



**The Impact of Digital Divide on University Academic Staff and Students: A Comparative Study Between the University of Zambia and the University of Strathclyde**

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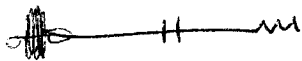
## Declaration

This dissertation is submitted in partial fulfilment of the requirements for the degree of MSc in Information and Library Studies in the Faculty of Science.

I declare that, in accordance with University Regulation 20.1.20, this dissertation embodies the results of my own work and that it has been composed by myself. Following normal academic conventions, I have made due acknowledgement to the work of others.

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## **Abstract**

Access to electronic information is becoming more and more important in the modern information economy and yet developing countries like Zambia are far from putting policies in place to ensure that there is rapid information communication technologies (ICTs) development in the country. This has created an unequal balance between countries and sectors of the population which is generally referred to as digital divide.

This research outlines the digital divide that exists between the University of Zambia and the University of Strathclyde. This was established by comparing the two Universities. The research provides an overview of the state of ICT development in Zambian libraries as well as strategies that have been put in place in UK to ensure that their citizens have access to electronic information.

The research has revealed huge discrepancies between the two worlds in the availability of hardware in libraries, laboratories and lecture theatres as well as technology literacy between the students in Zambia and those in UK. It also reveals that there are huge problems in accessing the Internet and electronic resources in Zambia than there are in Britain.

Finally, recommendations have been made on how the University of Zambia and other libraries in developing countries in general can narrow the divide by participating in some of the initiatives that are being developed globally to ensure that the divide is narrowed.

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Lastly but not the least, my sincere thanks to my wife Alice who in my absence from Zambia took care of our children Kondwani, Benson Junior and Tapiwa. I am grateful that she accepted to visit me in Scotland for the last six weeks of the course

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## Chapter 1

### Introduction and Objectives of the Research

#### 1.1 Introduction

In the modern information society, it is clear that those who are unable to access the Internet through the application of information and communication technologies (ICTs) are increasingly disadvantaged in their access to information. In western countries such as UK, every effort is being made by governments to ensure that all citizens have the opportunity to access and effectively use ICTs in order to enable them participate fully in the educational, social, economic and democratic processes. On the contrary, Akst and Jensen (1) say that Sub – Saharan Africa has by far the least developed ICT infrastructure in the world. There are only over one million Internet dial-up subscribers in the whole continent of Africa, and North Africa account for 200,000 and South Africa has 650,000 subscribers leaving about 150,000 for the remaining African countries which count well over 40.

However, he says that the potential is staggering. Although encouraging trends are emerging, the difference between the development levels in Africa and the rest of the world is especially wide in the area of information and communications technologies. Africa's telephone systems are spotty and often rely on antiquated equipment and progress is hindered by bureaucracy, outdated administrative structures, and in most cases state owned monopolies as the case with Zambia Telecommunication Corporation (ZAMTEL) in Zambia. The electrical grid is also not consistent resulting in irregular or non-existent electrical suppliers in some areas in urban areas as well as rural areas.

The state of the underdevelopment of the ICT related services in developed and developing nations is what brought about the digital divide which is described as a gap between those who can effectively use information communication tools such as the Internet and those who can not.

While a great deal of attention has been paid to the supposed digital divide within developed countries, where computers are readily available to school children, most of the governments in the developing countries such as Zambia are not just doing enough to improve access to information to its citizens. The gap of ICT development between the rich and poor countries, men and women, the educated and uneducated, rural and urban areas is caused by socio-economic, geographical, educational and attitudinal factors or in some cases physical disabilities.

While it is agreed that technology does not in itself solve social and economic discrepancies within societies, it is a known fact that ICTs contribution to the poor countries of the world include the sharing of global knowledge to help support poor countries initiatives against poverty and disease. Other benefits include better communication with trading partners through e-commerce, ability to market tourism and trade opportunities through the use of the World Wide Web. The Internet is a powerful educational tool which enables students and lecturers in developing countries to have access to published papers on the Internet in some cases free of charge.

Despite all the benefits for the development of Internet, Zambia is still behind in terms of developing the telecommunication infrastructure which would provide sufficient bandwidth for Internet connectivity. In Zambia, there are only five Internet Service Providers (ISPs) between them serving a total of less than 10,000 clients connected to the Internet. This is nothing as compared to the population of over 10,000,000 people as confirmed by the 2001 census (2). The major factor that is hindering the development of Internet in the country is the underdevelopment of telecommunication infrastructure as stated above which is in the hands of ZAMTEL a state controlled monopoly. The cost of importing computers into Zambia is so high that very few ordinary Zambians can afford. Where there is access for Internet, the speed of downloading coupled with high costs makes it difficult for ordinary Zambians to access Internet. Continuous thefts of telephone wires and equipment, is a real problem facing the nation today. The University of Zambia Library is currently not offering Internet services to its users because the only ten

computers which were providing access to the more than 6,000 students were stolen in the year 2000.

Accessing Internet through libraries which provide such services free of charge is a tedious process since there are a lot of users waiting for such services. Again, the charges for accessing Internet in Internet cafes are beyond the reach of an ordinary Zambian. The lowest cost of Internet access in Internet cafes in Zambia is US\$2 per hour. One needs to spend at least three hours in order to have a meaningful search. This cost is too high for an average Zambian worker who gets an average salary of less than US\$100 per month.

## **1.2 Problem Statement**

While much research has been done on the continent and national levels, not much has been done on the existence of the digital divide and its related problems at the University of Zambia which is the highest institution of learning in Zambia. The University has inadequate ICT infrastructure and the costs of maintaining ICT is beyond its reach. At the moment the library and other departments depend on donor funds to buy books, subscribe to journals and establish Internet access.

The fact that students and lecturers have restricted Internet access puts them to great disadvantages in their research work since they do not have access to a variety of published materials through Internet resources which their fellow students have in the west. This affects the quality of education eventually being provided. The other problem is the literacy gap, which exists between the West and the South. At the moment providing Internet by itself without training the students is not enough. Students need to be trained in order for them to be technology literate. Lecturers also need frequent training to update themselves in the latest trends for them to feel comfortable in integrating technology in their lectures.

All these problems are testimony to the fact that the sort of education being offered needs to improve in order to produce graduates with modern information skills as demanded by the modern information economy.

### **1.3 Objectives of the Research**

This research will aim at assessing the extent of digital divide among the academics and students in Zambia and UK by assessing the differences in getting access to the ICTs, the Internet digital information. I have selected the research to cover Departments of Information and Library Studies at the University of Zambia and The University of Strathclyde. The University of Zambia is the only University of the two universities in the country offering Information and Library Studies, while The University of Strathclyde is one of the leading Universities in UK offering postgraduate studies in library and information studies and information management.

The research will therefore aim at establishing whether or not lecturers and students have access to the Internet from their homes, University Library, halls of residence or any other place. Questions relating to whether they are technology literate to be able to use ICT devices effectively will be probed. Issues relating to how the cost is affecting students and lectures in their access to digital information and the Internet will be investigated fully. This research will also make detailed examination of the services being provided by the two University Libraries to their users to ensure that users get the information they need.

### **1.4 Scope of the Study**

This research will cover the academic sector of the two Countries i.e. the United Kingdom and Zambia. Specifically it will target tertiary education. The University of Zambia has been selected in Zambia and the University of Strathclyde in UK is the second one to be investigated.

## **1.5 Dissertation Outline**

This dissertation therefore will have several components. The first chapter as already seen above will cover the background of the research, the problem statement, objectives of the research and the content of the research.

The second chapter will basically be a literature review of the topic under discussion. Methodology which include the sample selection, the size of the sample, the identification of data collection instruments will all be discussed in the third chapter. The rest of the chapters four and five will be devoted to discussing the findings, analysis, recommendation and conclusion respectively.

## **Chapter 2**

### **Digital Divide: Literature Review**

#### **2.1 Definition**

While Information and Communication Technologies are making our life easier, ICT development has created a social divide, which is known as the digital divide (3). The term digital divide is used to describe a situation where there is a gap between those who can effectively use new information communication tools, such as the Internet and those who can not. While there is no agreement on the extent of the divide and whether the digital divide is growing or narrowing, researchers are nearly unanimous in acknowledging that some sort of divide exists at this point in time (4). The digital divide exists between rich and poor nations, rich and the poor people within a given set up, men and women and also among different races.

Research has shown that ~~that~~ digital divide deepens where there is economic, political and social inequalities. Higher social class and wealth are frequently indicators of use of digital technologies.

#### **2.2 Digital Divide in Some Developed Countries**

In 1995, a Canadian study (5) found a strong correlation between income level and computer ownership; 86% of households with an income level of over \$100,000 owned a computer compared with 28% of those with incomes below \$20,000.

In 1999 US government report (6) indicated a widening in the gap between the information rich and the information poor with the division based on education, income and ethnicity as follows.

- Those with a college degree are eight times more likely to have a computer in the home and 16 times more likely to have Internet access than those with elementary education.
- A high-income household in an urban area is 20 times more than a rural low-income family to have Internet access.

- A child in a low income white family is three times more likely to have Internet access as a child in a comparable black family and four times likely as a child in a comparable Hispanic household.

In UK, 48% of Internet users are in the professional and managerial classes. It also shows that 62% of students in Britain have access to a personal computer in the home although the extent of their access to the Internet at home is not known (7).

The British Government realised early that the development of access to Internet has potential in increasing economic growth as well as material prosperity. The Government also realises that physical barriers in terms of access to Information are broken by Internet access. The British Government has therefore responded positively to the information age challenges by launching initiatives in all crucial areas of policy which include e-business, e-government, IT training and lifelong learning.

In the area of e-government and provision of public services, the British Government has gone far in providing electronic government information with a view to:

- Making it easier for businesses and individuals to deal with government.
- Enable government to offer services and information through new media like the Internet or interactive TV.
- Improving communications between different parts of government so that people do not have to be asked repeatedly for the same information by different service providers.
- Giving staff at call centres and other offices better access to information so that they can deal with members of the public more efficiently and more helpfully.



- Making it much easier for different parts of government to work in partnership for example, central government with local authorities or the voluntary sector; or government with third-party delivery channels such as the Post Office or private sector companies.
- Helping government to become a learning organisation by improving our access to, and organisation of, information (8).

In the educational sector, the British Government has come up with a number of initiatives, which are in line with the Labour Party election campaign. The initiatives aim at training the workforce of tomorrow to gain digital skills and develop fresh skills for learners of all ages. In 1997 the British Government set a wide range of targets for the adoption of ICTs in education and life long learning in the consultation paper titled connecting the Learning Society (9).

The consultation document (10) stated that by 2002, all Schools, Colleges, Universities and as many Community Centres as possible should be connected to the National Grid for Learning (Ngfl). This initiative was launched in 1998 to develop suitable educational content on the Internet and also to ensure that access to the content is available throughout all the different educational sectors both formal and informal. Other initiatives in the educational sector include ICT Learning Centres and the University for Industry (Ufi).

The objectives of the ICT Learning Centres Initiative are to establish 700 ICT learning centres in disadvantaged communities, ensuring access to digital technologies and preventing the growth of Societal disparities in the benefits of ICTs. On the other hand the University for industry initiative aims at providing both open and distance learning for individuals and businesses using digital technology to deliver these learning services and products.

It is the British Government's determination to improve and increase learning in the post-16 year's population through these initiatives. The initiative is committed to achieving large increases in the numbers of adults participating in structured learning, to increasing skill levels in the working population to

world class levels and to making the best use of technological innovation in teaching and learning methods to achieve this (11).

The British Governments' effort to implement these initiatives is bearing fruit. At the University of Strathclyde for Example, there are 750 personal computers in 25 Central labs and additional 59 Unix workstations in 4 computer labs for students to use. Members of academic staff and research students have their own PCs in their offices, which are additional to the computers in the labs and the library. All halls of residence have Internet access to enable students with personal computers have access to Internet. Internet access is accessible to students and University staff on 24 hours basis.

### **2.3 Digital Divide in Developing Countries**

There is more adverse impact on the digital divide in the developing countries than in developed countries which result in users in developing Countries becoming more deprived of the accessibility to the digital information resources and services than their colleagues in the west.

It is a known fact that while a great deal of attention has been paid to narrowing the digital divide that exist within developed countries, not so much has been done in Africa. The Digital divide Fact sheet (12) shows that there are an estimated 429 million people online globally. This represents only 6% of the world's entire population. The distribution of the Statistics is as follows:

- 41% of the global online population is in the United States & Canada.
- 27% of the online population lives in Europe, the Middle East and Africa (25% of European Homes are online).
- 20% of the online population logs on from Asia Pacific (33% of all Asian Homes are online).
- Only 4% of the world's online population are in South America.

Most developing Countries especially those in the Sub-Saharan Africa are preoccupied with dealing with daily bread and butter issues of famine, poverty and disease. Development of information services such as ICTs are way down the list of government priorities. Corruption is also rife in Government so much so that a lot of taxpayer money as well as money loaned to the governments ends up in leaders pockets. This has a hand in retarding development.

Basic literacy levels as well technology literacy and information literacy are a growing concerns in developing Countries. Consequently, while the governments are now trying to improve the levels of basic literacy, libraries are calling for another level of literacy in the name of technology literacy and information literacy. Though most of the libraries in developing countries are introducing ICT related services, this is hampered by lack of continuity in the flow of funds as well as lack of well-trained staff. A catalogue of problems that hinder ICT development in libraries in developing countries follows:

- No government policy in place to encourage the development of ICT.
- Poor technology and information literacy levels among staff and users causes lack of appreciation of modern information services and their use.
- Poor infrastructure development by telecommunication companies which in most cases are government monopolies.
- Absence of fully developed and up to date OPACs and little accesses to online information resources.
- Non existence of library budgets. Libraries thrive on donour funding and where donour funds are not fourth coming, no developments take place.

## 2.4 Current State of Internet Services in Zambia

There are now five public Internet service providers in Zambia. The largest and one of the first in Africa is ZAMNET, with about 3000 subscribers. The second largest ISP is Coppernet which was created out of ZCCM's privatised IT division and has about 2700 subscribers. The national telecom operator, Zamtel, has also provides Internet service in competition with the private services. The latest two Internet service providers are Microlink and UUNET. As stated in chapter one, Zambia has less than 10,000 total subscribers shared by all the five ISP.

The cost of a license to operate an ISP is USD\$40 000, obtainable from the regulator. The basic cost of Internet access per month is US\$25 for full Internet access while local call cost US\$2.5/hr peak, US\$1.5/hr off-peak (13). This cost is considered very high in a country where an average income of a worker is less than US\$100 per month.

The Zambia Communications Authority is responsible for the regulation of the sector, falling under the Ministry of Transport and Communications. Restructuring of the telecommunications sector with a privatisation of the national telecom operator is being considered.

The Zambia Telecommunications Company (ZAMTEL) is the sole provider of basic telecommunication services. International traffic growth has been substantial, reaching 17.7 million minutes in 1995. Microwave links are being upgraded to digital and a new earth station is being commissioned to replace one of the two Standard A satellite stations.

The telecommunications network in Zambia has improved substantially over the last few years, but is still at a very low level of development. About 400 payphones are in operation and a further 450 smart card based phones are planned. Zamtel is also in the process of digitising its transmission and earthstation network and introducing an X.25 based data service (a \$1.5M project being implemented by London International Projects Ltd).

There are three private cellular providers i.e. Zamtel, Zamcel and Telecel. Many more are expected to start operations soon.

## 2.5 Current State of Libraries in Zambia in Relation to ICT Development

It can be rightly claimed that libraries in Zambia are the most widely distributed information institutions in the country. They include academic, public, school, special and documentation centres. Chisenga and Chelemu (14) confirm that Zambia has no National Library to co-ordinate library functions in the Country. However, the functions of the National Library are shared among four institutions, which include the University of Zambia Library which has a reference function, Zambia Library Service, which has a lending function, National Archives, which has a depository function, and the National Council for Industrial and Scientific Research, which has a documentation function. All the four libraries are based in Lusaka, which is the Capital City of Zambia. The current state of each of the categories is discussed below.

### 2.5.1 Public Libraries

Zambia has three types of public libraries. The three categories include libraries which operate under the Zambia Library service, libraries under the district councils and last but not in any way least, libraries operating under international organisations which include the British Council and the American Centre.

#### *Zambia Library Service Libraries*

Zambia library service was established in 1962 with a grant of ZK82,000.00 which was equivalent to (£43,000) from the Ford Foundation for its initial book collection with the following terms of references:

- Establish a public network of libraries throughout the republic of Zambia in conformity with the trends of development taking place from time to time in Zambia.
- Run a primary and secondary school library network.
- Establish and run ministerial and government libraries
- Eventually take over public libraries that have been in the hands of

local authorities.

Zambia Library service is far from achieving the terms of references above. Except for establishing six provincial libraries which have a net work of branch libraries in rural Zambia and helping in setting up a few ministerial and school libraries, the organisation has not done well in other objectives. It must be noted that Zambia Library service is the only major information service in rural areas in Zambia.

Other activities being undertaken by Zambia Library Service include providing support to communities who wish to open libraries or reading rooms in the form of channelling book donations, advice on library management, etc. Zambia Library Service has also started developing specialised information services such as women's corners, which provide information particularly interesting to women (15). This is done to encourage women to maintain their basic literacy skills and also help them to be informative. Finally, Zambia Library Service in the recent years has introduced an annual reading competition for children from Grades 1 - 9, in order to encourage children's reading culture to grow. This is held annually during the Library week event, which takes place normally in the third week of September every year. It is worth mentioning also that Zambia Library Service benefits more from Book Aid International (BAI) an NGO based in UK. Previously it also benefited from the Canadian Organisation for development through Education (CODE) based in Canada. BAI still donates books to date while code discontinued to the dissatisfaction of Zambia Library Service.

Though there is one computer connected to the Internet based at the head quarters in Lusaka, there is absolutely no presence of Internet let alone PC availability in the Libraries. There are therefore no electronic information services being offered to its users.

Zambia Library service suffers from lack of funding. This is so because the government, which provides most of its resources largely, concentrates on meeting a wage bill. Zambia Library Service staff also need training in order to provide electronic resources if Zambia Library Service is to introduce electronic services. As the situation is at the moment, users who include

pupils, college and university students, professionals based in rural areas, farmers are all denied the chance to have latest information.

None of the libraries under Zambia Library service has automated its collection to date. This means that library services can not be accessed remotely as users continue using card catalogues. The collections of Zambia Library Service Libraries though better than the rest of the local public libraries leave much to be desired.

### ***District, Municipal and City Council Libraries***

District, municipal and city council libraries are located along the line of rail which stretches from the town of Chilibombwe bordering with Democratic Republic of Congo to Livingstone, a tourist Capital of Zambia located in the Southern Province. The libraries fall under the Department of Housing and social services.

The state of these libraries leaves much to be desired. Almost all of them with the exception of Lusaka and Ndola public libraries are stocked with outdated books and journals. They do not subscribe to any journals apart from buying local newspapers.

The main reason for this poor state of affairs has been the poor funding. Most of the libraries have not had any budgets for years and due to poor conditions of service, these libraries have failed to attract qualified staff.

Ndola and Lusaka public libraries are fairly stocked. This is because the Ndola Library received a large proportion of books which were part of the collection of the Ndola British Council Library which closed in 1999 (16) and Lusaka Public Library also received textbooks from The British Council when the British Council closed its students textbook library. The British Council has continued donating new books to the two libraries to date.

All the Council libraries are far from setting up and providing electronic services to their users due to financial constraints to buy computers and

maintain the Internet bills. Ironically, within the library building of Lusaka City Council, there is a privately owned Internet café which is extremely busy, a sign that the service is actually on demand. The income raised from the Internet café is not ploughed back into the library activities but goes to the central account of the Council where it is utilised on other purposes other than developing the library.

Non of the catalogues of the council libraries is automated.

Lack of up to date books and also non-availability of Internet access in public libraries has perpetuated Information famine in many parts of Zambia.

### ***Libraries Run by International Agencies***

The best well run libraries in Zambia are those run by the British Council and the American Centre in Lusaka. The British Council was the first library to offer Internet services in Zambia in 1996 initially as a dial up service. In the year 2000 the 24 hours lease line Internet service was introduced. The British Council has 8 PCs available to its users and charges extra fees (ZK10,000 per hour) for Internet access. However, the services of the British Council have been focusing on special user groups such as managers (17). This means that students and other categories of potential users are “starved” since they are not able to use the British Council library services despite the fact that their demand for libraries is more than that of managers.

The American Centre operates on the similar lines like the British Council. They have one PC, which is open for public usage to access Internet resources. American Centre does not charge for Internet access. The American Centre is also only open to special groups.

### **2.5.2 Academic Libraries**

The University of Zambia Library, established in 1966 and moved to its permanent building in 1969 on the main campus along great East Road, is the largest Library in the Country with over 200,000 books and 21 titles of hard copy journals. It has over 700 full text electronic journals. The subscriptions for electronic journals are supported by DANIDA, SIDA, and DFID

The library has a capacity to accommodate up to 1800 readers at any one time but utilises only 800 at the moment because of lack of enough study chairs and tables.

Its book collection is outdated because the Library has had no book budget since early 90s. Students have demonstrated on several occasions because of lack of up to date books in the library as one of the reasons for demonstrating. The library has two branch libraries located at the School of Veterinary Medicine and school of Medicine respectively. The School of medicine library is well stocked and offers Internet to its users who are students, lecturers and medical doctors.

The University of Zambia main library has Internet connection but this is restricted to members of staff at the moment because the ten computers which used to provide Internet access to the 6,000 population of students were stolen in 2000. The library's collection is automated and users are able to check the catalogue within the library.

The University has other computer labs in various departments, which are very restrictive in being accessed by students and lecturers because of high demand.

The Copperbelt University Library was initially established in 1978 when it was serving the University of Zambia at Ndola (UNZANDO) located in Kitwe. This campus was transformed into Copperbelt University in 1987. The Copperbelt University (CBU) was established through Act No. 19 of 1987 after the Government of the Republic of Zambia had decided to do away with the federal system of the university. The federal system had been created through Act No. 17 of 1979 and under this system the University of Zambia comprised three constituent institutions namely:

The University of Zambia at Lusaka, The University of Zambia at Ndola and The University of Zambia at Solwezi.

When it became obvious that the Federal system was not the best way to run a university, the Government decided to reconstitute The University into; The University of Zambia (UNZA) and The Copperbelt University (CBU)

with the third being incorporated into the University of Zambia. The announcement was made in Parliament in August 1987 by the Minister of Higher Education when he presented a Bill, which called for the repeal of Act No. 17 of 1979. Simultaneously he presented two Bills to Parliament calling for the creation of the two independent universities to be called The University of Zambia and The Copperbelt University.

The Minister of Higher Education informed Parliament that the University of Zambia would continue to operate from the premises in Lusaka while the Copperbelt University would take over the premises which were being occupied by the Zambia Institute of Technology (ZIT) along Jambo Drive, Riverside, Kitwe. The Zambia Institute of Technology would be incorporated into the University as the School of Technology together with Mwekera Forestry College, which would be, called the School of Forestry and Wood Science.

The Copperbelt University started to operate as a separate institution on December 1, 1987. The new University started with two schools, the School of Business and Industrial Studies and the School of Environmental Studies, with a student population of five hundred and fourteen. It now has four schools after incorporating the School of Technology and the School of Forestry and Wood Science, which was established in 1995.

Copperbelt University Library's collection is automated and has Internet access though this is restricted to staff usage. The students have one PC, which gives them access to the Internet and CD-ROM databases. The University has a student population of 2,500. The Copperbelt University Library collections can not be accessed remotely (18). Like at the University of Zambia, students at the Copperbelt University have demonstrated (19) on a number of times to demand improved library services among other needs.

The University has computer labs, which offer services to students though these are not adequate and are still being developed. Figure 1 below shows students in a clustered computer lab.



Figure 1. Students working in a clustered Computer lab at the Copperbelt University in Kitwe (20)

### **2.5.3 College Libraries**

There are various libraries in technical, business and teacher training colleges in Zambia. Most of these libraries which are under government department suffer financial constraints. This has resulted in poor library services to users of these libraries. Internet services in these libraries are at the moment a pipe dream. Students rely on old books for their research.

However, there is a unique library run by Zambia Centre for Accountancy Studies College, which currently enjoys a lot of donour funding. The library at this college has a capacity of 300 students. Though the library is run on a closed access basis, it has up to date books. The library offers study material on various media such as video, books and computer multimedia.

The library has various materials in line with the centre's faculties such as accounting, management, economics and information technology. In addition, the library stocks popular periodicals such as Time, Newsweek, Harvard Business Review and the Economist to ensure students keep in tune with current and economic affairs.

In addition to the library facilities, ZCAS has three computer laboratories, which have a capacity of sixty computers. Each of the computer laboratories has an average of twenty PC's. The computers in the laboratories all use pentium technology with twenty recent additions running on Pentium 4 processors.

The computers all operate in a networked environment and are connected to the Internet via a wireless connection which makes the Internet available 24 hours daily. The Laboratories are used for research, class work and recreation purposes by the students (21). Below is Figure 2 showing students working in a well set up laboratory.

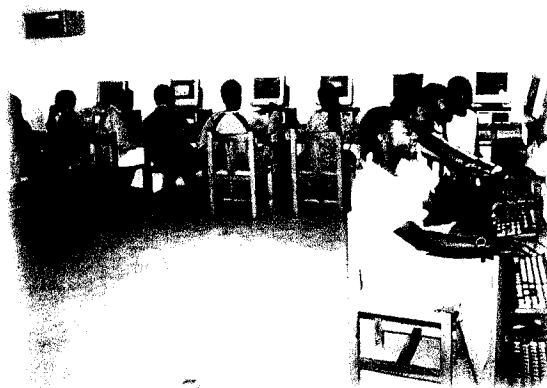


Figure 2. Students working in a computer lab at ZCAS (22).

#### 2.5.4 School Libraries

The state of school libraries in Zambia can best be described as non-existent. Very few schools have libraries. Most of the schools have out dated books, which gather dust on the so-called library shelves.

As expected however, private schools have well-established libraries. In Lusaka, Lusaka International school has two libraries one for primary school and the other for secondary school. Qualified librarians have been employed to manage these libraries. The two libraries have Internet access and are in the process of automating their collection. There are many other private schools with well-established libraries. However, very few people go to these schools since fees are very prohibitive.

On the general development of ICTs in schools, there are some efforts to change the persistent status quo of the majority of schools by the British Council in conjunction with the British High Commission, The Beit Trust, Computers for African Schools (CFAS) a registered charity and the HSBC Equator Bank. These organisations have embarked on a programme aimed at donating computers to secondary schools in Zambia.

The programme kicked off in Kabwe, Central Province where the charity donated 12 computers to Kabwe high school as part of the 20, US\$15,000 worth of computers that the secondary school will receive this year (23). This programme aims at donating 160 computers to Secondary schools in 2002. The programme will also include the two universities in the country. However, it remains to be seen how the programme will work out because donation of hardware in itself is not enough to ensure that there is beneficial usage of computers let alone access to the Internet. The questions that come to mind are who will meet the phone bills for Internet connection? Who will maintain the computers? Who will train the teachers? Etc.

In a nutshell, what we are seeing in Zambia is that lack of ICT policy development is affecting the development of Internet adversely. This is especially so in Government Institutions which include schools, colleges and

Universities. This in turn has cut the majority of the people who depend on government services from the rest of the world.

On the other hand private Institutions with adequate finances are well ahead in developing ICT related services. This however benefits a very small fraction of the Zambia population who can afford to pay high fees.

## **2.6 How the Internet Can Benefit the People in the Developing Countries**

There are no quick or easy solutions to the problems of the digital divide either within nations or between nations. Cullen (24) says that both the rich and the poor countries have too little cash to attract the attention of multinational computer and telecom giants who are more interested in the profits to be made from higher bandwidth and new technologies. Some of the Solutions proposed by the United Nations in trying to improve the digital divide include the transfer of knowledge from the rich Northern Hemisphere to the South by putting more scientific and research publications on the World Wide Web. Another programme known as Health Inter Network Access to Research Initiative (Honari) was proposed by UN Secretary General Kofi Annan and is being organised by the World Health Organisation (WHO). This programme has led to the negotiations with biomedical publishers to offer free or reduced-charge of 1,000 electronic, health science journals to accredited universities, medical schools, research Centres and other public Institutions in about 70 countries with lowest GNP (25).

It is also argued that careful renegotiations of existing global telecommunications agreements and the restructuring of the World Wide Web will be needed to ensure that the United States, which has the hub of Internet traffic, does not deprive poor countries of the income they so much need by paying heavy traffic exchange fees. The United Nations is also encouraging the development of local community access centres established in existing community centres, schools, or meeting houses. The United Nations also views content of Internet as an important factor in ensuring that as many people as possible are attracted to use Internet. At the moment, the dominance of English on the Internet is not helping at all because it is believed that the

number of people speaking English is reducing as compared to those speaking other languages such as Chinese. The solution then is to develop local contents in local languages.

Chowdhury (26) lists some of the free services which libraries and information services can take advantages of as follows:

- Information from government, Regional and International Organisations.
- Information through subject gateways and virtual libraries.
- Digital reference and information services
- Access to electronic texts- books, journals, theses etc.
- E-print Archives and open Archives initiative

The details of these services are described below.

#### **2.6.1 Information From Government, Regional and International Organisations**

Many governments now in developed and developing countries are trying to make as much information as possible accessible on the Internet. As a result of this, end users are able to get access to such information through the Internet free of charge. In sub Saharan Africa, Botswana is a good example where information about each ministry has been computerised and the public is able to have access to the information on the Internet (27). The Information computerised includes activities in the ministries, policies, publications etc. Most of this information is free. The American Government and Britain have their Governments Information available on the Internet ready to be accessed by those who need it.

Britain just like many other western countries have a wealth of information digitised and available on the Internet which members of the public can access freely.

Librarians and Information professionals should make this information available in their libraries and Centres to their clients through Internet resources.

### **2.6.2 Web gateways or portals**

One of ways in providing Internet resources adopted by many libraries is the web gateways or portals, which vary in the degree detail, comprehensiveness and accessibility. Burnett and Seuring (28) say that gateways and portals range from libraries providing pages with only a small range of subjects to libraries with a subject guide for every department of the institution the library serves. The gateways select and organise valuable subject specific information available on the web and let users access to those resources through a custom-built interface. Some of the gateways as listed by Chowdhury (29) include:

- Art and Architecture: Adam (<http://www.adam.ac.uk/adam/index.html>)
- Health and medicine: OMNI (<http://omni.ac.uk/>)
- Social Sciences: SOSIG (<http://www.sosig.ac.uk/>)
- Business and economics: Biz/ed (<http://bized.ac.uk>)
- General: NOVAGate: (<http://novagate.nova-university.org>)

### **2.6.3 Open Archives Opportunities**

One development that has a great potential value for poorly resourced countries is the open archiving or the deposit of scholarly research papers into networked servers accessible over the Internet. The process allows scientist in the South to retrieve research results from the North through an online interoperable mechanism (30). It also allows scientists in the South to contribute to the global knowledge base through participation. Archiving initiatives are of great importance to all scientists, but particularly to those in the developing countries because free access to research information from the

north would have incalculable benefits for local research in the South. Other advantages for the open Archiving initiative include:

- Global participation of scientists from developing countries
- The academic communities in poor countries can take advantage of servers anywhere in the world offering OAI services without need to set up their own independent servers or maintain them.
- Scientists from the South have a means of distributing local research in a way that is highly visible and without the difficulties that are sometimes met in publishing in journals e.g. biased discrimination between submissions generated in the North and South.

Chan and Kirsop (31) lists common misconceptions for the Open Archiving Opportunities for developing countries as:

- There is a concern that since everybody can publish through this project, self-archiving could lead to lack of quality control. However, this is looked into by clearly defining the type of material on the Internet. Both refereed and non-referred materials provide clear option for readers to select.
- Another concern is that the volume of materials available online makes more difficult to retrieve required materials. However, efforts such as the OAMHP, with its emphasis on common metadata standards are designed specifically to address the issues of accurate and efficient retrieval and interoperability with other OAI- compliant servers.
- Copyright is seen as a major concern. In the paper era, researchers routinely sign away their copyright to publishers in exchange for the opportunity for their research known and to gain career advancements. However, in the electronic era, authors are becoming increasingly aware of

their rights and professional need to distribute their own research as widely as possible for maximum impact.

- Scientist in poor countries have a major obstacle to participating in these developments in that there is lack of awareness of the availability of the different mechanisms for distributing and accessing research documents. Since most of the developments and services are not yet on the Internet, the lack of awareness is caused mainly by the lack of telecommunications infrastructure in the developing world. However, there are major international and local efforts to invest in the infrastructure and there is growing optimism that with time this problem will be resolved.
- Another cause of the lack of awareness is a lack of concerted effort from the archive institutions and the development agencies to inform and promote the new practices regarding the use of the technology. This is being solved by distributing brochures to the wider community.

#### **2.6.4 Digital References and Information Services**

The web offers a number of digital reference services which librarians and information professionals in developing countries are able to use. Most of the reference services are free though some of them need to be paid for.

Chowdhury (32) categorises online reference and information services into three broad groups, which include:

- Reference and information services from publishers, database search services, and specialised institutions.
- Reference services provided by libraries and /or experts through the Internet.
- Reference and information service where users need to conduct a search and find information through the web.

Some of major online information services that belong to the first category described above include the contents page service from commercial publishers, information on new books available free from publishers and SDI services from online search service. Notable online reference and information service currently available include Askme ([askme.com](http://askme.com)), allExperts, ([Allexperts.com](http://Allexperts.com)) Inforocket ([Inforocket.com](http://Inforocket.com)), AskAuntie Nolo ([Nolo.com](http://Nolo.com)) etc.

Chowdhury (33) lists additional web based references services where users need to conduct a search for a reference query as Internet Public Library (<http://www.ipl.org>), Infoplease (<http://www.infoplease.com>) Britannica (<http://www.britannica.com>); Internet Library for Librarians; (<http://www.itcompany.com/inonforetrieve/>), Electric Library (<http://ask.elibrary.com/refdesk.asp>), etc.

Ask Jeeves is a good example of a search engine which also performs the function of web based information service. Users are able to ask questions and get answers instantly unlike other metasearch engines are able to ask questions on a given topic and ask Jeeves come up with a list of questions on the same or similar topics.

## **2.6.5 Access to Electronic Textbooks, Journals Thesis etc**

One of the most prominent benefits of having access to the Internet is that those accessing Internet are now able to get online access to books, journals and other publications such as thesis, conference proceedings etc. Most of these services are free to users though some of the services need to be paid for.

### ***Ebooks.***

Rao (34) defines ebooks as:

“Text in digital form or books converted into digital form or digital reading material or book in computer file format or electronic file of

words and images to be displayed on a computer through a network or view on a desktop, note/book dedicated portable devices or read on all types of computers or formatted for display on ebooks readers”.

Ebooks have a number of advantages. While it is not possible to adjust print size for books in hard copies, one can adjust print size for electronic books to suite them. Electronic books also enable professionals and researchers to have instant access to literature at any time they require such materials. Electronic books enable students to download many textbooks which are always updateable into one device rather than carry a lot of books that need replacing, as information becomes outdated.

However librarians are faced with challenges of providing this service. There is no universal catalogue to enable users access these materials easily.

Durability of electronic books is not certain as technology changes all the time. Finally, there are not enough electronic books at the moment to provide readers with a variety.

Chowdhury (35) lists some notable examples of ebooks as:

- The dictionary .com (<http://dictionary.com>) provides access to a number of dictionaries, thesaurus, writing resources, and other tools including the automatic webpage translation services.
- The elibrary reference desk (<http://ask.elibrary.com/refsearch.asp>) provides access to a number of dictionaries, encyclopaedias and almanacs.
- The classic book shop.  
(<http://www.classicbookself.com/siteMap.htm>) provides access to a number of classic books available in electronic format.
- The Webbooks.com (<http://www.web-books.com/cool/ebooks/library.htm>) Provides access to cover 2200 electronic books in different subjects.

## *Ejournals*

Unlike books, electronic journals are becoming very popular in academic libraries. Fosmire and Yu (36) in a paper examining how good free electronic journals are, say that while serials price are increasing, there is steadily growing segment of free serials offered electronically. They conclude in their paper that high quality, productive free scholarly electronic journals exists currently and that such journals are doing very well because among other reasons, they provide an alternative to the current serials crisis of spiralling price increases. The list they give for free ejournals include a number of journals in agriculture, biology, computer science, engineering, mathematics and medicine.

A survey conducted in late 1997 and early 1998 by Shemberg and Grossman (37) showed that many libraries are beginning to cancel paper journals in favour of electronic journals a sign that electronic journals will soon be dominating library subscriptions.

Some publishers and associations are now making journals available free to the readers in some countries. Chowdhury (38) lists these as follows:

- Blackwells ([www.blackwells.co.uk](http://www.blackwells.co.uk)) is making all 600 of its journals freely available to institutions within Russian Federation
- World Health organisation (WHO) (<http://www.who.int>) is spearheading an initiative to enable 100 of the worlds poorest countries to access 1000 of their top biomedical journals while Academic Press's Ideal service ([www.ideallibrary.com](http://www.ideallibrary.com)) is making 300 science, technology and medicine journals available to research centres across Senegal and in West Africa.
- PubMed Central (<http://www.pubmedcentral.nih.gov/is>) is a digital archive of life sciences journal literature managed by the National Centre for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM). It is free for use from anywhere in the world.

In a nutshell, this literature review has shown that developing countries have serious problems in that while most of the libraries have Internet connection of some sort, this has not been extended to users. This is so because due to lack of funds to buy additional computer hardware as well as funds to cover running costs. Lack of trained staff in libraries in developing countries to handle electronic services effectively is also another problem.

We however see that if libraries in the developing countries can make efforts and provide Internet access to its users, there are currently a number of benefits users can utilise such as accessing reference services, electronic journals, electronic books free of charge or at affordable charges.

## **Chapter 3**

### **Research Methodology**

#### **3.1 The Research Model-Framework for the Study**

As seen in chapter two, educational institutions in Zambia like other educational institutions in developing countries stand to benefit a lot from academic initiatives that use the Internet to publish materials which can be accessed by users world over. ICTs if harnessed effectively, can sustain life long learning among academic staff as well as provide latest resources for university students. In the final analysis, this would improve the standard of education being provided in Zambian Universities. However, lack of infrastructure development, government policy to encourage the development of ICTs related services and a number of other factors have brought about the digital divide among academic staff and students in developing countries and Zambia in particular.

This research is therefore aimed at establishing the existence of the digital divide at the University of Zambia and make recommendations in chapter five on the way forward on how lecturers, students and other Zambians would be exposed to all the resources stored electronically. The research compared the facilities and technology skills of academic staff and students the two Universities.

#### **3.2 The Research Model: University of Zambia: The Digital Divide**

As I write today, Zambia together with all other countries in the Southern Region of Africa are in the grip of a famine. There is a documentary being shown on BBC TV almost once in a fortnight appealing for financial help in the UK to buy food for people in the Southern African region. However, little do people know that there is a perpetual affliction of information famine in the country. This is more felt at the University of Zambia where students and lectures are supposed to thrive on latest information which is nowhere to be seen in the University of Zambia Library and other public libraries due to the country's poor economic performance which has resulted in under funding

public institutions. The ICTs infrastructure in the University Library is under developed and in most cases, accessing Internet is restrictive to students as well as lecturers. The university budget is being cut every year and this results in the expansion of the library facilities difficult. Students and lecturers have to depend on outdated hard copy materials for their research work. Akst and Jensen (39) argue that using the Internet in Countries in Africa would make available a world of information and expertise to remote, information-starved communities at very little expense. This research therefore looked at issues of Internet as well as electronic library materials access by lecturers and students at the University of Zambia in comparison to students and lecturers at the University of Strathclyde. Issues relating to whether accessing Internet are affordable by lecturers and students were explored in Zambia and Scotland.

The other factor that this research examined is the technological literacy as well as usage of electronic materials as a source for latest information for research. Issues relating to life long learning for lecturers through seminars or workshops have been dealt with in the research.

The research model which is basically the summary of the main elements of the research including mapping out what will be studied, how when where and the method of execution is outlined below.

1. Preparation:

Included in preparation is the selection of the research topic, selection of research methodology, exploration, operationalisation and formulation of hypotheses.

2. Research Design:

Included in this is the selection of the sample respondents, selection of sampling procedure, selection of data collection methods as well as data analysis methods.

3. Data collection:

4. Data processing

5. Reporting- This is actually the publication of the findings.

### **3.3 Preparation**

#### **3.3.1 Preparation: Selection of the Research Topic**

The issue of digital divide is currently topical in Zambia. There are a lot of statements being made by NGOs, government officials students etc on the need for the country to narrow the digital divide in many areas in order for the nation to be part of the global information economy. Students at the University of Zambia have gone on strike on several occasions to demonstrate among other things, against lack of up to date materials in the library.

To this end, there has been little research to confirm that there are problems related to accessing electronic based information resources, technology illiteracy among students and lecturers at The University of Zambia. The University of Zambia is the oldest and most respected University of the only two Universities the country has. However, there has been two general research work done by Africa Information Society Initiative (AISI) (40) in 1998 and The British Council in 2001. The research by AISI was about use, benefits and constraints of electronic communication in Zambia and the research by the British Council –Zambia was to do with the needs assessment of users of the British Council Library (41). In both cases the use of ICTs by respondents was examined.

This research was therefore specific in nature, focusing on how the digital divide is affecting lecturers and students at the University of Zambia.

#### **3.3.2 Preparation - Selection of Research Methodology**

The methodology included both qualitative and quantitative methods. Questionnaires were sent to University students in the Department of Information and Library Studies at the University of Zambia and The University of Strathclyde. The research captured a good percentage of lecturers and students from both Universities. Due to the fact that the University of Zambia does not offer Library and Information Studies degree at a postgraduate level, the respondents from the University of Zambia were

undergraduates unlike the respondents from The University of Strathclyde who were postgraduates. The University of Strathclyde does not offer undergraduate degrees in this subject area. This did not affect the research adversely since the research information students look for are similar. Personal experience of the researcher who has used the University of Zambia Library as well as the University of Strathclyde library has been used extensively. Where possible, personal interviews were conducted among some of the lecturers and students.

### **3.3.3 Preparation: Exploration**

The exploration of the topic included literature review to ascertain the nature of the main points about the research and the main arguments which have been presented so far. Different type of media was consulted including academic journals, books, newspapers, the web and so forth. These provided the researcher with the wealth of information to understand the topic. However, it must be understood that little has been written particularly on a detailed topic like the one on the effects of digital divide among the students and lecturers at the university of Zambia.

### **3.3.4 Preparation: Operationalisation**

In order to translate concepts into measurable indicators, operationalisation was done right at the beginning of the research. The construction of the operational definitions used in the study needed to be defined clearly. This in turn removed contentions as to their definitions within the results of the research. For the purpose of this research, operational definitions assigned to various indicators are as follows:

1. Sex was operationalised according to the only two categories possible. male and female.
2. Operationalisation has also been done for the level of education for respondents. As for students at the University of Strathclyde, the research will target those doing an M.Sc. or PhD in Library and

Information studies. Lecturers who have attained a level of a Masters degree in Library and Information Studies from both universities will be targeted. Undergraduate students doing library and Information Studies will be targeted at the University of Zambia.

### **3.3.5 Preparation - Formulation of Hypothesis.**

Cambridge International Dictionary of English defines hypothesis as (42) as “an idea or explanation for something that is based on known facts but has not been proved”. The formulation of hypothesis is a routine element within the research model for those researchers who intend to employ statistical tools analysis. It is at a point of hypothesis formulation that a research question is clearly identified. Thereafter, possible methods of data collection are identified. The hypothesis for this research is as follows:

**Disparities of access, technology literacy, cost of accessing Internet and availability of computers to students at the University of Zambia are believed to be affecting the quality of education being delivered to match the needs of the global information economy. This applies to both lecturers and students.**

## **3.4 Research Design**

### **3.4.1 Research Design -Selection of Sample Students and Lecturers**

Rather than select all students at the University of Zambia and The University of Strathclyde, only students from the department of Information and library Studies in both cases were dealt with. It was hoped that in this way the research would be detailed. The University of Zambia has a total of 200 students doing library and information studies from first year to fourth year and on the other hand The University of Strathclyde has 95 students studying for MSc./Dip in Information and Library Studies an MSc/Dip Information Management respectively.

### **3.4.2 Research Design – Selection of Sampling Procedures**

This research targeted a total of 40 students which represents 42% of the total student population at the University of Strathclyde and 6 lecturers (75%) of the total lecturers in the department of Information and Library Studies at the same University. Due to the fact that the questionnaires in Zambia were managed by remote from Glasgow by the researcher, a reduced percentage of 25% representing 50 students were targeted at the University of Zambia. The research targeted 6 (66%) of lecturers at the University of Zambia. The targeted respondents were broken down as follows.

1. 6 lecturers from the department of Information and Library Studies at the University of Strathclyde.
2. 40 students from the department of Information and Library Studies at the University of Strathclyde.
3. 6 lecturers from the Department of Information and Library studies at The University of Zambia
4. 50 students from the department of Information and Library studies at The University of Zambia.

Selection was done at random. 50 Questionnaires were sent to students at the University of Zambia and six questionnaires were sent to lecturers at the same University. 6 questionnaires and 40 questionnaires were sent to lecturers and students respectively of the University of Strathclyde.

### **3.4.3 Research Design – Method of Data Collection.**

Data collection was mainly done by a survey. Interviews, literature review, and personal experience complimented the survey carried out. The combination of the above come up with excellent results. The questionnaire was pilot run to a couple of lecturers and students in order to ensure that the questionnaire which was finally sent was suitable for the research.

#### **3.4.4 Research Design – Data Analysis**

The form of analysis employed was quantitative as well as qualitative analysis. The quantitative analysis provided facts and figures for each University and each respondent while the personal experience and knowledge gained from literature review added to the qualitative analysis to establish the digital divide at the University of Zambia department of Information and Library Studies.

#### **3.5 Data collection**

The method of data collection was both by mail and personal approach in UK and only personal approach in Zambia as respondents were all at one place and it was easy to collect the questionnaires.

## Chapter 4

### Findings of the Research

#### 4.1 Research Findings: Background

This chapter will cover the research findings from the results of the questionnaires sent to lecturers and students in the department of Library and Information studies at the University of Zambia and the University of Strathclyde respectively as stated earlier in the methodology chapter.

Personal experience of the researcher regarding ICTs services available in the University of Zambia Library as well as the University of Strathclyde Library will be part of the qualitative findings.

The data for this research was collected in the third and fourth week of July. Data from Zambia delayed in being collected because students were on break and lecturers were busy with University work.

Microsoft excel was used to analyse the quantitative data.

There was a 66% (33) response rate of questionnaires from students at the University of Zambia. 50 questionnaires were sent to the students. Out of 6 questionnaires sent to lecturers at the same university, 4 were returned representing a response rate of 67%. The fairly high response rate can be attributed to the personal follow up efforts made by colleagues who were administering the questionnaires in Zambia on behalf of the researcher.

40 questionnaires were sent to students at the University of Strathclyde and 24 were received. This represents a 60% response rate. Out of a total of 6 questionnaires sent to lecturers of the same department, 4 (67%) were received back. This high response rate can be attributed to the fact that three methods of distributing the questionnaires were applied. The methods included email, the post and personal distribution.

## **4.2 Research Findings Through the Researchers Experience**

### **4.2.1 ICTs Related Services at the University of Strathclyde Library**

The researcher of this dissertation has used both Libraries and has therefore given an outline of his findings of ICTs related services in libraries of both universities below.

The University of Strathclyde Library has a web site which has information about all the services the library offers. This includes an online library catalogue, ejournals, electronic databases and subject and reference services. The library has a photocopying service as well. It must be noted that access to all these can be gained using PCs located within the library itself, from the offices within the University campus, the students halls of residence and from any home which has Internet access anywhere in the world. Remote access is possible by using a password.

#### ***Online Library Catalogue***

The catalogue menu provides a University of Strathclyde Library catalogue which allows users to find materials in the library. The catalogue menu also allows users to reserve and renew library materials online. Information about lending terms, membership conditions and regulations available on the web site. Catalogues for other universities with agreements with the University of Strathclyde are linked through this web site. In this case one can access catalogues of Glasgow University Library, Caledonian University Library, National Library of Scotland, Library of Congress, British Library and other catalogues within the European Union.

The library has a fully automated circulation system in place which enables loans to be processed electronically.

### ***Electronic Journals and Electronic Databases***

The Library web page gives access to thousands of electronic journals. News on new developments on ejournals and instructions on how to retrieve ejournals is part of this module. This is one of the most useful services the library offers because of the currency of the journal articles. The module gives access to hundreds of electronic databases in all the subject areas taught at the University.

### ***Electronic Reference Services***

The library web site provides an electronic reference service which gives access to travel information, electronic dictionaries, directories, encyclopaedias, publishers, educational and statistical information. Education information is also provided electronically. This service has links to international organisation which include The European Union (EU) and The United Nations (UN). Lastly, it gives the University of Strathclyde Campus map for the benefit of new students (44).

### ***Photocopying Service***

A self-service photocopy and printing service is available in the library. Users buy £3 and £10 for a 50 and 200 units copy card respectively. A scanning facility has just been installed in the library computer lab to be used by users.

## **4.2.2 ICT related services at the University of Zambia Library**

The University of Zambia Library has a web site which aim at introducing its library users who include academicians, students, researchers, and the public to the many services that the library provides. It also highlights some of the various Internet resources that academics might consider using to support their work. The web site has links to its branch libraries, CD-ROM services, ejournals, and an online catalogue. Other links on the web site lead users to

some useful web sites identified by library staff. The web sites also hosts the library newsletter. It must be noted that except for the access to online library catalogue, other ICT related services can no longer be accessed by users within the library because the library has no PCs for the purpose. The services can however be accessed through a central computer lab which normally has long queues of students.

### ***Online Library Catalogue***

The University of Zambia Library Catalogue is computerised using Dynix automated Library system. The catalogue can be searched online via several VT100 terminals available in the main library as well as the two branch libraries. All faculties based at the Great East Road Campus can access it through the fibre optic campus area network or Internet. Remote login is primarily by telnet. Training on the use of OPAC is offered to all new students and all that are interested. The web site gives detailed instructions on how to access the catalogue remotely.

### ***CD-ROM Service***

The University of Zambia Library has an established CD-ROM database service to all its users. Following the acquisition of the InfoWare CD/HD Networking System, it is possible to search the CD-ROM databases on the Campus Area Network (CAN). The InfoWare CD/HD Server is loaded with seventy (70) CD-ROM databases.

The list of available databases under five broad subject categories include agriculture, veterinary medicine, education, medicine, science, engineering and social sciences.

### ***Electronic Journals***

The University of Zambia Library has a donor-funded programme of supporting electronic journal subscriptions. As a result of this, it has an

electronic journal service which gives library users access to latest journals in the subject areas including agriculture, health, humanities and social sciences, pure sciences etc. Some of the databases which can be accessed from the library web site include:

- CAB Abstracts ( <http://www.silverplatter.com/erl11?>), gives access to abstracts in the field of agriculture.
- CAB Health (<http://www.silverplatter.com/erl11?>), gives access to journal articles in the field of health.
- Blackwell-Synergy (<http://www.blackwell-synergy.com>), gives access to journal articles in the field of sciences.
- INGENTA (Blackwell Publishing) (<http://www.ingenta.com>), gives access to journals in the field of humanities & social sciences.
- SAGE E-Journals (<http://sagepub.co.uk/freeaccess>), gives access to journals in all subject areas (45).

### ***Electronic Reference Services***

The library web site has a list of universal resource locators (URL) which the library staff identifies as useful to users. The URLs given include those of the general search engines, information gateways, and local Internet Service providers. Some of the general search engines linked to the library page include Alta Vista (<http://uk.altavista.com/s?r=1>), Yahoo (<http://www.yahoo.com/>), Google (<http://www.google.com>), Dogpile (<http://www.dogpile.com/index.gsp>)

The local Internet service providers included on the web sites are ZAMNET, ZAMTEL and Coppernet. Notable subject gateways on the web site include Biz/ed, Bulb, EELS, EEVL, Humbul and Internet Directory for Botany.

### **4.3 Pitfalls to Accessing to the Internet Observed by the Researcher**

While the University of Zambia Library is well connected to Internet, there are a number of problems observed which make it difficult for users to access the Internet based resources. Some of the problems facing the University of Zambia library include:

- Internet too slow to down load.
- Low rate of technology literacy amongst students.
- Lack of funding to update the technology when need arises.
- There are serious safety questions. As stated above the only ten computers which were providing Internet access to students were stolen in the year 2000.
- There are long queues for very few computers in a few computer laboratories. The Library hosts a computer laboratory managed by the department of computer studies. The laboratory is based in the library basement and has 40 computers connected to the Internet against a student population of over 6,000.

### **4.4 Research Findings From the Questionnaires**

#### **4.4.1 Access to ICTs, Internet, Email, and Library Electronic Resources by Students at the University of Zambia**

Of the 33 students who responded to the questionnaire, 29 (88%) of them said they do access the computer in the library only for the purpose of accessing the electronic library catalogue. Non of them indicated that they access the computer in the library for other purposes because such facilities do not exist. Only 1 (3%) student said that he does access computer at the halls of residence as well as at home. This student does not however have access for Internet electronic resources, library electronic resources, University Intranet and email at the halls of residences because the halls are not wired to provide Internet access. Only 5 (15%) of the students do access email, 1 (3%) do access

Internet electronic resource and 0% do access library resources and Internet from home.

5 (15%) said they do access the email, Internet electronic resources, University Intranet using the computer lab which was provided by the computer department located in the library basement though there is high competition for the usage of these computers. 32 (97%) of the students however said that they do not have a 24 hours access to the Internet even in these labs.

The students indicated that harsh economic hardships the country is experiencing is a reason for them or their parents not being able to buy computers for use either at the University residences or at home. The non-existence of ICT infrastructure development within the University was cited as the major factor which is hindering ICT development in the University.

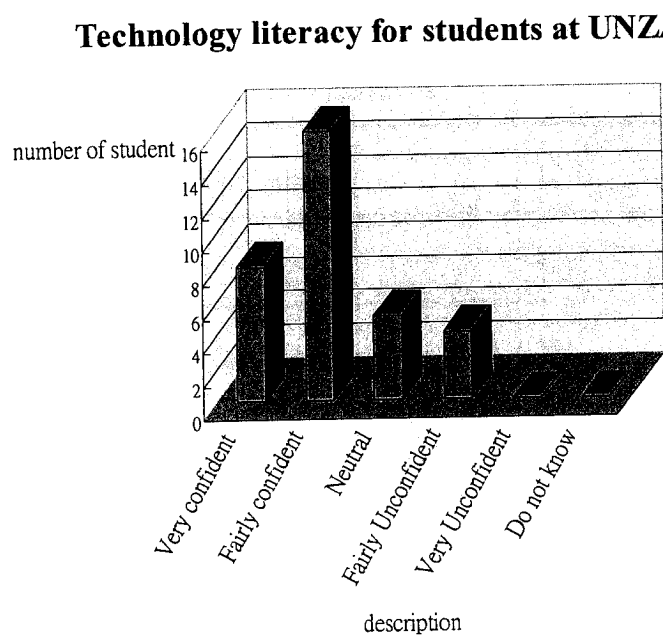
In terms of whether the students use other facilities provided elsewhere for accessing Internet, 23 (70%) of the students said they do use other places to access Internet. However, 22 (67) said that they find it very expensive to pay for such services and 7 (21%) said they find such services fair, while 4 (12%) did not comment.

31 (97%) of the students said that Internet access would improve the quality of education at the department while 1 (3%) did not think Internet could improve the quality of education. The reasons advanced by those who said it would improve the quality of education include the fact that Internet access would provide a variety of up to date materials which would help them in their research. Other reasons advanced included the fact that Internet access would provide materials in a variety of subject areas, that Internet access would also make lectures more interactive and interesting, that users would be able to download whatever useful information they find. Students also said that Internet would allow students have access to publications which are only published in electronic form. They said that Internet provides a one-stop

facility for finding information more easily and in the process frees up time to do other activities such as sport.

8 (24%) of the students said that they are very confident in using computer based resources while 16 (48%) said they are fairly confident in using computer based resources. In terms of technology literacy, 32 (97%) of the students said they would be interested in being trained in using the Internet while 1(3%) of students were not interested in further training. Below is a table showing technology literacy levels.

Results showed that of all the students who responded, only 10 (30%) said they normally use electronic resources to get their latest information. 25 (75%) said they use hard copy books and journals to get their latest information for their research and 2 (6%) use other sources such as information from colleagues for the same purpose.



**Figure 3 Showing technology literacy results for Students at UNZA**

| <b>Description</b>                                                       | <b>No.of Students</b> | <b>Percentage</b> |
|--------------------------------------------------------------------------|-----------------------|-------------------|
| <b>Can assess computer in UNZA library with Internet Connection</b>      | 0                     | 0%                |
| <b>Can assess computer with Internet connection in UNZA computer lab</b> | 5                     | 15%               |
| <b>Can access computer for accessing library catalogue</b>               | 29                    | 88%               |
| <b>Can access computer in halls of residence and home</b>                | 1                     | 3%                |
| <b>Can access Internet at home</b>                                       | 1                     | 3%                |
| <b>Say Internet access very expensive to access</b>                      | 22                    | 67%               |
| <b>Say Internet improves education standards</b>                         | 31                    | 94%               |
| <b>Do not have 24 hours Internet access</b>                              | 32                    | 97%               |
| <b>Say Internet is too slow</b>                                          | 31                    | 94%               |
| <b>Say there are long queues for accessing Internet</b>                  | 27                    | 82%               |

**Table 1 showing other results for students at UNZA**

#### **4.4.2 Access to ICTs, Email, Internet and Library Electronic Resources by Lecturers at the University of Zambia**

Of the 4 lecturers who responded to the questionnaire, all (100%) of them said they do access the computer in the library only for the purpose of accessing the electronic library catalogue. 1 (25%) indicated that she does access the

computer for other purposes in the library because she is employed full time by the University of Zambia Library and therefore have full Internet access on her desk within the library. 3 (75%) of the lecturers said that they have a computer in their offices while of the four only 2 (50%) are able to access Internet in their offices though they have computers. The other 2 (50%) use Internet facilities provided in a departmental computer lab which has two computers with Internet access for use of the whole of School of Education. 4 (100%) of the lecturers say they do access the email, Internet electronic resources, University Intranet using either the departmental computer lab or Internet provided in their offices. They however cited a number of problems affecting them in accessing Internet and library electronic resources. Problems cited included slow Internet down loading speed, competition of few computers with students, and that they do not have a 24 hours access to the Internet.

3 (75%) of lectures indicated that they do not have computers at home and therefore do not have access to Internet. 1 (25%) said that he has a computer at home and is able to access email, Internet electronic resources. However even him said that he is not able to access the University Intranet and the library electronic resources. 4 (100%) of the lecturers said they are not able to access a computer let alone Internet facilities in the lecture rooms. They however have one small lab with ten computers of which only two of them have Internet connection for use of the lecturers and students in the School of Education.

Just like students, lecturers indicated that the harsh economic hardships in the country are making it difficult for them to buy computers for use at their homes. The average monthly cost of Internet subscription is around 7% of their monthly income.

Lack of development of ICT infrastructure within the university and indeed the residential areas were cited as some of the major factors which hinder ICT development at the university and the country as a whole.

3 (75%) of the lecturers said they do use other places to access Internet. The only lecturer who said she does not use other places is the one who is part time lecturer who is full time Deputy Librarian and has Internet at her desk.

4 (100%) of the lecturers said that Internet access would improve the quality of education at the department. Similar reasons advanced by students as advantages for Internet access in improving education standards were cited.

In terms of technology literacy, 4 (100%) of the lecturers said they were very confident in using Internet based resources while a similar percentage said they would be Interested in further training in using Internet based resources but that the training would have to be at an advanced stage.

Results showed that of all the lecturers who responded, 3(75%) used both electronic and hard copy books and journals for acquiring latest information for their research. Only 1 (25%) said he only uses electronic based information resources to acquire latest Information.

#### **4.4.3 Access to ICTs, Email, Internet and Library Electronic Resources by Students at the University of Strathclyde**

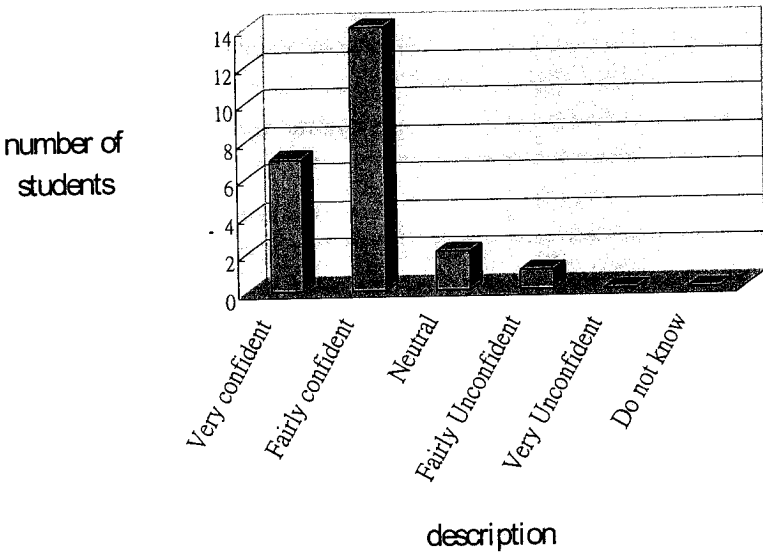
Of the 24 students who responded to the questionnaire, all of them (100%) said they do access a computer in the Library. The computer in the library enables them to access Internet, email, and the university Intranet and library electronic resources. 2 (8%) of the respondents said they do access a computer and all other ICT related facilities in the halls of residence. This small percentage is explained by the fact that the two were the only respondents who were residents in the halls of residents at the University. The rest of them were coming out of campus. 21 (88%) of the students said they do access computers at their homes.

In terms of whether the students use other facilities provided elsewhere for accessing Internet, 20 (83%) of the students said they do use other places to access Internet. However, 3 (12%) said Internet was expensive elsewhere and 16 (67%) said they found it fair to pay for such services. Another 3 (12%) of

the students did not comment as to whether Internet was expensive or fair mostly because their parents paid for the cost.

In terms of technology literacy, 7 (29%) of the students said they are very confident, 14 (58%) said they were fairly confident and 2 (8%) said they were neutral and 1(4%) said s/he was fairly unconfident in using electronic based resources. 12 (50%) said they would be willing to have further training in using electronic based resources and the same percentage said they were not interested in doing further training. Find a graph showing technology literacy levels below.

**Technology literacy for students at the University of Strathclyde**



**Figure 4 Showing Technology Literacy for Students at the University of Strathclyde**

| <b>Description</b>                                                                     | <b>Students</b> | <b>Percentage</b> |
|----------------------------------------------------------------------------------------|-----------------|-------------------|
| <b>Can assess computer in the library with Internet Connection</b>                     | 24              | 100%              |
| <b>Can assess computer with Internet connection in computer labs</b>                   | 24              | 100%              |
| <b>Can access computer for accessing library catalogue</b>                             | 24              | 100%              |
| <b>Can access Internet in halls of residence</b>                                       | 2               | 8.3%              |
| <b>Can access Internet, email , electronic resources and library resources at home</b> | 17              | 71%               |
| <b>Say Internet access very expensive to access</b>                                    | 3               | 12.5%             |
| <b>Say Internet improves education standards</b>                                       | 31              | 94%               |
| <b>Do not have 24 hours Internet access</b>                                            | 22              | 92%               |
| <b>Say Internet is too slow</b>                                                        | 6               | 25%               |
| <b>Say there are long queues for accessing Internet</b>                                | 13              | 54%               |

**Table 2 Showing other results for Students at the University of Strathclyde**

Note that the percentage of students who can access Internet from halls of residence at Strathclyde is small because most of the students do not leave in the University residence. They travel from their homes.

This research showed that of all the students who responded, 21(88%) said they normally use electronic resources to get their latest information and 6 (25%) use hard copy books and journals to get their latest information for their research and 1 (4%) use other sources.

22 (92%) of the students felt that Internet access has a role in improving education standards. Reasons advanced to support this included currency of

materials, Internet as being a one stop facility for all materials required and that time is being served by not moving up and down looking for materials in the library.

#### **4.4.4 Access to ICTs Email, Library Electronic Resources by Lecturers at the University of Strathclyde**

Of the 4 lecturers who responded to the questionnaire, all of them (100%) said they could access the computer from the library for the purpose accessing Internet resources, electronic library catalogue, emails and the university Intranet. However, 3 (75%) indicated that they do access the computer for the mentioned purposes in the library and 1 (25%) said that though the library has facilities, he does not go there because he is able to access everything from his office desk computer. 4 (100%) of the lecturers said they can and do access a computer, email, library electronic resources, Intranet and Internet resources from home as well as the office. 2 (50%) of the lecturers said they do access email as well as library electronic resources from classrooms while 3 (75%) said they do access Internet electronic resources as well as University Intranet from classrooms.

The lecturers did not cite any problems in accessing Internet. All the lecturers said they learnt how to use electronic based resources by self instruction and 3 (75%) of them were not interested in further training while 1 (25%) said that she would be happy to get further training.

1 (25%) of the lecturers said that they used the computer based resources provided by the library three times a week while 2 (50%) said they use such facilities less than once a month and 1 (50%) said they use these facilities about once a week.

4 (100%) of the lecturers said they do use other places to access Internet. The cost of accessing Internet was generally affordable by all the lecturers.

4 (100%) of the lecturers indicated that they use electronic resources to get their latest information. However 3 (75%) of them said they also use hard copy books and journals to get latest information for their research. All the lecturers confirmed that they store their course notes, references timetables on the university Intranet which is available to students 24 hours a day and this is updated as and when necessary. 4 (100%) of the lecturers agreed that Internet access contributes to improving the standard of education in the department.

#### **4.5 Comparison of Access to ICTs, Emails, Internet Resources and Library Electronic Resources Between Lecturers and Students of the University of Zambia and The University of Strathclyde**

##### **4.5.1 Comparison for Students**

There are serious discrepancies between the students from the two Universities. For example, while (100%) of students at the University of Strathclyde can access the whole range of electronic services from the library, students from the University of Zambia are only able to access the catalogue resources from the computer terminals provided in the library. While a 100% of students accommodated in the halls of residence at the University of Strathclyde can access Internet in their halls of residence, none can do the same at the University of Zambia because there is no infrastructure in place to enable them access the Internet.

It is pathetic to note that the research show that only 15% of UNZA students can access email, 3% can access Internet electronic resources while 0% can access library resources and Internet from home. On the other hand a high percentage of students from the University of Strathclyde (79%) do access emails from home while 67% of them access Internet electronic resources and the University Intranet from home. 75 % of them access library electronic resources from home.

While 94% of students from Zambia say that there are a lot of problems relating to accessing Internet, only 17 % of the students from the University of Strathclyde have the same opinion. 82% of students from Zambia cited long queues for few computers in the University while 54% of their counterpart at Strathclyde said the same. There was a high percentage of 94% of the students from Zambia who said Internet is too slow to down load while only 25% of the students at the University of Strathclyde said the same.

While only 25% of the students from the University of Strathclyde said accessing Internet was very expensive, 67% of the students from Zambia found accessing Internet very expensive.

The other important comparison is that of how students acquire latest materials for their research. 88% of the students from the University of Strathclyde said they get their latest information through the Internet based resources while only 30% of the UNZA students said the same. 25% of the students at the University of Strathclyde get the Information through hard copy books and journals while 76% of the students from the University of Zambia do the same. The level of confidence in retrieving Internet based resources were not far apart for students from both Universities though more of the students from UNZA were willing to get further training than colleagues from the University of Strathclyde. Below is the table of the comparison.

| Description                                                                     | Students at the University of<br>Strathclyde | Students at the University of<br>Zambia |
|---------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------|
| Access to Computer with<br>Full Internet Connection<br>in the Library           | 100%                                         | 0%                                      |
| Access Internet electronic<br>resources at home                                 | 67%                                          | 15%                                     |
| Access to email at home                                                         | 79%                                          | 15%                                     |
| Access to Lib. electronic<br>resources from home                                | 75%                                          | 0%                                      |
| Say that there are<br>problems related to<br>Internet access                    | 17%                                          | 94%                                     |
| Say that there are long<br>queues for few computers<br>at the University        | 54%                                          | 82%                                     |
| Say that Internet is too<br>slow to down load                                   | 25%                                          | 94%                                     |
| Say it is very expensive<br>to access Internet                                  | 25%                                          | 67%                                     |
| Say they acquire latest<br>information through<br>Electronic based<br>resources | 88%                                          | 30%                                     |
| Say acquire latest<br>Information through hard<br>copy books and journals       | 25%                                          | 76%                                     |
| Say they are very<br>confident in accessing<br>Internet based resources         | 29%                                          | 24%                                     |
| Say they are fairly<br>confident in accessing<br>Internet based resources       | 58%                                          | 48%                                     |
| Say they are fairly<br>unconfident in accessing<br>Internet based resources     | 4%                                           | 12%                                     |

**Table. 3 Showing Comparison of Access to ICT Based Resources for Students**

Note that the percentages of those acquiring latest information through hard copy books and electronic resources do not add to 100% because some of the respondents indicated that they use both modes.

#### 4.5.2 Comparison for Lecturers

Major discrepancies between lectures of the two universities occur in the area of accessing computers in the library, at home and in lecture theatres.

While lecturers at the University of Strathclyde have a library with fully developed ICT related services, access to a computer with full Internet service, email, Library electronic services etc, their counterparts in Zambia can only access an electronic catalogue in the library.

While (100%) of lecturers at the University of Strathclyde have a computer at home with full Internet access, only 25% of the lecturers at the University of Zambia have a computer at home with Internet connection.

100% of lecturers in the Department of Library studies at the University of Strathclyde store their lecture notes, references, handbooks, timetables etc on the University Intranet with 24 hours access to students. 100% of the lecturers in Zambia do not have this facility.

While a high percentage of the lecturers from both Universities say they are very confident in accessing Internet based resources, all lectures from Zambia welcome further training while only 25% of lecturers from the University of Strathclyde would be happy to go for further training.

Lastly but not the least, lecturers at the University of Zambia find it very hard to buy computers and subscribe for Internet connectivity because they are not able to meet the high costs from their meagre income. The cost of subscribing to the Internet per month is 7% of their monthly income while on average it is only .07% of the monthly income for their colleagues in UK. Table ....below shows the comparisons for the lecturers.

On the whole, the research has revealed very pertinent findings which confirm that there is a digital divide in many areas of ICT usage between the two universities. The analysis, recommendation and conclusion chapter which follows will come up with suggestions on the way forward in narrowing this divide.

| <b>Description</b>                                                                        | <b>University of Strathclyde<br/>lecturers</b> | <b>University of Zambia<br/>lecturers</b> |
|-------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------|
| <b>Access to Computer with<br/>full Internet Connection<br/>in the Library</b>            | 100%                                           | 25%                                       |
| <b>Access Internet electronic<br/>resources at home</b>                                   | 100%                                           | 25%                                       |
| <b>Access to email at home</b>                                                            | 100%                                           | 25%                                       |
| <b>Access to Lib. electronic<br/>resources from home</b>                                  | 100%                                           | 0%                                        |
| <b>Say that there are<br/>problems related to<br/>Internet access</b>                     | 0%                                             | 100%                                      |
| <b>Say that there are long<br/>queues for few computers<br/>at the University</b>         | 0%                                             | 100%                                      |
| <b>Say that Internet is too<br/>slow to down load</b>                                     | 0%                                             | 100%                                      |
| <b>Say they acquire latest<br/>information through<br/>Electronic based<br/>resources</b> | 100%                                           | 100%                                      |
| <b>Say acquire latest<br/>Information through hard<br/>copy books and journals</b>        | 75%                                            | 75%                                       |
| <b>Say they are very<br/>confident in accessing<br/>Internet based resources</b>          | 75%                                            | 100%                                      |
| <b>Say they are fairly<br/>confident in accessing<br/>Internet based resources</b>        | 25%                                            | 0%                                        |
| <b>Say they a would be<br/>welcome further training<br/>in Internet</b>                   | 25%                                            | 100%                                      |

**Table 4 Showing Comparison of Access to ICT Based Resources for  
Lecturers**

## Chapter 5

### Analysis, Recommendations and Conclusion

#### 5.1 Analysis

We have so far observed from the previous chapters that the digital divide in the majority of Zambian libraries is not just one divide, but a whole range of divides including ICT infrastructure, running costs of ICT networks, training of library staff and users in how to use ICT devices. This chapter will try to analyse the research findings outlined in chapter four and come up with recommendations to counter the divides that exist.

It must be noted that this analysis is based on a limited sample of respondents as there was limited time to cover a wider audience of the two Universities. This research has shown in the literature review chapter that while western countries like UK are putting ICT strategies in place in every key sector of the economy, this is not the case with the underdeveloped countries like Zambia. There is mere rhetoric on the subject by politicians and very little is being put into practice. This has resulted in all libraries, most of them located in the rural areas, under the government of the Republic of Zambia being under funded and consequently stocking "stone age books" as one university of Zambia student put it. The research revealed that ICT services are non existent in all public libraries except those run by the International organisations.

Although the University of Zambia Library is connected to the Internet, the library is faced with serious problems of being unable to acquire and maintain hardware. Training is another problem. Library staff needs constant training in order for them to keep in tune with the latest trends in electronic based information retrieval methods.

In Chapter four, research results show that a few privately run colleges and schools have comprehensive Internet access but this is to the benefit of a few citizens. Ng'ombe (46) says that ICT underdevelopment in Zambia is due to lack of ICT policy in Zambia. The country has a long way to achieve the policy formulation level. What should be realised by the Zambian Government

is that ICTs have ceased two substantial barriers which include time and distance. It is now possible to have a meaningful dialogue on any subject instantly with anyone from anywhere in the world. The Internet can promote education and improve its quality significantly by availing needed information to those who need it whether for the purpose of research, health, business, or recreation.

While the University of Zambia Library has access, the halls of residence are not wired at all. This makes it difficult for students who own computers to access the Internet. What makes matters worse is that the public library network, which would provide an alternative for the students and lecturers, are in a deplorable situation.

The weak economic situation of the country also makes it difficult for individuals to purchase computers or subscribe to ISPs for Internet connection. This is reason enough for the government to revamp the public library network by connecting it to the Internet for the benefit of the communities. The books are archaic and the public libraries are not connected to the net.

The research therefore shows the following analysis.

- students at the University of Zambia mostly rely on old books for their research due to the fact that they are not availed to electronic resources available on the Internet. Their colleagues in the UK have a wide range of resources on the Internet, the Intranet and well as hard copy books and journals.
- There is no infrastructure to enable lecturers as well as students to have 24 hours access to Internet in the student's halls of residence and lecturers homes. The lecture theatres are not wired to provide access to the net in Zambia at UNZA.

- Both students and lecturers need more training to be up to date with the latest trends in electronic or digital Information.

## 5.2 Conclusion

This research has come up with results which need urgent attention if the digital divide that exist between Zambia and other western countries like UK is to be narrowed.

We clearly see that the majority of individuals, lectures and students inclusive, are not able to buy and let alone connect to the Internet. As discussed above, this is because of poor economic performance of the country. Connecting public libraries and enhancing electronic services that are hampered by poor funding in the university library would be a cost effective way to give the people access to Internet. Bonjawo (47) says that the great idea of information sharing behind a library has not changed. Just like you can go to a library and borrow a book and return it when you're done, people also should be going to libraries to access computers as Internet resources for a few hours and free the machine for other people to use. It still remains information sharing.

The research has also revealed that with little efforts, libraries with already Internet connections can be able to access valuable Internet resources free of charge if not at reduced charges. It is imperative therefore that the government of the republic of Zambia should work towards providing basic ICT facilities which are a pre-requisite to the Internet based services.

It must be noted that digital divide is not just a problem of the developing countries like Zambia, it is a problem for the world as a whole since we are now a global village. The development of ICTs help a great deal in providing education and in turn, the developed world benefits in some way to the trained manpower from developing countries as the case is now with nurses and Doctors recruited to Britain from all over the world.

It is the hope of this researcher that the issue is taken with all the seriousness it deserves by the Zambia Government and all stakeholders.

### **5.3 Recommendations**

In order to counter the research results, the following recommendations are being suggested in order to see a start in ensuring that ICT based information sources are availed to the lecturers, students and the general Zambian public.

#### **5.3.1 Deregulation of Telecommunication Industry**

There is a general agreement that there is a difficulty in improving the telecommunication infrastructure because of highly regulated telecommunications services in Zambia. The only company responsible for telecommunications is ZAMTEL. The performance of the company leaves much to be desired. The company has failed to develop the infrastructure in urban areas as well as rural areas. There is a long queue of people waiting to be allocated telephone lines. Deregulation of the Telecommunication Company would for sure bring in competition and solve some of the physical access issues and other telecommunication infrastructure problems.

#### **5.3.2 Tax Incentives to Encourage the Importation of ICT Devices**

The Government should come up with tax incentives to encourage the private sector to donate computers to the public, academic and college libraries so that students, lecturers and the general public can benefit from the services. The tax relief incentive could also encourage individuals to buy computers. This has worked in other sectors like the transport sector where the government removed taxes on the imported buses for the prescribed period. The country was flooded with buses and the transport blues the country was experiencing is now history. This success history could be repeated if Government can act now.

### **5.3.3 Digital Outsourcing**

Chowdhury (48) lists digital outsourcing as one of the way in which libraries in Zambia can ensure that they provide free electronic services available on the world scene. Information professionals in the developing country like Zambia should spend time on outsourcing of these free digital information sources. He continues to say that the task of selection should include a number of activities including identification of appropriate sources and services based on the subject, sources, authority and user requirements, evaluation of the sources in order to assess the suitability of the selected sources and services. Lastly, information professionals should ensure that they create some sort of surrogate for each source and service to facilitate organisation etc.

### **5.3.4 Training of Lecturers, Students and Library Staff in Accessing ICT Based Resources**

Poor information and digital literacy is a major problem in the developing county like Zambia. While a high percentage of lectures at the University of Zambia indicated that they are very confident in accessing ICT based resources, the question remains as to what extent they are up to date with the latest developments. All of them indicated that they are willing to do further training an indication that they recognise that constant training need to take place to keep them abreast in organising, retrieval and dissemination of information.

Library staff need frequent training in order for them to train users of their libraries. This would be beneficial to the students of the University of Zambia whom indicated that 50% of them are not confident in using ICT based resources. A leaf should be taken from the lifelong learning Initiative (49) in the UK, which aims at connecting all public libraries and museums for the benefit of the general public free of charge.

### **5.3.5 Awareness Campaign Among Information Professionals in Developing Countries about Free Available Electronic Resources**

As indicated in chapter two, information professionals in the poor countries have a major obstacle accessing the free electronic resources because in the first place they are not aware about the services. It is recommended therefore that there must be concerted effort from the originating institutions of these services and the development agencies to inform and promote the new practices regarding the use of the established services.

## Appendix 1

### The University of Strathclyde Department of Information and Library Studies:

This questionnaire is for students in the Department of Information and Library Studies at the University of Strathclyde and University of Zambia.

*Thank you for taking your time to complete this questionnaire. It will help in my Msc. research to establish the digital divide of academics and students at the two universities. Please use the X sign to mark your preferred answer inside the brackets as follows:[x] You will also need to fill in spaces to provide answers for a few questions.*

Background information:-

Name(Optional):-

Sex:-

. Permanent address (Optional)

Telephone:-

E-mail:-

3. Qualifications being pursued

- ☐ Msc. Information and Library Studies
- ☐ Msc. Information Management
- ☐ Bachelor of Arts with Library Studies (First year)
- ☐ Bachelor of Arts with Library Studies (Second year)
- ☐ Bachelor of Arts with Library Studies (Third year)
- ☐ Bachelor of Arts with Library Studies (Fourth year)

4. On average, how often do you visit the library during term time in a week?

- ☐ More than 6 times

- ☐ 4 – 6 times
- ☐ 1 – 3 times
- ☐ Not at all
- ☐ Other please specify

5. Which of the following **can you access** from your university library? (More than one option may be chosen from this question)

- ☐ Computer
- ☐ E-mail
- ☐ Electronic resources on the Internet
- ☐ University Intranet

6. Which of the following **do you access** from your university library? (More than one option may be chosen from this question)

- ☐ Computer
- ☐ E-mail
- ☐ Electronic resources on the internet .
- ☐ The University Intranet
- ☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

7. If you do not use any of the facilities in the University Library specified in question 5 and 6 above give reasons below:

8. Which of the following **can you access** from your university halls of residence? (More than one option may be chosen from this question)

- ☐ Computer
- ☐ E-mail
- ☐ Electronic resources on the Internet
- ☐ University Intranet
- ☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

9. Which of the following **do you access** from your university halls of residence? (More than one option may be chosen from this question)

☐ Computer

☐ E-mail

☐ Electronic resources on the Internet

☐ University Intranet

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

10. If you do not access any of the facilities in the University halls of residence specified in question 8 and 9 above give reasons below why you do not access the facilities?

11. Which of the following **can you access** from your home?

(More than one option may be chosen from this question)

☐ E-mail

☐ Electronic resources on the Internet

☐ University Intranet

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

12. Which of the following **do you access** from your home?

(More than one option may be chosen from this question)

☐ E-mail

☐ Electronic resources on the Internet

☐ University Intranet

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

13. If you do not access any of the facilities from your home given in question 11 and 12 above give reasons?

14. Do you find access to the Internet at your university problematic?

☐ Yes

☐ No

15. What restrictions do you experience in accessing Internet at your University? (More than one option may be chosen from this question)

☐ Internet too slow

☐ Long queues for few computers

☐ Can not afford the cost of Internet access

☐ Opening hours for library not suitable for me

☐ Location of library not suitable for me

16. Do you use other places other than your university to access Internet? (e.g. Internet cafes and other libraries with internet access or your home?)

☐ Yes

☐ No

17. If your answer is yes in question 16, how much does it cost you per month to access Internet in other places other than your university?

18. On the whole, how do you find the cost of Internet?

☐ Very expensive

☐ Fair

☐ No comment

19. On average, how often do you use the computer-based facilities provided by the library services ( e.g. online catalogue, e-journals, databases, CD-ROMs etc.)

☐ Every day

- ☐ At least three times a week
- ☐ About once a week
- ☐ About once a fortnight
- ☐ About once a month
- ☐ Less than once a month
- ☐ Never
- ☐ Internet access facilities do not exist

20. How did you learn to use Internet?

- ☐ Self instruction
- ☐ Assistance from colleagues
- ☐ Literature ( Manuals, computer magazines, library magazines etc)
- ☐ Online instruction
- ☐ Training given by the library and computer centre
- ☐ A course given else where

21. How Confident are you in using computer based resources

- ☐ Very confident
- ☐ Fairly confident
- ☐ Neutral
- ☐ Fairly unconfident
- ☐ Very unconfident
- ☐ Do not know

22. Would you welcome further training in using the Internet?

- ☐ Yes
- ☐ No

23. How do you normally get latest information for your research?

- ☐ Through electronic resources
- ☐ Through hard copy books and journals
- ☐ Other please specify

24. Do you have access to your course notes, lectures, timetables from your university Intranet which you can access 24 hours a day?

☐ Yes

☐ No

25. On the whole do you think excellent access to Internet would improve/has improved the quality of education in your department?

☐ Yes

☐ No

26. If your answer is yes in question 25, give reasons as to why you think Internet access has improved, the quality of Education being offered in your department?

27. If your answer is no in question 25, give reasons as to why you think access to Internet does not improve the quality of Education being offered in your department.

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Thank you for answering the questionnaire. I would be grateful if it could be returned to me as soon as possible to: Benson Njobvu, 64 Rottenrow East, Block A Flat 6/1, James Goolld Hall, Glasgow, G4 0NG.

**Appendix 2**  
**The University of Strathclyde Department of**  
**Information and Library Studies:**

**This questionnaire is for lecturers in the Department of Information and Library Studies at The University of Strathclyde and University of Zambia.**

*Thank you for taking your time to complete this questionnaire. It will help me in my Msc. research to establish the digital divide of academics and students at the two universities. Please use the X sign to mark your preferred answer inside the brackets as follows: [x]. You will also need to fill in spaces to provide answers for a few questions.*

**1. Background information**

Name(Optional):-

Sex:-

**2. Permanent address:- Optional**

Telephone:-

E-mail:-

**3. How often do you visit the library during term time in a week?**

☐ More than 6 times

☐ 4 – 6 times

☐ 1 – 3 times

☐ Not at all

☐ As and when necessary

☐ Other please specify:-

4. Which of the following **can you access** from your university library? (More than one option may be chosen from this question)

☐ Computer

☐ E-mail

☐ Electronic resources on the Internet

☐ The University Intranet

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

5. Which of the following **do you access** from your university library? (More than one option may be chosen from this question)

☐ Computer

☐ E-mail

☐ Electronic resources on the internet

☐ The University Intranet

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

6. If you do not use any of the facilities in the University Library specified in question 4 and 5 above give reasons below:

7. Which of the following **can you access** from your home? (More than one option may be chosen from this question)

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

☐ E-mail

☐ Electronic resources on the Internet

☐ The University Intranet

8. Which of the following **do you access** from your home? (More than one option may be chosen from this question)

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

☐ E-mail

☐ Electronic resources on the Internet

☐ The University Intranet

9. If you do not use any of the facilities in your home specified in question 4 and 5 above, please give reasons below:

10. Which of the following **can you access** from your university office? (More than one option may be chosen from this question)

☐ Computer

☐ E-mail

☐ Electronic resources on the Internet

☐ The University Intranet

☐ Library electronic resources (e.g. OPAC, databases, library e-journals, digital library, etc.)

11. If you can not access any of the facilities from your university office in question 10 above, give reasons:

12. Which of the following **can you access** from your university classrooms or lecture theatres? (More than one option may be chosen from this question)

☐ Library resources (e.g. Databases, library e-journals, digital libraries etc)

☐ E-mail

☐ Electronic resources on the Internet

☐ The university Intranet

13. If you can not access any of the facilities from your university classrooms or lecture theatres in question 12 give reasons:

14. Do you find access to the Internet at your university problematic?

☐ Yes

☐ No

15. What restrictions do you experience in accessing Internet at your University? (More than one option may be chosen from this question)

- ☐ Internet too slow
- ☐ Long queues for few computers
- ☐ Opening hours for library not suitable for me
- ☐ Location of library not suitable for me
- ☐ Other restrictions, please specify :-

16. Do you use other places other than your university to access Internet? (e.g. Internet cafes and other libraries with Internet access, or your home)

- ☐ Yes
- ☐ No

17. If your answer is yes in Question 16 above, how much does it cost you per month to access Internet in other places other than your university?

18. On average, how often do you use the computer-based facilities provided by the library services ? ( e.g. online catalogue, e-journals, databases, CD-ROMs etc.

- ☐ Every day
- ☐ At least three times a week
- ☐ About Once a week
- ☐ About Once a fortnight
- ☐ About once a month
- ☐ Less than once a month
- ☐ Never
- ☐ Internet access facilities do not exist

19. How did you learn to use Internet? (More than one option may be chosen in this question)

- ☐ Self instruction
- ☐ Assistance from colleagues
- ☐ Literature ( Manuals, computer magazines, library magazines etc)
- ☐ Online instruction
- ☐ Training given by the library and computer centre
- ☐ A course given else where

20. How confident are you in using computer based resources to assist you in your daily work?

- ☐ Very confident
- ☐ Fairly confident
- ☐ Neutral
- ☐ Fairly unconfident
- ☐ Very unconfident
- ☐ Do not know

21. Would you welcome further training in using the Internet?

- ☐ Yes
- ☐ No

22. How do you normally get latest information for your research? (More than one option may be chosen in this question)

- ☐ Through electronic resources
- ☐ Through hard copy books and journals
- ☐ Other please specify:-

23. Do you store students information such as course notes and references etc to be accessed by students on your university Intranet

- ☐ Yes
- ☐ No

24. If the answer is Yes in question 23 above, how often do you update the information?

- ☐ Every day
- ☐ Every week
- ☐ Every month
- ☐ Once a year
- ☐ As and when necessary

25. If the answer is no in question 23 above, how do you ensure that students have unlimited access to lectures notes, references, etc.
26. On the whole, do you think excellent access to Internet resources has improved or would improve the quality of education being provided in your department?
- ☐ Yes
- ☐ No
27. If your answer is yes in question 24 above, give reasons as to why Internet access improves the quality of education being provided?
28. If the Answer is no in question 24 above, give reasons why you think Internet access does not improve the quality of education provided?

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*Thank you for answering the questionnaire. I would be grateful if it could be returned to me as soon as possible by email.*

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