order to guide the users, i.e. EbscoHost and AVU. Respondents did not indicate the actual databases available from EbscoHost, which are: Academic Search Elite, Business Source Premier, Newspaper Source Plus, Masterfile Premier, Medline, and Health Source Plus. The results indicate that Ebsco-Host is the most used by 100% respondents from both libraries. AVU database was again used by 100% from the University of Zimbabwe, while Sabinet and First-Search were the second most used databases by respondents from the University of Zululand with 89%. The reasons for 100% usage of Ebsco-host and African Virtual University (AVU) databases by the University of Zimbabwe is that there are freely available, to selected universities participating in regional projects. They also seem to have been marketed to patrons more than other databases. Sabinet and First-search are local databases providing South African sources, hence the possible heavy use among local librarians. Table 37 overleaf provides a summary by database.

Table 37: Online databases used

Database/Host	Frequency					
	University of Zimbabwe N=16		University of Zululand N=9		Overall Total N=25	
<i>**Denotes full-text and abstracts</i>						
	N	%	N	%	N	%
Ebsco-Host **	16	100	9	100	25	100
Sabinet	4	25	8	89	24	96
First-Search	3	19	8	89	11	44
Africa Virtual University (AVU)**	16	100	-	-	16	64
LISA	1	6	-	-	1	4
DATAD	2	13	-	-	2	8
Britannica	1	6	-	-	1	4
AJOL**	4	25	-	-	4	16
Cab Abstracts	1	6	-	-	1	4
National Library of Medicine	2	13	-	-	2	8
World Health Organization	1	6	-	-	1	4
Medical student.com**	1	6	-	-	1	4
Eric	1	6	-	-	1	4
Ingeta**	3	19	-	-	3	13
Synergy**	1	6	-	-	1	4
Library of Congress Catalogues	8	50	-	-	8	32
PERI**	2	13	-	-	2	8
Butterworth law**	1	6	-	-	1	4
Nexus	-	-	2	22	2	8
Emerald**	-	-	3	33	3	12
OCLC	-	-	1	11	1	4
INCH	-	-	1	11	1	4
SA Media & Govt Gazettes**	-	-	1	11	1	4

5.2.21 Other electronic resources used

Respondents were also asked to indicate if they were using any other electronic resources available via the Internet, for example, Subject Based Information Gateways (SBIG's). As had emerged from the pilot study, a brief explanation of what subject gateways are, was provided in order to guide the users. The question required a 'yes' or 'no' answer. The overall response indicated that 16 (67%) respondents used other electronic resources available on the Internet compared to 8 (33%) who indicated that they did not. Institutional analysis indicates that 13 (81%) respondents from University of Zimbabwe used other databases compared to 3 (33%) from University of Zululand.

5.2.22 Type of resources used and purpose

This question was a follow up to 21 above and required respondents who had indicated using other resources to show which ones and for what purpose they were using them. 9 (56%) of those who indicated using other resources responded to this question, 8 (89%) from the University of Zimbabwe and 1 (11% from the University of Zululand. All respondents indicated using these resources for work purposes, as one respondent put it ‘I use them for work purposes, I have no time for personal use.’ Table 38 below gives the summary of results.

Table 38: Other electronic resources used

Resource	Institution				
	University of Zimbabwe N=8		University of Zululand N=1		Location (URL)
	N	%	N	%	
Sosig	6	75	-	-	http://www.sosig.ac.uk
Edlis	1	13	-	-	http://www.ntl.ids.ac.uk/edlis
Agrigate	1	13	-	-	http://www.agrigate.edu.au
Agrifor	1	13	-	-	http://agrifor.ac.uk
Engineering Science	1	13	-	-	http://www.eevl.ac.uk
Humbl	1	13	-	-	http://www.humbl.ac.uk
Lawlinks	1	13	-	-	http://library.ukc.ac.uk/library/lawlinks
Bubl-link	1	14	-	-	http://www.bubl.ac.uk/link
Pinakes	4	50	-	-	http://www.hw.ac.uk/lib/
Omni	2	25	-	-	http://omni.ac.uk
Other (professional organisations)	-	-	1	100	

5.2.23 Use of search engines

This item was to find out if the respondents did use search engines in their daily searches of the Internet. Responses from the two institutions indicate that 25 (100%) used search engines. The purpose of this question was to provide a lead to the next question that required respondents to indicate which search engines they used.

5.2.24 Type of search engines used

As a follow up to 5.2.23 above, respondents were asked to indicate which search engines they were using and two examples (Google and Altavista) were provided in order to guide them. There were 24 responses to this question, 16 (67%) from the University of

Zimbabwe and 8 (33%) from the University of Zululand. Google emerged as the most popular search engine used by 100% from the University of Zimbabwe and 75% from the University of Zululand. The results also indicate that librarians from both institutions were using a variety of search engines. Table 39 below gives a summary.

Table 39: Search engines used

Search engine	Frequency					
	University of Zimbabwe N=16		University of Zululand N=8		Overall Total N=24	
	N	%	N	%	N	%
Google	16	100	6	75	22	92
Altavista	9	56	3	38	12	50
Yahoo	7	44	2	25	9	38
Dogpile	2	13	2	25	4	17
Northern Light	3	19	1	13	4	17
Lycos	3	19	1	13	4	17
MSN	1	6	-	-	1	4
Hotbot	3	19	2	25	5	21
Excite	3	19	1	13	4	17
Infoseek	2	13	-	-	2	8
Aardvark	-	-	1	13	1	4
Amanzi	-	-	1	13	1	4
Jeeves	-	-	1	13	1	4
Metacrawler	3	19	1	13	4	17
Mweb	-	-	1	13	1	4

5.2.25 Library home page

Library home pages usually provide information about the library, which include among other things, opening hours, services offered etc. This question sought to find out if respondents did have a library home page over the Internet. This question required a ‘yes’ or a ‘no’ as an answer. All (100%) respondents did indicate that their library did have a home page on the Internet.

5.2.26 Contribution to Library home page

As a follow up to 5.2.25 above, for respondents who indicated that they had a library home page, the question required them to indicate if they did contribute to the content

and technical development of such pages. This question would also help to point at how much the librarians were contributing towards making library information available via the Internet. 17 (68%) of the respondents indicated that they contributed to the library homepage's contents and technical development of which 13 (76%) were from the University of Zimbabwe and 4 (24%) were from the University of Zululand while 8 (32%) indicated that they did not contribute to its development both technically and in terms of content.

5.2.27 Current awareness of Internet services

Respondents were asked to indicate how they make their patrons or users aware of information resources that are available via the Internet. 100% (16) from the university of Zimbabwe indicated that they used newsletters to inform their users. Other methods cited include via:

- Information literacy classes
- Notices on library notice boards
- Personal endorsements and recommendations
- Advertising on the library homepage
- Faculty board meetings
- During training sessions

Similarly, 7 (78%) respondents from the University of Zululand indicated informing users on the availability of information on the Internet. 2 (22%) did not respond to this question. Users were informed through the following channels:

- By e-mail
- By word of mouth
- Via the library home page
- When users approach librarians for information
- Through listservs
- Discussion groups

5.2.28 User education

Related to the question in 5.2.27 above, respondents were asked on whether they conducted any information literacy programs for their users. This question was necessary because informing users above did not necessarily imply that they were shown how to use these resources. Respondents were asked to indicate with a 'yes' or a 'no' answer. There were 22 responses, 15 (68%) from the University of Zimbabwe and 7 (32%) from the University of Zululand. 14 (64%) of the respondents indicated that they conducted information literacy programmes, of which 4 (29%) were from the University of Zululand and 10 (71%) from the University of Zimbabwe. 8 (36) indicated that they were not involved in information literacy programmes at their universities, 5 (62.5%) from the University of Zimbabwe and 3 (37.5%) from the University of Zululand. There were 3 non-responses.

5.2.29 Resources used in user education

If the response from 5.2.28 above was 'yes', respondents were asked to indicate which resources they were using in these programs. There were varying responses from both institutions that are summarized as follows.

At the University of Zululand, the following resources were highlighted:

- Electronic mail
- Displays
- Print and electronic resources (which includes pamphlets)
- The traditional library orientation
- Oral instruction

Similar resources were mentioned by respondents from the University of Zimbabwe which are summarized below:

- Personal tutorial
- Downloaded electronic tutorials
- Printed pamphlets
- Overhead projectors
- The traditional card catalogue and the OPAC
- Print and electronic references sources

- CD-Rom databases
- Internet tutorials which contribute towards the term coursework

5.2.30 Influence of the Internet on work

Having said all the above, respondents were asked if the Internet had changed the way they conducted their work. This question required a 'yes' or a 'no' response. All (100%) respondents from the 2 institutions indicated that the Internet had changed their work habits, that is the way they conducted their day-to-day activities.

5.2.31 Nature and type of influence

This item was to be answered only by respondents who had indicated 'yes' in question 5.2.30 above. There were varying responses depending on the responsibilities of the respondents. For example those in cataloguing indicated that they were now able to import records from other library databases using the Z39.50 facilities. This accordingly helped speed up their work and minimized on original cataloguing. More significantly highlighted was the aspect on accessibility. The followings comments indicate some of the changes:

- 'I can easily access information electronically and it's less time consuming'
- 'Efficient delivery and higher quality work'
- 'Access to more current information'
- 'Searching the catalogue (OPAC) has been made much easier, especially when answering reference queries'
- 'Real time access, just in time against just in case, especially with regards to remote databases'
- 'Serendipity, occasional browsing exposes one to useful information not originally sought after'
- 'It has made my cataloguing more precise, accurate and much faster'
- 'Can conduct information literacy skills using Internet tutorials'
- 'Improved communication with both lecturers and students'
- 'Access to a wide variety of sources and answers, especially with regard to reference enquiries'

The responses above show that the Internet had changed the ways in which librarians helped users as well as in other traditional duties like cataloguing.

5.2.32 Factors affecting usage on the Internet

Respondents were asked to indicate factors that they consider to be affecting the usage of the Internet in their respective institutions. Although the two institutions differ geographically and in terms on infrastructural development, there were similarities in needs and expectations. The following summary indicates opinions from the respondents:

- **Training**

Respondents felt that there was generally inadequate training in the use of Internet resources, which affected efficient delivery of services.

- **Computers**

The second concern from respondents in the two institutions was the shortage of IT resources, especially computers. There was a general concern that PCs were not enough to afford librarians to handle large groups for information literacy and instructional purposes. The following quote helps to illustrate this concern:

‘ ... The hardware is not adequate for the clientele we are serving, as a result subject searches are confined to postgraduates and staff only’ (University of Zululand).

- **Software**

Closely related to computer hardware is the issue of software. Incompatible software was seen to affect access to certain Internet documents. For example, some information was available as pdf documents which required specific software like adobe acrobat, or as frames. This together with the slowness of the Internet at certain times affected the downloading of documents.

- **Connectivity**

The Internet was regarded as very slow in both institutions. At the University of Zululand, librarians felt that there were very few computers connected to the Internet. Those connected were in individual offices.

- **Cost**

Librarians from the two libraries highlighted the inhibiting cost of subscribing to electronic resources, especially online databases and electronic journals. At the

University of Zimbabwe, for example, subscriptions to journals were mostly through donor-funded efforts, which were being affected by the political environment. However, a lot of initiatives still remain donor driven.

- Awareness

Concern was also raised on the general lack of awareness by the academic community (including students) on what the Internet can provide.

5.2.33 Recommendations

This item required respondents to give their recommendations on how best the Internet could be utilized in helping both readers and librarians in the two institutions. This question on Internet accessibility drew a lot of responses and comments from the respondents, which are summarized below:

Access:

The issue of access was of concern to all respondents. There was a request to have all registered users have access to computers and the Internet.¹ To quote one respondent 'Internet access is not a luxury, but a necessity, especially since they have cut the book budget claiming that students can use the Internet.'

Training

Respondents strongly recommended that there should be more training on Internet skills for both students and staff, including academics. These were some of the views:

'... Training of library staff and users on searching and assessment of quality of websites and the information provided.'

'... More information literacy programmes for users.'

'... First and foremost, library staff should be given refresher courses time and again on the use of the Net.'

'... More IT training programmes for faculty.'

¹ With effect from August 2002, the University of Zululand offered Internet access to all registered students

‘... Provision of adequate resources and intensive training programmes for both staff and students.’

Hardware

The current number of computers available was not enough which made it difficult to assist users. Some respondents indicated that they end up training people in individual offices. There was also need for better machines as one respondent put it: ‘... to have quality when buying computers.’

There was also concern from librarians at the University of Zimbabwe to have more printers so that users could print their searches. Again as one respondent put it: ‘... the value of accessibility is greatly diminished if users cannot record and take away relevant information they find. For many of our users, access to printers is essential ...’

‘... Increase the number of computers for students and other academic users’

‘... More computers dedicated to Internet searching’

Costs

There were strong recommendations from both institutions on the need to allocate more funds to pay for electronic resources, i.e. journals and online databases and renewal of licenses for those databases already subscribed to.

Servers

‘The main library servers should be housed in the main library and not in the Computer Centre as is currently the case.’ This concern was raised from the University of Zimbabwe, the reason being that if there is no power or some other technical problem in the Computer Centre, the library is affected, at times unnecessarily.

Connectivity

There is need to have reliable connection to the Internet which is too slow.

‘... The bandwidth does not seem to have changed positively at all since the systems was last upgraded’ (University of Zimbabwe).

Marketing

In order to effectively utilize the services available on the Internet, respondents felt that there was need to have a more aggressive and rigorous marketing strategy. This would help create awareness and cultivate a culture more receptive to electronic information resources. There was concern that the academic community was not fully aware of the amount of information that they could use from the Internet, which in some cases the librarians have helped create, e.g. Subject gateways.

‘... More marketing and publicity of information available on the Internet.’

‘... Pro-active approach to marketing the Internet to users so that they appreciate the new approaches to information.’

Information technology policy

The need for an IT policy was considered to be important. These were some of the views:

‘... Development of an IT and Internet policy for the University of Zimbabwe, which should see the introduction of compulsory Internet lessons in all classes.

‘... Academics must take the lead in learning how to use the Internet and other ICT resources as part of their teaching process if students are to follow suit.’

‘... Basic computer skills should be made a compulsory subject for all new students.’

‘... IT training to be part of the curriculum.’

‘... Faculty and Librarians liaison on Internet use requirements for students’ research.’

5.3 Interviews

Earlier in the research, it had not been possible to gather enough information on the IT status of the University of Zululand Library from documented literature. The purpose of the interview was to obtain more information in this regard. The Interview was initially scheduled with the Acting Librarian but later rescheduled with the acting Systems Librarian. The first question asked was on how many computers library staff were currently using and how many of them were connected to the Internet. It was pointed out that there were 24 PCs in the library, all connected to the Internet but scattered in individual offices. Secondly, the researcher wanted to find out what plans the library had in Internet access to users in the library. The Systems Librarian pointed out that there

were two computer laboratories in the library that were being prepared for Internet connection. The first laboratory had been completed with 30 computers installed but was waiting for full connection. Work was in progress in the second laboratory, which would house 50 computers donated by the European Union. One laboratory would be used for staff training and Internet while the second laboratory would be used to access library databases and by library staff. She pointed out that currently, Internet and database use was being done on individual basis and from individual offices. Lastly, the Systems Librarian was asked what her duties were and how she related to NSU department. The following were her duties:

- Systems back-up

This includes taking charge of the quality control and integrity of data on library system as well as software maintenance of URICA database models.

- User support

Conducting training for library staff in using the various systems installed, providing helpdesk functions and providing Subject Librarians with technical support when training sessions for library databases are performed.

- File save

This involves monitoring security on the various systems.

On the relationship between the Library and NSU, the Systems Librarian pointed out that the Library was responsible for its own activities, including maintenance, while the NSU was responsible for networking only.

The interview helped clarify the IT status of the Library and also raised issues that were similar to those from the University of Zimbabwe. Firstly, it is the creation of computer laboratories within the library for patrons and secondly, having staff in the library dedicated to systems maintenance rather than calling on for external help in the event of technical problems occurring.

5.4 Summary

This chapter has looked at the analysis of responses from librarians from the two universities. Factors analysed include personal details of the respondents and their different levels of computer and Internet literacy. The chapter has also looked at how librarians were using the different Internet services and resources for work purposes and in assisting users. The results have shown that librarians in both institutions have high computer and Internet skills and use the Internet and related resources in conducting their duties. Areas of concern were raised from both institutions and recommendations submitted.

The next chapter presents discussion of findings that emerged from chapters 4 and 5.

CHAPTER SIX

DISCUSSION OF FINDINGS

6.1 Introduction

This chapter discusses the results of findings from Chapter 4, which presented responses from academics and students, and Chapter 5, which reflected on the responses from librarians. The first section looks at the personal details of the respondents while the second part looks at discussion based on research objectives.

6.2 Personal details of respondents

Two sets of questionnaires were distributed, one to students and academics and the other to librarians. The respondents provided information on institutional affiliation, faculty and departments, academic status, level of study and designation in the case of librarians. They also provided information on their age and gender while librarians provided additional information on their qualifications. Due to distance and other constraints, affiliate colleges and other campuses were not considered for both institutions. All faculties in the main campus from the University of Zululand were represented and so were those from the main campus and Medical school from the University of Zimbabwe. An overall 350 (90%) of the respondents indicated 79 departments in the student and academic category. Due to some discrepancies and in order to create uniformity, analysis was, therefore, limited to faculty in this category. All respondents from librarians did indicate their departments and these show that all the major departments in a library were represented. These are shown in Table 30 of Chapter 5.

Regarding academic status and rank, and level of study for students, all the academic categories were represented, i.e. from teaching assistant to professor, while there was a high response rate from undergraduates, compared to postgraduates. While it was possible to get doctoral students from the University of Zululand, it was not possible with the University of Zimbabwe, except for one respondent who was also a research fellow. Analysis for this respondent was done under research fellow status. Masters' students

were also lowly represented although in the case of the University of Zimbabwe, all teaching assistants were masters' students, the former status was considered for analysis. Tables 6 and 7 in Chapter 4 give the analysis by faculty representation. Librarians were requested to indicate their position in the staff hierarchy. This stratification allowed the researcher to analyse the use of Internet services by each category of respondents. All categories of professional staff were represented from Assistant Librarians to Deputy University Librarians. As for qualifications, these ranged from Diploma to Masters in Library/Information Science as shown in 5.2.6. The qualifications indicate that the librarians were indeed professionally qualified. Although there were 2 masters from the University of Zululand, the honours qualification in LIS in South Africa is considered at the level of first year of master's degree.

Coming to age, responses from students indicated that the majority were in the 21-25 years age group with 64% and 54% for the University of Zimbabwe and Zululand respectively. Table 8b in Chapter 4 also illustrates that undergraduate constituted the bulk of this group. In the academic category and with the exception of one response from the University of Zimbabwe, all senior lecturers and beyond were over 40 years, and noticeably, the majority of professors were over 50 years of age. Lecturers were in the lower age groups with 38% of responses from the University of Zimbabwe being in the 31-35 years age group. To some extent, the use of resources by status among academics could be considered similarly by age, e.g. age could, therefore, not be considered to affect Internet use as most senior lecturers to professor were above 50 years while the majority of undergraduates were under 25 years and these categories used resources in almost the same fashion. This is again illustrated in Table 8a. Responses indicate that seniority tends to correspond with age. Librarians, on the other hand, were most concentrated in the 40-49 years age group for the University of Zululand and 31-39 for the University of Zimbabwe. Responses from librarians showed some correspondents between age and length of service in a library environment.

On gender composition, there were 71% males compared to 29% females among academics. In the student category, there were more male students compared to female

students from the University of Zimbabwe. The reverse was observed from the University of Zululand where there were more female students compared to males, albeit by a small margin as shown in Figure 2d in Chapter 4. Among librarians, results indicated that there were more females compared to males from responses received. From the responses analysed, there were more females than males in the study.

6.3 Computer and Internet access

This was considered to be the most crucial part of the questionnaire, which separated users from non-users on the basis of accessibility. Respondents were required to indicate whether they had access to a computer and if so, indicate the location. Secondly they were also required to indicate if they had access to the Internet and where such access was available. Responses indicated that students had access in the computer laboratories with 61% and 53% from the University of Zimbabwe and University of Zululand respectively. Academics from the University of Zimbabwe showed little access in their offices and more in the computer laboratories compared to their counterparts from the University of Zululand. The former also had more cases of office sharing while the latter had none. In their study, Applebee et al (2000:143) found out that the majority (95.6%) had access to a personal computer in their office at work, which was connected to the Internet.

This study also revealed that the majority of academics had access in their work place, both from computer laboratories and offices. Similarly, there were fewer academics sharing computers in Applebee et al (2000), which also emerged from this study. Responses tabulated in Table 9, Chapter 4 show that the majority of students, both undergraduates and postgraduates had access to a computer in the laboratories. Studies by Ray and Day (1998) and Perry, Perry and Hosack-Curlin (1998) also found similar trends with lesser numbers having own access. Although Internet access is closely linked to computer access, the study showed that fewer respondents had access to the Internet from home in all categories surveyed. The study also revealed that there were more students from the University of Zululand who did not have access to the Internet compared to the University of Zimbabwe as shown in Table 10 Chapter 4. The reason for this discrepancy

was the quota allocation system that was in place at the University of Zululand at the time questionnaires were distributed and collected. This was, however, abandoned in August 2002, giving all students computer and Internet access. This reduced significantly the number of respondents who completed the rest of the questionnaire. Among the librarians, responses revealed similar trends as in the academic and student categories. All (100) librarians had access to a computer and the Internet the majority (80%) from their offices. Computer and Internet facilities in the two libraries could, thus be said to be better compared to similar studies, e.g. Saeed, Asghar, Anwar and Ramza (2000) who looked at university libraries in Pakistan. As already reviewed, half of the libraries in their study did not have Internet connection with some libraries having only one terminal.

6.4 Internet use and academic discipline

Studies by Lally (2001), Voorbij (1999) and Lazinger, Bar-Ilan and Peritz (1997) sought to explore among other aspects, Internet use by academic discipline. They concluded almost ‘unanimously’ that there was discrepancy in the use by discipline, which favoured the Sciences than Humanities and Arts. Several factors emerged from this study that point to the contrary. It is important to note that departments falling in a particular faculty may affect how that faculty uses the Internet and related resources and some modules. This was especially true with the University of Zululand. For example, some modules in Arts required students to use the Internet more compared to other faculties. Faculties showed differences in their use of Internet resources as discussed below.

6.4.1 Length of Internet use

In order to understand how the different faculties were using the Internet, this discussion looks at how long respondents had been using the Internet and secondly how they learnt to use the Internet. Studies by Voorbij (1999) and Lazinger, Bar-Ilan and Peritz (1997) showed that the majority of respondents had more than one-year experience in using the Internet, which enabled them to have more competent skills. 20% of respondents from the University of Zimbabwe indicated that they had been using the Internet for less than one year, albeit the high skills levels reflected in Table 11 of Chapter 4. Comparatively, the majority of respondents from the University of Zululand had less than 6 months of

Internet use as shown in Table 14b. Science & Agriculture, and Arts from The University of Zululand showed more representation in all the stages of Internet use. This could be explained by the fact that there were students at each level of study using the Internet as part of their curriculum compared to other faculties. Responses from the University of Zimbabwe showed that the majority of faculties were represented at each stage of Internet use. Secondly, time spent on the Internet was analysed by faculty. Responses from the University of Zimbabwe show that the top users in the one hour and less category were Social Studies followed by Education and Arts being third, while the majority from Engineering and Science spent more than 5 hours per week. Comparatively Commerce & Administration were the top users in the one-hour and below followed by Science and Arts, while Science & Agriculture spent more than 5 hours. Tables' 16c and 16d, as already indicated provide this summary.

6.4.2 Purpose of Internet use

Research was undoubtedly the most singled out purpose for which respondents from the University of Zimbabwe used the Internet. The faculty of Arts was the highest users for this purpose followed by Social Studies and Agriculture. Learning was second while in the multiple purposes; teaching, learning and research were third. Research and learning, on the other hand, were the most recognised purposes by respondents from the University of Zululand, by the faculties of Arts followed by Science and Agriculture. This was followed by multi-purposes of teaching, research and learning. This is shown in Table 17 of Chapter 4. The reasons for research being the most singled out purpose could be that the Internet provides more current resources including research results, which other scholars may want to build on. Most of these resources may not be readily available in the university libraries. Compared to other studies from literature, the Internet was used for variety of purposes in the study by Ocholla (1999) although not highly compared to other resources. Theology was consistent in their use with 100% on use by academics and 75% on how academics gained knowledge of the existence of information sources. In total, 49.5% respondents in his study acknowledged the Internet as a source of information.

6.4.3 Perceived importance of the Internet for work or study

The Internet was perceived to be very important for work and study purposes, reinforcing the observations made in the purpose of use in 6.4.2 above. As analysed in Table 26 in Chapter 4, 9 (4%) of the total respondents from the University of Zimbabwe considered the Internet not important for their work, and these were from Engineering, Science, Social Studies, and Law. The same scenario was also observed from responses from the University of Zululand. All faculties found the Internet to be important for their work or study with 11% of total respondents finding it not important, with 6 (67%) coming from Commerce & Administration. It cannot be said, therefore, that the Internet is used more by the Sciences compared to Arts and Humanities as observed in the studies mentioned above.

6.4.4 Internet resources used

While other Internet resources have been analysed by status and institution, the availability and use of electronic journals was also analysed by faculty. Faculties from the University of Zimbabwe indicated having more access to e-journals compared to the University of Zululand with 71% and 41% respectively, as shown in Table 21 of Chapter 4. The University of Zimbabwe is currently participating in donor-funded projects that are promoting the use of electronic journals. Projects include INASP’s African journals online (AJOL), PERI, African Virtual University and EBSCO. This could be the reason for the high access to e-journals. Social Studies and Education had the highest and second highest number of respondents accessing e-journals. Although journals access was lower from respondents from the University of Zululand, all faculties except Theology did indicate accessing e-journals, the highest being Arts with 55% of the total number of those accessing. There were fewer responses when respondents were asked to indicate the number of journals they were accessing, an indication of probable uncertainty. In the absence of the actual titles being accessed, responses show that Social Studies accessed more titles followed by Medicine and Engineering for the University of Zimbabwe while Arts had more titles followed by Science & Agriculture for the University of Zululand. This is shown in Tables 22a and 22b.

6.5 Internet use and level of study

Studies by Kibirige and De Palo (2000) found out that undergraduates were the lowest point of the totem with regard to expertise in information seeking in any academic institution and that the introduction of computers and electronic resources has made the situation to be even more difficult. The discussion in 6.3 above focused on computer and Internet access of all subjects of this study, it has also looked at how and where such access was available including by undergraduates and postgraduates. This will not be repeated here, but rather, the focus will be on skills and resources used.

6.5.1 Internet and computer skills

In their study on student attitudes towards electronic resources, Ray and Day (1998) point out that in order to effectively utilise the growing range of electronic resources available, students must acquire and practice the necessary skills. It was found that students had high computer and Internet skills from both institutions. Fewer postgraduates indicated 'excellent' computers skills compared to undergraduates, while there were more undergraduates with poor skills than postgraduates in both institutions as shown in Table 11 of Chapter 4. A similar pattern emerged when Internet skills were compared. There were fewer postgraduates with 'excellent' Internet skills compared to undergraduates, while there were more undergraduates with 'poor' Internet skills than postgraduates in both institutions as shown in Table 12 of Chapter 4. According to Ashcroft (2002), the process is unpredictable in terms of traditional hierarchy of learning; some undergraduates have high technology skills than their seniors.

6.5.2 Time spent on the Internet

As already shown in 6.4.1 above the majority of respondents spent less than one hour on the Internet per week as analysed by faculty. The majority of undergraduates from both institutions spent less than one hour per week on the Internet, while the majority of postgraduates spent between 1-2 hours on the Internet per week, although there were more from the University of Zululand than Zimbabwe. The major reason that could be proposed for this is that of restrictions. As indicated in Chapter 4, facilities are generally not enough to support the number of users and potential users. At the University of

Zimbabwe, for example, each student is allowed 45 minutes per session when there are many users waiting to use the Internet. Secondly, because of the quota system that was in place at the University of Zululand, students were restricted on the amount of money they could spend on the Internet, which impinged on the time they could spend on the Internet. The other reason as proposed by Ocholla (1999) is that postgraduates require more current information from journals and research oriented information resources of which the Internet is one such resource. The distribution on use is shown in Table 16a in Chapter 4.

6.5.3 Use and perceived importance of Internet services

Various Internet services were analysed by institution as indicated in Table 18 of Chapter 4. This section discusses how students used these services while the discussion on status is left to item 6.6 below. Studies by Voorbij (1999) and Jefferies and Hussein (1998) found that e-mail was by far the most popular Internet service used by students. Similar observations were also obtained in this study. E-mail was the most used Internet service by all respondents from the two institutions with the majority using it daily. This study then looked at what they were using e-mail for, shown in Table 20. Both undergraduates and postgraduates used e-mail for corresponding with colleagues. Results indicate that there was very low usage for correspondence between students and their lecturers by undergraduates from the University of Zimbabwe and postgraduates in both institutions. For example 30% of postgraduates from the University of Zululand selected options that included corresponding with lecturers compared to 40% from the University of Zimbabwe. It was, however, interesting to note that 75% of undergraduates from the University of Zululand chose the options which included communicating with lecturers. The reasons for this could be linked to the fact that most Internet users among students were doing so as part of their module/coursework requirements.

The web was also extensively used and was also singled out for analysis based on status of students. Students were required to indicate the perceived importance of the web to their studies. All postgraduates from the University of Zululand considered the Internet as important while 17% from the University of Zimbabwe said it was not important. Among

the undergraduates, 19% from the University of Zimbabwe considered the Internet to be not important compared to 7% from the University of Zululand. The low score from the University of Zululand could also be linked the modular requirements mentioned above where students were using the Internet as part of their curriculum.

Do students, therefore, always find what they want when they are searching the Internet? Based on Table 25, 58% of postgraduates indicated finding sought information compared to 49% of total undergraduate responses. Postgraduates seemed more satisfied with their searches compared to their undergraduate counterparts. The possible reason for this could be that postgraduates are more analytical, specific and focused in their searches than undergraduates.

6.5.4 Effect of Internet on information seeking behaviour

What has been the impact of the Internet on students' information behaviour? Based on Table 29b of Chapter 4, the majority of postgraduates from the University of Zimbabwe were positive that their information behaviour had changed while for the University of Zululand; the figures were the same for and against. Among the undergraduates, the general consensus was that of change in information behaviour due to using the Internet. In total, 64% of postgraduates indicated their behaviour had changed compared to 58% of undergraduate responses. What can be deduced from the analysis is that the Internet has had some impact on the students' information seeking behaviour.

6.6 Internet use by academics

According to Bane and Milheim (1995:32) academics were among the first to take the cyberspace walk. Their study also revealed a high rate of participation in Net activities among academics. The following discussion looks at how academics, were using the Internet, by level of status.

6.6.1 Computer and Internet skills

There were fewer academics that indicated their computer skills to be 'excellent' or 'poor' from both institutions as shown in Table 11 of Chapter 4. The majority had

‘enough’ skills followed by ‘very good’. The reverse was noted when it came to the Internet skills where the majority of academics indicated ‘very good’ skills followed by ‘enough’. As shown in Table 12b in Chapter 4, there were no major variations by level of academic when Internet skills were compared. The distribution shows that senior lecturers and lecturers were represented in all the categories from ‘poor’ to ‘excellent’ and this could be linked to how they learnt to use the Internet (shown in Table 15). The absence of more formal training and high inclination towards ‘self study’ places respondents in the different stages of Internet skills. This could also be another reason why the majority of respondents indicated requiring more training skills when results were analysed by faculty in Table 13 of Chapter 4.

6.6.2 Time spent on the Internet

Respondents were required to indicate time spent on the Internet per week for study or work purpose. Table 16a in Chapter 4 provided comparison on time spent by academics and students and showed that 33% of respondents spent less than one hour per week on the Internet. Table 16b provided a more specific analysis by the level of academics. In general, all professors spent less than 3 hours per week. The majority (80%) from the University of Zimbabwe spent between 1 and 2 hours, while 60% from the University of Zululand spent between 2 and 3 hours per week. The majority of senior lecturers from both institutions spent more than 2 hours per week on the Internet 58% of those from the University of Zimbabwe and 76% in the same category from the University of Zululand. 59% of lecturers from the University of Zimbabwe spent less than 3 hours per week. This could be attributed to the point of access as shown in Table 9 of Chapter 4. The majority of academics from the University of Zimbabwe were accessing the Internet from computer laboratories, where they compete with other users. The same trend was also observed among teaching assistants. The absence of home access can also be another reason for time spent among lecturers in particular and academics and other groups of users in general. Access is limited to working hours, mostly or when the respondents are on campus where they can access the Internet.

6.6.3 Use and perceived importance of Internet resources

In their study on Australian academic use of the Internet, Applebee et al (2000) concluded that e-mail, and the web in particular were essential for academics in conducting their research, for publication purposes as well as for communicating with students. While results in Table 19a indicate services by institution, selected services indicated use by status. The web was considered to be important by the majority of academics from both institutions. This was evident from results in Table 19b in Chapter 4 where only 11% and 4% of academics from the University of Zimbabwe and Zululand respectively felt otherwise. Academics used e-mail for a variety of purposes. Options that included conference papers featured prominently from both institutions, being 63% of academic responses from the University of Zimbabwe and 80% in the same category from the University of Zululand. Professors and senior lecturers accessed more electronic journal titles compared to their junior counterparts from both institutions as shown in Table 22c of Chapter 4. 75% and 50% of professors had access to more than 4 titles and so were 50% and 75% of senior lecturers from the University of Zimbabwe and Zululand respectively. The majority of lecturers accessed 2 titles and below, 60% from the University of Zimbabwe and 80% of the same category from the University of Zululand.

There was a tendency that the number of titles accessed increased with seniority. The possible reason for this could be viewed in terms of affordability on the part of senior academics or through established contacts. For example, one professor from the University of Zimbabwe indicated accessing more titles through a joint research project he is conducting with the University of London. It was ironical to note that despite using established sources like e-journals above, the majority of professors indicated that the Internet did not always provide them with information they wanted. The trend was observed among the other categories of academics with only senior lecturers from the University of Zimbabwe (67%) and (58%) lecturers from the University of Zululand expressing satisfaction. This is shown in Table 26c of Chapter 4. In the absence of the actual titles being accessed, the reasons for not finding information sought could be affected by the quality of the titles accessed and whether they were referred or not. Evaluation of Internet information may also be thorough among professors.

Despite the limitations expressed above, the Internet was considered important for work and study purposes by academics as shown in table 26c. Only 3% and 8% of academic responses from the University of Zimbabwe and Zululand respectively felt the Internet was not important. These were from the following categories, 20% of professors from the University of Zululand, senior lecturers, 17% from Zimbabwe and 13% from Zululand and 13% of teaching assistants from the University of Zimbabwe.

6.6.4 Effect of Internet on information seeking behaviour

The Internet has had some impact on the information behaviour of academics as shown in Table 28 of Chapter 4. 74% of academics indicated that the Internet had changed their information seeking behaviour compared to 26% from both institutions. Comparatively, the results reflect a similar pattern among students as shown in 6.5.3 above. These observations are further reinforced from conclusions drawn from Table 29 of Chapter 4 where the perceived importance of Internet for specific purposes is discussed. In his study (Ocholla 1999: 132) hypothesized that the rank of an academic would determine the academic's information seeking behaviour. This assumption was not confirmed as it was discovered that all categories of academics tended to seek information resources in a more or less similar pattern. Similar observations were made in this study as witnessed in the analysis above. Internet use followed more or less similar patterns with no significant differences between the different levels of academics. The conclusion drawn from this was that the Internet was important for searching factual and general information, and in keeping abreast with developments in own subject areas. The results could suggest that the Internet is gaining acceptance among academics and students as an alternative source of academic information and would need to be sustained if this momentum is to be maintained.

6.7 Internet use by librarians

6.7.1 Computer and Internet skills

According to Kaniki (1999) in order for librarians to provide the intermediary or user education services in the use of and access to the Internet resources, assumes that they are

knowledgeable about the Internet resources and posses better searching skills in the use of the Internet for research and study skills than students, researchers and academics. Librarians in both institutions indicated a high level of computer and Internet skills that could be considered adequate in assisting users. It cannot be said, however, that their skills were higher than their users as shown in the sections above.

6.7.2 Length of service in a library and current position

This item was important in establishing how experienced the respondents were, firstly in a library environment and secondly in their current positions. The majority of respondents were in the age range of between 10 and 30 years experience in a library environment. This is reflected in Table 31 in Chapter 5. In terms of knowledge and use of resources, it can be assumed that librarians had exposure to both traditional sources of information and modern resources, which have seen increased usage in the library environment in recent years. In terms of length of service in current position, the majority of librarians had less than 5 years, i.e. 74% of total responses from both libraries. The conclusion drawn from this scenario was that while librarians have on average been exposed to library work for a long time, the majority were fairly new in their current positions.

6.7.3 Length of Internet use

Librarians had more years of Internet experience than any of the other groups investigated in this study. 100% of the librarians indicated having more than 2 years of using the Internet. Although no special reasons can be advanced for the University of Zululand, the University of Zimbabwe Library was connected to the Internet long before most of the other departments and faculties and this placed librarians on an advantage. Training could also have played an important contribution to this. Although the majority of librarians indicated having learnt to use the Internet through self-study, in-house courses offered by the libraries played a significant role as indicated by 64% and 62% respondents from the Universities of Zimbabwe and Zululand respectively. Table 34 in Chapter 5 shows that in-house courses offered by the universities also contributed

towards acquisition of skills among librarians. Formal training over a given length of time could, therefore, be linked to why librarians had more experience of Internet use.

6.7.4 Using Internet search tools

Finding information on the Internet can be difficult if one does not know the search tools available. In order for one to be able to search the Internet, it is imperative that they know how to use these different search tools. Librarians showed a clear understanding of the different search engines available as shown in the list provided in Table 39 of Chapter 5. Similar results were obtained in the academic and students category. Respondents in these categories also showed that they were using multiple search engines when using the Internet. Some respondents were even more advanced as shown in their use of multiple search options. This is shown in Table 23a and 23b of Chapter 4. Google was the most popular search engine used by the majority (92%) of respondents.

6.7.5 Internet services used and purpose

A list of services was presented from which librarians were requested to indicate the ones they were using and for what purposes. There were high similarities in the use of services compared to observation made earlier by faculty and level of study. E-mail and the web were the most used services for 'work and personal use.' These observations concur with earlier studies by Saeed, Asghar, Anwar and Ramza (2000), in their study on Pakistan academic libraries and Garoufallou (1999) on Greek academic libraries. Telnet, 'Other library OPACs' and electronic journals were the most used for work purposes. Librarians, especially those who perform cataloguing duties frequently connect to remote databases in order to download records. Actually, with automated library systems, original cataloguing is becoming less frequent. This could be the major reason for high use of telnet and other library catalogues. The frequency of use of these services varied with e-mail and the web being the most used on daily basis as shown in Table 35 of Chapter 5.

Investigation was narrowed down to online databases and subject gateways. This was considered more specific and would enable respondents to indicate which resources they were using. Ebsco-host and Africa Virtual University followed by Library of Congress

were the most used by respondents from the University of Zimbabwe while Sabinet, First-Search and Ebsco-Host were the most used by librarians from the University of Zululand. This is shown in Table 37 of Chapter 5. The results indicate that both libraries have access to wealthy sources of electronic information, in both abstracts and full-text. This fails to correspond with what the library users said in responses shown in Table 19a of Chapter 4. While the majority of respondents viewed these resources as important, a significant number also thought that they were not important for their work or study. For example 42% of respondents from the University of Zimbabwe considered electronic journals to be not important. What this could mean is that users might not be aware of the full exploits they could derive from the databases mentioned above.

When respondents were asked to mention other resources, the question was leading more towards subject gateways. Subject based information gateways were not popular among librarians from the University of Zululand as shown by the responses in Table 38 of Chapter 5. Only one respondent indicated using gateways from professional organisations. Comparatively, librarians from the University of Zimbabwe were using subject gateways. Subject gateways provide a more 'subject specific' and focused starting point when searching the Internet. Given that users have less time on the Internet due to lack of computers and other factors, subject gateways provide a positive alternative. Librarians could therefore play a meaningful role in supporting this, but only if they start using the resource themselves.

6.7.6 Influence of Internet on work

The Internet has had a significant impact on librarians and in the way they conduct their duties. This is evident firstly from their preference in answering reference queries, 69% from the University of Zimbabwe showed preference to Internet compared to print sources and so were 55% of librarians from the University of Zululand. Secondly the Internet had changed the way librarians handled different tasks and saving on time, to quote one librarian: 'I can easily access information electronically and it's less time consuming.' Kaniki (1999) in a related study on Internet use among professional librarians in KwaZulu-Natal concluded that the Internet was very underutilized mainly

due to lack of skills and knowledge of its use among library staff of all categories. For example, e-mail facilities were used by 3 (3.12%), e-journals 7 (14.2%) and current awareness 10 (20%). This situation seems to have improved considerably as shown in use of resources in this study. E-mail was the most used by 100% respondents.

6.8 Availability of information in different disciplines

Availability of electronic information in the different disciplines was examined based on the number of databases being accessed by the two libraries in Table 37 of Chapter 5 and access to electronic journals and number of titles accessed as shown in Tables 21 and 22 of Chapter 4. The databases listed provide access to electronic journals in a variety of disciplines, both full text and abstracts. Databases like Ebsco-host, Emerald, Ingeta and Butterworth law, which are publisher based, provide unlimited access to full-text journal articles once subscriptions are met. Libraries are also able to access electronic versions of print journals that they subscribe to. Other electronic resources indicated in Table 38 of Chapter 5 further supplement the list of electronic resources. The gateways listed provide access to electronic resources emanating from organisations and institutions, which have been verified for accuracy and authority. The cost of sustaining subscriptions for some of the databases listed above were, however, of concern from librarians in both institutions as it was considered to impinge on what they were accessing over what they would want to see available in their libraries.

6.9 Information literacy programmes

Librarians were asked about their current awareness activities with regards to use of electronic resources. Results indicated that they were informing their users through a variety of methods both print and electronic, including via the library homepage. While informing users on the availability of resources does not necessarily mean that the users will know how to use the resources, the same question was posed to students and academics. They were asked on how often they received assistance from librarians with regards to use of Internet resources. As shown in Tables 27a and 27b, the majority of respondents indicated not getting assistance from their subject librarians, i.e. 57% from the University of Zimbabwe and 61% from the University of Zululand. This poses a

question to the Librarians on whether they are indeed reaching a wider audience. According to Kibirige and DePalo (2000:8) 'information professionals have a direct to providing users with guidance to proven online databases... Education for end user is paramount for the optimum utilization of electronic information sources.' The problem could be lack of resources as highlighted in the focused group interviews. Librarians especially from the University of Zululand were only in the process of getting their laboratories ready for Internet access and were meanwhile providing such services from individual offices.

User education programmes conducted by librarians alone are not sufficient in imparting use skills among their library users. The question often raised by librarians is on who should be responsible for training users? Applebee et al (2000) suggest that where there seems to be a clear need, university libraries in particular should consider offering basic training. This was evident from responses presented in Tables 15 and 34 of Chapters 4 and 5 respectively. Formal training played an insignificant role among students and academics compared to librarians. While librarians seemed to have benefited immensely from in-house courses offered by their libraries, there is little evidence of it having been extended to their patrons. At the same time, academics and students seem to have also not benefited from in-house courses offered by their institutions. If librarians are to have effective information literacy programmes, this should be complemented with efforts from other sections within institutions. Kaniki (1999) proposes a wider and more comprehensive programme in which library and information science education and training programmes and institutions impart Internet knowledge and skills to LIS staff as part-time or post-qualification education. He cites the Cape Library Consortium (CALICO) in which tertiary departments and their libraries have developed a joint information literacy course INFOLIT for undergraduates. Indeed, such programmes could be more effective if many players are involved.

6.10 Internet use policies

Two different policies were observed in the use of Internet between the University of Zimbabwe and the University of Zululand, and these were confirmed by interviews

conducted with the respective IT units. The University of Zimbabwe provides Internet access to all registered students and staff. Use is not restricted by level of study or whether one is taking certain modules or not. The only restriction on time is when there are many people wanting to use the Internet that users will have to book a slot. The situation at the University of Zululand was different (until August 2002), when Internet access used to be restricted to students whose modules required them to use the Internet. Such students were allocated a quota, which allowed them to connect and use the Internet. All registered students are allocated a quota, which they re-charge once they have exhausted their allocation. While this helps regulate usage, it is seen as limiting the benefits that can be derived from Internet resources. Policies also provide acceptable guidelines on using the Internet and encompass (in some instances) penalties that are likely to be incurred if these rules are not followed. Both institutions do have policy documents governing Internet use and in both instances, these are produced by University Committees.

6.11 Factors affecting Internet use

Results from Saeed, Asghar, Anwar and Ramza (2000) in their study on Internet use in university libraries in Pakistan bear similarities with those emerging from this study, especially on problems encountered. This might be like this because of the level of economic development of their countries and of historical background, in the case of the University of Zululand.

- **Access**

Problems of access were presented in three perspectives. Firstly, restrictions based on module/coursework requirements. This was highlighted by respondents from the University of Zululand, who felt that the system of only allowing such groups to use the Internet was discriminatory. Within the same restriction, was the quota allocation system, which restricts access once the student's Internet account is empty. Secondly, access was affected by the availability of computers. These were seen at very few and not proportional to the number of users. Where these were available, some were too old and could not handle certain programmes and files, e.g. pdf. The third dimension was on

access to the Internet based partly on the number of computers available. The number of Internet connections was seen as too few, again to support the high numbers of users. This caused congestion in most areas. Although mechanisms of regulating usage to avoid factors like congestion were in place at the University of Zimbabwe, the booking systems was seen to have its own shortcomings. The first come first-served basis witnessed by the researcher in the computer laboratories at the University of Zululand contributed to congestion. There were cases where users would play games while others with more serious work to do queued for the next available terminal.

- Connectivity

The Internet connectivity was seen as very slow and affecting at times how much users can download in the limited time. Both institutions have, however, been upgrading their systems to meet the demanding needs. Telecommunication systems were sighted as another problem affecting bandwidth according to the ICT manager at the University of Zimbabwe libraries.

- Training

Lack of adequate training was seen as a major factor affecting Internet use among respondents. According to one professor, 'not all academics have been trained on the use of computers and would know how to use the Internet.' Formal training has not played a major role in promoting Internet literacy among students and academics as shown in how they learnt to use the Internet in Table 15 of Chapter 4 and their training needs indicated in Table 13 of the same chapter.

- Awareness

As already mentioned in other discussions above, there is no strong link between librarians and users with regard to use of Internet resources. This alone contributes greatly to lack of awareness on the benefits of such resources among users. Librarians called on academics also to view the Internet as a potential source of academic information if their students were to follow suit. Academics were urged to show initiative that would create awareness among students.

- **Technical support**

Technical support during certain hours of the day was seen as affecting use of the Internet. In the Pakistan example already cited above, libraries had their own support staff that was able to troubleshoot machines in the event of any problems arising. The two institutional libraries have a similar set-up where staff is dedicated to managing IT services. The problems mentioned are minor, like passwords and login, which could be overcome if such skills are extended to those manning stations during the 'odd hours.' This extends to computer laboratories as well.

- **Cost**

Electronic resources were seen as expensive and subscriptions inhibitive in some instances. It was felt that management was not allocating enough funds to support such services. If the full benefits of the Internet were to be realised, through maybe rigorous marketing, then management may feel encouraged to increase the budgets for such subscriptions. It also means that current services like Ebsco-host and AVU which are being donor funded or subsidised must be exhaustively used before justification can be made for paying towards additional services.

6.12 Recommendations

At the end of it all, respondents were asked to provide recommendations on effective Internet accessibility in their respective institutions. Recommendations that emerged from this study were based on the problems highlighted and looked at how the issues raised could be improved in achieving maximum Internet utilization. These are summarised below.

- **Access**

More computers connected to the Internet were required in order provide more access points to users. This means additional laboratories and more connections in academic offices especially from the University of Zimbabwe where there were high cases of office sharing. The universities were also requested to consider extending access to halls of residents. There was also need to have printers, which would enable users to print their

search results and alternatively users to be allowed to download search results onto floppy disk, a facility not currently available to those using laboratories in the University of Zimbabwe Library. Lastly respondents felt that the computer laboratories should be accessible for longer periods during the day and night.

- Connectivity

Bandwidth should be continuously upgraded in order to improve the speed especially with more users likely to gain access based on the recommendations above.

- Training

Both students and academics considered training paramount. As seen from discussion above, most users had learnt to use the Internet through self-study and from colleagues. There was need, therefore, to have this formalised. Librarians were also called upon to improve their skills if they were to effectively help users to use e-resources.

- Marketing

Marketing of Internet resources was seen as one way through which awareness could be increased among users, potential users and management.

- Information technology policy

The provision of an information technology policy was considered important, as this would provide an operating platform from which issues like training would be based.

- Cost

Users felt that in order to sustain the current continued access to electronic journals and other online databases, the institutions should allocate enough funds to meet these costs.

- Regulatory measures

The systems in place that regulate time one can spend on a computer were considered not effective and should be closely observed. Respondents felt that computers should be used for academic purposes as much as possible, eliminating things like games, etc.

- Technical support

The respondents felt that assistance should be available in the computer laboratories and library at all times so as to minimise any inconveniences that might arise due to technical hitches. Such people should be able to attend to problems and not provide referral service.

6.13 Summary

This chapter has discussed issues based on responses received from students and academics in Chapter 4 and those from librarians in Chapter 5. The personal details of the respondents were enumerated. The discussion showed that there was representation from all segments of the targeted population albeit in different numbers. Students had more access to both the computers and the Internet from computer laboratories while academics had access from offices, and laboratories in the case of the University of Zimbabwe.

Respondents showed a high degree of computer and Internet literacy, which had been acquired through self-study for the majority. Formal courses did not appear to have played a significant role in imparting these skills, except among librarians, who cited internal workshops. Because of this factor, training emerged as to be a major requirement from respondents, even from among those whose skills were good.

It was evident from this discussion that respondents used the Internet for academic and other purposes. This was shown in the patterns of use between disciplines, by level of study and academic status. The Internet was perceived to be important for study and work purposes by the majority of respondents. Although e-mail was the most used Internet service, other information resources were also used for teaching learning and research. Electronic sources ranged from journals to online databases, which the Universities were subscribing to. There were also databases, which the libraries were accessing by virtue of participating in certain international projects. This was more at the University of Zimbabwe than at the University of Zululand.

Librarians were contributing towards Internet accessibility in a number of ways. Marketing of Internet resources was one major activity carried out through various information literacy programmes, selective dissemination of information and through attending board meetings. Librarians from the University of Zululand also used Listservs and e-mail for this purpose. Proposals from related studies indicate that for effective information literacy programmes to be achieved Internet training should be integrated in LIS education and regional initiatives or consortium as seen with CALICO, could be some of the ways in which libraries could achieve this.

The respondents also highlighted problems they were encountering in accessing and using the Internet. These were very similar in the two institutions. Among the major highlights were lack of computers connected to the Internet and insufficient training. Recommendations were put forward which were based mostly on the problems experienced.

The next and final chapter provides the summary, recommendations and conclusions based on these research findings.

CHAPTER SEVEN

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

7.1 Introduction

This chapter provides a summary, recommendations and conclusions drawn from findings, and from both primary and secondary sources. Recommendations for further study on the same or similar subject are also provided. The aim of this study was to explore and examine, through a comparison, the use of the Internet for teaching, learning and research by academics and students at the Universities of Zimbabwe and Zululand and also to explore how their libraries could contribute towards achieving this aim. In so doing, the following objectives were pursued:

- To determine the link between Internet use and academic discipline, e.g. Science, Engineering, Agriculture, Arts, Social Sciences, Medicine, etc.
- To determine the link between Internet use and level of study, e.g. undergraduate, post-graduate, etc.
- To determine the link between Internet use and status of faculty of academics e.g. junior lecturer, lecturer, senior lecturer, professor, etc.
- To examine the level of Internet use by Librarians in the two institutions and its impact on students and academic users.
- To determine the general availability of electronic information in the two universities.
- To examine the information literacy programmes available in the two universities and how such programmes contribute towards Internet use and appreciation.
- To examine the Internet policies at the two universities

The study also sought to answer the following research questions on Internet use by academics, students and librarians:

- Does academic discipline affect Internet use among students and academics?

- Does the level of study of students influence their frequency of use of the Internet?
- Does faculty status have any influence on Internet use?
- What Internet resources are mostly used by academics, students and library staff and for what purpose?
- What factors impede the effective use of Internet by students and academics?
- What can Librarians do to maximise the use of the Internet resources by students and academics?

Data was collected through the use of questionnaires and interviews were conducted with IT sections from each university. Data collected was then analysed using the SAS system.

7.2 Summary based on research objectives

This section provides a summary based on the seven research objectives outlined in chapter one of this study.

7.2.1 To determine the link between Internet use and academic discipline

The study has shown that there was no recognisable difference between Internet use and academic discipline between and within the two institutions. At the University of Zululand, the situation is that there are science-oriented courses in non-science faculties like Arts' (BA Information Science), which required students to use the Internet. However, this argument is dismissed with examples from the University of Zimbabwe where use was not restricted to faculty or modules. There were fluctuations, however, depending on resource used, for example, on the time spent on the Internet, Engineering and Science faculties from the University of Zimbabwe spent more in the 5 hours and above category, while Commerce and Administration from the University of Zululand spent more than other faculties in the same category. But, when respondents were asked to indicate their purpose of use of the Internet, Arts from the University of Zimbabwe had the highest number of users in the research category, while Science and Agriculture were second in the 'research and learning category' for the University of Zululand. When respondents were asked on their perceived importance of the Internet for their work or study, the majority of respondents across all faculties considered the Internet to be

important. Social Studies accessed more titles followed by Medicine and Engineering for the University of Zimbabwe, while Arts had more titles followed by Science & Agriculture for the University of Zululand. Unlike in previous studies discussed in literature, it could not be concluded that Sciences used the Internet more than Humanities.

7.2.2 To determine the link between Internet use and level of study

Although there was a generally high skills level among students in both institutions, undergraduates showed more excellent skills than their postgraduate seniors in both institutions. The majority of undergraduates from both institutions spent less than one hour per week on the Internet while the majority of postgraduates spent between 1-2 hours on the Internet per week, although there were more from the University of Zululand than Zimbabwe. The reasons could be, as Kibirige and DePalo (2000) observed, that the graduate user is more sophisticated in terms of information requirements than undergraduates. Their information needs are more purpose and research oriented. While e-mail was the most used service by both categories of students, undergraduates from the University of Zululand communicated more with their lecturers than other students in both levels of study. However, postgraduates were more satisfied with their search results than undergraduates from both institutions and had changed their information seeking behaviour more compared to undergraduates by 64% and 58% respectively. Despite these indications, there seems to be no significant differences in how the level of study influenced the use of the Internet as also observed in the use by disciplines above.

7.2.3 To determine the link between Internet use and status of faculty academics

Status of faculty did not play a major role in the use of Internet among academics from the University of Zimbabwe and the University of Zululand, although slight variations were evident in use of particular resources. For example, professors spent less time on the Internet compared to other categories, i.e. 100% spent less than 3 hours per week. On use of Internet resources, and e-journals in particular, a noticeable trend was observed in which the number of titles accessed increased with one's status, with professors accessing more than lecturers. On whether respondents always found information sought, all

categories replied in the negative except the senior lecturers from the University of Zimbabwe and lecturers from the University of Zululand. On perceived importance of Internet for work or study all but 8% professors, 14% senior lecturers and 13% teaching assistants considered the Internet to be important. Even when asked on the effect of Internet on information seeking behaviour, the majority in all categories from both institutions indicated positive influence except 100% of research fellows from the University of Zimbabwe.

7.2.4 To examine the level of Internet use by librarians and its impact on academics and student users

Librarians in both institutions showed high levels of computer and Internet skills. They had more years of Internet use than their academic users and showed clear understanding of search tools vital for navigating the Internet as shown in the list of search engines they provided. This was partly due to the fact that they had received more formal training on Internet use through courses run by their respective libraries, although self-study was ranked very high. There were similarities in the use of resources, for example e-mail and the web, although librarians from the University of Zimbabwe indicated accessing more online databases. A huge variation was observed in the use of subject-based gateways, used in total by 89% from the University of Zimbabwe and 11% from the University of Zululand.

It was intriguing, however, that the majority of students and academics, (57%) from the University of Zimbabwe and from the University of Zululand, (61%) indicated that they did not receive assistance from library staff with regard to use of the Internet resources. This was observed despite librarians indicating using resources for work purposes. Librarians, therefore, seem to use resources more, which help them do their work like cataloguing, reference, acquisition, etc., than those, which guide users, use the information, themselves. This can be understood for the University of Zululand where there are limited resources connected to the Internet in the library unlike at the University of Zimbabwe where there are more terminals connected to the Internet in the library.

7.2.5 To determine the general availability of electronic information in the two universities

Both institutions have access to databases that have full text resources and journals, subsidised or paid for through donors. Ebsco-host for example, is accessed by both libraries and covers major disciplines, which include those being studied in the two institutions. The University of Zimbabwe library also enjoys access to other databases through participation in international projects and links like INAPS's AJOL, PERI and through African Virtual University (AVU). The University of Zululand has access to local databases, like Sabinet. These are, however, not sufficient and need to be increased. Efforts by librarians are sometimes thwarted by insufficient budgets to meet the escalating subscription costs. The heavy reliance on donors and subsidies may expose the libraries in the event of such services being terminated. There is a link between availability of electronic information and donor support in both institutions.

7.2.6 To examine information literacy programmes in the two universities and how they contribute to Internet usage

There are information literacy programmes being conducted by librarians in both institutions, but as shown in 7.2.4 above these have not reached the majority of academics and students. Despite the high skills shown by librarians in terms of computer and Internet use, and in use of e-resources for work purposes, the majority of their users do not seem to benefit much from this expertise. The absence of formal training on Internet use could be a contributing factor.

7.2.7 To examine Internet policies in the two universities

There are Internet use policies in the two institutions that help regulate and provide mechanisms for monitoring usage among users. While the policy on access at the University of Zimbabwe allowed all registered students and staff to use the Internet, this had just undergone a metamorphosis at the University of Zululand. Access was formerly restricted to students whose modules required them to use the Internet but the new policy currently allows all registered students access to the Internet on a limited quota allocation per term, with the provision for 'pay as you go' after one has exhausted their allocation.

The pre-paid system is not yet available at the University of Zimbabwe and does not seem to be something that is likely to come in the near future. Policies on use and abuse, and penalties are also available in both institutions, at the University of Zululand; a print version is given to every user when they get their passwords from NSU.

7.3 Summary based on research questions

This section provides a summary based on the six research questions outlined in chapter one of this study.

7.3.1 Does academic discipline affect Internet use among students and academics?

Academic discipline did not affect use of the Internet among students and academics in the two institutions. This is when courses taken in different faculties determine Internet use, and when Internet use is not restricted to faculty.

7.3.2 Does the level of study of students influence their use of the Internet?

The level of study did not show any significant influence in Internet use between undergraduates and postgraduate students from the two institutions. This was despite indications that the Internet had changed the information seeking behaviour of postgraduates more compared to undergraduates.

7.3.3 Does faculty status/age have any influence on Internet use?

Faculty status does not have any influence on Internet use among academics in both institutions. Age equally does not have any influence, for example, the majority of professors and senior lecturers were more senior (above 50 years), while lecturers and teaching assistants were in the lower age groups and as shown above by faculty statutes, this did not impact on use of Internet facilities.

7.3.4 What Internet resources are mostly used by academics, students and library staff and for what purpose?

Research was singled out most as the main purpose of using the Internet by respondents from the University of Zimbabwe followed by learning, while 'research and learning'

were singled out most by respondents from the University of Zululand. E-mail and the web were the most used services by students, academics and librarians in the two institutions. While academics used e-mail for communicating conference papers among other services, students, both undergraduates used it to communicate with colleagues. Electronic journals were used by 71% respondents from the University of Zimbabwe, but were lower by 41% by respondents from the University of Zululand. E-mail was the most used service for personal and work purposes by 100% librarians in both institutions on daily basis. 81% librarians from the University of Zimbabwe for work purposes used Telnet and other library OPACs, while librarians from the University of Zululand used OPACs, telnet and e-journals for the same purpose.

7.3.5 What factors impede effective use of the Internet students and academics?

Factors affecting Internet use were similar at the two universities. Access to the Internet, was considered a major huddle in using the Internet both in terms of who could use and the number of actual connections. The quota allocation was criticised, as the amount of money allocated per term per student was considered inadequate. Problems of access also arose from the number of connections available that was caused by the shortage of or limited computers in both laboratories and staff offices. Incidences of office sharing were thus observed at the University of Zimbabwe. The Internet was also considered to be very slow which affected downloading of information, which was exasperated in some instances by old equipment. Training was also seen as a hindrance. Most users had learnt to use the Internet through informal channels and required formal training. Lack of awareness on what the Internet can provide and the 'poor' link between librarians and users was also seen to affect use. The cost of subscribing to electronic resources when libraries were already inundated with other high costs was considered a handicap. Some services were marketed but were not available on the 'shelves', e.g. e-journal on trial, and this resulted in frustration among users. There was inadequate technical support in the computer laboratories and in the library 'after hours' which resulted in minor hiccups being left unattended. At the University of Zimbabwe, there was no close monitoring on who was using terminals to avoid monopoly of use by a few, while at the University of

Zululand, there were problems on the 'first come basis' which saw people play games while others queued for the same facilities.

7.3.6 What can librarians do to maximise the use of the Internet resources by students and academics?

There is a very poor link between librarians and users in both institutions. This was evident when students and academics were asked to indicate how often they got assistance from library staff with regards to use of Internet resources. Change is a prerequisite if librarians are to help maximise use of e-resources by their users. This can be achieved through rigorous marketing that reaches a wider audience than is currently the case. Academics and students already perceive the Internet to be important for their work or study purposes and the majority indicated that their information behaviour had changed due to using the Internet. Librarians could then come in by identifying resources available over the Internet and from such databases like Ebsco-host, AVU and Sabinet, which users may not be aware of, especially e-journals which were not very much used.

7.4 Recommendations

This study looked at the problems affecting Internet use and accessibility at the University of Zimbabwe and Zululand and solicited for possible ways of improving use from respondents in the categories of academics, students and librarians. The recommendations provided below are based on these findings and from literature.

- **Access**

Access is paramount to effective use of the Internet and related resources and should be considered a priority in the two institutions. This could be achieved by ensuring that there are sufficient computers that are connected to the Internet. Besides the main computer laboratories already available, more laboratories could be made available through decentralisation by faculty and encourage individual initiatives by departments. More access should be extended to academics' offices and reduce on shared access.

- **Training**

Skills training in both computer and Internet use should be extended to all academic users. Librarians need to cast the net wider in order to reach the majority. Such programmes should not be left to the library alone, but should be complemented by other resources from within and without the institutions. Skills training could be embedded in the curriculum, making it compulsory to all first year students for a set period of time, e.g. one semester and assessment contributing towards a term paper. Such training could be refreshed to finalist when they start preparations for their minor and major projects. Due to the complexity of Internet information, evaluation skills should also be extended to all users. In order to ensure continued skills development, students should as much possible be encouraged to submit their assignments word-processed. Self-guided tutorials could also be made available on the universities' web pages.

- **Inventory of resources available**

An inventory of electronic resources available in each university should be publicly available, possibly as a link on web OPACs in a format that would be easy to follow, e.g. by subject. Such an initiative has already been shown at the University of Zimbabwe but could still be improved. Internet resources can be very migratory in nature and the URL's will need to be continuously updated to make sure that they point to the resources mentioned. Such resources may include those in the library, and those accessed by individual departments by virtue of link projects they may individually be participating in. Librarians could also contribute towards building such links by identifying organisations and institutions that provide useful information freely over the Internet. The Massachusetts Institute of Technology (MIT) in the USA is among such learned institutions, which has, since 2002, placed freely, their lecture materials on the Internet for public access.

- **Marketing**

Marketing of electronic resources should be intensified in both institutions and should extend to all faculties and departments. While some departments may not be as receptive, this should not be seen as discouragement. This can be done through organised

workshops, open days organised by the library in conjunction with computer departments, through faculty and departmental meetings where the library activities are included on the agenda. Library committees, which usually have representatives from each department, could also be used as vehicles of communicating any such strategies.

- **Commitment by management**

Through marketing strategies described above, it ensures that management is on board with developments 'on the ground.' University management becomes aware of the pressures brought about by any such changes and adequately prepares for it. The biggest problem that characterise many organisations is the inadequate financial resources or at times misplaced priorities. Management in both institutions should commit themselves financially towards sustaining subscriptions and licence fees for electronic resources. It can be very discouraging for users to find that much publicised services are not sustained after only a few months of accessing. Such initiatives should complement donor and government subsidies that are already in place in both institutions. Management could also forge links with local organisations, or companies in the locality and with other universities.

- **Internet quota as part of fees**

The Internet quotas which are considered to be too little could be scrapped, or alternatively be part of the student fees. Such subtle changes could be subsidised by the respective universities (where these are not already in place), without placing an extra burden on the students.

- **Regulatory policy**

Regulatory mechanisms should be put in place, and where these already exist, should be enforced so that computers and the Internet are used for academic purposes as much as possible.

- **Technical support**

Trained personnel should be available at all times when the computer laboratories or library are open to assist users on computer and Internet use and on any other problems that may occur during the course of Internet use.

- **Information technology policy**

A comprehensive information technology policy that encompasses the above should be developed and act as an official document in enforcing recommendations, subject to their acceptance. This would ensure continuity in policy implementation or as back up to any changes that may be brought into effect.

7.4.1 Recommendations for further study

The following recommendations are therefore proposed:

- A wider study by comparison be carried out within South African universities to assess the impact between former Historically Disadvantaged Institutions (HDIs) and Historically Advantaged Institutions (HAIs).
- On an international perspective, a comprehensive study be carried out on the Internet and its implications on higher education in institutions of higher education in Africa. Such a study would also (depending on availability of resources), apply examples from developed economies and other less developed but enterprising examples from Asian institutions.
- The use of Internet or ICTs ought to be promoted in secondary education and implications be made known for institutions of higher learning.
- That an audit of IT resources available in universities be carried out and investigate how they are being utilised.

- A similar study be carried out focusing on undergraduates by year of study. Such a study could be longitudinal, for example, comparing first years' use of Internet in the first semester and possible influence on information behaviour by the end of their first year, second year, etc. also depending on resources and objectives set.

7.5 Conclusions

This study looked at the Internet as a source of research, teaching and learning, comparatively between the University of Zimbabwe and Zululand. It also looked at how librarians in the two institutions were using the Internet and related resources. Librarians' roles are changing with the advent of new technologies, shifting from mere custodians of information to creators of such information in some instances. This has necessitated reorganisation in the ways they disseminate and help users to maximise the use of such information. It has also resulted in new skills-acquisition for both librarians and users. They are seen as providing a gap between information sources and the end users. This study has also shown that librarians had high computer and Internet skills and were using the Internet for work and other purposes. Evident in this area was the fact that there was a poor link between them and the users, which would impact on use of e-resources.

Contrary to assertions in literature reviewed on the patterns of Internet use by discipline, academic status, and level of study, these factors did not emerge as major influences in how users in both institutions were using the Internet. E-mail and the web were the most used services by the majority of respondents, including academics. This confirms earlier studies by Applebee et al (2000:146) in which they concluded that e-mail and the web in particular have become essential for academics at all levels to enhance their research, publication, professional contribution and communicate with colleagues. Note is also taken on these implications for administrators and the dilemmas created by integrating new technologies into the curriculum. The level of Internet use in the two institutions could be considered high, based on perceived importance of Internet for work and study purposes. The majority of respondents perceived the Internet to be important to very

important. Overall, the study has shown that there is potential for Internet use for academic and work purposes in the two institutions that will need individual, organisational, governmental and institutional commitment in order to succeed.

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9. APPENDICES

Appendix A

QUESTIONNAIRE FOR ACADEMICS AND STUDENTS

Most questions require you to tick or encircle the answers as they apply to you. No names or personal details will be referred to in the analysis of data. The information will be treated as confidential.

SECTION ONE: PERSONAL DETAILS:

1. What is the name of your university?

1.1 University of Zimbabwe ☐

1.2 University of Zululand ☐

2. Faculty:.....

3. Department:.....

4. Status

Undergraduate student: 1st year/ 2nd year/3rd year/4th year/5th year/Final

Graduate student: Honours / Masters / Doctoral

Professor ☐

Associate Professor ☐

Senior Lecturer ☐

Lecturer ☐

Research Fellow ☐

Teaching Assistant (Junior Lecturer) ☐

Other, please specify:.....

5. Country where qualifications were obtained. E.g. UK or USA (*you may state more than one*)

.....
...

6. Age

Below 20 years ☐

21-25 years ☐

26-30 years ☐

31-35 years ☐

36-40 years ☐

41-50 years ☐

Above 50 years ☐

7. Sex

Male ☐

Female ☐

SECTION TWO**INTERNET ACCESS AND USE OF INTERNET SERVICES**

8. Do you have access to a computer? (*you may select more than one*)

Yes, on my desk in my office []

Yes, in the computer labs on campus []

Yes, we share in the office []

Yes, at home []

No []

Other, please specify.

9. Do you have access to the Internet? (*you may select more than one*)

Yes, in the office []

Yes, in the computer labs on campus []

Yes, at home []

No []

Other, please specify.

IF YOUR ANSWERS IN 8 AND 9 ABOVE ARE NO, THEN YOU HAVE FINISHED COMPLETING THE QUESTIONNAIRE

10. How do you rate your computer skills?

Excellent []

Very good []

Good []

Enough to make me work []

Poor []

11. How do you rate your Internet skills?

Excellent []

Very good []

Good []

Enough to make me work []

Poor []

12. Do you need more training in (*you may select more than one*)

Computer skills []

Internet skills []

None []

13. How long have you used the Internet?

Less than 6 months []

6 months to 1 year []

1-2 years []

2-3 years []

3-4 years []

More than 5 years []

14. How did you learn to use the Internet? (*you may select more than one*)

Self-study []

From colleagues []

In-house course offered by the University []

In-house course offered by the library []

Continuing education course []

Other, please specify.

15. How much time do you spend on the Internet for study or work purposes per week?

- Less than 1 hour []
 1-2 hours []
 2-3 hours []
 3-4 hours []
 More than 5 hours []

16. For what purposes do you use the Internet?

- Teaching []
 Research []
 Learning []
 Other.....

17. Which Internet browsers do you use? (you may select more than one)

- Netscape []
 Microsoft Internet Explorer []
 Other, please specify.

18. How often do you use the following Internet services?

5=daily, 4=weekly, 3=monthly, 2=sometimes, 1=never

Service	Daily	Weekly	Monthly	Sometimes	Never
World Wide Web					
E-mail					
Discussion lists/ newsgroups/					
Your University library on-line public access catalogue (OPAC)					
Other library catalogues (OPACS)					
On-line databases					
Electronic journals (e-journals)					
Subject based information gateways					
Download software					
Others (specify)					

19. How important are the following services to your work or study?

Not important=1, important=2, very important=3

Service	Not important	Important	Very important
World Wide Web			
E-mail			
Discussion lists/ newsgroups/			
Your University library on-line public access catalogue (OPAC)			
Other library catalogues (OPACS)			
On-line databases			
Electronic journals (e-journals)			
Subject based information gateways			
Download software			
Others (specify)			

20. Please indicate the purposes to which you use the e-mail. (*you may select more than one*)

Corresponding with colleagues ☐ ☐
 Corresponding with students ☐ ☐
 Corresponding with lecturers ☐ ☐
 Corresponding with editors ☐ ☐
 Conference papers and notices ☐ ☐
 Other, please specify.....

21. Do you use electronic journals in your subject area via the Internet?

Yes ☐ ☐
 No ☐ ☐

22. If yes, how many titles?

One ☐ ☐
 Two ☐ ☐
 Three ☐ ☐
 More than four ☐ ☐

23. Do you use search engines to find information on the Internet?

Yes ☐ ☐
 No ☐ ☐

24. If the answer above is yes, from the list provided, indicate which ones you use in order of priority.

1=never, 2=at times, 3=always

Search engine	Always	At times	Never
Google			
Altavista			
Excite			
Northern Light			
Hotbot			
Lycos			
Yahoo			
Other, please specify			

25. When using search engines, which options do you use?

Simple search ☐ ☐
 Advanced search ☐ ☐
 Both ☐ ☐

SECTION THREE: IMPORTANCE OF INTERNET RESOURCES

26. Do you always find what you want when using the Internet?

Yes ☐ ☐
 No ☐ ☐

27. How important is Internet information to your study or work?

Very important ☐ ☐
 Important ☐ ☐
 Not important ☐ ☐

28. How often do you get assistance from your subject librarians or other library staff with regards to use of Internet resources?

Often []

Sometimes []

Never []

29. If assistance is given, please indicate areas of assistance.

a).....

b).....

c).....

d).....

e).....

30. Has the Internet changed the way you seek information from the library and other resources?

Yes []

No []

31. If the answer above is yes, please indicate how.

.....

.....

.....

32. How important are information resources on the Internet in fulfilling the following purposes?
 1= not important, 2= important, 3= very important

Purpose	Not important	Important	Very Important
Searching factual information			
Finding general information on a topic			
Keeping abreast with developments in own subject or discipline			

33. In your opinion, how do you compare electronic resources and print sources of information?

.....

.....

.....

34. What do you consider to be factors affecting the usage of the Internet in your institution?

.....

.....

.....

35. What recommendations do you propose for effective Internet accessibility? *(you may use back of this page for additional information)*

.....

.....

.....

.....

THANK YOU VERY MUCH FOR COMPLETING THE QUESTIONNAIRE

Appendix B

QUESTIONNAIRE FOR LIBRARIANS

Most questions require you to tick or encircle the answers as they apply to you. No names or personal details will be referred to in the analysis of data. The information will be treated as confidential.

SECTION ONE: PERSONAL DETAILS

1. Name of institution:
 - 1.1 University of Zimbabwe ☐
 - 1.2 University of Zululand ☐
2. Designation:
 - University Librarian ☐
 - Deputy University Librarian ☐
 - Sub-Librarian / Senior Librarian ☐
 - Senior Assistant Librarian/ Librarian ☐
 - Assistant Librarian ☐
 - Other, please specify
3. Department e.g. Cataloguing, Acquisitions, Law. Etc.....
4. How long have you worked in the library?
5. How long have you worked in your current position.....
6. Qualifications:
.....
7. Age
 - Below 20 years ☐
 - 21-30 years ☐
 - 31-39 years ☐
 - 40-49 years ☐
 - Above 50 years ☐
8. Sex
 - Male ☐
 - Female ☐

SECTION TWO: INTERNET ACCESS AND USE OF INTERNET SERVICES

9. Do you have access to a computer? (*you may select more than one*)
 - Yes, on my desk in my office ☐
 - Yes, in the computer labs on campus ☐
 - Yes, we share in the office ☐
 - Yes, at home ☐
 - No ☐
 - Other, please specify.

10. Do you have access to the Internet? (*you may select more than one*)
- Yes, in my office ☐ ☐
- Yes, in the computer labs on campus ☐ ☐
- Yes, at home ☐ ☐
- No ☐ ☐
- Other, please specify.
11. How do you rate your computer skills?
- Excellent ☐ ☐
- Very good ☐ ☐
- Good ☐ ☐
- Enough to make me work ☐ ☐
- Poor ☐ ☐
12. How do you rate your Internet skills?
- Excellent ☐ ☐
- Very good ☐ ☐
- Good ☐ ☐
- Enough to make me work ☐ ☐
- Poor ☐ ☐
13. Do you need more training in:
- Computer skills? ☐ ☐
- Internet skills? ☐ ☐
- None ☐ ☐
14. How long have you been using the Internet?
- Less than 1 year ☐ ☐
- 1-2 years ☐ ☐
- 2-3 years ☐ ☐
- 3-4 years ☐ ☐
- More than 5 years ☐ ☐
15. How did you learn to use the Internet? (*you may select more than one*)
- In-house course offered by the University ☐ ☐
- In-house course offered by the library ☐ ☐
- Self taught ☐ ☐
- From colleagues ☐ ☐
- Other, please specify.
16. Does your library provide Internet services to all:
- Students ☐ Yes ☐ No
- Academics ☐ Yes ☐ No

17. Which Internet services do you use and for what purpose? (you may select more than one for each resource)

Services	Work purpose	Personal use	Never
E-mail			
World Wide Web			
Telnet*			
File Transfer Protocol**			
Discussion lists/ newsgroups			
Other library catalogues (OPACS)			
Electronic journals			
Other, please specify			

*Telnet is an Internet service that allows users to connect from their system to a remote electronic system

**File transfer protocol is the program of transferring files from one computer that is connected to the Internet to another computer that is connected to the Internet

18. How often do you use each of the services listed? (you may select more than one purpose for each resource). 5= daily, 4= weekly, 3= monthly, 2= sometimes, 1=never

Services	Daily	Weekly	Monthly	Sometimes	Never
E-mail					
World Wide Web					
Telnet					
File Transfer Protocol					
Discussion lists/ News groups					
Other library catalogues					
Electronic journals					
Other, please specify					

19. When faced with a reference enquiry, which sources do you prefer first?

Internet ☐

Print ☐

20. Which on-line databases do you use? E.g. EbscoHost, AVU.

Database/ Database Host Name	Full-text	Abstract

21. Do you use any other electronic resources available via the Internet? E.g. Subject Based Information Gateways***

Yes ☐

No ☐

*** Subject Based Information Gateways (SBIGs) are subject entrances (clearing houses) to quality assessed Internet resources, e.g. OMNI, Organising Medical Networked Information

22. If your answer above is yes, please indicate which ones and for what purpose. (you may select more than one for each resource)

Resource	Work purpose	Personal use

23. Do you use search engines?

Yes ☐ No ☐

24. If the answer above is yes, please indicate which ones in order of priority. E.g. Google, Altavista.

.....

25. Does your library have a home page?

Yes ☐ No ☐

26. If the answer above is yes, do you contribute to its content and technical development?

Yes ☐ No ☐

27. How do you make your users aware of the resources available on the Internet?

.....

28. Do you conduct any information literacy programs for your user?

Yes ☐ No ☐

29. If the answer above is yes, which resources do you use?

.....

30. Has the Internet changed the way you do your work?

Yes ☐ No ☐

31. If the answer above is yes, please indicate how.

.....

32. What do you consider to be factors affecting the usage of Internet in your institution?

.....

33. What recommendations do you propose for effective Internet accessibility?

.....

THANK YOU FOR COMPLETING THE QUESTIONNAIRE

Appendix C

Work plan

Item	Activity	Timeline												Remarks	Year
		Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec		2002
1	Registration														2002
2	Development of Research proposal														2002
3	Submission & Approval of Research proposal														2002
4	Development, submission and correction of Chapter 1: Introduction														2002
5	Development & delivery of Chapter 2: Literature review														2002
6	Development and submission of Chapter 3: Research methodology														2002
7	Compilation of instruments for field research														2002
8	Approval of research instruments														2002
9	Preparation for field research														2002
10	Field research														2002
11	Development and delivery of Chapter 4: Analysis and results														2002
12	Development and delivery of Chapter 5: Analysis and results														2002
13	Development, correction & submission of Chapter 6: Discussion														2002
14	Development, correction and submission of Chapter 7: Summary, recommendations & Conclusions														2002
15	Submission & correction of draft dissertation														2002
16	Submission of final dissertation for examination														2002
17	Examination of dissertation														2002
18	Corrections based on examiner's report														2003
19	Submission of final bound dissertation to examination section														2003
20	Graduation														2003