THE USE AND APPLICATION OF INFORMATION COMMUNICATION TECHNOLOGIES FOR INFORMATION PROVISION BY LIBRARY WORKERS OF THE UNIVERSITY OF BOTSWANA LIBRARY
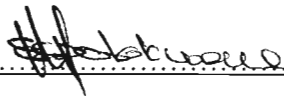
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DECLARATION

I, the undersigned hereby declare that the work contained in this thesis is my own original work and has not previously in its entirety, nor in part, been submitted at any university for a degree.

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December 2002

As the candidate's supervisors we have approved this thesis/dissertation for submission

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ABSTRACT

The purpose of this study was to determine the use and application of information communication technologies (ICTs) by the library workers of the University of Botswana Library. ICTs play an important role in a library environment because they enable libraries to be accessed rapidly as well as increasing the range, relevance and accessibility of information provided by the libraries. ICTs are therefore important for supporting the library workers in their everyday roles. This research was done with a view to propose recommendations which may enhance the efficiency and effectiveness of University of Botswana Library workers in facilitating timely, relevant, accurate and reliable access to information for the library users through the utilisation of ICTs. The population of the research was the University of Botswana Library and its branches namely the Faculty of Engineering Library in Gaborone, the Centre for Continuing Education Branch in Francistown and the Harry Oppenheimer Branch in Maun.

Primary and secondary sources of data were used to meet the objectives of the study. The research was done using a self-administered questionnaire, observation and interviews. The response rate was 67 (86.36 %) out of a population of 88. The data collected for this study identified that the University of Botswana Library workers had limitations on the use and application of ICTs as well as varying levels of skills and knowledge on their utilisation. The library workers lack ICT skills because they are only trained for specific routine tasks. In addition, some workers do not have enthusiasm to learn on their own.

ACKNOWLEDGEMENTS

DEDICATION

This thesis is dedicated to Botsi, whose support was key to completing this thesis, to my late grandfather James Mpotokwane who believed that education is the key to a successful life, and to my late grandmother Linda Mpotokwane who believed that education gives independence to one who receives it. May their souls rest in peace!

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LIST OF ABBREVIATIONS AND ACRONYMS

CD: Compact Disk

CD-ROM: Compact Disk Read Only Memory

DVD: Digital Versatile Disk

EBSCO: Elton B. Stephen Company

HTML: Hypertext Markup Language

HTTP: Hypertext Transfer Protocol

ICT: Information Communication Technology

ICTs: Information Communication Technologies

IT: Information Technology

LAN: Local Area Network

MARC: Machine Readable Cataloguing

NDP: National Development Plan

OCLC: Online Computer Library Center

OPAC: Online Public Access Catalogue

SABINET: South African Bibliographic and Information Network

SPSS

TCP/IP: Transmission Control Protocol/ Internet Protocol

US MARC: United State Machine Readable Cataloguing

WWW: World Wide Web

XML: Extensible Markup Language

CHAPTER ONE: SETTING THE SCENE

1. Introduction

Information communication technologies (ICTs) in the information world have brought about some major changes. According to Lal ICTs are: "a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information" (cited in Chisenga (2001:3). According to Chisenga (2001:3) "ICTs came about as a result of the digital convergence of computer technologies, telecommunication technologies and other media communication technologies". Munoo (2000:1) goes on to say "the drive towards globalisation of ICTs which involve computer hardware and software, radio and television receivers, broadcasting and telecommunications equipment and networking, and multimedia systems has created new technologies, products and services." Chisenga (1999:2) pointed out that "ICTs if properly harnessed, can play an important role in the development of the continent". The use of ICTs in general, and the computer and Internet in particular, enable library resources all over the world to be accessed rapidly.

Developments in microcomputers and telecommunications led to the growth of ICTs applications. Abbas (1997) argued that the use of ICTs has changed the roles and culture of libraries and library workers. ICTs play an important role in information and knowledge management. Technology has the potential to allow more useful and valuable services to be produced than have previously been available. The appetite and expectation of the library users has increased because of ICTs, and academic library workers are facing new challenges because of the rapid technological advances. They are experiencing escalating expectations and demands from the library users. It is therefore especially important for university libraries whose core asset is information, to instantly respond creatively and dynamically to all these changes.

Information and communication technology (ICT) started developing in the 19th Century. According to Lesk (1997:16), technology that has been developed to store digital

information has been very impressive because it makes available cheap storage that makes digital libraries affordable. According to Richvalsky and Watkins (1998), a digital library is a collection of information stored and accessed electronically; this may be graphics, operating systems or networks. Digital libraries provide a central location for accessing information on a particular topic. The computer systems may use devices such as magnetic tapes and compact disks (CDs), Internet, and the World Wide Web for storage and retrieval.

With the development of ICTs, automation systems, telecommunications, the Internet, the World Wide Web and other technologies emerged and have pushed libraries towards rapid development, acquiring the best from all over the world as dictated by the library budgets. It is important to realize that it is not just technology, but the right approach to technology that gives the ability to help a researcher turn information into knowledge, especially with the information overload.

According to Chisenga (2001: 3) ICTs refer to the following technologies:
- Computers
- Software applications
- Internet, the World Wide Web, Intranets and Extranets
- Computer mediated conferencing and video conferencing
- Networking
- Smart cards, credit/visa cards
- Television and radio

According to the North Lincolnshire Libraries (2001), ICTs applications that can provide information in a library environment include:
- Online public access catalogue (OPAC) terminals
- Compact disc Read Only Memory (CD-ROM) stations

- Digital photographic collections [Image archive]
- Self tutorial packs
- Internet and e-mail stations
- Library web-sites
- Electronic library (books, journals and indexes)
- Resource sharing consortium, networked databases
- Copying and printing services
- Video conferencing facilities
- Scanning, drawing and design facilities
- Braille specialist software
- Gateways providing links to key subject areas on the web
- 24 hours virtual library concept through the library web-site
- Integrated circulation system
- Cataloguing and acquisition stock management system.

ICTs are more than just another tool. Their potential for increasing the range, relevance and accessibility of information and communication used in libraries is very significant as well as their potential for supporting library staff in their everyday role and for continuing training and professional development. The use of ICTs facilitates storage of information in CD-ROMs, digital versatile disc (DVD) and other electronic media. Furthermore, ICTs can be used to integrate or repackage information from different sources that can then be distributed (Chisenga 2001: 6).

Libraries are among the major information providers in most countries. They need to be in the forefront in terms of using the latest efficient information storage and disseminating technology to deliver services to the users. To prepare information professionals, there must be an assessment of the librarian's role in the new electronic information environment. The library workforce then needs to be provided with the necessary skills to

effectively assume that role. According to Meadows, Gordon and Singleton (1982:1), some libraries are making a "transition from traditional communication channels to digital channels". However the major drivers of the changeover are information collection, analysis, storage, retrieval, distribution and dissemination.

Library employees have been trained to understand the content of information resources, to understand technology and to understand people. Library workers face tremendous pressure to fulfil their traditional role and to utilise the latest technology to radically restructure conventional library functions. Stover (1999:9) argued that:

> the library is a place that clearly must stay grounded in history, but at the same time we must prepare for the changes that inevitably await us. Just as the old cannot survive without the new, so the new must not become disconnected from the old.

The information society has brought about changes in the traditional skills of library workers. According to Steele and Guha (1999):

> employees will be involved in a life long learning process; be able to process and apply information to the satisfaction of their client communities, be able to market information and have high level of expertise as appropriate in information technologies.

Desai (2002) qualifies the above statements by saying:

> Librarians are most interested in instructional techniques and technologies and in the teaching of information literacy in the sciences. They are also interested in learning more about electronic resources, including selections, management, and impact.

Library workers are no longer relying only on their traditional skills, but they are now looking at having more ICTs skills in order to be of more assistance to the library users. Simmonds and Andaleeb (2001:631) argued that in finding a way of familiarizing users

with the library, there is need to have access to helpful and knowledgeable library staff. Users will be able to effectively use library resources if they fully utilise the ICTs tools. Knowledgeable librarians seem to be key to the whole process. Therefore ICTs skills are essential for all levels of library workers and the traditional library core courses taught in library and information science schools in the past years.

Even though there is so much emphasis on ICTs, paper print books will remain important in libraries. According to Stover (1999:11) books have their own advantage of being able to be browsed, and they are portable and therefore have a large base for users. Print and electronic information will continue to coexist for the foreseeable future.

The modern library must be equipped to ensure fast and up to date provision of information. The demand for library service has increased over the last few years with ICTs having transformed the services. The content and programs of the universities have been transformed, and there have been significant infrastructural developments within libraries. Setting up ICTs takes a lot of work, but once implementation has been done and the library workers have been trained, it enables the staff to be knowledge workers and therefore become creative and more productive even though they bring their own problems.

1.1 Background and context

According to the Department of Library Services Annual Report (2002:1), the University of Botswana Library is a national reference library and the largest research institution in the country. The mission of the library is to support the teaching, learning and research of the University. The principal customers of the library are the students and the staff. Members of the public are allowed to use the library for reference purposes or may pay a fee to enroll as external borrowers.

The University of Botswana in general and the library in particular have not been left out in the use and harnessing of information and communication technologies. In fact, Maphakwane (1996:19) identified the University of Botswana Library as the most technologically advanced library in Botswana and one of the best in Southern Africa. The University of Botswana has grown tremendously, looking at the increase in the number of programs being offered; the Library has also maintained pace with the university by increasing its physical size, collection and ICTs.

The Department of Library Service Annual Report (2002:2) identified that the University of Botswana Library budget for the academic year 2001/2002 was 56 815 000 pulas (90 904 000 Rands) for books, periodicals, multimedia and binding. The University of Botswana Library has 15871 users, 2087are external borrowers, while the rest are students who are 12680 and staff who are 1104. Online access of information for the users of the University of Botswana Library is through 200 workstations, and there are 300 000 volumes of books and non-book material. The University of Botswana Library subscribes to 1250 journal titles of which 455 full text titles are available online through the University of Botswana Library web page. Past exam papers are also accessible online.

The University of Botswana Library offers information literacy skills to first year students and to senior undergraduate students on request. The senior library staff teach information literacy skills for 30 hours within a three week period allocated for teaching. The senior librarians offer reference and information services during extended library opening hours, while the junior library staff (as an experiment) provide for directional queries and general enquiries service during regular office hours (Department of Library Services Annual Report 2002: 7-8).

The University of Botswana Library has extension services through the Centre for Continuing Education in Francistown to support the distance learning library users, the Faculty of Engineering and Technology which is not within the main campus but is in

Gaborone and the Harry Oppenheimer Okavango Research Centre which is a research institute in Maun Town. According to the Department of Library Services Annual Report (2002: 6) the library is looking at extending its services through sharing space and services with libraries like the national library and other academic institutions like the teachers training colleges, education centres and technical colleges.

The library offers a supportive and advisory working relation with institutes affiliated to the University of Botswana. The library is considering offering induction courses for librarians of teacher's training colleges and institute of health sciences in the operation of the automated library, and searching CD-ROMs and the EBSCOhost database. The objective of all the above is to facilitate collaborative activities for students from affiliated institutions, and to ensure exposure to the latest available information technologies (Department of Library Services Annual Report 2002: 6).

As stated by the Department of Library Services Annual Report (2002:7-8), the University of Botswana Library has a number of in-service training programmes aimed for the academic year 2001/2002. These include:

- library diploma holders training: to equip them with skills for handing general reference queries at the reference desk
- internal refresher course: to update senior staff on the search techniques and the resources on the Internet
- basic HTML training: to update senior staff with skills for building link collections based on departmental profiles to support teaching, learning and research needs.

Joint training sessions with external consultants have been organised as well, and they comprises of:

- abstracting workshop,
- critical thinking workshop,

- e-learning and workshop on electronic journals and
- electronic resource library management.

Workshops organised for library management are as follows:
- project management, customer services,
- performance measurement system, reviewing NDP 8 and 9,
- shaping the future: a review of NDP 9 strategic direction, and
- workshop to cascade performance management in library divisions.

Even though the library has the above-mentioned policies and plans, the University of Botswana library suffers from a high staff turnover. It is not easy to retain or attract (both professional and para-professional) staff and this creates a difficult situation in terms of productivity. Steele and Guha (1999) pointed out that in many libraries the lack of new recruits has led to "a greying population of most female librarians, new staff, younger blood needs to be recruited". As a result backlogs have been experienced in the cataloguing and classification department of the library. Maphakwane (1996:17) argued that full utilisation of ICTs will ensure the elimination of backlogs. Library workers can simply electronically download the available cataloguing materials. For instance, if the available SABINET and Library of Congress MARC records are used effectively they would reduce the cataloguers' workload.

The changing patterns of library usage and service should be met through full utilisation of the available ICTs. According to the University Librarian (Library Services Director) in the University of Botswana Annual Report (1984:121):

> it is especially crucial that the only centre of higher learning, responsible for the development of manpower for the nation be adequately provided for in order to achieve higher academic standards.

The University of Botswana Library has to keep up with modern developments in information technology. According to University of Botswana Annual Report (1991:69), "the overall objective is to utilise modern information technology to enhance the library's capacity to provide effective service to members of the university community".

1.2 Definition of key concepts

Library: There are many types of libraries, and they have been characterised as public library, national library, special library and academic library. The University of Botswana Library is an academic library. According to Prytherch (2000:3), an academic library is a library in "educational establishments at any level - university, college, research association etc". It associates with educational institutes to support the development of the institute they are part of. In this study, academic library refers to a university library maintained and administered by the University to meet the instructional and research programs of the University.

Information communications technologies (ICTs) are a group of technologies that are revolutionising the handling of information and embody a convergence of interest between electronics, computing and communication (Adeya 2001). ICTs are used for capturing, processing, storing and disseminating information.

Information provision involves collecting, organising and disseminating information on demand and therefore serving the information needs of library users (Rubin 1998: 2).

Library workers are people who are responsible for the acquisition, storage and dissemination of information, people who take care of the library and its contents. In this study, library workers are those people who are employed in the library and do all the library duties. The concentration is on the library workers who have undergone formal university training, be it certificate, diploma, degree or Masters degree.

1.3 The importance of the problem

With the dynamic change of technology with respect to libraries, ICTs resources and services, librarians must have the skills to adequately use the ICTs that are available in libraries. The librarians must be able to identify and recommend new ICTs suitable for the library. Fatuyi (1998: 54) examined the role and importance of information technology in modern society and highlighted some vital roles for librarians in the provision of accurate and timely information. He concluded that librarians should be computer literate with knowledge of both the hardware and software.

According to Lancaster and Sandmore (1998:1), libraries use technology in order to cope with increasing demands. These include, reducing staff, allowing more activities to be performed by clerical and para–professional staff, improving existing services, providing new services, and the ability to collect better data to aid overall management of the library. The use of ICTs can improve the library services if the staff uses them appropriately.

According to Bill and Wanyama (2001:303), "for automation to boost library staff there should be concrete plans for consistent structured in-house training, and free access to the available software". That will ensure maximum utilization of ICTs by the trained library staff leading to the highest, up to date, relevant output within the library. In addition, library staff could have skills in the following subject areas identified by Chisenga (1999: 2):

- Web page design, hypertext markup language (HTML) and the emerging extensible markup language (XML)
- Use of electronic networks;
- Use of descriptive metadata for the catalogue;
- Evaluation of Web-based information sources;
- Setting up and maintaining subject-based information gateways;
- Management of electronic documents and collections.

1.4 Research problem

The use of ICTs in the library requires competent and skilled library workers. Speed and time are fundamental to the effective and efficient provision of access to information when offering information services. The researcher (by virtue of her employment as a library assistant in the same library) has identified the library workers of the University of Botswana as having different levels of ICTs skills and knowledge. Despite the fact that the library has a good collection of ICT applications their utilization seems to be limited. In order to address the research problem, the following objectives were formulated.

1.5 Objectives

The purpose of the study was to examine the use and applications of ICTs in a library environment using the University of Botswana Library as a case study. The specific objectives were to:

- establish the type of ICTs used in the University of Botswana Library;
- determine the purpose for which ICTs are used;
- determine the ICTs skill and knowledge of the University of Botswana Library workers;
- establish how the workers of the University of Botswana Library gained their ICTs skills and knowledge;
- identify the University of Botswana Library worker's training needs;
- give recommendations on how ICTs could be effectively and efficiently utilised to maximise information provision in the University of Botswana Library.

The objectives were converted to research questions as outlined in section 1.6.

1.6 Research questions

- What ICTs are available in the University of Botswana Library?
- What purpose are ICTs used for in the University of Botswana Library?

- What skills and knowledge do the University of Botswana Library workers have?
- How did the University of Botswana Library workers gain their ICT skills and knowledge?
- What are the University of Botswana Library workers' training needs?
- What are the recommendations for efficient and effective utilisation of ICTs for Information provision in the University of Botswana Library?

The research questions and objectives are summarised in Table A below. The possible sources of data to address the research issues are also indicated.

Table A: Research objectives, questions and source of data

Research objectives	Research questions	Possible source of data
Establish the type of ICTs used in the University of Botswana Library	What ICTs are available in the University of Botswana Library?	Literature, observation, questionnaire
Determine the purpose for which ICTs are used	What purpose are ICTs used for in the University of Botswana Library?	Questionnaire, literature, interviews
Determine the ICTs skill and knowledge of the University of Botswana Library workers	What skills and knowledge do the University of Botswana Library workers have?	Questionnaire, interviews
Establish how the workers of the University of Botswana Library gained their ICTs skills and knowledge	How did the University of Botswana Library workers gain their ICTs skills and knowledge?	Questionnaire, interviews, literature

Research objectives	Research questions	Possible source of data
Identify the University of Botswana Library worker's training needs	What are the University of Botswana Library workers training needs?	Questionnaire, interviews
Give recommendations on how ICTs could be effectively and efficiently utilised to maximise information provision in the University of Botswana Library	What are the recommendations for efficient and effective utilisation of ICTs for information provision in the University of Botswana Library?	Questionnaire, literature, interviews

1.7 Methodology

After the definition of the research problem, which was to determine the extent of the use and application of ICTs by the library staff at the University of Botswana, the exploration of existing scientific work provided very little help. Therefore, a decision was made to carry out an empirical investigation. A survey method was used to conduct this study. Survey research involves "obtaining information directly from a group of individuals" (Dane 1990:120). The population in this study was the library workers of the University of Botswana Library who have undergone formal training and deal with library readers on a day-to-day basis. The methodology used is discussed in greater detail in Chapter Three.

1.8 Significance of the study

In this study we were looking at the use and application of ICTs in providing information by the library workers in order to identify training needs of the University of Botswana Library workers in utilizing ICTs for information provision. The focus was to identify the gaps in the use and application of ICTs by the University of Botswana Library workers in order to maximize their provision of information if there are any. This is the most

electronically advanced academic library in the country, whose vision is to be " a leading academic center of excellence in Africa and the world" (University of Botswana Calendar 2001).

If this study identifies the training needs of the library workers in order to fully utilise the available ICTs that change with time, then the research would be useful to the University of Botswana Library. In addition, information science education at the University of Botswana when in need of revitalisation may use the results of the study in designing the curriculum of librarians. Both the library and the School of Library and Information Studies of the University of Botswana can use the results of this study as a base for training and equipping their staff and students with the requisite skills to manage libraries in the digital age.

1.9 Assumptions of the study

- The University of Botswana Library has most of the ICTs needed in a modern library.
- Having ICTs should reduce problems of cataloguing, waiting for library material to be returned, not being able to do a subject search, and many other library problems.
- The University of Botswana Library would like to exploit the potentials of the ICTs for effective and efficient provision of up to date relevant and available information.

1.10 Scope and limitations of the study

The study surveyed the University of Botswana Library workers who were based in Gaborone and other towns. The Main Library has branches like the Faculty of Engineering Library, which is in Gaborone as well, the Centre for Continuing Education Branch Library that is in a town called Francistown and the Harry Oppenheimer Okavango Research Centre in Maun.

The survey was done on the University of Botswana Library workers who have undergone formal certificate, diploma, degree and masters training in a university and deal with library users on daily bases. These workers were targeted because they went through formal training of library and information studies programmes that are supposed to equip them with knowledge to assist library users to obtain the information they need. The main focus was to establish the available knowledge and skills in the use and applications of ICTs for information provision.

The major limitation of the study was the lack of co-operation of the respondents. Some respondents gave the following as reason of non-response:

- Some claimed to have sent back the electronic questionnaire which I never received.
- Some misplaced their questionnaire and the same happened to the second ones given during follow-ups.
- Some claimed not to have had time to attend to it.
- Some potential respondents were on study leave.

Since the research was done in Botswana, the researcher had to apply for a research permit from the Office of the President (see Appendix F). It took three weeks to get a permit, and in those three weeks the researcher was supposed to have conducted the research. That left the researcher with very little time to follow up on all the respondents. The researcher was not able to observe and test in order to determine the application of skills for particular ICTs because of limited time.

1.11 Organisation of the thesis

Chapter One of this thesis is an introduction to ICTs and background and context of the University of Botswana Library, followed by a definition of the key concepts used in the thesis. Identified are the importance of the problem, the research problem, research objectives, research questions, significance of the study, assumptions of the study, and the scope and limitations of the study.

Chapter Two of the thesis is a review of the literature that puts the study in context and expounds on other related research.

Chapter Three outlines the research methodology incorporating a discussion on the population of the study and how the data was collected and analysed.

Chapter Four is a presentation of data analysis in a form of frequencies, percentages and cross-tabulation, and its interpretation.

Chapter Five discusses the research findings, and presents conclusions and recommendations.

1.12 Summary

This was an introductory chapter to the thesis. It described what ICTs are. The main focus was on ICTs development and their potential in the library as well as how it has escalated expectations and demands from the library users. Approaches to technology were identified, together with the availability of technology that assists library users to get the right information in the wake of information overload. Libraries have been identified as the major information providers and therefore have to be in the forefront in terms of using ICTs.

The section on the background and context identified the University of Botswana Library as the most technologically advanced library in Botswana. The key concepts were defined as information communication technologies (ICTs), information provision, and library workers. The importance of the problem, the research problems, the objectives, and research questions were identified together with significance and assumptions of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews some of the literature on the use and application of ICTs to develop, manage and disseminate information. The literature review aims at looking at how library workers use and apply ICTs during their work. This enabled the researcher to identify the University of Botswana Library worker's skills and limitations as well as training needs in order to be able to fully utilize ICTs in their library.

In reviewing this literature the researcher looked at a number of information sources relevant to all types of libraries like the digital library, the library workers who perform the services, the clients of the library, and changes in information technologies. The literature review was done using different types of resources including print sources (books and journal articles), CD-ROM databases and the Internet.

2.2 Information communication technologies in libraries

Libraries are going through some major changes brought about by ICTs, namely the OPAC moving away from the manual catalogue, MARC records which enable records to be imported and CD-ROM which provides abstracts and full text databases. The library concept is changing, and the transition from collection to connection seems to be natural and continuous.

There is a growing emphasis on new technologies in particular ICTs. According to Garrod (2001:35), "the library complements the new learning technologies which are playing an increasing role in higher education". ICTs offer a value-added approach to information resources. Lor (2000:218) points out that most university libraries in Africa now have adequately trained staff, " there is need for post-professional education in areas such as information technology (IT) and management". Lor (2000:233) went on to say, "ICTs have opened opportunities for far more powerful and efficient resource sharing systems".

Nawe (2000: 25) has identified ICTs as having brought about a lot of challenges such as, "coping with the escalating rate of growth of the information industry and associated changes in ways which both organizations and individuals function".

Sharif and Mahmood (2001:1) argued that,

> what is most lacking in the widespread use of computers in libraries and information centers is not the capability of computers or the availability of necessary software, but the right kind of personnel in implementing computer application projects in libraries.

Contemporary library and information services depend heavily on automation in all areas, and this can be overwhelming for new librarians and even for those who have been in the field for a while. The information explosion has created lots of electronic data that require computers for access. According to Gregory (2000), " as librarians, we must understand automation concepts so that we can plan to design, and provide the best possible services".

Library workers are expected to provide access to the expanding range of available digital information. They have to support the library users and therefore be the key to the resources. This potential can only be realized through staff training, in order to develop new skills and abilities. The skill and ability enables the library workers to deliver the highest quality service with comfort (Library and Information Commission 1998).

Whitney and Glogoff (1994:325) point out that a " library should integrate itself into scholarly communication. It should become a server, connecting users to a community of networked information like e-journals and World Wide Web pages". The envisaged server will need ICTs trained library staff. Brandt (2001:74) argued that, "not only are skills and knowledge of information itself important, but so are skills and knowledge of the technology that is often heavily integrated with the information".

According to Papandrea (1998:113):

> the influx of electronic information and technologies such as the Internet, CD-ROM indexes, networked workstations, and full text databases, changes the what, how, when, and where of answering questions, and the degree to which librarians feel competent to do so.

On the other hand, there are problems accompanying the new technology and those should not be ignored. Papandrea (1998:113) describes these as having been caused by:

> demographic shifts that are bringing an increasingly diverse clientele and work force into all work places, including libraries. Diversity includes many dimensions like age, ethnic background, skill level, and specialization of interests.

Libraries are also being pressured by clients to make more information available more quickly and conveniently at little or no cost to themselves, from all over the globe.

According to Sada (1999),

> as users are looking for information that comes from various resources, the help and support of librarians becomes important to perform an accurate search. The university institute should consider that a library is a complex service made by human, financial and technical resources that have to be managed well in order to attend adequately to the needs of the users.

According to Nawe (2001b:33), "constant improvement of workplace skills is now a norm as a response to unprecedented and unpatterned changes taking place". Investment in skills and attitudes of workers ensures significant success of an organization.

According to Lesk (1997:5), "building a digital library is not just a question of machines and people, perhaps even a culture in which people are able to find information and use it". This may be built by having the skills and knowledge to adequately use ICTs. Stover (1999:106) argues that library workers need both technology and interpersonal skills to present and explain information to non-computer oriented clients; they should be able to

set expectations and communicate effectively. Librarians have an important part to play within the society; they serve to reverse the digital gap by ensuring that they teach those who have no or very little computer skills (Van Zeijl 1998:16-17).

Library workers have been found to have different skills in library work that is often not matched with the tasks they perform or to the service to be provided. Nawe (2001a:138) saw different skills as bringing about "dissatisfaction with services and the apparent uneasiness between the library and information workforce and their respective employers".

Not all human beings accept ICTs instantly. There are many human-technology interaction problems that plague some employees for various reasons. Those employees find it difficult to learn as fast as others do in areas like functional usage and they have technological anxiety. Stover (1999:330) argued that, "some employees clearly have issues of computer phobia and avoidance, and thus needs special assistance". The phobia is at most times related to evaluation anxiety. Critical evaluation of one's work by others which then results in failed expectations, lead to shameful exposure. The non-use of ICTs on the part of library workers often originates from the fear of being seen to be inefficient or ignorant, especially in front of library users (Garrod 2001:32).

Much has been written about the possible fear of using computers among staff in the library. There has been widespread talk about the effects of using computers on human eyes. Qi (1996) pointed out that computers and electronics in general have side effects that cover a wide spectrum including "threat against health by weariness arising from much more time spent at microcomputers by staff". Some staff fear redundancy or de-employment. Some feel a threat to their status as if their years of experience in the system will no longer be of value. Many suffer de-skilling, for example in the case of an experienced cataloguer whose work is partly taken over by a non-professional who merely downloads records from a bibliographic tool. Some staff experience techno-fear, the fear

of using unfamiliar technology. The concern about being unable to learn new skills or the embarrassment of being unable to understand technical jargon can cause difficulties (Wema and Nawe 2000: 157).

2.3 CD-ROM and Internet

As mentioned in Chapter One, ICTs are diverse and the most commonly used in the libraries are CD-ROM and Internet (Chisenga 2001: 3). Librarians seek to provide access to information as well as store it, this means an increased utilization of online and CD ROM databases. Compact disk read-only memory (CD-ROM) is a high capacity storage medium shipped with data that cannot be altered. This is a type of information storage device that can be read with the aid of a computer. Internet, according to Prytherch (2000:397), refers to "an amalgamation of inter-related computer networks using the TCP/IP protocol, permitting electronic communication on a global scale". In this study Internet is referred to as a networking facility supporting some services like e-mail, database access, file transfer protocol and the World Wide Web (WWW). It is the most popular way of locating and retrieving information (Chisenga 2001: 6).

Totterdell and Harrison (1998:151) argue that:

> to deliver electronic services libraries are increasingly requiring staff with skills in that area, and into design and implementation of networks and network access points to allow the services provided to be used by as many people as possible.

People with computer expertise view the changes of information access in quite a different way from those who have little or no computer experience. Computer literacy is not a traditional library skill, hence it should be emphasized during library training (Ratcliffe 1995: 9-21).

The level of computer literacy determines the use of CD-ROM and Internet. Morriello (2000: 46) argues that the librarian's role as an intermediary is essential in developing

basic user and electronic information research skills. Computer literacy is widely accepted as an essential part of elementary education.

Librarians' key skills nowadays are identified in special Librarians Association (1998), as "the ability to conduct research, use critical thinking, use cutting-edge technology, and organise information". According to Soong (1998) librarians of the 21st century are supposed to be knowledge navigators, proficient with digital resources as well as printed and other formats of information. Physical location will not be a hindrance to the librarians' services, librarians should be able to work in both the traditional library and broaden their domain into being competent and skilled as generalists when there is need for their particular specialised competencies. The skills the library workers have should be more important than the library worker's professional's status.

Burke (1996) argued that the Internet could be taught using an electronic discussion group and questions could be answered via the discussion group. This method had been found to be very convenient because at most times it is not possible to have all participants for library promotion in one place. According to Burke (1996):

> the possibilities for offering library instruction and promotion through the Internet are many. Building on the work and suggestions of others, any library can find a way to improve the delivery of services to their users. Librarians should not overlook this tremendous opportunity to extend their reach.

2.4 Changes in information provision, skills and access

ICTs are altering the function of libraries and are intrinsically changing the role of librarians. Schools need not continue to suffer from lack of library support, from isolation and from a wealth of learning resources that are readily available on the Internet.

Totterdell and Harrison (1998:149) argued that library stock is far less than that held by networks, which is why library workers have to provide access to networked sources of information. They went on to say, libraries are going through changes from developing a range of non-print and electronic services that are very important nowadays as part of the library service to globalization. This has brought about changes in presenting information and making it available to users together with the skills and ability to operate and manage those services. With the emerging global information society no one will be untouched, every organization should be concerned with how to adapt to the pressure of globalization.

According to Garrod (2001: 32):

> staff working with students in a networked environment will need the requisite skills to support these students in terms of accessing resources, regardless of format, and troubleshooting hardware and network-related problems.

The new technology environment needs significant skills of different types. Rubin (1998: 90) pointed out that:

> there is no doubt that libraries of the future will be looking for new skills and abilities among its employees and will be continuously emphasizing retraining and continuing education as new technologies are introduced.

According to Subramanian (1998: 127), the underlying aspects as to why libraries have to look at new ways of obtaining information are that: today's rapid expansion and change in the means of supplying information has left many feeling that they no longer have effective knowledge regarding the path of obtaining information. Secondly, the information overload problem has been widely recognized. With the total volume of available information escalating so precipitously, it becomes difficult even for those very familiar with newer formats of information access to keep abreast with the location and organization of all this material. Thirdly, the rapid period of change brought about by technology has an impact on human beings. This has brought about anxiety and insecurity

in libraries and calls for adequate continuous training for library workers to enable them to exercise their professional judgement on the use of ICTs.

Some library workers, especially senior librarians, resist changes. More often than not one finds that they have actually not been given the opportunity to learn. According to Woodward (1997:33), "staff should be given ample time and resources to achieve the level of expertise required".

Langerman (2001) points out that:

> Increasingly, the library profession demands knowledge of new technologies, skill in data base design, expertise in scientific fields, sophisticated management skills to address such issues as budgeting and library cooperation and commitment to service.

All these challenges and opportunities are brought about by the availability of ICT as an information accumulator, storer, disseminator and reproducer. The new information situation has brought about multi-discipline library workers since they are now performing different tasks from the ones performed in the past. According to Rubin (1998:86), because librarians perform new tasks, they "will require new skills as the information environment becomes increasingly complex". Library workers should be competent for this dynamic situation in areas like, ability to manage changes, adaptability and flexibility. Knowledge of new information technologies increases skills to determine information needs of users and willingness to take risks when searching for information.

Papandrea (1998:111) observed that library reference services, as a result of technological growth of networked information have become dominant. New technology will increase the number of reference services, and library workers will need to solve the clients' problems using the increased available databases. This calls for the need for library workers to continuously upgrade their skills in using the new technology.

Papandrea (1998:114) argues that:

> the internal focus has expanded as well, to include deep concerns about the need to continuously upgrade reference librarians' technical skills to deal with new technologies, the economy, and the ability of reference managers to influence decision making concerning the acquisition of often needed expensive resources. The time frame for decision making has also changed, with more long-range and strategic planning being incorporated into managerial roles.

Abram (2002) points out that, "if libraries are not integrated into the new blended learning environment, then we will lose relevance to the mainstream of society". Library workers need skills in the use and application of ICTs to serve well in such an environment. Steele and Guha (1999) argued that "different skills and attitudes are essential if the library is to survive as a facilitator of the changes in scholarly communication." According to Garrod (2001:35), "the hybrid library can be a changed agent given the right organizational culture and management support".

2.5 Training of library staff

Staff training and development is very important in an academic library. Staff should be confident and at ease when using ICTs and when assisting the library users. According to Garrod (2001:32), "Training should also provide staff with advice and guidance as to what is expected of them, and it should help them to cope with change". Aina (1994:8) specified that library professionals require computer skills to meet the challenges of information technology. According to Dole and Stalker (1996), academic libraries must not only gain knowledge, but must learn to act that is to apply that knowledge.

The process of assisting the library patrons to use the available ICTs effectively and efficiently within the library requires library workers who have acquired new roles, and undergone training. In a study entitled "Investigating computer anxiety in an academic

library", Subramanian (1998:136) pointed out that "library staff themselves experience anxiety related to computers and technology". Librarians need to be more comfortable and less reluctant to approach particular formats. This calls for re-educating and enhancing information workers who will enter the service educating and training the users on the new forms of information services (UNESCO 1999).

Tran (2001:257) argued that, due to limited training, "libraries are unable to serve users who have increasingly sophisticated information requirements that often are best met by electronic means". There is a growing gap between user expectations and library capabilities. According to Dole and Stalker (1996) "staff training and development are essential to all organizations". Staff training and purchasing of ICTs should be budgeted for. Dole and Stalker (1996) argued that, "few libraries are able to devote the level of resources to training and development". Libraries recognize the importance of training and development but resources are not adequately allocated for the implementation of staff training in general and ICTs in particular.

There is a need to cultivate a workforce of ICTs resource library workers, through training library workers in wide array of user-oriented applications using innovative electronic resources. The solution to proper utilisation of ICTs is to focus on workforce that deals with critical information needs of library users (Soong 1998). According to Steele and Guha (1999):

> employees will be involved in a life long learning process; be able to process and apply information to the satisfaction of their client communities, be able to market information and have high level of expertise as appropriate in information technologies.

Wema and Nawe (2000:160) recommended that training should be given to university library workers so as to improve effective utilization of ICTs. There is need for the library to train its workers on using computers for information retrieval purposes, so that they are

able to train users. All library workers must get a basic training on the use of ICTs in libraries and keep on upgrading it so as to assist users in utilizing these facilities in the library as well as being able to execute their daily duties comfortably.

According to Mulira (2000) training for workers in libraries should be done "in house (on the premises) as much as possible unless specialized training is required". However, the American Society for Quality (2002) argued that library ICTs experts should give in-house training to library workers from a recognized institute offering ICTs training courses. This has been found to be cost effective, easily customized, enables all workers to be trained at the same time, and can even make follow up to the trainer.

The disadvantages of in-house training are:
- it can only be done for eight or more people;
- participants are less likely to be open and honest because of political pressure;
- it is difficult to get all the employees at the same time, some will get held up by work; and
- interruption is prevalent in order to attend to crises in the office.

On the other hand, training courses offered at other institutions have their own advantages too (American Society for Quality 2002). They are usually given away from the workplace by staff from different organisations, and in a formal way. The advantage is that it encourages staff from different institutes and jobs to mix and therefore make comparing easy. There is usually no political pressure associated with workplaces. It also builds good communication, openness and honesty. There is no interruption from other staff. However, the disadvantage is that they are normally expensive and therefore many workers cannot be enrolled at the same time.

Kaniki (1996) also advocates the use of library and information science education and training programmes and institutions concerned with ICT training to impart the Internet knowledge and skills to library workers. This is a type of formal training given to students

who have enrolled for attaining a particular certificate, diploma or degree. Such partnerships are important if library workers are to gain the necessary skills to effectively utilize ICTs.

It is evident that the operation and financial viability of ICT-based library and education programmes in universities would largely depend on academic institutions entering into partnerships with the private sector, particularly the IT industry (UNESCO Asia-Pacific Regional Bureau for Education 2002). According to the UNESCO Asia-Pacific Regional Bureau for Education (2002), many universities offering information studies programmes are realising that linking with the business sector will not necessarily threaten the school systems, but will create learning alliances in the delivery of products and offer multiple benefits, such as reduced training development costs, or shared organisational content databases and libraries.

Learning delivered and supported online has been identified as one of the different ways of training staff in the use of ICTs. However, Donovan (2001) is totally against the use of online courses for training staff in the use of ICTs. He argued that it is ironic that many propose that the training should be computerised by presenting the very thing that they need to learn, the electronic text, into their learning activities. This merely increases the gap as those with some ability use it to forge ahead whilst others languish behind. Workshops, short courses and electronic discussion groups have also been identified as the other ways of staff training in the use application of ICTs.

Library workers with training and experience will have skills of assembling information. They would be able to locate and evaluate relevant resources and integrate them into a virtual collection, they are able to address each kind of intellectual need and may even provide a new interface and of course a new way of training users (Sada 1999). Garrod (2001:34), argues that:

Equally the growing band of off-campus learners will create a demand for staff with problems solving and marketing skills; staff who are able to develop new sustainable services to meet the needs of new client groups. Web based skills, and an understanding of human computer interaction will also feature prominently, as there will be an ongoing need to provide fast and easy end-user access to a range of hybrid services.

Cannon (1995: 68) sees the information world moving faster and faster into the information age, and tomorrow's information workers needs to be trained to meet the needs of the future. This they can do through preparing to be flexible in job duties, learn and take advantage of computer technology and to continuously improve their education and skill levels.

The rapid change in the information environment calls for continuing education that involves, according to Rubin (1998: 370), "the improvement of the knowledge skills, and ability of individuals in their professional performance". Knowledge that is conveyed by most library information studies programmes inevitably becomes obsolete quickly.

Formal training of library workers should be able to give them a good base for using electronic resources. Tran (2001: 258) indicated that:

> training in the utilization of electronic services is not concerned merely with the application of IT, information handling, library automation, database design, CD-ROM and online services, and Internet resources in libraries and organizations. It is also influenced by the limitations and present situation of LIS education.

Advanced technologies have changed the role of information literacy in the 20th Century, this includes, teaching role of librarians, applications to the library instruction, students' information literacy that is all about students' learning and the role of assessment in the

higher education. According to Subramanian (1998: 127) " the librarians have acquired new roles because of the changed process of assisting library clients to use the available ICT, and therefore require new training".

The Library and Information Commission (1998) identified that "within the library authorities, there are significant disparities between the levels of skills possessed by different groups of staff". The senior library workers are mostly the ones who have the skills and are mostly exposed to ICT use and its applications. The front line library workers have limitations in their exposure to ICTs, as they have basic skills of the routine jobs they perform only (Library and Information Commission 1998). These disparities should be overcome so that library users deal with staff who are knowledgeable and comfortable in their use of technology. Fors and Moreno (2002: 3) argue that effective use of ICTs requires a tertiary certificate as well as technical and computer skills.

Library and information studies curricula have to make changes because of the important role ICTs play. According to Rubin (1998: 369), library and information studies schools "have to integrate the ICTs information into current courses". Library schools are now looking at integrating (or have already integrated) ICTs teaching in the context of the library and information work, this includes technological storage, retrieval, networking and programming of information.

The 21st Century libraries have to be learning organizations with continuous monitoring, updating and changes that are critical for staying in business as in private sector business. Being a learning organization means the library workers should take advantage of both formal and informal learning opportunities and therefore change in response to what they learn (Soong 1998).

Trained library workers will be able to guide users to come to terms with the technology and the resources it delivers. There is a clear indication that library workers should

become familiar with technology available in their library. The library workers should develop a degree of competence to use technology without fear, therefore ensuring full capability and exploitation of the ICTs to provide assistance and support others. According to Soong (1998), the "information technology solution will only be successful if we directly focus on the workforce which is expected to satisfy the critical information needs of our users".

2.6 Related studies

Some studies related to this research were identified. Research was carried out on, "The role of information technology in development: a case study of Nigeria" by Awa (1996). The survey involved the perceptions of top government officials, top officials of para-statals, business executives, information /communication experts and other persons chosen randomly who responded to open-ended questions and informal interviews. In this research, analytical survey techniqueswere used and they involved obtaining information directly from individuals. The results of this study indicated that there are prospects and potentials to develop information technology in Nigeria. The study recommended that the Nigerian government should invest in research and development, and map a comprehensive policy stressing development of information technology.

Secondly Capeles-Roman (1997) researched on, "The impact of new library information technology on knowledge, skills, and attitudes of University professors of the Rio Piedras campus of the University of Puerto Rico". The study measured the impact of new library information technology on the knowledge, skills and attitudes of the professors of five of the schools offering graduate programs at their university. Survey research was used for this study, a questionnaire was administered and the data was analyzed using different statistical analysis, models of frequencies, and percentages. The results of the study identified the need to improve faculty access to and use of information technology, the need for schools and libraries to enhance their access to campus networks, and the needs and information seeking patterns in technology environment. The study recommended

training using the best model for teacher education considering the needs, interest, skills and abilities of these faculties.

The third study was by Kaniki (1999) on the "Internet use and training needs of staff of the esAL consortium, Kwa Zulu-Natal. South Africa: partnership between historically disadvantaged and advantaged institutions." The research was about the provision of Internet based information services in academic libraries. This study looked at how best to incorporate the Internet service with services offered by the library. The assumption of the study was that librarians are knowledgeable about the Internet resources and possess better searching skills necessary in the use of the Internet for research and study needs (Kaniki 1999). Survey research for this study was carried out, questionnaires were the main data-collecting instruments and were administered by hand, post and e-mail. The results of the study showed that there is need for Internet training courses linked with training needs of library staff to be developed for both librarians and trainees. The study recommended that joint Internet courses and programmes be developed and these courses should be linked to the training needs of the staff of the libraries concerned.

The fourth study was on the "Impact of computer training on professional library activities in Pakistan" by Sharif and Mahmood (2001:3-4). The study aimed at determining the impact of the Certificate in Library Automation on librarianship in Pakistan, to examine the computer use pattern of the Certificate in Library Automation holders and to identify the specific areas in which Pakistan Library Association's computer training center needed improvement. The survey research method was used, together with the questionnaire as the data-gathering instrument. The questionnaire included closed and open-ended questions. The questionnaire was hand-delivered, posted or e-mailed. Through the results of the study it was evident that it had been mostly comparatively young professional librarians, who attended the basic computer course offered. After acquiring the computer knowledge they participated significantly in the automation process of their libraries and many other skills they acquired through the course. The recommendation was that the

computer-training center should keep in close contact with its alumni to monitor and help in their automation related activities, and get feed-back of its training programme.

The fifth study was that of Simmons and Andaleeb (2001), entitled, "Usage of academic libraries: the role of service quality, resources, and user characteristics". This study tested a model to explain the use of academic libraries including service, quality, resources and user characteristics of the advent of online catalogue, CD-ROMs, online databases and other electronic resources. The fact that access to information and the role of academic libraries have changed and increased dramatically wasexplained too. A self-administered questionnaire was administered in this study. The respondents were informed of how the study would benefit the libraries. The results of this study showed that the quality of service depends on advisory service offered by the librarians and the available library resources. The resources are limited and the basic resources available are under utilized. The library users have been identified as being keen to use the hybrid library. The study recommended that the librarians should have knowledge and should be experts in order to provide the optimum service to the library users.

The sixth study analyzed was on "Prospects and traumas of computer-aided service in university libraries: a case study of the University of Dar es Salaam Library" by Nawe (2001a: 138-145). The study was undertaken in order to assess the impact of introduction of computer applications in the provision of service at the University of Dar es Salaam library. The methodology used was a survey research, using a questionnaire as a data collecting instrument as well as observation. The results of the study showed that the librarians themselves have different levels of acceptance of the computers. Older librarians who have been in the field were not keen to use the computers for information provision while the younger librarians were very keen to use them. The librarians did not have adequate skills to use the computers effectively. The recommendations were that the librarians should be given training on the library programmes to encourage acceptance of

the computer and to enable them to confidently assist the library users with online information and resources.

2.7 Summary

This chapter reviewed the literature on ICTs in the library. There is recognition in libraries and information centres that there is a need for cultural change; with more use of ICTs the nature of the service and working environment of the library workers will change. New forms of demand and expectations from library users will call for a different approach from library workers. The library can act as a change agent given the right organisational culture and management backing.

The need for library workers to be able to use and apply the available ICTs (particularly CD-ROM and Internet) was highlighted. There is a need for library and information workers to have knowledge on the use and application of ICTs because their work is generally affected by the ever-changing technology, and the ICTs environment is constantly evolving and therefore there is need for a particular level of skill not just competence. Library workers must assist users to come to terms with the new technologies and their applications. Training of such workers has been identified as crucial for the junior library workers, the middle line and the senior library workers and that calls for skills that are updated regularly.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This study aimed at determining the use and application of the available ICTs in the University of Botswana Library. Data was obtained to:

- identify utilization and limitations to the use of ICTs;
- to solicit the views and impression the library workers have concerning their ICTs utilization and limitations; and
- to establish what should be done to maximize the utilization of ICTs.

After having received the green light from the Training Office at the University of Botswana to carry out the research in Botswana instead of South Africa,[1] the researcher first applied for a research permit from the Office of the President in Botswana (see Appendix D), and went on to write to the Director Library Services at the University of Botswana and asked for permission to administer a questionnaire in the libraries during working hours (see Appendix E). Upon obtaining a research permit (see Appendix F), the researcher pretested the data collection instrument at the Botswana National Productivity Center on library workers having the same qualifications as those of University of Botswana library workers.

3.2 Research design

According to Bless and Higson-Smith (1995:63), a research design " is a specification of the most adequate operations to be performed in order to test a specific hypothesis under given conditions." Research design revolves around surveys, experimentation and case studies. Mouton (1998:208) describes experimental research as taking action and observing the consequences of that action. According to Rowley (2002:16) the case study

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[1] One of the supervisors of this thesis and the then Information Studies Programme Director jointly wrote a letter to motivate for carrying out the research in Botswana (see Appendix C).

research seeks to undertake a modest scale research project based on a workplace or a comparison of a limited number of organizations. Case studies are able to achieve insights that are not possible with other approaches, they are useful for preliminary exploratory stage of a research project and as a basis for a more structured tool necessary in surveys. Yin (1994:13) identifies the strength of a case study as its ability to investigate a phenomenon in its context. Rowley (2001:17) identified that a case study research "uses a variety of evidence from different sources, such as documents, artifacts, interviews and observations". The case study was conducted using survey research.

Survey research involves "obtaining information directly from a group of individuals" (Dane 1990:120). In the context of this study, a survey method was appropriate because the study required the collection of data on the opinion and views of library workers of the University of Botswana Library.

Survey research is the most appropriate methodological approach for this type of study given the nature of the research problem and purpose of the study. According to Dane (1990:120), survey research "involves obtaining information directly from a group of individuals", in this study information was obtained from the University of Botswana Library workers.

According to Durrheim (1999: 40), descriptive studies:

> seek accurate observations, and the research design should focus on the validity (accuracy) and reliability (consistency) of the observations, and - especially if it is a positive study - the representativeness of sampling.

This study was carried out using a quantitative research method with the language of measurement as numbers. Durrheim (1999:42) describes quantitative research as collecting data in the form of numbers and using statistical types of data analysis. The process "begins with series of predetermined categories, usually embodied in standardized

quantitative measures, and uses this data to make broad and generalizable comparison" (Durrheim 1999: 42).

3.2.1 Case study approach

A case study method is used in this survey research. Soy (1997) describes a case study as "a qualitative research study method that excels in bringing an understanding of complex issues and can extend experience or strengthen issues already known". Case studies can be used to examine contemporary real life situations and providing bases for application of ideas and extension of methods. When using case studies the researcher has to:

- determine and define the research question
- select the cases and determine data gathering and analysis techniques
- prepare to collect data
- collect data in the field
- evaluate and analyze the data
- prepare the report

Soy (1997) goes on to point out that case studies have been found to be complex because they usually involves multiple sources of data or even multiple cases within a study and produces large amount of data for analysis. Case studies are used to produce a new theory or to build upon an existing theory, to dispute or challenge a theory, to explain a situation or to describe an object or phenomenon. The object of this case study was to describe the use and application of ICTs for information provision by the University of Botswana Library workers. The advantage of a case study is it can be applied to real life, contemporary human situations, and it facilitates an understanding of complex real life situations.

3.3 Population

Bless and Higson-Smith (1995: 85) described the population as, "the entire set of objects and events or group of people which are the object of research, and about which the researcher wants to determine some characteristics." According to Powell (1991:63), "a population is a group of units to which a researcher generalizes the results of the research". Gay (1976:67) describes a population as a group of interest to the researcher that has a character differentiation from another group.

Mouton (1998:135), describes a target population, as the population to which results would be generalized on, in this case is the University of Botswana Library workers. The sampling-frame according to Mouton (1998:135) "is the operational definition of the population that provides the bases for sampling". A census instead of a sample population was used for this study. Israel (1992) identifies a census study as suitable because it includes all units of the population.

The population in this study was library workers of the University of Botswana Library who have undergone formal training and deal with library readers on a day-to-day basis. Bless and Higson-Smith (1995: 86) indicated that the population parameters are "specific value of quantities that relates to the population, such as the average age of all primary school teachers." For this research, it is library workers who have undergone formal university training, be it one year or four years. The trained university library workers were numbered 88. Bless and Higson-Smith (1995: 87) argued that, the best way to get an accurate picture is to examine each and every member of the group being researched, this was done in the present study. According to Bless and Higson-Smith (1995: 85), "it is also possible to reach accurate conclusion by examining only a portion of the total group". Leedy (1997:211) pointed out that "for smaller population, N<100, there is little point in sampling. Survey the entire population".

3.3.1 Background of the respondents

The library has about three divisions of junior library workers namely library assistants, library officers and library supervisors. There are two divisions of senior library workers and they are librarians and senior librarians. There are three more senior administrative posts of the library that have not been mentioned before in this research, they are the Director Library Services, the Deputy Director Resource Management, the Deputy Director Customer Services and Extensions, and the Deputy Director Information and Research Services.

The junior staff are those workers who have undergraduate certificates and diplomas, and those who have first degrees but have not attained masters degrees. The posts they held are of Library officers, which is for certificate and diploma holeders and library supervisors for those who were promoted with a diploma in LIS and first degree holders. The promotion of diploma holders from library officer to library supervisor is supposed to be after five years if the worker is found to qualify during assessment. The junior staff work as library assistants in the different library sections except the subject related offices. Senior staff is those workers who have attained their masters degree and are therefore professionals in the field. They are the subject librarians and senior librarians. Professionalism at the University of Botswana Library only starts after one has attained a master's degree. Library employees are not encouraged to enrol for a degree in librarianship but have to have a degree in any other discipline before one can do a masters degree in library and information studies.

The senior librarians work as heads in their sections like cataloguing, ordering, periodicals, circulation and automation while some are heads of their subject related faculties like Humanities, Science, Education, Social Sciences and Engineering and Technology. The librarians serve as subject librarians with subject allocation comprising of two to three subjects from one faculty.

The library officers assist in the technical and circulation sections of the library. They order, receive, catalogue new library books in the technical service, and process inter-library loans (ILL) requests, while in the circulation section they issue and return books and do other administrative duties as assigned by their supervisors within the sections.

3.4 Data collection process

There was a physical assessment of the available ICTs resources in the library, with the assistance from the relevant supervisors and the senior systems librarian, informal interviews were carried out to collect data from the library workers. Published and unpublished sources were used to collect additional data relevant to the study. Most of the data was collected by means of a self-administered questionnaire at Appendix B. The questionnaire was used to identify the knowledge and skills in the use and application of ICTs for information provision by the University of Botswana Library workers. The workers' needs were identified as well in order to promote full utilization of the available ICTs efficiently and effectively during information provision.

The questionnaire was divided into three parts
- a paragraph providing background information and instructions for the respondent
- demographic information including, gender, qualification and experience
- divisions of questions including:
    i) The available ICTs
    ii) The utilization of ICTs
    iii) Previous training
    iv) Skill and knowledge of applications of ICTs
    v) Training needs.

The questions were made as specific and simple as possible. Most of the questions asked provided respondents with choices. Open-ended questions were used to allow respondents to write their own views.

3.5 Questionnaire design

A self-administered questionnaire at Appendix B was the main data-gathering instrument for this study. Informal interviews and observation were also done in order to supplement the questionnaire in probing and obtaining clarification. According to Israel (1992:10), "Questionnaires are an information gathering technique which allows the researcher to gather information on attitudes, beliefs, characteristics and behaviors from several key people in the organization". Survey research done through self-administered questionnaires is the most reliable and valid and is the most suitable for this type of study because the population was distributed over a wide geographical area as indicated in Chapter One and is relatively cheaper than the interview or observation method. Admittedly, according to Bless and Higson-Smith (1995:111) a questionnaire has disadvantages such as low response rate, getting lost and not being responded to adequately. However, they remain the most attractive instrument for data collection. Honest answers can be obtained from the anonymous questionnaire and they eliminate the interference of the researcher with the responses of the respondents.

This questionnaire had both open-ended questions leaving all possible response options open to the respondent, and closed ended questions that restricted the respondents to what was provided. According to Kanjee (1999:297), "open ended questions allow respondents to communicate their experiences or opinion about a specific issue in their own words, without any restriction". Closed questions limit the response options available to the respondent. Kanjee (1999:295) argues that, "closed questions do not allow the respondent to provide answers in their own words, but force the respondent to select one or more choices from a fixed list of answers provided". Below are examples of the open-ended questions taken from question 18 and 19 at Appendix B:

- Please describe any factors which influenced/restrict your preferences or,
- Do you have other training needs related to information communication technologies? If so, please list them.

The examples of closed question at Appendix B are:

- What type of training do you think you will benefit more from? (please select)

  a. understanding the theory, practice and pedagogy of online learning   [ ]

  b. increasing your awareness of how online learning technology could be used in locating existing online resources [ ]

  c. evaluating existing online learning materials [ ]

  d. designing and developing new online materials [ ] or,

- Have you had any formal training in the form of short course(s) or part of specific programmes / qualifications in the use of the computer and its programmes?

  Yes [ ]   No [ ]

The questionnaire was designed on the bases of the research objectives. The questionnaire was able to collect data on different attitudes, comments and ideas on the issues under study. It is suitable for both quantitative and descriptive research, it collects demographic data, perceptions and problems associated with the survey. Powell (1991: 84-5) points out that a questionnaire eliminates interviewer bias and because the questions are fixed in format, means that there would be no variations. A questionnaire can be completed at the leisure of the participant and this encourages well-thought out and accurate answers.

A questionnaire was used because it enabled the researcher to collect data from the population without having to be there at all times. Large amounts of data can be collected in a short time according to Powell (1991: 85). The questionnaire was distributed by hand, and for those workers at the Center for Continuing Education in Francistown and the Harry Oppenheimer Center in Maun questionnaires were sent by electronic mail. The questions in the questionnaire provided the means of obtaining information about and from the respondents. Confidentiality and anonymity has been promised in order to facilitate the respondent's willingness to give the necessary information.

3.6 Pretesting

A pretest of the questionnaire was carried out at the Botswana National Productivity Center. Dane (1990:127) finds pretesting as the most important phase of survey research, no survey data can be trusted unless one can ensure that the respondents understood the instrument and provide appropriate responses. Pretesting involved surveying a small group of people who had similar qualifications to those to be surveyed. Pretesting ensures relevance, effectiveness and clarity. According to Alreck and Settle (1995:178) it establishes if the survey population will understand the questions, the scales and instructions, how easy or difficult they find it and asks for suggestions after attending to the questionnaire. This enables the researcher to make changes that improves the performance of the questionnaire. The pretest of a questionnaire may at times reveal serious errors, oversights or problems.

Dane (1990:127) describes the purpose of pretest as to "fine tune the instrument in much the same way that a bench check allows a technician to evaluate a part before installing it". Powell (1991: 99) points out that a pretest of the questionnaire is supposed to give the researcher an opportunity to identify items that tend to be misunderstood by the participants or do not obtain information that is needed or to give general reaction to the instrument. Pretest ensures that the respondents understand and respond to the instrument appropriately. It is done to allow the research to identify those items that might be misunderstood, are poorly constructed and those that are irrelevant.

Ten (10) questionnaires were given by hand to the Botswana National Productivity Center employees and collected after five days. The collected questionnaires identified some need for either rephrasing questions or addition of more questions. Peterson (2000:116) points out that "the most common approach to questionnaire pretesting involves a convenience sample". He goes on to say that "the size of a convenience sample can vary from a handful of individuals to as many as 30". A convenience sample according to Peterson (2000), "are individuals who are similar to the proposed study participants".

3.7 Procedure for data collecting

Questionnaires were hand delivered to library workers in the main campus and the Faculty of Engineering and Technology Library. Other questionnaires were sent by electronic mail to the Center for Continuing Education in Francistown and the Harry Oppenheimer Center in Maun. Leedy (1997:187) argues that questionnaires can be sent to people who are not within the researcher's reach by mail.

According to Leedy (1997:187), questionnaire's main disadvantage is a low response rate. In order to improve the response rate reminders were sent to those who received questionnaires by electronic mail and a follow up was made to those who received them by hand.

Eighty-eight questionnaires were distributed by hand and through e-mail, 67 questionnaires were returned. The respondents were the library workers who had undergone formal training and obtained a certificate, diploma, degree and masters and dealt with library users in their daily duties. A date was set for collection of the questionnaires. A total of 67 (76.13 %) usable questionnaires were received back. The returned questionnaire were sight-edited to eliminate those that were not usable, and were post-coded to prepare for the net response rate as proposed by Alreck and Settle (1995:207). The response rate was according to Babbie's analysis very good. Babbie (1991:267) pointed out that a response rate of 50 percent is adequate, 60 percent is good, and 70 percent is very good and adequate for analysis and reporting.

3.8 Data analysis

Alreck and Settle (1995:267) describes data analysis as "the use of statistical tools in order to reduce the amount of details in the data, summarizing it and making the most important facts and relationships apparent". Variables were distinguished and entered into the provided SPSS table. Alerck and Settle (1995:268) describes variables as "data from each

individual survey questions because they vary from one person to the other". SPSS is a program used for analyzing statistics and managing data. Variables are analyzed into the collected data's frequencies, percentages and cross-tabulation

Responses were coded beginning with 1, in a case where there were multiple responses, the first response was coded 1 and the second was coded 2 and the third was coded 3 and so forth. Data was manually entered into the SPSS Data Editor. SPSS generates data to make it easy for analysis. The next chapter presents the data that was generated. Frequency tables were generated to express percentages and charts were also used to display categorical distribution graphically.

According to Powell (1991:164) the content analysis approach is best used for the responses for open-ended questions, and this was the method adopted in this research. Content analysis is collecting, organizing information systematically in a standard format that allows analysts to draw a conclusion about the characteristics and meaning of recorded material (Alreck and Settle 1995:271).

Content analysis was made for open-ended questions; major themes were drawn from the diverse responses. Dane (1990:154) describes content analysis as a methodology used for determining the content of written recorded or published communications via a systematic, objective and quantitative procedure. It is collecting, organizing information systematically in a standard format that allows analysts to draw a conclusion about the characteristics and meaning of recorded material. It is useful for tabulating the results of open-ended questions.

3.9 Summary

This chapter outlined the methodology used in this survey research. The chapter covered areas such as research design, population, data collection processes, the data collection

instrument, pretest, and data analysis. The data collection instrument was a questionnaire that had five divisions. Procedures for data collection were discussed and data analysis was facilitated by the use of SPSS.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The purpose of this study was to determine the use and application of ICTs by the library workers of the University of Botswana Library. It surveyed workers in their work sitiuation. The objectives of this study were: to establish the type of ICTs used in the University of Botswana Library; to determine the purpose for which ICTs were used; to determine the ICT skills and knowledge of the University of Botswana Library workers; to establish how the workers of the University of Botswana Library gained their ICT skills and knowledge; to identify the University of Botswana Library worker's training needs; and then give recommendations on how ICTs could be effectively and efficiently utilised to maximise information provision in the University of Botswana Library.

As has been discussed in the previous chapter, the study population was the University of Botswana library workers who had undergone formal training and worked with library users on a daily basis. The questionnaire was the main data-gathering instrument for this survey, and informal interviews and observations were done in order to supplement the questionnaire. The questionnaire was hand-distributed to library workers in Gaborone and e-mailed to those library workers outside Gaborone in Maun and Francistown. Eighty-eight questionnaires were distributed and 67 usable questionnaires were returned, making it a response rate of 76.13 percent.

This chapter presents, and analyses the survey data to answer the research questions summarised above. The purpose of each question or group of questions in the questionnaire at Appendix B was meant to answer the research question. The first eight questions of the self-administered questionnaire were on demographic characteristics. They were designed to provide the researcher with information about the respondents. This information was asked in order to provide variables that could influence the research results such as the age, gender, where the respondents worked before, and the length of

period they had been working in the University of Botswana Library and posts that they held.

The second section of the questionnaire had five questions that were meant to establish the knowledge that University of Botswana Library workers had of ICTs at their disposal and how they had accessed them. This was done with the view to determine what the University of Botswana Library had in the form of ICTs and how library workers used them to provide information to users.

The third section of the questionnaire contained two sub-divisions of questions with the first requiring five responses and the second thirteen responses. This part of the questionnaire looked at how the University of Botswana Library workers used their ICTs, and for what purpose. The information was to determine the way and extent the ICTs were used by the library workers of the University of Botswana Library in assisting the library users to get information, and professional development.

The fourth section of the questionnaire was meant to establish how the University of Botswana Library workers gained their ICT skills and knowledge. There were two questions about the previous training of library workers. The section was meant to find out how the University of Botswana Library trained its workers on how to use and apply the available ICTs when assisting the library users.

The fifth section is on University of Botswana Library workers skills and knowledge of ICTs. Thirteen responses were required in this section to establish the skills the University of Botswana Library workers had in using and applying ICTs in their work place.

The sixth section contained two parts requiring four responses in the first part, and seven responses for the second part. This section relates to the training needs of the University of Botswana Library workers. ICT use and application requires in-house and formal

continuous training of the workers in order to keep abreast of the ever-changing technology. The respondents were required to select from the options on areas they thought would improve their work. This was meant to find out from respondents which ICTs resources they found useful and what limitations they faced when using them.

The last and seventh part of the questionnaire required the respondents to make recommendations on what they thought could ensure the use of ICTs in the University of Botswana Library by the workers in order to be of assistance to the users. The respondents had been using ICTs for some time now, and it was assumed that they would be able to recommend the type of support and training they would need.

4.2 Characteristics of the study sample

This section deals with demographic information of the respondents, such as gender, academic qualifications, present occupation and positions, and experience.

4.2.1 Gender

The respondents were asked to indicate their gender in order to identify the gender distribution of the study population. Table B shows that the female respondents were 45 (67.2%) compared to 22 (32.8%) males.

Table B: Gender

Gender	Frequency	Percent
Female	45	67.2
Male	22	32.8
Total	67	100.0

4.2.2 Academic qualifications

The respondents were asked to indicate their academic qualifications in order to get their formal educational background in relation to their work. This was with the knowledge that the respondents have all undergone formal university training. Information given in

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Table C regarding the respondent's professional qualifications showed that only three have a Certificate in Librarianship, 37 had a diploma in Librarianship, three had both a diploma in Librarianship and a degrees from other subject disciplines, and the holders of Masters in Librarianship were 24.

The masters' degree holders accounted for 35.8 percent, while first degree and certificate holders accounted for 4.5 percent each, and diploma holders accounted for 55.2 percent. The University of Botswana Library used to train all its staff up to masters degree, but has since changed its policy and is now training those recruited with high school certificate up to undergraduate diploma level, while those recruited with first degree are trained up to masters level.

Table C: Academic qualifications

Academic qualifications	Frequency	Percent
Certificate	3	4.5
Diploma	37	55.2
Degree	3	4.5
Masters	24	35.8
Total	67	100.0

4.2.3 Present position and area of work

According to the data collected and analyzed in Table D below, there are thirty eight (56.7%) library officers, five (7.5%) library supervisors, fifteen (22.4%) librarians and nine (13.4%) senior librarians.

Table D: Post held

Post held	Frequency	Percent
Library officer	38	56.7
Library supervisor	5	7.5
Librarian	15	22.4
Senior librarian	9	13.4
Total	67	100.0

The respondents were also asked to indicate their present area of work. This was meant to identify the type of routine jobs ICTs are used for depending on their work position in the library. The data collected and analyzed indicated that the library workers work in various areas. Graph A below shows that the circulation assistants are nineteen (28.4%), cataloguing assistants are nine (13.4%), acquisition assistants are six (9%), periodicals assistant are three (4.5%), inter library loans assistants are three (4.5%), the automation assistant is one (1.5%), Botswana Documents and Special Collection (BDSC) are two (3%); and subject librarians are 24 (35.8%). The subject librarians are each responsible for at least two to three academic subjects offered by the University of Botswana.

Graph A: Present Position
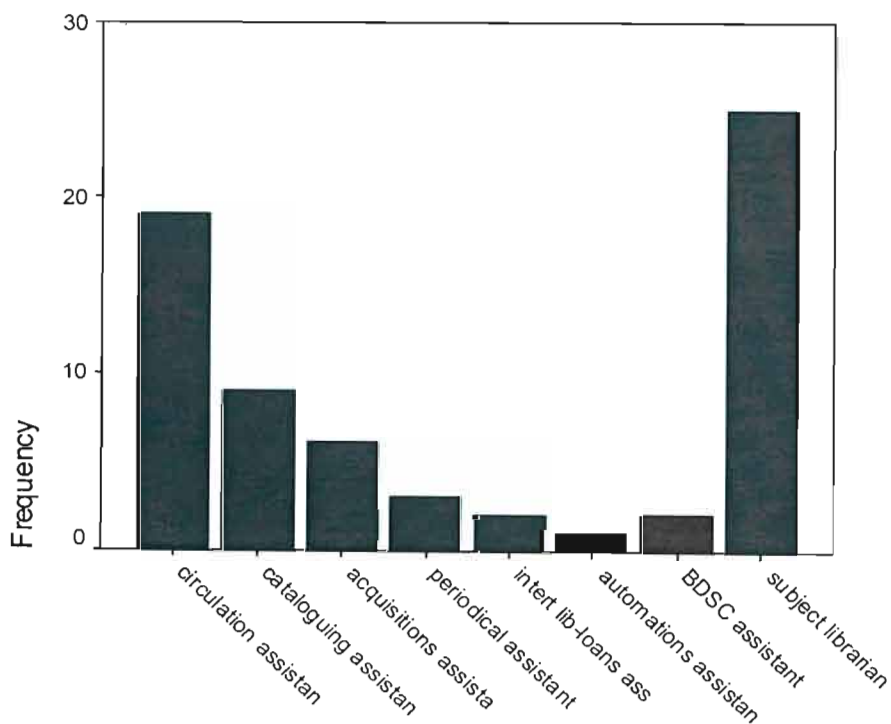
4.2.4 Experience

The respondent's work experience in the University of Botswana Library was sought. The data on Table E show that 23.9 percent of the respondents have 1-5 years experience, 40.3 percent account for those respondents with experience of 6-10 years, 16.4 percent have 11-15 years experience, 10.4 percent have 16-20 years, six percent have 21-25 years and three percent have 26-30 years.

According to the informal interviews, most of the respondents who have experience of 16 years and more were recruited with the minimum entry qualifications of high school certificate and junior certificate. It is most prevalent for the library workers who were recruited with a minimum of a degree to leave the University of Botswana Library after some time for other libraries or change professions. The majority of the respondents have worked for the University of Botswana Library only, for instance, 40 (71.6%) had never worked in other libraries while only 19 (28.4%) have worked in other libraries.

Table E: Experience

Experience	Frequency	Percent
0-5 years	16	23.9
6-10 years	27	40.3
11-15 years	11	16.4
16-20 years	7	10.4
21-25 years	4	6.0
26-30 years	2	3.0
Total	67	100.0

In order to identify what ICTs are they available to, and how they are used for provision of information. The analysis was as follows:

4.3 Access to information and communication
technologies

Table F provides the data on the availability of ICTs and access to computers that are commonly used in libraries. The data analysis shows that all the respondents have access to computers. This data was collected in order to identify what ICTs were available and to how many respondents. Those who had access to both personal and terminal computers were 35 (52.2%), and four (6%) shared computers. Workers who indicated that they use terminal computers are three (4.5%). All the senior library workers have personal computers, while the cataloguing and acquisitions assistants have personal computers too, although at times they have to share them with other workers.

According to the senior systems librarian, the University of Botswana Library has managed to provide its workers with Hewlett and Packard and Dell computers in order to be in line with the latest emphasis of using ICTs to provide library services in today's libraries. The researcher also observed that the library had two document scanners, barcode scanners for the circulation, cataloguing and ordering sections, microfilm and microfiche readers, televisions, video machines, videos, a telephone line in every office, telex-fax machines, shared printers for all the computers, and two audio systems. Data analysis shows that the computers in the University of Botswana Library have Windows 2000, 98 and Windows NT. These ICTs are for use inside the University of Botswana Library only.

Table F: Access to information and communication technologies

ICTs access	Frequency	Percent
Personal computer	25	37.3
Terminal computer	3	4.5
Shared computer	4	6.0
Personal and terminal	35	52.2
Total	67	100.0

Data received through interviews and observation shows that all library workers had access to the Internet and World Wide Web, the intranets (University of Botswana databases) and extranets (databases outside the University of Botswana) for their computers. The networking systems of the University of Botswana Library are the local area network (LAN) and SABINET which is a South African bibliographic and information network; Online Computer Library Centre (OCLC) database that is an American based Institute; and the US Machine Readable Cataloguing Record (USMARC) bibliography. All the library workers are connected through the LAN but not all of them have a connection with other networks like SABINET and OCLC. According to the interview, all junior staff (those who do not have masters) in the ordering and cataloguing sections had SABINET and OCLC connection but not all senior staff had those databases because they do not order and catalogue library material.

4.4 Utilization of information communication
technologies

This section is an analysis of the interview and questionnaire data on the library workers' efficiency and effectiveness in using the available ICTs in their work place. According to the data analysed, even though all library workers have access to ICTs the junior workers hardly use the ICTs for anything else except their routine jobs because they work on targets and have to produce a specified statistical output at the end of the day. The junior library workers use computers for their routine jobs like cataloguing, ordering, issuing and returning of library material at all times in their job to an extent that if the computers are down they can not do any work. Senior library workers use and apply a number of ICTs' resources and at the same time have hands on practice and get trained in the process.

4.4.1 Access and use of information and communication technologies

The respondents were asked to indicate the ICTs' resources they had access to in order to try and identify the skills they had and identify their limitations in using the available tools. According to Table G, all the 67 respondents are able to access and use online

public access catalogue (OPAC), 37 respondents could scan draw and design, and photocopying and printing services could be done by 32 respondents. Respondents who could do cataloguing and acquisitions using ICTs were 54, 50 respondents could operate the integrated circulation systems, 53 respondents could operate the compact disk read only memory (CD-ROM).

The majority used the e-mail tool that accounted for 66 respondents, the image archive could only be used by ten respondents and therefore not very popular. Forty respondents could use the resource sharing electronic library, and 62 respondents could use Internet and the World Wide Web. Only four respondents could use video conferencing facilities, Braille specialist software was found to be not known by any respondent. The respondents that were able to make links to specific subject gateway were 37. The data analysis indicates that the ICTs resources the respondents have access to and used were those they used for their daily work, as well as e-mail that is used for the institutional communication and private communication.

Table G: Access to and use of the following:

Access and use the following	Frequency	Percent
OPAC	67	100
Scanning drawing, and design	37	55.2
Photocopying and printing services	32	47.8
Cataloguing and acquisitions	54	80.6
Integrated circulation systems	50	74.6
CD-ROM	53	79.1
E-mail	66	98.5
Image archive	10	14.9
Resource sharing electronic library	40	59.7
Access and use the following	Frequency	Percent
Internet and the WWW	62	92.5
Video conferencing facilities	4	6
Braille specialist software	0	0
Links specific subject gateways	37	55.2

4.5 Previous training in information and communication technologies

Data on training of the respondents (see Table H), shows that 31 (46.3%) were trained on the use of ICTs available in the library. Those who had not had training in ICTs were 26 (38.8%). Some respondents got their ICTs training while they were doing their diplomas in information studies and those account for six (9%) while the ones who got it when they were doing masters degrees account for four (6 %).

The majority of the respondents who have had training in ICTs had in-house training. Some had computer knowledge they learnt from their colleagues; and some enrol on their own for courses offered by other institutions. A few senior library workers have gone for ICTs training course or workshops as mentioned below, and some even indicated that they

wish they could be trained on routine library programmes so that they are not rendered helpless when they experience problems after working hours.

Apart from being trained on the programmes that the library used, data analysed show that some library workers attended short courses and workshops on the following:

- two respondents trained on Powerpoint;
- two respondents trained on library systems;
- two respondents were trained on e-mail;
- seven respondents attended a course on Internet;
- four respondents attended a CD-ROM course;
- one respondent did a course on hypertext mark-up language (HTML);
- two respondents trained on index and database access;
- one respondent did records management;
- three respondent were trained on US Marc, OCLC and SABINET;
- one respondent did hands-on practice and theory on online resources;
- two respondents did web use and design.

The only respondents who were trained on the above-mentioned ICTs were seven library workers who seem to enjoy a monopoly over training courses.

Table H: Previous ICTs training

Previous ICTs training	Frequency	Percent
Yes	31	46.3
No	26	38.8
Diploma	6	9.0
Masters	4	6.0
Total	67	100.0

4.6 Skills and knowledge for application and use of information communication technologies within the library

The respondents were asked if they had skills in some of the ICTs' resources that are commonly used in libraries. This was to try and find out what resources they are able to use in their work. The respondents use the routine work programmes as reflected by Table I. E-mail use was by 66 (98.5 %) respondents, 61 (91 %) respondents searched the WWW, 54 (80.6%) respondents used Microsoft Word, 52 (77.6 %) respondents catalogued, 48 (71.6%) used circulation control, 42 (62.7%) did a reference service using online tools, and 39 (58.2%) used the resource ordering programme.

The following ICTs applications are not used as much as the above mentioned by the respondents, these includes journal control which was used by 17 (25.4 %) percent, and inter library loans (ILL) could be done by 24 (35.8 %) of the respondents. Journal control and inter-library loans have fewer staff than other departments such as circulation and cataloguing, and those library workers are the only ones who have been trained on the job to use those programmes.

According to an informal interview held with the head of circulation, fines control is a very sensitive module because it deals with financial affairs and therefore only 18 (26.9%) respondents knew how to operate it. The rest of the ICTs' resources like enrollment in online courses was done by eight (11.9%) respondents, the use of online discussion forum could done by 23 (34.3%) and the use of video conferencing could be done by four (6%). The respondents who had skills for the above three mentioned tools, online courses, online discussion forum and video conferencing were mostly expatriates who got training from the libraries they worked in before.

Table I: Skills in information and communication technologies

Skills in ICTs	Frequency	Percent
Circulation control	48	71.6
Catalogued	52	77.6
Ordered	39	58.2
Journal control order and invoice	17	25.4
Fines control	18	26.9
Inter library loans	24	35.8
Reference services using online tools	42	62.7
Created Microsoft word document	54	80.6
Used E-mail	66	98.5
Searched the Web	61	91
Enrolled for online course	8	11.9
Used online discussion forums	23	34.3
Used video conferencing	4	6

4.7 Training needs

The respondents were asked to identify their ICTs training needs in order to determine if training was needed and what in particular was needed. The respondents were given a choice of the types of training needs and as indicated by Table J. Understanding the theory, practice and pedagogy of online learning was chosen by 35 (52.2 %), increasing awareness for locating online resources there were also 38 (56.7 %), for evaluating online learning material there were 38 (56.7%) and for designing and developing new online materials there were 29 (43.3 %) respondents. Some of the respondents indicated that they were not familiar with the listed programmes and therefore could make the best choices.

Table J: Training respondents would benefit from

Training to benefit from	Frequency	Percent
Understanding the theory, practice and pedagogy of online learning	35	52.2
Increasing your awareness locating online resources	20	22.9
Evaluating existing online learning material	38	56.7
Designing and developing new online materials	29	43.3

4.7.1 Online resources training that will improve their work

In order to determine the perception of the respondents on what they thought could improve their work they were asked to indicate the online resources that they perceived to be key to the improvement of their work. Table K highlights the analysis of the respondents' answers. Those who thought:

- finding information on the web were 41 (61.2 %) respondents and was the majority;
- online assessment exercise were 39 (58.2 %) respondents and was the second most popular.
- electronic discussion lists were 29 (43.3 %) respondents;
- authoring online learning material were 28 (41.8 %) respondents;
- E-mail could help improve their work were 27 (40.3 %) respondents;
- video conferencing were 26 (38.8 %) respondents.

There was an open-ended question asking respondents to add what other areas they could think of that would improve their use and applications of ICTs they can think of that will improve their work apart from the above listed ones, only four (6 %) indicated the following:

- digitalisation
- word processing and
- an introduction to library ICTs course.

Table K: Online resource training that will improve work

Online resource training that will improve work	Frequency	Percent
E-mail	27	40.3
Electronic discussion lists	29	43.3
Video conferencing	26	38.8
Web information	41	61.2
Authoring online learning material	28	41.8
Online assessment exercise	39	58.2
Any other resources	4	6

The respondents were asked to suggest the type of training they would find suitable. The respondents indicated how they would like to have their training in future. Table L shows the frequency distribution of the number of respondents according to what they prefer. A traditional face-to-face workshop was chosen by 54 (80.6%) respondents, they indicated that they prefer it because one is able to ask questions and have the trainer go back and repeat what was missed. The respondents who chose an advice by phone were 23 (34.3%) because they prefer learning at their own pace and in their privacy. An open or flexible learning online was chosen by 42 (62%) respondents because it would still be part of ICTs training, they should be able to learn online.

The other training needs the respondents had varied and were many. They have training needs in:

- web design
- video conferencing
- general information technology in libraries
- authority control
- designing web based courses
- subject links

- trouble shooting skills
- E-publishing
- digitalization
- document scanning
- drawing and design facilities
- Database management systems
- attending more conferences and workshops on information systems
- Hyper Text Markup language and
- use of all the available ICT tools in the library

The respondents indicated that except for only a few, none had ever attended any ICTs training in a form of workshop or course except on the programmes they use for their jobs.

Table L: Preferred mode of acquiring information and communication technology skills

Recommendations	Frequency	Percent
Traditional face to face workshop	54	80.6
Advice by phone, E-mail or through electronic discussion lists	23	34.3
Open or flexible learning online	42	62.7

4.8 Summary

The demographic data analysis of the results indicated that there are more female library workers than male ones. Qualifications of the respondents varied from certificate, diploma, degree and masters. The diploma holders were the majority (37) followed by the master's holders (24) while the degree (three) and certificate (three) respondents were the same numbers. The experience the respondents had varied from less than five years to more than 26 years. Most of the University of Botswana Library workers have not worked in other libraries only a smaller number worked in any other library.

The University of Botswana Library is well equipped with the necessary ICTs, software applications, LAN connection, and two bibliographic networks controlled from outside the country and the latest versions of Windows. The library workers had knowledge of accessing the computer programmes they used for their routine work, and some workers were not aware that their computers had other programmes. In house training has been done in the University of Botswana Library, a few senior library workers have attended a course or workshop on ICTs training. Library workers would like to be given training on ICTs, and the majority supported traditional face-to-face workshops/courses.

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This Chapter discusses, concludes and makes recommendations on the findings derived from data analysis and information presented in the previous chapter. Kerlinger (1973: 17) argued that analyzing of research data and information does not provide answers to the research questions, interpretation of data and information is therefore essential after data analysis, because at that point sense is made out of data analysis. The discussions of significant results are made in terms of the research questions and objectives as outlined in Chapter One.

The purpose of this study was to find out the use and applications of information communication technologies for information provision by library workers of the University of Botswana. This thesis established the level of skills and knowledge the library workers had and identified their limitations. Recommendations are made in order to promote efficient, effective, timely, relevant and accurate service by the University of Botswana Library workers to its users.

5.2 Summary of findings

Findings are summarized in this section in line with the research objectives and questions outline in Chapter One.

5.2.1 Type of information and communication technologies used in the University of Botswana Library.

The research question wanted to identify the ICTs that were available in the University of Botswana Library. The research was able to establish that the following ICTs were available:

- All the respondents had access to either Hewlett and Packard or Dell computers and were all connected to shared printers, and all computers have Microsoft office applications installed in them. The respondents had access to the Internet, E-mail, CD-ROMs, Intranets with the library programmes and Extranets provided by the University. Forty respondents (59.7%) had access to other libraries outside the country. The respondents who had access to links to specific subject gateways were 37 (55.2%). The Windows versions loaded in the library workers computers were Windows 2000, Windows 98 and Windows NT.

- According to the researchers' observations, the other available ICTs were telephones in all library offices, telex-fax machines for the library management and inter library loans (ILL) staff, two document scanners and barcode scanners for the circulation and the cataloguing and ordering sections. Library users, students in particular use smart cards identities, and there are sensors on the doors leading outside the library. Microfilm and microfiche readers, televisions, video machines, videos, and two audio systems are all in the audio-visual room.

- The University of Botswana library did not have an image archive or digital photographic collection, video conferencing facilities for scholarly discussions, self-tutorial packs for self-development and Braille software for the blind library users.

5.2.2 Purpose for which information and communication technologies are used

The other research question examined the purpose that the ICTs were being used for in the University of Botswana Library. The findings showed that the use of ICTs varied from employee to employee.

It is evident that most ICT work involves the use of a computer, therefore, the University of Botswana Library workers used computers more than any other ICTs. The subject

librarians, cataloguers, acquisitions, periodicals, Botswana Document and Special Collection, and automation had exclusive use of computers in their sections. The respondents who did not have exclusive use of computers were four (6%) and they shared with others. The computer is mostly used for library programmes such as circulation control, cataloguing, ordering, journal control, fines calculation, ILL, providing reference service, creating word processed documents, E-mail, and searching the web. Programmes such as enrolling for online course, online discussion forums and video conferencing (which its absence influence its popularity) are not popular at all and some of the workers were not even aware of them.

5.2.3 Information and communication technology skills and knowledge of the University of Botswana Library workers

One of the research questions sought to establish the skills and knowledge the University of Botswana Library workers had. Out of 67 respondents, 71.6% had skills in operating the circulation module, 77.6% had skills on cataloguing, 58.2% had ordering skills, 35.8% could provide ILL, 25.4% could operate journal control, 26.9% could use fines calculation modules, 62.7% could provide reference services, 80.6% could create documents using Microsoft Word, 98.5% could use E-mail, 91% could search the web, 11.9% had enrolled for online course, 34.3% had skills on using online discussion forums and 6% had skills on video conferencing through the computer and its resources. The respondents had skills and knowledge on searching the web mostly, followed by creating a Microsoft Word document. They seem to have very little skills on video conferencing and had no knowledge on enrolling for online courses.

5.2.4 How the workers of the University of Botswana Library gained their information and communication technology skills

The fourth research question wanted to establish how the University of Botswana Library staff gained their ICTs skills and knowledge. The respondents were trained on library ICTs programmes they work with, and only a few had very little training in ICTs.

The respondents had skills on the library programmes they used in their work, 9% had computer background from the diploma course they did in librarianship and 6% had experience from master's course they did in librarianship. Some respondents had been trained for different programmes of the library because they worked in different sections of the library. Those who trained for circulation were 35, 29 for cataloguing, 15 for ordering, five for ILL, and four for journals and serials. The above training applied to the library officers and their supervisors only. All the twenty-four librarians and senior librarians have been trained on Internet and CD ROM databases. In addition, two of them trained on power-point, two on library systems, two on e-mail, one on HTML web use and design, two on index/database access, two on records management, three on US MARC, OCLC, SABINET, one on a course on ICT theory and hands on practice and two were trained on web use and design. Most of the respondents had very little training on non-routine general ICTs in the library like the Internet, E-mail and web use and design.

5.2.5 University of Botswana Library worker's training needs

The fifth research question wanted to identify the training needs of the library workers of the University of Botswana Library. A list of common library ICTs training needs was provided.

The respondents wanted to be given training on understanding the theory, practice, and pedagogy of online learning, 22.9% wanted training on increasing one's awareness of how online learning technology could be used in locating existing online resources, 56.7% wanted training on evaluating existing online learning materials and 43.3% wanted to learn on designing and developing new online materials. The findings show that the respondents had limitations in using and applying ICTs in their library and therefore find it necessary to train on different aspects of library ICTs resources.

The other section on training needs was for the respondents to identify ICTs resources and programmes that would improve their work. Again a list was provided for the respondents

and they selected all the resources and programmes and even added more on the provided space at the end. The respondents who wanted to do some training on e-mail were 40.3%, while 43.3% wanted training on electronic discussion lists, 38.8% on video conferencing, 61.2% on finding information on the Internet, 41.8 % on authoring online learning materials, 58.2% on designing online assessment exercises and 6% added digitalisation, word processing and introduction to library ICTs. The finding of the research identifies that the respondents need to be trained in order to improve on their use and applications of ICTs in the library as an important information source.

5.3 Discussion and interpretations of findings

5.3.1 Characteristics of the study sample

The findings of this research have identified that the female workers are more dominant than male workers in the University of Botswana Library. The skills and limitations in the use and application of ICTs by males who constituted 32.8% of the 67 respondents and females who constituted 67.2% did not differ. This shows that gender does not seem to contribute to the level of available skills and knowledge of library workers in the application of ICTs in their work.

The qualifications of the library workers were found to be ranging from certificate to masters with the diploma holders being the majority in the University of Botswana Library. This study's requisite was to have only those workers who had undergone formal training as the research population. The findings of this study confirm Lor's (2000: 218) assertion that most university libraries in Africa now have adequately trained staff, and there "need for post-professional education in areas such as information technology (IT) and management". The skill on the use and application of ICTs in the University of Botswana Library increases with the level of qualification. The more educated the respondents, the more skills they have. Soong (1998) indicated that the skills the library workers should have are more important than the library workers professional status. That

is not of the University of Botswana Library situation where more emphasis is placed on professional status than skills development.

Previously as indicated by the respondents, the University of Botswana Library used to train all its employees up to masters level, and that at least gave hope that at some point those junior workers could have the opportunities of qualifying to train on the use and application of library ICTs that are not part of routine programmes they use as has been the case for senior library workers.

As previously identified in Chapter Four during analysis, the library fails to retain its workers who were recruited with either a degree or masters in librarianship. The only workers who have been working in the University of Botswana Library for over 16 years are mostly those recruited with a basic entry qualification of junior certificate or high school leaving certificate and some progressed through more education until attaining masters degree and therefore feel they have an obligation to serve the university. Most of the library workers have six to ten years of service followed by those with zero to five years of service. University of Botswana Library has to constantly recruit new staff to fill up the post of those workers who leave for greener pastures. That has negative implications for productive and quality of service.

Most of the respondents have been identified as having worked in the University of Botswana Library only; they do not have experience of working in other libraries. This too has turned out to be a disadvantage because according to the findings of the research the workers who had experience from other libraries, especially the expatriates, are able to use and apply ICTs more than the other workers. Abram (2002) indicated that, "if libraries are not integrated into the new blended learning environment, then we will lose relevance to the mainstream of society".

According to the research findings, most of the library workers have been working in their present positions for more than five years without any progression. This led to the worker having skills only on routine programme of the library. Library workers do not have the initiative as finance to enroll for ITCs courses provided outside the institution that could help develop them.

5.4 Availability of computers and resources in the library

The findings of the research indicated that the University of Botswana Library has the needed computers and terminals. There are those who share computers like the circulations desk assistants but the rest have exclusive use of their computers. The software applications have been loaded on all the computers. There are programmes that are not available in the library like SPSS because they expire every six months and the library workers do not need these on a daily basis.

The findings of this study are that the library of the University of Botswana is connected to the WWW and Internet, as well as intranets, extranets and some network connection with other systems outside the country. The findings of the research agree with the argument of Abbas (1997) that library users' appetite and expectations have increased because of rapid technological advances. The University of Botswana Library is now looking at connecting with the local libraries like the National Library and the institute of higher learning libraries. The University of Botswana Library did go through major changes from collection to connection and is now using online resources like OPAC, SABINET, MARC records and CD-ROM databases. Sharif and Mahmood (2001:1) had identified that with the availability of computers in libraries and their software, there is more need of the right kind of personnel to use and apply the resources.

The result of the survey correspond with the list provided by the North Lincolnshire Libraries (2001) that identified the applications and the type of information that can be

provided in a library environment. The ICTs available at the University of Botswana Library is consistent with the list provided by the North Lincolnshire Libraries (2001) outline in Chapter One.

5.5 Respondents' utilization of information communication technologies

Most of the respondents have been identified as having exclusive use of their computers, and those who share computers are the circulations desk workers and a few workers who had recently come back from studying. The findings identified the purpose of the computer in the library work was for routine jobs like circulation system, cataloguing and ordering system, and the periodicals/journal and the inter library loans system. Apart from that the computers were used to access library programmes like the OPAC, e-mail, Internet and the University web site most. The rest of the resources provided by the library were not popular, and were used by senior library workers only 6% used video conferencing and 11.9% enrolled for online course out of 67 respondents.

According to the research findings, junior library workers had limited skills in the utilization of ICTs other than those they used in their routine jobs. Their output is measured on a daily basis, this then dictates to them to do their assigned job all the time. Junior library workers use the computers for cataloguing, ordering, circulation system, ILL, e-mail, periodical/journal stock control, for the University web sites, and for Internet which they do not have training for. It was evident from these findings that the junior library workers have the least ICTs skills. This corresponds with the situation identified by Nawe (2001a: 138) whereby different skills of library workers did not match the services they provided, thus bringing about dissatisfaction with services and uneasiness between the workforce and administration. The University of Botswana Library workers have limited skills looking at the available applications in their library.

The findings again reveal that some respondents have an element of resistance to learning the use and applications of ICTs within their library. According to the findings unlike the senior staff who had indicated that they enrolled for courses on their own, most junior library workers are waiting for the library to train them on each and every aspect of ICTs and they use their computer for executing their routine jobs only, rather than take the advantage of having computers to do hands-on practice like some senior library workers. This reinforce with Stover's (1999: 3) argument that, "some employees clearly have issues of computer phobia and avoidance, and thus needs special assistance". There are still some of the University of Botswana Library workers who experience techno-fear, fear of using unfamiliar technology looking at the number of workers who can not use e-mail even though most of the University memorandums are sent through e-mail. Wema and Nawe (200: 157) identified techno-phobia as the concern about being unable to learn new skills or the embarrassment of being unable to understand technical jargon.

Utilization of computers in particular has been over emphasized in these research findings: junior library workers use their computers from morning until they knock off. This is not healthy as Qi (1996) argued that exposure to computers over a long period of time could have side effects, that include weariness, eye troubles, cervical and vertebra disorders tendonitis carpal tunnel syndrome and many others that may be very harmful to workers. There is emission of electronic waves from ICTs that are harmful to human bodies and copying have already produced a large amount of ozone harmful substance.

It is apparent that the senior library workers seem to have an advantage of fully utilizing the computer and its resources considering the courses offered to them in the year 2001/2002. The findings have identified the senior library workers as getting hands on training and figuring some things by themselves while others enroll for computer courses through their institution and private organizations. This finding corresponds with Soong's (1998) conclusion that being a learning organization means the library workers have to

take advantage of both formal and informal learning opportunities and therefore change in response to what was learned.

5.6 Previous training

Most of the library workers who have in the past year to four years graduated from either a diploma or a master's course in librarianship refer to the introductory courses they got at the university for applications of ICTs. Rubin (1998: 370) had observed that knowledge that is conveyed in library information studies programme inevitably becomes obsolete quickly.

In order to update the skills of library staff, the University of Botswana Library has concentrated on senior library management staff. The rationale being that once they are trained, they would train the other workers. This explains the fact that "within the library authorities, there are significant disparities between the levels of skills possessed by different groups of staff" (The Library and Information Commission, 1998). As argued in section 2.5 of Chapter Two, in-house training has its own merits and demerits. If it is not properly executed, it can have negative effects on skills development and lead to large disparities in the performance of tasks by staff.

The research findings show that there is very little in-house training given to the library workers. Ratcliffe (1995: 9-21) pointed out that computer literacy is not a traditional library skill and should be included during library training. The library workers should not be expected to know the library technical programmes only and not how to attend to different library users needs. The front line library workers have limitations of their exposure to ICTs, they have basic skills of the routine jobs they do only (The Library and Information Commission, 1998).

The library workers who have had training in the use of ICTs are rarely given refresher courses afterwards, what they had learnt is all that they use and apply for the provision of

information to library users. Contrary to Wema and Nawe (2000: 160) who asserted that library workers must get a basic training on the use of ICTs in libraries and keep on upgrading their skills. Such an approach to capacitate the library workers would ensure that they assist the library users in utilizing the facilities in the library as well as being able to execute their duties comfortably. According to Rubin (1998: 90) libraries of the future, should "be continuously emphasizing retraining and continuing education as new technologies are introduced".

5.7 Skills and knowledge in the application and use of information communication technologies within the library

The findings of the research suggested that the respondents have limited skills and knowledge in using some library ICTs. As discussed in the preceding paragraphs, most of the skills they have are on library programmes used for routine jobs like circulation control, cataloguing, ordering, journal control, fines calculations and inter-library loans. E-mail was used by 98.5% of the respondents followed by searching the WWW accounting for 91%, creating documents using Microsoft Word accounted for 80.6% and providing reference services using online computer services was 62.7%. The following ICTs programmes are scarcely used, that is, online discussion forums were used by 34.3%, enrollment for online courses was 11.9% and video conferencing was used by 6%.

According to the research findings, the respondents who are expatriates have the skills to use and apply the scarcely used ICTs mentioned above. Other library workers have never heard about some of the above-mentioned programmes. Gregory (2000) indicated that librarians must understand automation concepts and should be able to design and therefore provide the best services and that is not the case for the University of Botswana Library workers. The University of Botswana Library has tended to concentrate on giving continuous in-house training on routine library programmes at the expense of other ICT aspects. Training on the other aspects of ICTs have not been continuous for those who

have had them and as more workers were being recruited they were only trained on the basics like CD-ROM, OPAC and Internet.

Video conferencing would be an advantage for library workers to engage in scholarly communication with other librarians' worldwide. Online discussion forums are used for scholarly discussion too and are important for libraries because through them information can be found fast with the guide and assistance of other distant library workers as well as learning and copying what others have designed. The online courses are important because through those, library workers are able to develop themselves in different areas of the library including ICTs training.

Library workers should be able to create documents using Microsoft Word, search the Internet and use e-mail. Some of the junior staff of University of Botswana Library had never operated the above-mentioned programmes because they were neither introduced to them nor trained in those programmes. Those who are able to use them learnt informally from senior staff and the University of Botswana secretaries or enrolled for courses outside the institute. The above are part of the disparities between the levels of skills, possessed by different groups of staff within a library that were described by Library and Information Commission (1998). The library workers who cannot use the programmes miss out a lot in office information, communication and getting the latest information of interest offered on the Internet.

5.8 Training needs
The library workers identified that they had training needs in all the areas that were listed in question 15 at Appendix B. The majority (56.7%) of the respondents indicated that evaluating existing online learning materials is what they would like to be trained on. This is an important aspect in academic libraries because library users need relevant and up to date learning materials all the time.

Secondly, (52.2%) the respondents wanted training on understanding the theory, practice and pedagogy of online learning. The respondents who needed to be trained on designing and developing new online materials were 43.3%. Some of the library workers did not think they may need that because they do not want to add new responsibilities to their jobs.

The respondents indicated that all areas listed in question 16 at Appendix B would improve their work if they could be utilized. There is still a problem of limited ICTs skills within the library. The library workers would like to design online assessment exercise as part of the information literacy teaching, they would like to know how to author online learning materials so that they too can be part of it. The libraries workers identified that knowing how to find information on the Internet, electronic discussion lists, e-mail and video conferencing would help them improve their work. In support of the library workers' needs, Subramanian (1998:127) argued that new roles acquired by librarians requires new training because of the changed process of assisting library users to use the available ICTs. According to the data analysis, the library workers need a lot of training on the general use and application of library ICTs. Digitalization, word processing, and introduction to library ICTs were given, as some of the areas the respondents need to be trained on.

The recommendations on the training method suitable indicated that different methods of training will be suitable for the library workers. Traditional face-to-face workshops/courses were wanted by 80.6% followed by open flexible learning delivered and supported online with 62.7% and advice by phone, and electronic discussion lists by 34.3%. According to the data analysis, face-to- face workshops were preferred more to other delivery modes because the trainer would always be there to answer questions and assist those who did not understand. The American Society of Quality (2000) identified the face-to-face workshops as the most expensive training option, while Kaniki (1999)

suggested that training institutions and libraries must develop one joint course linked to the training needs of the library staff.

The open online flexible learning method was preferred by other respondents. Donovan (2001) argued against training by computer though, he found it ironic to use the computer to teach people on how to use them. He argued that instead of having a positive impact, it might in fact increase the gap between those who have the ability because they would forge ahead and those who do not have the ability would remain behind.

The advice by phone and electronic discussion list was selected by the library workers who wanted training that will allow one to learn at ones own pace and privacy. According to The American Society for Quality (2000) learning alone is not the best method, a public training course enables the trainee to mix with other staff from different jobs and organizations and therefore are able to compare with other staff doing similar jobs. Even in-house training the trainees are able to work as a team and that itself is an advantage and ensures easy learning. That itself is an advantage ensuring learning through others.

5.9 Summary of the findings
The discussion of data analysis has identified that the University of Botswana Library is technological advanced but the library workers have different levels of skills. The library has allocated the necessary resources for buying the latest ICTs and their programmes but not much has been done to train and develop the library workers. The library workers use the available ICTs to do the library routine jobs and not all of them are able to use them for other information provision purposes, development on the job, personal use and organizational communication.

The availability of ICTs is determined by the needs of library users as well as by the importance given to it by the library workers. Abbas (1997) identified the library user's appetite and expectations as having increased because of ICTs, and that academic library

workers are facing new challenges because of rapid technological advances. Libraries should respond creatively and dynamically to all these changes. Major limitation in ICTs prevents identification and provision of very important programmes like the Braille specialist software. This limitation was brought about by the lack of training for the library workers. There has not been enough continuous training on ICTs for those library workers who had formal training on the use and applications of ICTs before.

The library workers identified the type of training they want, and the computer programmes that will help them improve their work. Of the three methods that were recommended for training, the traditional face-to-face mode was mostly preferred (80.6%). The respondents wanted to be trained on the use and application of the available ICTs in their library. Kaniki (1999) had proposed a joint ICTs training course to reduce the cost and train many people at the same time. Donavan (2001) does not support the idea of having an ICTs training online because it will increase the gap between those who have the skills and those who have not. Mulira (2000) supports in –house training because it is cost effective but indicates that a qualified expert should do it.

5.10 Conclusions

The University of Botswana Library has a variety of ICTs for information provision, emphasis has been on the quantity and types of the library ICTs in order to give good service to the library users. There is a clear indication that the use and purpose of the ICTs was not adequately assessed in order to measure their impact within the institution. There is no support system to give the library workers the knowledge and skills to assist library users get the information they need using ICTs. According to Mulira (2000):

> Even well designed and technically elegant systems can succeed or fail because of the way they are operated and used. Therefore, the quality of training received by the personnel involved with the system in various capacities helps or hinders, and may even prevent, the successful implementation of an information system. Those who will be associated with or affected by the system must know in detail what

their roles will be, how they can use the system, and what the system will or will not do. Both systems operators and users need training.

The ICTs in the University of Botswana Library are used mainly for routine programmes of the library like acquisitions and cataloguing. The Internet and e-mail are not adequately used by the library workers. Some of the ICTs like document scanners are just decorations waiting for specific people to operate once in a while when in actual fact they are needed for use at all times. Soong (1998) indicated that this time is exciting and challenging for librarians, and it calls for necessitating innovative ways for library service, collections, information access, and roles of academic librarians. The ever-increasing and changing potential of technology continuously challenges our efforts to create a vision for the future that does not quickly become the past.

Limited skills and knowledge are the main limitations to the University of Botswana Library. Most of the library workers are able to operate the ICTs like computer programmes and some of the computer resources and they use them every day in their duties. The library workers do not seem to be challenged by the new technologies even though their impact has been positive in their routine jobs because their output is higher than before they used ICTs. They do not seem to have the urge to learn on their own. According to Simmonds and Analeeb (2001: 629) the varying needs and expectations of an academic library should be known by the library staff and therefore strive to meet them through knowledgeable advisers.

The University of Botswana Library offers in–house library computer training on the library routine duty programmes. The senior library workers and automation library workers who have been trained by the software provider give this training. Some library workers who attained their diplomas and masters degree in the past four years have had introduction to ICTs course as part of their course requirement, and there has been some in-house computer training given to some of the senior library workers. The junior library

workers have not had any form of ICTs training except for the library programmes they work on. Some library workers indicated that they enrolled for training courses by themselves in other institutions; while the rest are assisted by their colleagues to utilise and operate ICTs they have not had training on.

The University of Botswana Library may be the most technologically advanced in the country but it does not focus on its workforce's training in order to satisfy the critical information needs of the library users. Brandt (2001: 74) argued that "not only are skills and knowledge of information itself important, but so are skills and knowledge of the technology that is often heavily integrated with the information".

Training on the use and application of library ICTs for information provision should therefore be an integral part of the University information policy plan. Avatech Solutions (2002) indicated that,

> Training enhances employee retention. A Louis Harris and Associate Poll says that among employees who say their company offers poor or no training, 41% plan to leave within a year. Of those that say their company offers excellent training, only 12% say they plan to leave.

Libraries have gone through major changes from books to electronic information, and networked information is growing very fast leading to the growth of global information society. Library user's expectation and appetite have grown and changed, there are a lot of opportunities for resource sharing, and all these call for library workers who are comfortable and have developed a degree of competence in the use of ICTs as identified by Soong (1998). All the library workers need basic training in ICTs in libraries in order to execute their duties comfortably.

The University of Botswana Library needs library workers who continuously upgrade their skills in using technology because its main objective is to make available information to its library users, and it therefore should respond creatively and dynamically to all the

changes of ICTs. Brandt (2001: 74) pointed out that skills and knowledge of information are as important as skills and knowledge of the technology that gives information. The use and application of ICTs changes with time and the future library workers have to be prepared for the change through training and continuously improving their skills and education in order to be flexible in their jobs and taking advantage of the computer and its resources.

The University of Botswana Library workers recommended that they be given training in the use and application of ICTs. They prefered face to face workshops/courses type of training more than the advice by phone or e-mail, and open flexible learning delivered and supported online.

5.11 Recommendations

This thesis identified the following points on the use and application of ICTs for information provision among library workers of the University of Botswana Library:

- there is a good collection of library ICTs in the library
- ICTs are mostly used for the routine library jobs, reference services, e-mail and accessing the WWW
- the skills and knowledge of application of ICTs are varying and mostly limited
- the skills were gained as part of formal university training, on hands practice, in-house library programmes training for specific individuals, hands on training and workshops/courses to very few individuals
- the training needs are on library ICTs use and application, and continuous updating of skills for all library workers

The ICTs collection is quite developed in the University of Botswana Library, but there are some resources like the Braille software, video conferencing and links from the library OPAC to the Internet that need to be focused on as well. The library workers should have

as part of the library ICTs programmes, listserv discussion groups that can assist them in developing scholarly discussions and self-development. Continuous use of the computers by junior library workers should be reduced in order to prevent them from suffering from the ICTs side effects already mentioned.

The University of Botswana library should train its workers at the same pace as it is acquiring and developing its ICTs. Dole and Stalker (1996) too pointed out that libraries should devote some of the resources to training their workers. In that regard, the University of Botswana Library should adapt and devote some resources every year in order to have continuous training on ICTs considering how dynamic they are. Training should be considered important for all the levels of library workers because their main objective is to make available information to the library users. The objective could be impossible to be implemented with the diverse users the library has because of the vast information provided by ICTs and the ever-changing technology.

UNESCO Asia-Pacific Regional Bureau for Education (2002) indicated that, Universities are entering into partnerships with the private sector, particularly the IT industry, in order to help maintain operation and financial viability of ICT-based education programmes. This ICTs programmes must be sustained and developed on a long-term basis. The University of Botswana Library has already indicated its plan of linking with other higher institutional libraries and national libraries for information provision, it should include training as a joint venture. Kaniki (1999) recommended that, "it will be a waste of limited resources for each institutions and library to develop its own courses as the needs for training appear to be similar". The University of Botswana Library therefore should work together with other institutions that have ICTs training needs within the country. A systematic and organised mechanism for training library workers should be developed and put in place in order to have continuous training for its workers.

Training analysis should be done on all the library staff and a system for identified types of training and specific times for upgrading should be put in place. A training provider should be from an accredited ICT training institute and should be able monitor and assess training standards. Training on ICTs should be provided in a number of areas, there can be specialised courses, scheduled training sessions. Mulira (2000) suggested that training could be done in-house as well as by an expert from a software company, unless specialist training is required. Training in-house has been identified as cost effective when comparing it with public and formal training.

In order for the library workers to familiarize its users with the library, there should be ongoing training as well as access to helpful and knowledgeable staff. Library workers should have at least basic skills of library ICTs fundamentals that will grow with continuous training. The library workers should understand how ICTs can support them in their work taking into consideration health and safety as well as legal issues in the context of ICTs.

Being able to find information on behalf of the library user is a skill that has to be learned and gives confidence to the staff. Knowing how to use ICTs improve the library worker's own professional efficiency and reduces bureaucratic burdens within the library. Reader development activities should be supported by the use of ICTs to ensure effective learning. ICTs resources should be managed effectively in the library, the automation staff should not be only ones who are able to manage the library ICTs.

Academic library workers who have undergone formal training should have the skills to be Internet navigators doing in depth information searches and validating web pages. They should be web designers, mounting and updating information, setting up and managing e-mail databases for example, and setting up digital links for their library users as well as troubleshooting skills. Library workers must be information consultants, be able to analyze user's needs as well as being aware of information sources and being able to

identify with other information providers and therefore be able to design information links and be able to present them.

The Department of Library and Information Studies in the University of Botswana must assist in giving ICTs training to both the library user and the library staff through short courses like:
- seminars
- on-campus training
- distance learning
- teleconferencing
- on the job learning
- self directed learning

5.12 Recommendations for further research

This study concentrated on the library workers and their ability to utilize ICTs to provide information to their clients. It would also be important to find out from the users the type of ICTs they think would be best suited for their information needs as well as how the library staff can assist them. A research into that area would be a legitimate exercise.

5.13 Conclusion

The University of Botswana Library is going through rapid technological changes and advances requiring an even more adaptive and sophisticated workforce. There is a need for a newly developed workforce of electronic resource library workers, information managers, system interrogators and training and education providers to conceive, build and implement a wide array of information technology.

The University of Botswana Library has most of the ICTs suitable for use in libraries and should use them for the efficient and effective provision of information to its users.

Utilisation of ICTs in the University of Botswana Library by the workers is inadequate as only the library workers who provides certain service know how to use the relevant ICTs for that service. The use and applications of ICTs requires library workers with skills and knowledge. The University of Botswana Library workers are not fully utilising the ICTs in their office because of their varying levels of ICT skills. This research has established that the University of Botswana library workers have varying and limited ICT skills, and that there is need to train the library workers at all levels in order to achieve effective and efficient use and application of ICTs. The library should establish a central training office for training of its workers. Information communications technology solution will only be successful if they directly focus on the workforce that is expected to satisfy the critical information needs of the library users.

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APPENDICES

Appendix A: Covering letter for the questionnaire for collecting data on the use and application of information communication technologies for information provision by library workers of the University of Botswana Library.

Dear Sir or Madam,

I am conducting research on "The use and application of information communications technologies for information provision by library workers of the University of Botswana Library". Information communication technologies (ICTs) are defined as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information. This study is done in partial fulfillment of a Masters degree in Information Studies at the University of Natal, Pietermaritzburg.

The purpose of the study is to find out how the University of Botswana library workers utilize the available information communication technologies (ICTs) during their work. The questionnaire is being administered with the intention of collecting data from the University of Botswana library workers. The information that you give will be kept confidential and anonymous and will be used strictly for the research. The identity of the respondent will not be revealed in any form; names are not required.

Please return this questionnaire to Mrs N. M. Dintwe who is the designated person in your library by 30 August 2002. For those of you who would have received it through e-mail, please return it to the sender (Mpotokwa@hotmail.com) after attending to it.
Thank you in advance

Yours faithfully,
Eng S. Mpotokwane

Appendix B: Questionnaire for collecting data on the use and application of information communication technologies for information provision by library workers of the University of Botswana Library

Instructions for filling in the questionnaire

    i.   Please tick in the space(s) provided when several answers are required, or when you make a selection.

    ii.   Please input data on the lines provided.

    iii.   Please answer the questions as completely and honestly as possible.

A. Demographic details

1. Gender

a) Male   [ ]

b) Female   [ ]

2. Qualifications

Certificate in Library and Information Studies   [ ]

Diploma in Library and Information Studies   [ ]

Degree in any subject discipline   [ ]

Masters in Library and Information Studies   [ ]

3. Experience

    How long have you been working in the University of Botswana Library?

    ....

4. Have you worked in another library before?

                         Yes [ ]   No [ ]

5. If yes, please state the name of the library you previously worked at

……………………………………………………………………………………………………

6. Present position and official job title (e.g. subject librarian, circulation assistant, cataloguing assistant, inter-library loans assistant)

……………………………………………………………………………………………………

7. How long have you worked in the present position?

……………………………………………………………………………………………………

8. Previous position held

……………………………………………………………………………………………………

B. Availability of information communication technologies in the library

9. What type of information communication technologies exists in the library generally?

	Yes	No
a. i. Personal Computers	[ ]	[ ]
ii. Terminals	[ ]	[ ]
iii. Shared computers	[ ]	[ ]
iv. Others, please specify		

b. Software applications (Microsoft Office (Word, Excel, Access, PowerPoint), Corel Word Perfect, SPSS, etc.) please state what you have

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

c. Please indicate the online resources you have access to

i. Internet / The World Wide Web   [ ]

ii. Intranets and Extranets   [ ]

d. Networking system   Yes   No

    i. within the university (LAN)   [ ]   [ ]

    ii. with other libraries (library consortium)   [ ]   [ ]

e.   Which   version   of   Windows   is   loaded   on   your

PC?...

C. The utilization of information communication technologies

10. Which of the ICTs listed in Section B do you personally have access to for your own use in the library?

		Yes	No
a.	Do you use a computer in the course of your duties	[ ]	[ ]
b.	Do you have exclusive use of a computer at work	[ ]	[ ]
c.	Do you share a computer with others	[ ]	[ ]

    d. What do you use the computer for in the course of your duties

....

....

11. Can you access and use the following from your computer?

		Yes	No
a.	Online public access catalogue	[ ]	[ ]
b.	scanning drawing, and design facilities	[ ]	[ ]
c.	photocopying and printing services	[ ]	[ ]
d.	cataloguing and acquisitions stock management system	[ ]	[ ]
e.	integrated circulation systems	[ ]	[ ]
f.	CD-ROM resources	[ ]	[ ]
g.	E-mail	[ ]	[ ]
h.	digital photographic collection archive	[ ]	[ ]

i.   resource sharing electronic library
     (databases and indexes)   [ ] [ ]
j.   Internet and the World Wide Web   [ ] [ ]
k.   video conferencing facilities   [ ] [ ]
l.   Braille specialist software   [ ] [ ]
m.   links to specific subject gateways
     from the library web-page / catalogue   [ ] [ ]

D. Previous training

12. Have you had any formal training in the form of short course(s) or part of specific
    programmes / qualifications in the use of the computer and its programmes?

                          Yes [ ]   No [ ]

13. If yes, please describe the form(s) of training

....

....

....

E. Skills and knowledge for application of information communication technologies within the library

14. Have you done the following using information communication technologies?

                                                       Yes   No
a.   circulation control   [ ]   [ ]
b.   catalogued   [ ]   [ ]
c.   ordered   [ ]   [ ]
d.   journal control order and invoice   [ ]   [ ]
e.   fines calculation   [ ]   [ ]
f.   interlibrary loans   [ ]   [ ]
g.   provided reference services using online

computer services	[ ]	[ ]
h. Created documents using Microsoft word	[ ]	[ ]
i. used E-mail	[ ]	[ ]
j. searched the Web	[ ]	[ ]
k. enrolled for online course	[ ]	[ ]
l. used online discussion forums	[ ]	[ ]
m. used video conferencing	[ ]	[ ]

F. **Training needs**

15. What type of training do you think you will benefit more from? (Please select)

    a. Understanding the theory, practice and pedagogy of online learning   [ ]

    b. increasing your awareness of how online learning technology could be used in locating existing online resources [ ]

    c. evaluating existing online learning materials [ ]

    d. designing and developing new online materials [ ]

16. Which of the following areas would improve your work? (Please select)

    a. Electronic mail [   ]

    b. electronic discussion lists [   ]

    c. video conferencing [   ]

    d. finding information on the Web [   ]

    e. authoring online learning materials [   ]

    f.   designing online assessment exercises [   ]

    g. any other resources, please specify

    ....

17. Which methods of training and support would you find suitable?   Yes   No

    a. Traditional face-to face workshops/courses   [ ]   [ ]

    b. advice by phone, electronic mail or through electronic discussion lists [ ]   [ ]

c. open or flexible learning delivered and supported online   [ ]   [ ]

18. Please describe any factors which influenced/restrict your preferences

....

....

19. Finally, do you have other training needs related to information communication technologies? If so, please list them

....

....

....

....

Please return this questionnaire to Mrs N. M. Dintwe who is the designated person in your library by 30 August 2002. For those of you who would have received it through e-mail, please return it to the sender (Mpotokwa@hotmail.com) after attending to it.

Thank you very much for your time and assistance.

APPENDIX C: Letter from the supervisor to the University of Botswana Training Office

UNIVERSITY OF NATAL

PIETERMARITZBURG CAMPUS

School of Human and Social Studies

Information Studies Programme

P Bag X01, Scottsville 3209

Pietermaritzburg,

South Africa

24 June 2002

Director of Training

The University of Botswana

P/B 0022

Gaborone

Dear Mrs Odirile

RE: ENG MPOTOKWANE STUDENT No. 201505640 (RESEARCH REQUIREMENTS)

As you are aware Ms Eng Mpotokwane, a member of staff at the University of Botswana Library and Information Services, pursuing the Master of Information Studies (MIS) degree at the University of Natal. Part of the requirement of the degree is a completion of an academic thesis, based on independent and original research. In view of this Ms Mpotokwane has proposed to conduct a study on "The use and application of information and communication technology for information provision among library workers at the University of Botswana Library". As per university requirement, the Faculty of Human

and Management studies in consultation with the Information Studies Programme has accepted the proposal and the topic. This implies that she can no proceed to conducting the research and subsequently write up the thesis.

Ms Mpotokwane's proposed study is very pertinent because information and communication technologies (ICTs) are changing the way in which we are managing information. ICTs offers a diverse set of technological tools that can be used to communicate, create, disseminate, store and manage information. Libraries, as traditional providers of information, should embrace the capabilities of information communication technologies in order to enhance their clients' access to and use of information resources.

Many libraries, including the University of Botswana Library and Information Services have the infrastructure necessary for utilizing ICTs. However, due to a variety of reasons staff tend to under-utilize the ICTs infrastructures. This may result in the failure of the library to satisfy the information needs of its users. In order to have "best practices" in the use and application of ICTs in any library, and more specifically that of the University of Botswana it is important to carry out an evaluative study of the kind that Ms. Mpotokwane is proposing. The results of the study should be directly relevant to initiating staff development programmes as well as assisting in effective management of the ICTs infrastructure. To conduct the study, Ms. Mpotokwane will need to travel to the Botswana and visit the University of Botswana. In the light, of the above we strongly recommend that Ms Mpotokwane be supported to carry out the study.
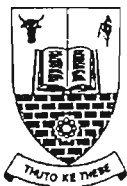
Yours sincerely

_____   _____

Patrick Ngulube (Supervisor)   Prof. AM Kaniki (Programme Director
                                            and Acting Deputy Vice Chancellor (Academic)
CC   Mrs. H. K Raseroka (Director, Library and Information Services, UB)

APPENDIX D: Letter to the Office of the President requesting for permission to carry out the research

University of Botswana
LIBRARY AND INFORMATION SYSTEM

Private Bag 00390   Gaborone   Botswana
Telephone: 351159/3552295   Fax: 357291/356591
email   ub lib @ noka.ub.bw

Department ....

Office of the President,
P/Bag 1
Gaborone.

Dear Sir / Madam,

I am an employee of the University of Botswana Library doing final year Masters of Information Studies at the University of Natal in South Africa. I would like to carry out a research on " The use and application of Information Communication Technologies for information provision among library workers of the University of Botswana Library". This study will be carried out in partial fulfillment of the Masters program's requirements.

I have chosen the University of Botswana Library because it is the most advanced in communication technology in the country. The purpose of the study is to determine the training needs of the library workers.
I am requesting permission to carry out a research in the University of Botswana Library.

Thank you in advance for your cooperation.

Yours truly,

Eng S. Mpotokwane.

Cc: The Director, Library Services, University of Botswana.

APPENDIX E: Letter to the University of Botswana Library for permission to carry out the research during working hours

<div align="right">

University of Natal

Pietermaritzburg

Private Bag X01

Scottsville.

3209

15 August 2002

</div>

The Director, Library Services

University of Botswana

P/Bag 390

Gaborone.

Botswana.

Dear Madam,

I am a final year Master of Information Studies student carrying out research on "The use and application of Information Communication Technologies for information provision by library workers of the University of Botswana Library". This study will be carried out in partial fulfillment of the programme's requirements. I have chosen your library because it is the most advanced in terms of information communication technology and serves the highest institute of learning in the country. The University of Botswana Library should have the best and most efficient and effective library workers looking at the challenges information communication technologies have brought to libraries.

I am requesting to distribute a questionnaire to your staff during working hours. The questionnaires will be for the formally trained employees only, from Certificate to Masters level.

Thank you in advance for your cooperation.

Yours faithfully,

Eng S. Mpotokwane

Cc: Mr P. Ngulube

APPENDIX F: Letter from the Office of the President granting permission to do the research

TELEGRAMS: PULA
TELEPHONE: 350800
TELEX: 2655 BD

REPUBLIC OF BOTSWANA

OFFICE OF THE PRESIDENT
PRIVATE BAG 001
GABORONE

OP 46/1 XCVII1 (24)

26th July, 2002

Ms. Eng Mpotokwane
P/Bag 390
Gaborone

Dear Madam,

RE: GRANT OF A RESEARCH PERMIT: MS. E. MPOTOKWANE

Your application for a permit refers.

We are pleased to inform you that you have been granted permission to conduct a study entitled "The Use and Application of Information Communication Technologies for Information Provision among Library Workers of the University of Botswana". The research will be carried out in Gaborone.

The permit is valid for a period not exceeding five (5) months effective July 26, 2002.

The permit is granted subject to the following conditions:

1. Copies of any report/papers written as a result of the study are directly deposited with the Office of the President, National Assembly, Ministry of Labour & Home Affairs, National Library Service, Research and Development Office, National Conservation Strategy Agency and University of Botswana Library.

2. You conduct the study according to the particulars furnished in the application.

3. The permit does not give authority to enter any premises, private establishment or protected area. Permission for such entry should be negotiated with those concerned.

4. Failure to comply with any of the above-stipulated conditions will result in the immediate cancellation of the permit.


Yours faithfully

J Mosweu
for/PERMANENT SECRETARY TO THE PRESIDENT

cc: Permanent Secretary, Ministry of Labour & Home Affairs
Clerk of the National Assembly
Executive Secretary, National Conservation Strategy Agency
Director, National Archives
Director, National Library Service
Director, Research and Development Office
Librarian, University of Botswana Library
District Commissioner/Town Clerk
- Gaborone

APPENDIX G: Letter from the University of Botswana Library the Office of the President
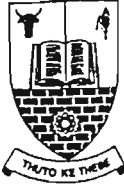
University of Botswana
LIBRARY AND INFORMATION SYSTEM

Private Bag 00390   Gaborone   Botswana
Telephone: 351159/3552295   Fax: 357291/356591
email   ub lib-@ noka.ub.bw

Department ....

22 July 2002

Office of the President
Private Bag 1
Gaborone

Dear Sir/Madam

Re: Application by Ms Eng Mpotokwane to Conduct research on use of ICT in UB Library

Ms Mpotokwane has expressed an interest in interviewing employees of the UB Library as part of the research for her dissertation for Masters degree. The Library has no objection towards her conducting the research.

We look forward to receiving a copy of her dissertation as part of the legal deposit obligations

Yours faithfully

D M Mbaakanyi
Deputy Director, Resource Management