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**The use of electronic information services (EIS) by undergraduate nursing students at the University of Namibia's (UNAM) Northern Campus: a descriptive study**

A major dissertation submitted in the fulfilment of the requirements for the award of the degree of Master of Philosophy in Library and Information Science

by

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## **COMPULSORY DECLARATION**

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work or works of other people has been attributed, and has been cited and referenced.

**Signature**

27 May 2008  
**Date**

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## **Abstract**

Library and information science professionals are increasingly taking a keen interest in gaining a better understanding of how university's students are making use of the electronic information services (EIS) in academic libraries. This study investigated the use of EIS by undergraduate nursing students at the University of Namibia's (UNAM) Northern Campus. The study has specifically examined the extent to which these students used EIS, the purposes for which they used EIS, the barriers they encountered in their use of EIS, the benefits they feel they gain from using EIS, the sources they use to acquire EIS skills, and their perceptions of EIS. The study followed a survey design and employed a mixed-method approach, whereby a self-administered questionnaire and interviews were used as data collection instruments. The results of the study are based on the data from 163 returned questionnaires and 15 interviews that were conducted with the students. The study found that the vast majority of the students made the greatest use of the Internet and email, and that the OPAC was moderately used, while the library electronic databases and e-journals were found to be substantially under-utilised. These students used the EIS for a variety of purposes, including obtaining course-related information, general current awareness, communication, and entertainment. The study also identified several barriers that prevented students from effectively using the various EIS. These include the shortage of computers, unreliable Internet connection, time constraints, and the lack of EIS skills. The study further found that the majority of students relied heavily on their fellow students to acquire EIS skills. It was further found that while many students were generally enthusiastic and have a positive perception of the Internet and email, only a few thought that the library's electronic databases and e-journals were useful to them.

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### **Glossary of abbreviations and acronyms**

ACRL	Association of College and Research Libraries
ALA	American Library Association
CD-ROMs	Compact Disk, Read-Only Memory
CHHS	College of Health and Human Services
CINAHL	Cumulated Index to Nursing and Allied Literature
D-Lib	Digital Library
E-Books	Electronic Books
EBP	Evidence-Based Practice
EDNER	Evaluation of the Distributed National Electronic Resource
EIS	Electronic Information Services
E-Journals	Electronic Journals
ELR	Electronic Library Resources
ERIC	Educational Resources Information Centre
ESTIP	Education and Training Sector Improvement Programme
ETS	Educational Testing Service
ICT	Information and Communication Technology
ICTs	Information and Communication Technologies
IL	Information Literacy
IT	Information Technology
ITL	Information Technology Literacy

JISC	Joint Information Systems Committee
JUSTEIS	JISC Usage Surveys: Trends in Electronic Information Service
KBE	Knowledge-Based Economy
LIS	Library and Information Science
NAMLIT	Namibia Literature
NCRs	North Central Regions
OCLC	Online Computer Library Centre
OPAC	Online Public Access Catalogue
PCs	Personal Computers
PoN	Polytechnic of Namibia
SABINET	Southern African Bibliographic Information Network
SPSS	Statistical Package for the Social Sciences
UNAM	University of Namibia
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISA	University of South Africa
WWW	World Wide Web

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Introduction**

This study describes the use of electronic information services (EIS) by undergraduate nursing students at the University of Namibia's (UNAM) Northern Campus. The focus of the study was to examine the extent to which these students used the various EIS, the purposes for which the various EIS were used, the barriers faced by these students in their use of EIS, the sources they used to acquire EIS skills and their perceptions of the various EIS. To set the context of the study, this chapter starts with a brief overview of the UNAM Northern Campus and presents the background to the research problem. It further states the research problem, aims and objectives, and research questions of the study. It then highlights the significance of the study and discusses the limitations and delimitations of the study. The chapter concludes with a general overview of the study and an outline of the chapters.

### **1.2 Overview of UNAM Northern Campus**

Being one of the major players in the provision of tertiary education in Namibia, UNAM has committed itself to expand its educational programmes to the different geographical regions of Namibia and this commitment has been manifested by the establishment of a number of campuses and centres in all regions of the country. One of the largest campuses of UNAM is the Northern Campus that is located in the densely populated North Central Regions (NCRs) of Namibia. According to the last report of the National

Population and Housing Census conducted in 2001, the NCRs are home to more than 42.6% of the Namibian population (Namibia. Central Bureau of Statistics, 2003). It is also important to note that some of the poorest communities in Namibia are located in these regions and the majority of the inhabitants of these regions face challenges related to educational opportunities. The University of Namibia thus established the Northern Campus in 1998 with the primary aim of expanding and improving access to higher education to the communities of these regions.

The Northern Campus offers educational programmes in the fields of nursing, education, business studies and has recently launched a science foundation programme (SFP) that provides tutorials to young learners to improve their grade 12 results in the science subjects and the English language. The only residential post-secondary education course that is offered on a full-time basis is a 4-year Diploma in Comprehensive Nursing Science and Midwifery and all the other courses are offered by means of distance education. At the time that this research was conducted, the Northern Campus served a student body of over 3000, of which approximately 9.2% were the full-time nursing students while the remaining 90.8% consisted of distance education students who were registered with UNAM, Polytechnic of Namibia (PoN) and the University of South Africa (UNISA). It is important to mention here that the campus does not provide accommodation facilities and as a result students commute every day from home to the campus.

In order to provide effective academic support to these students, UNAM has been providing library services even before the Northern Campus was established. These services consisted mainly of print-based materials that were sent to a central place where these students could access them. However, since 1998 when the campus was established, UNAM Libraries has invested a substantial amount of financial resources to expand its services. It particularly invested in information technology (IT) infrastructure and equipment to broaden access to information and communication technologies (ICTs) and facilitate the use of EIS by the academic community of the Northern Campus. The library branch at this campus has since then been providing students with access to modern EIS. These services form part of two important library goals, the first one being to expand opportunities to students and staff to engage with EIS, and the second one to complement the print-based materials in the library in order to support the university's core activities in an effective and efficient manner.

A modern library building became operational in 2002 and this enhanced the library's capacity to provide improved EIS to students and staff. Some of the EIS that are available via the UNAM Libraries Web site include scholarly databases, such as EbscoHost and Sabinet Online; electronic journals; the Web-based OPAC systems, and several links to educational sites on the World Wide Web (WWW). The EbscoHost package includes some of the well-recognised scholarly databases such as the Academic Search Premier, Health Source and MEDLINE that contain a large amount of full-text articles relevant to nursing education. In addition, students can use the computers in the library to access information that is freely available on the Web.

### **1.3 Background to the research problem**

New developments in ICT and computer networking have significantly enhanced the ways in which academic libraries organise, provide and disseminate information to users. Consequently, many students in tertiary institutions enjoy considerably improved access to a wide range of electronic information services and resources. Orr, Appleton and Wallin (2001:451) have rightly argued that improved access to technology has changed the way that students study, while the variety of electronic information resources has broadened the potential resource base. The provision and exchange of information by means of the various EIS is therefore considered an important aspect of the contemporary educational context (McDowell, 2002:256) and this explains why academic libraries are increasingly taking the advantage offered by modern IT to effectively meet the information needs of their users.

The fact that modern electronic information resources offer enormous opportunities and benefits to students in terms of easy access to information is not debatable. What is debatable is whether the majority of students, particularly undergraduates, are actually using the various EIS in a meaningful way and this makes it extremely important to examine if students are making optimal use of EIS. It must also be stressed that the benefits derived from the use of EIS do not come automatically and students are thus required to master a wide range of skills pertaining to the use of information and computer technologies. It is equally important to emphasise that students' EIS skills must be continuously upgraded so that they can easily adapt to the rapid pace of technological development. Bachman and Panzarine (1998:155) have argued that in order to benefit

from the vital health care resources, nursing students must be able to use information technologies and must have a good understanding of how these technologies interface with various health care systems. Cole and Kelsey (2004:190) have asserted that “retrieving information electronically requires nurses and nursing students to be skilled in the use of computers” and therefore it must be borne in mind that acquiring information resources and make them available to users is not sufficient in itself (McDowell, 2002:256).

It is therefore important to investigate how students use the various EIS. There is no doubt that a better understanding of the various factors that relate to the students’ use of EIS can help librarians and administrators to improve EIS in their libraries and this was one of the reasons why this researcher conducted this study. The researcher had observed that the first-year nursing students exhibited varied levels of information and computer skills when they commence their studies at the UNAM Northern Campus and the majority demonstrated limited exposure to EIS. This observation however did not surprise the researcher because many families in the NCRs do not have computers at home. It also appears that many of the secondary schools in the NCRs, which feed the campus with a significant number of students, are poorly equipped with ICTs and computers. The computers that are available in few secondary schools are either not maintained properly. In addition, these schools lack the necessary expertise to provide the basic training in information and computer skills to students, let alone the advanced information and communication technology (ICT) skills that are a pre-requisite to effective use of the various EIS.

The Namibian government has however recognized the fact that effective application of ICTs would make a significant contribution to all endeavours geared towards accelerating national development. This recognition is articulated in Vision 2030, an ambitious long term plan of the Namibian government that was specifically formulated to improve the quality of all Namibian citizens. It is clearly stated in this Vision that there is an urgent need to improve access to ICT facilities for all members of the Namibian society (Namibia. Office of the President, 2004:32). The Ministry of Education responded to this vision by formulating an important policy document in 2005, known as the Education and Training Sector Improvement Programme (ESTIP). ESTIP provides broad guidelines to all stakeholders in the education sector to implement strategies that would improve the education sector in Namibia in order to facilitate the transition to a knowledge-based economy (KBE) and ultimately contribute to national development goals. The ESTIP document clearly states that the Namibian government prioritizes ICT skills and competencies as core elements that are critical for effective participation in the twenty-first century and in the development of a dynamic KBE (Namibia. Ministry of Education, 2005:65). Moreover, the educational sector in general and libraries in particular feature prominently in this document as key players in the provision of ICT and the development of the necessary skills to enable the majority of Namibian people to actively participate in an information society as productive citizens. This clearly underscores the importance of integrating ICTs in the operations of UNAM activities and therefore UNAM Libraries continue to invest in IT with the intention of facilitating the exchange of information. The UNAM librarians further play an important role in this regard by providing information literacy skills to the new intakes of students during orientation programmes.

Generally, there are two main approaches that librarians follow to orientate new students. The first is the traditional approach that involves library staff as the only trainers who introduce students to information and computer skills during the first semester of an academic year, whereas the second approach entails integrating information and computer literacy programmes into the curriculum. The literature shows strong evidence to suggest that most academic institutions, especially in the developed world, are moving away from the first approach and are increasingly in favour of the second approach in which both the teaching staff and librarians are heavily involved in imparting information literacy skills to the students. Verhey (1999:253) underscores this and has suggested that “if nurses are to have the knowledge, skills, and attitudes necessary to value research-based practice and life-long learning, schools of nursing must integrate information literacy content and practice into their curricula”. Bachman and Panzarine (1998:155) also support this view and have stated that “it is imperative that health care educators incorporate information technologies in their teaching because of the growing need for nurses to access the latest health information and have quick access to other health care professionals to meet patient needs”.

The Northern Campus Library currently only follows the first approach of introducing the new students to information skills and providing computer training to new students in the first semester. Although the computer training is a positive development, it is not accredited and many students appear to show less interest because the course is not compulsory. Furthermore, in its current form, this course only covers basic computer skills such as word processing and basic introduction to the Internet. There is thus an

urgent need to review and assess whether this course actually equips the students with the necessary skills to enable them to effectively locate information held in the electronic environment. Little is known about how the students at the Northern Campus use and benefit from the EIS and a review of the literature has further indicated that the use of these modern resources of information has never been investigated at the Northern Campus and therefore this study aims to fill that gap.

#### **1.4 Statement of the research problem**

From the above it is thus clear that the research problem that this study wishes to address relates to:

- Uncertainty and lack of knowledge in general with regard to the impact of new developments in ICTs on the UNAM Library operations and services and its capacity to effectively contribute towards the Namibian government's plans (Vision 2030) and programmes (ESTIP) that aim to accelerate national development and the transition to a knowledge based economy by means of the effective application of ICTs; and
- More specifically uncertainty and lack of knowledge regarding how effectively the UNAM Northern Campus Library is meeting the electronic information needs of its nursing students; whether the majority of nursing students are using the various EIS in a meaningful and optimal way; whether they have the required skills to effectively use ICTs; and whether appropriate information literacy and computer skills are being effectively imparted to the nursing students and integrated in the health care curriculum.

### **1.5 Aims and objectives of the study**

This study therefore aims to investigate the use of electronic information services (EIS) by undergraduate students registered for the Diploma in Comprehensive Nursing Science and Midwifery at the University of Namibia's (UNAM) Northern Campus. A further aim is to gain a better understanding of students' perceptions of the EIS in order to obtain empirical evidence that could guide UNAM Libraries to improve electronic information services and use.

To achieve these aims the study was guided by the following specific objectives:

- a) To describe the extent to which undergraduate nursing students at the UNAM Northern Campus use the various EIS;
- b) To determine the purposes for which the various EIS are used;
- c) To identify the barriers that students encounter in their use of EIS;
- d) To identify the sources used by students to acquire and improve EIS skills;
- e) To gain a better understanding of students' perceptions of the various EIS.

### **1.6 Research questions**

From the above objectives, this study sought to answer the following questions:

- a) What is the extent of use of the various EIS by undergraduate nursing students at the University of Namibia's (UNAM) Northern Campus?
- b) For what purposes do these students use the various EIS?
- c) What are the main barriers that these students encounter in their use of EIS?
- d) How do these students acquire and improve EIS skills?

- e) What are these students' perceptions of the various EIS?

### **1.7 Significance of the study**

The significance of the study lies in that fact that it will provide a better picture of the use of the various EIS by the nursing students at the UNAM Northern Campus. It is essential to realise that the use of EIS by students at different institutions may differ simply because of different contexts and this justifies the need for each library to conduct its own investigation. In her review of the literature of the use and users of electronic library resources, Tenopir (2003b:43) underscores this point and has argued that "there are individual and library-specific differences that make it beneficial for many libraries to collect their own data".

As stated earlier, the various EIS at the UNAM Libraries are, among other things, intended to complement the current stock of print-based materials that is fairly small and it is therefore important to gain a better understanding of how students at this campus use the various EIS. It is equally important to emphasize that the investments made by the UNAM Libraries in IT to provide access to EIS would be meaningless unless the library investigates whether the intended users are actually making optimal use of these resources. Moreover, this study is significant because it aims to:

- a) Firstly, uncover the barriers that inhibit students from effectively using the EIS and identifying the purposes for which EIS are used;
- b) Secondly, gain a better understanding of students' perceptions of the EIS;

- c) Thirdly and perhaps most importantly, generate empirical evidence on the nursing students use of EIS that could serve as a basis to guide the library management to make informed decisions and improve the various electronic information services; and
- d) Fourthly, contribute to the body of knowledge relating to the use of EIS in academic libraries.

### **1.8 Limitation and delimitation of the study**

According to Locke, Spirduso and Silverman (1993, quoted by Punch, 2000:75), limitations refer to “limiting conditions or restrictive weaknesses which are unavoidably present in the study’s design”. In contrast the concept ‘delimitations’ means “defining the limits, or drawing the boundaries around the study, and showing clearly what is and is not included” (Punch, 2000:75). A limitation of this study is the fact that it employed self-administered questionnaires as the main instrument to collect the necessary data. The main drawback that can be associated with this instrument is the fact that the results of the study were based on students’ self-assessment of how they used the various EIS. Although the researcher piloted the questionnaire, he wishes to acknowledge that often self-assessment surveys limit one to obtain a full picture of the questions being investigated. This usually occurs because sometimes students have a tendency of exaggerating their knowledge and skills of using the EIS.

With regard to delimitation, the study investigated only full-time undergraduate nursing students and excluded the UNAM distance education students who are the majority of the

student population at the UNAM Northern Campus. UNISA and PoN students who are accorded the same privileges as UNAM students in terms of using the various EIS in the library were excluded too. These students are very difficult to access because they are scattered throughout the vast regions of the NCRs of Namibia and they come less frequently to the campus. They were thus excluded from this study because investigating them would be a major research undertaking that would evidently require adequate time and financial resources, which were also limitations in this study.

### **1.9 Overview of the study**

As stated above, the main purpose of this study was to investigate the use of EIS by undergraduate nursing students at the UNAM Northern Campus. The study followed a descriptive survey design and employed a mixed method approach, whereby both quantitative and qualitative methods of research were used to collect data. A questionnaire and interviews were thus used as data collection instruments. The data were collected during the months of August and September 2007.

While the data that were collected with the questionnaire were analysed with the Statistical Package for Social Sciences (SPSS) software, the data from the interviews were analysed using Marshall and Rosmann's analytical approach. This approach involves organising the data, generating categories and main themes, extracting meaningful conclusions and ultimately writing the report. The results of the study are presented in the form of graphs and tables, and reported in the form of descriptive notes and percentages.

The following is a brief outline of the chapters:

- Chapter 1: Introduction, overview of the UNAM Northern Campus, background to the research problem and statement of the research problem, aims and objectives, research questions, significance of the study, limitation and delimitation of the study, and an overview of the study;
- Chapter 2: Literature review, definitions of key concepts and terminologies, conceptual framework of the study, review of related studies, and summary of the review of the literature;
- Chapter 3: Research design and methodology, validity and reliability of the study, population of the study, sampling methods used and sample size for this study, data collection instruments, and pilot study;
- Chapter 4: Data analysis and presentation of the results, analysis of the results from the questionnaire survey and the interviews (demographic analysis, extent of students' use of the various EIS, purposes for which EIS were used, barriers faced by students in their use of EIS, students' development of skills, students' perceptions of EIS); and
- Chapter 5 Discussions of the key findings and conclusion (students' use of the various EIS, barriers encountered by students in accessing the various EIS, students' level and development of EIS skills, students' perceptions of EIS, recommendations, and suggestions for future research).

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

Investigating the use of electronic information services (EIS) in libraries, particularly academic libraries, is not a new phenomenon. It can be traced back to the early 1950s. As Bourne (1980:155) has noted “an investigation of on-line bibliographic searching was first made by Bagley in 1951”. Subsequently many bibliographic databases, such as DAILOG, ERIC, etc., and CD-ROMs were developed and introduced in academic libraries. However, until recently the use of these resources has, to a large extent, been restricted to library staff in most libraries. Tenopir and Read (2000:235) have observed that “earlier studies for automated resources often were done to help libraries determine how many terminals were required when they first brought up an online catalog...”

However, with new developments in ICT, particularly from the early 1990s, EIS have become popular and powerful sources of information that offer library staff and users tremendous possibilities to access information much faster than ever before. Consequently, this has attracted great attention and interest among scholars and practitioners in the Library and Information Science (LIS) field to investigate the use of the various EIS in libraries and elsewhere within institutions of higher education.

A review of the literature reveals a large number of studies that have investigated the use of various EIS in libraries, especially from developed countries. This chapter provides a

critical analysis of the literature in relation to the usage of EIS in the context of education. Firstly, the chapter discusses several concepts that have informed this study and provides a conceptual framework for this study. Secondly, the chapter critically reviews the previous studies in relation to students' use of EIS in educational institutions, focusing on the main themes, findings and research methodologies that have been employed by other researchers.

## **2.2 Definition of key concepts and terminologies**

The LIS literature uses several terms to describe information services that are provided via electronic formats. These include electronic information services, electronic library resources, digital libraries, electronic information sources, online information services, and Web-based information resources. These terms are sometimes confusing to readers, especially but not exclusively, to those readers who are not familiar with the terminologies commonly used in the LIS profession. Furthermore, it is usually a necessity for researchers to contextualize key concepts in their studies so as to avoid the possibility of misinterpretations. This researcher thus wishes to provide clear and succinct definitions of the following key concepts and terms as used in this study.

### **2.2.1 Information literacy**

For the purpose of this study information literacy is defined as “the ability to access, evaluate and use information from a variety of sources” (Doyle, 1994:1).

### **2.2.2 Computer literacy**

Computer literacy can be defined as “familiarity with personal computers and the ability to create and manipulate documents and data via word processing, spreadsheets, databases, and other software tools” (Spitzer, Eisenberg & Lowe, 1998:27).

### **2.2.3 Information and communication technology literacy**

Information and communication technology (ICT) literacy may be viewed as “the skills and abilities that will enable the use of computers and related information technologies to meet personal, educational and labour market goals” (Lowe and McAuley, 2000:6).

### **2.2.4 Electronic information services**

For the purpose of this study, electronic information services (EIS) are defined as services and information sources available online or by means of some or other electronic format and that are accessed by means of computers. Thus, in this study the definition of EIS includes both electronic library resources (ELR) such as Online Public Access Catalogues (OPACs), electronic books and journals, and scholarly electronic databases that are usually paid for by libraries through subscriptions as well as the Web that contains freely available information.

### **2.2.5 Use of electronic information services**

In this context, the use of EIS is defined as the actual users' interaction with the electronic information resources for the purpose of locating information.

### **2.2.6 Nursing students**

For the purpose of this study, nursing students are defined as the full-time students registered for the undergraduate diploma in Comprehensive Nursing and Midwifery Science at the University of Namibia's (UNAM) Northern Campus.

## **2.3 Conceptual framework**

The literature reveals that the level of competences and skills in information literacy, computer literacy and ICT literacy is a major determining factor that affects the students' use of the various EIS in academic libraries. As Bruce (1997:20) has noted "the idea of information literacy has been influenced by five other concepts, namely information technology literacy, computer literacy, library literacy, information skills and learning to learn". Although these concepts are interdependent and related, they have also distinctive meanings and each demands different competences and skills.

It can however be argued that they all have a major influence on information literacy as a broader term. Hence, this study falls within the conceptual framework of information literacy as a broader concept that embraces the concepts of ICT literacy and computer literacy. This study was therefore informed by these concepts and an overview of their respective meanings is provided and discussed within the context of the education sector. In order to clarify how these concepts are interrelated in this study, the following discussion concludes with a graphical diagram that depicts the scope that each concept occupies in the conceptual framework of this study.

### **2.3.1 Discussion of the concept of information literacy**

According to Bruce (1997:2) the concept of information literacy “has its roots in the emergence of the information society, characterized by rapid growth in the availability of information and accompanying changes in technology used to generate, disseminate, access, and manage information”. A review of the literature indicates that the term ‘information literacy’ was first used by Paul Zurkowski in 1974 in a report to the United States of America’s (USA) National Commission on Libraries and Information Council (Doyle, 1994:5; Behrens, 1994:309; Spitzer, Eisenberg and Lowe, 1998:22; Bawden, 2001:230).

Although Bruce agrees with other writers that the term information literacy is accredited to Zurkowski (1974), she has also argued that “the information literacy movement has grown out of a concern with the potential role of libraries and librarians in education, in both school and tertiary settings” and she further stated that “this concern emerged in the late 1960s, in relation to school settings, alongside early developments in computer based information technology” (Bruce, 1997:4).

It should however be borne in mind that traditionally the definition of information literacy focused on basic information skills and it was closely related to the ability to read and write. In the late 1980s Breivik and Gee (1989:22) have stated that most people would currently define a literate person as one who can read and write. They have also acknowledged that “a historical examination of the concept literacy reveals that a useful definition depends upon the information needs of the society” (Breivik and Gee, 1989:22).

Behrens (1994:318) reinforces this view and has stressed that “today literacy is viewed as an evolving concept, its meaning dependent on the social and individual requirements of a specific society.” Early definitions of information literacy were also associated with the “effective use of information within a working, probably commercial environment and specifically with problem solving” (Bawden, 2001:230). This view features prominently in early popular writings that have advanced and advocated the concept of information literacy to be not only a key requirement for students but also for the general working population. For example, citing Zurkowski (1974), Behrens (1994:310) strengthens this view and has noted that

“people trained in the application of information resources to their work can be called information literates. They have learned techniques and skills for utilizing a wide range of information tools as well as primary sources in molding information solutions to their problems”.

Over the years, however, researchers within the LIS field and the education sector in general have expanded the definition of information literacy. This is not surprising because as more sources of information became available the more people took cognizance of the importance of information as well as the link between information literacy and life-long learning. Life-long learning is one of the key objectives of contemporary education and information literacy is an important requirement to achieve this objective. Bruce (1997:5) has aptly argued that “today the meaning of information literacy has broadened considerably and the term represents a convergence of interests in the need to educate those who must live and work in our information society”.

Having adopted Doyle's succinct definition as the operational definition of information literacy for this study (cf. 2.2.1), this researcher explored the concept in greater depth. The United States (US) Association of College and Research Libraries (ACRL) provides one of the most widely cited definitions of information literacy, which defines it as "a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information" (ACRL, 2000:2). Meanwhile, Johnston and Webber (2003:336) define information literacy as "the adoption of appropriate information behaviour to obtain, through whatever channel or medium, information well-fitted to information needs, together with critical awareness of the importance of wise and ethical use of information in society". This definition highlights one skill that is usually omitted in other definitions of information literacy, and that is, the awareness of the ethical use of information. An awareness of ethical and legal implications of using information is indeed essential, particularly for information in the electronic environment.

The above definitions suggest that unlike traditional definitions, contemporary definitions of information literacy focus on the necessary skills an individual needs to have in order to locate, evaluate and use information from a variety of sources. In an information society, information literacy thus calls upon an individual to have "the capability of distinguishing useful from useless resources, reliable from unreliable and sensible from silly knowledge claims" (Candy, 2002:7). In this regard, Brievik and Gee (1989:13) add another important point and have stressed that "information literate people know how to find, evaluate and use information effectively to solve a particular problem or make a

decision, whether the information they select comes from a computer, a book, a government agency, a film or any of a number of other possible sources". Information literacy is thus a broad concept embracing a variety of literacy components and according to Cole and Kelsey (2004:191) it "includes computer literacy and the ability to use information". The ACRL standards rightly summarized as follows the key attributes and skills that information literate individuals should possess:

"determine the extent of information needed; access the needed information effectively and efficiently; evaluate information and its source critically; incorporate selected information into one's knowledge base; use information effectively to accomplish a specific purpose and; understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally" ( ALA, 2000:2).

This researcher would like to argue strongly that the attributes and skills outlined above would be critical for students if they are to effectively use a variety of information resources during their education and beyond. It is equally essential to emphasize that information literacy is relevant and important to all fields of studies and nursing science is no exception. It can thus be safely stated that information literacy, like other literacies, cuts across all fields of education and other human activities.

It is therefore important for the nursing students to be information literate in order to fully exploit EIS to meet their academic and personal information needs. Verhey (1999:252) has specifically stated that "information literacy for nurses involves acquiring the necessary process skills to find and evaluate nursing literature". Information literacy is thus closely linked to the students' ability to derive maximum benefits from the use of EIS.

### **2.3.2 Discussion of the concept of computer literacy**

A review of the literature suggests that the definition of computer literacy has been changing in parallel with new developments in computer technology and as computers became more widely available in the public domain. As a result, the discussion regarding this concept takes different perspectives, and Childers (2003:101), for example, has pointed out that

“the meaning behind the term computer literacy kept changing and altering, with those writing about it being drawn toward one of the two sides of the issue; one side being the complete understanding camp and the other campaigning for simply knowing how to use computers, but not how they work”.

Ruthven (1984) shared the same view and has discussed the three perspectives, which he referred to as distinct paradigms that influence the concept of computer literacy. The first paradigm he referred to is ‘computer literacy as mastery of technique’, which “sees computer literacy as knowledge of how a computer works, and technical skill in making use of it”. He went on and emphasized that “computer studies strongly reflect the influence of this paradigm” (Ruthven, 1984:135). In contrast, he termed the second paradigm as ‘computer literacy in context’, which emphasizes an “awareness of computer technology in its social and economic context” (Ruthven, 1984:136). The third paradigm, ‘computer literacy as access to tools’ refers to “the ability to make use of the computer as a tool for communication, information handling, learning and inquiry” (Ruthven, 1984:138). It is this third paradigm that describes computer literacy as a tool for information use that has direct relevance to this study. Hence, this study has adopted a definition of computer literacy (cf. 2.2.2) as provided by Spitzer, Eisenberg & Lowe (1998:27). Computer literacy may also be defined as “the minimum knowledge, know-

how, familiarity, capabilities, abilities and so forth, about computers essential for a person to function well in the contemporary world” (Bork, 1985:33). In this study, computer literacy is thus viewed as the basic skills that are needed in order to effectively use a computer and its applications as opposed to knowing the technical skills such as programming.

Although it has been associated with information literacy, computer literacy can be viewed as an independent, albeit narrower concept. Schloman (2001) highlights this view and has argued that

“it is important to note that computer literacy is not the same as information literacy. Computer literacy is the set of competencies represented by being able to understand computer basics and use a variety of applications to manipulate data and create documents. One can be adept at using computers, but not a knowledgeable information user, even if that information is in electronic form. Computer-related skills often serve, however, to enable information related activities”.

The above view clearly illustrates a point emphasized by many researchers, for example Schloman (1999); Bundy (2004:10); and Cole and Kelsey (2004:191), that unlike computer literacy, information literacy should be seen in a broader context and scope which entails the effective use of information from a variety of sources, including print and electronic sources. Computer literacy is therefore limited in scope since it is strictly and exclusively concerned with the use of information in electronic formats. As a concept, computer literacy fails to emphasize the critical evaluation skills and effective use of information to solve a particular information need. It further fails to mention ethical concerns emphasized in the concept of information literacy. This is however not

surprising because a computer is just a tool, albeit a powerful one, that plays an enabling role in storing, providing, disseminating and exchanging information.

It should, however, be stressed that computer skills have a major impact on students' abilities to find information in electronic environments, and these skills are extremely important for the effective use of EIS by students. Bachman and Panzarine (1998:156) have asserted that "the ability to use computers opens the gateway to the information superhighway". This is very critical for the education sector in general. Referring specifically to nursing students, Cole and Kelsey (2004:190) have contended that "retrieving information electronically requires nurses and nursing students to be skilled in the use of computers". The ability to effectively use computers to retrieve information from electronic information resources is a key objective of computer literacy education. The concept of computer literacy is therefore relevant to this study, as the study sought to investigate the use of EIS.

### **2.3.3 Discussion of the concept of information and communication technology literacy**

New developments in information technology (IT), particularly the Internet, have made information widely available to global consumers of information. The Internet has also considerably reduced the cost associated with accessing information. This is an important advantage to students, in particular, to students of educational institutions that are located in remote areas. It should be borne in mind that this advantage has also created a number of challenges. As Secker (2004:55) has argued "to assume that because information is

available on the Web, people will have the skills and knowledge to find, access and use it effectively is naïve". The challenges associated with ICT include computer skills to fully exploit EIS and evaluative skills to recognize the quality and accuracy of information. Equally important are the skills that are related to ethical and legal aspects of using information in electronic formats.

Being a new kind of literacy, the term ICT literacy is sometimes used interchangeably with several other terms such as network literacy, digital literacy, Internet literacy, electronic literacy or simply e-literacy and information technology literacy (ITL). Penrod and Douglas (1986:76) have argued that "in the broadest sense, ITL is the knowledge which allows an individual to function efficiently and effectively in whatever circumstance one finds him/herself in a technologically oriented society". The competences and skills in ICT therefore allow individuals to effectively utilize computers, software applications, databases, and other technologies to accomplish a wide variety of educational, work-related, and personal goals (ALA, 2000:3). This study has adopted the definition of ICT literacy (cf. 2.2.3) as provided by Lowe and McAuley (2000:6). In the education context, the USA's Educational Testing Service (ETS) defines ICT literacy as "the ability to use digital technology, communication tools, and/ or networks appropriately to solve information problems in order to function in an information society" (ETS, 2003:11). ETS further elaborates by stating that "this includes the ability to use technology as a tool to research, organize, evaluate, and communicate information and the possession of a fundamental understanding of the ethical / legal issues surrounding the access and use of information" (ETS, 2003:11).

The above definition suggests that ICT literacy is narrower in scope than information literacy as it only involves the capability to operate the technology as a tool for the purpose of using information more efficiently and effectively. Penrod and Douglas (1986:92) have argued that “technology provides alternatives, not answers; options not decisions”. It should thus be well understood that computers and related IT equipment are only tools to improve the use of information and as such computer literacy and ICT literacy would only help students to access information. The students would however require critical thinking skills that are emphasized in the concept of information literacy in order to turn information into knowledge.

Nevertheless, ICT skills are extremely essential for students in higher educational institutions, including nursing students who are the subjects of this study. McDowell and Xiping (2007:33) reinforce this view and have stressed that “graduates of nursing programs must be able to use IT tools, such as clinical information systems, in nearly all healthcare arenas”. This researcher therefore wishes to emphasise that students who lack ICT literacy would not benefit fully from EIS. McNeil and others (2003:341) have contended that “because health care delivery increasingly requires timely information for effective decision making, information technology to support practice must be integrated into nursing program curricula to prepare graduates for nursing practice”. This is particularly important because Evidence-Based Practice (EBP) is increasingly receiving great attention and emphasis in nursing education. According to Sackett (1996, quoted by Gannon-Leary and others, 2006:250), EBP is the “conscientious, explicit and judicious use of current best evidence in making decisions and it means integrating individual

expertise with the best available evidence from systematic research". In today's world, an effective use of ICT tools is thus not only important for nursing students during their studies but also when they become practitioners. It is for the reasons discussed above that ICT literacy has been integrated in the conceptual framework of this study and is considered to be one of the important prerequisites for students to fully exploit the various EIS.

#### **2.3.4 Discussion of the concept of electronic information services**

As stated earlier (cf. 2.2), this researcher found several terms that have been used interchangeably by many researchers to refer to sources of information in electronic format. These include, for example, the term 'electronic information services' used by Crawford (1999); Rowley and others (2002); Hewitson (2002) and Urquhart and others (2003). In contrast, other researchers, for example, Tenopir (2003); Holley and Powell (2004) and Appleton (2006) have used the term 'electronic library resources'. Meanwhile Baruchson-Arbib and Shor (2002) and Ramlogan and Tedd (2006) have referred to these resources as 'electronic information sources'. While, for example, Ray and Day (1998) and Ali (2005) have used the term 'electronic information resources'. On the other hand Covi (1999) used the term 'digital libraries'. It appears though that the term 'electronic information services' is increasingly gaining popularity among several researchers in the United Kingdom (UK). Despite these numerous terms the literature falls short on providing clear definitions of what they actually mean. Appleton (2006:619) strengthens this view and has asserted that "the definition of electronic library and information services does not appear to be consistent". This is, however, not unusual because new

concepts typically evolve over a long time before a particular terminology becomes widely accepted and used by scholars.

For the purpose of this study, the EIS concept is inclusive of all the information in electronic environments. These include not only electronic scholarly resources but also information resources that are freely available on the Web. Hence, this researcher had to formulate a definition that is appropriate for this study (cf. 2.2.4). It is important to mention here that the definition was arrived at after the researcher had examined the meanings of the each word in the term electronic information services. Reitz (2004:244) defines electronic resources as “material consisting of data / or computer program(s) encoded for reading and manipulation by a computer or by the use of a peripheral device directly connected to the computer or remotely via a network such as the Internet”. In contrast, information can be viewed as “all the facts, conclusions, ideas, and creative works of the human intellect and imagination that have been communicated, formally or informally, in any form” (Reitz, 2004:355). Whereas in the LIS context, an information service may be defined as “a service provided by, or for, a special library which draws attention to information possessed in the library or information department in anticipation of demand” (Prytherch, 1995:322).

As stated earlier, it is a normal practice for researchers to formulate definitions of key terms in their studies and as such, most researchers have had to define EIS for their respective studies. For example, Appleton (2006:619) defines electronic library and information services as “the variety of electronic and digital sources of information

available to teachers and learners within an academic context". In contrast, Rowley and others (2002:111) define electronic information services as "a collection of information tools/products delivered to requesting users electronically and usually computer mediated". On the other hand, Crawford, De Vincente and Clink (2004:102) define EIS as "pass-worded information databases, the Internet and the library catalogue". Hewitson (2002:43) provides a more general definition of EIS and stated that EIS can be viewed as "material that can be accessed from information sources using electronic means".

Defining EIS for a particular study is thus understandable, considering that at the moment there is a variety of electronic information resources available and it seems that a definition that would incorporate all of them is yet to be formulated. It is, however, evident that all the definitions outlined above tell us that EIS refer to resources of information from which an individual can access information electronically usually through a computer. Thus, whichever term a particular researcher adopts, it is the physical form, in this case electronic format, which matters to studies that are concerned with the use of EIS.

It is important to point out, however, that the objectives of a particular study would determine whether the focus would be on the scholarly information resources or the Web-based information or both as in the case of this study. Providing access to EIS within the academic community is increasingly becoming one of the important objectives of academic libraries and electronic resources of information are essentially relevant to the students' learning process. It should thus be emphasised that only when students are

equipped with information literacy, computer literacy and ICT literacy will they be able to derive maximum benefit from the use of the various EIS.

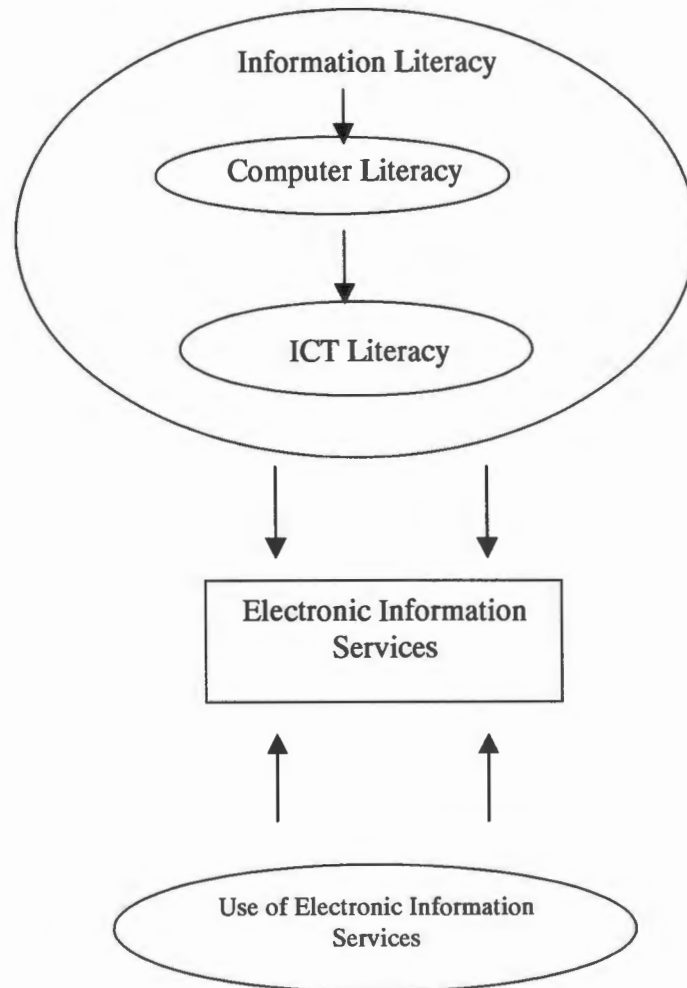
### **2.3.5 Discussion of the concept of use of electronic information services**

Line (1974:87) defines 'use' as "what an individual actually uses" and has further argued that 'use' is heavily dependent on the provision and availability of library and information services. In the Library and Information Science (LIS) context the term 'use' generally implies a particular user's engagement with the library services or resources. For the purpose of this study, this researcher thus provided the succinct definition of 'use of EIS' as outlined in 2.2.5.

This study focuses on EIS that are available at the UNAM Northern Campus through its library. These include, as mentioned above, the Web-based information resources and services that are freely available on the Internet; international electronic research databases such as Medline, Academic Search Premier, and Health Source; e-journals accessible through the EbscoHost database package; local electronic databases and digital collections; e-books; and the Millennium systems (that is, the Web-based OPAC at UNAM Libraries).

To summarize the discussion on the conceptual framework of this study, this researcher developed the diagram below (figure 2.1) with the intention to clearly explicate how these concepts are interrelated.

**Fig. 2.1. Conceptual framework for the use of electronic information services**



As mentioned above, the diagram for the conceptual framework of this study is aimed at enhancing an understanding of how the key concepts used in this study are interrelated. It illustrates the hierarchical level in terms of scope of the skills that each concept encompasses in order for students to effectively use the various EIS. The diagram thus provides a representation of which concept is broader in scope rather than showing whether a particular concept is more important than the other.

It can be seen that information literacy is the broadest concept that embraces the concepts of computer literacy and ICT literacy. The arrow that faces down from the term information literacy shows that for a student to benefit from using information in a productive way, he/she needs to possess information literacy skills as a first step. Similarly computer literacy occupies the next level because in order to gain ICT literacy, a student needs to possess the skills to operate the computer as an enabling tool. Once a student is skilled in using computers, he/she can then comfortably use advanced ICTs for the purpose of either generating or locating information in electronic environments. It is therefore clear that only when a student is competent in the three literacy concepts outlined above that he/she would be able to effectively use the various EIS to solve his/her information needs in a meaningful and productive way. All these skills are needed for the new social and economic world order and have the potential to prepare students to become productive citizens in their respective fields once they graduate. It should be noted, though, that each concept has a major influence on the other. It is equally important to realise that by depicting information literacy as the broader concept students should be motivated to become life-long learners, suggesting that information literacy is an essential life skill that allows students to engage with emerging technologies and the use of EIS.

#### **2.4 Review of related studies**

Having formulated and discussed the conceptual framework of the study, the researcher reviewed the previous studies in relation to the use of the various EIS in the education sector. The review focuses mainly on the undergraduate student population and is

organised and discussed under the following headings: general aspects relating to the use of EIS; extent of use of the various EIS by the student population; EIS that are used the most by students; factors influencing the students' use of EIS; purpose for which students use EIS; barriers to students use of EIS; students' perceptions of EIS; research methodologies used in previous studies; and this section concludes with a summary of the review of the literature.

#### **2.4.1 General aspects relating to the use of EIS**

A review of the literature revealed a large number of studies that have investigated several aspects related to the use and users of EIS in the education sector. The user groups studied, however, varies considerably, reflecting the diversity of users of EIS within the higher education sector. The studies that have investigated the use of EIS within the higher education sector can generally be grouped into three main categories, as follows:

- a) The first category includes studies that have focused on the entire academic community, that is, academic staff and students belonging to one or more institutions of higher learning. These include, for example, studies conducted by Crawford (1999); Rowley and others (2002); Bonthron and others (2003); De Groote and Dorsch (2003); Banwell and others (2004); Badu and Markwei (2005); Ali (2005); and Appleton (2006).
- b) In contrast, the second category includes studies that have concentrated only on academic staff members within a single disciplinary area, for example a study conducted by Scollin (2001). Alternatively they have compared the use of EIS

among academics across various disciplines and these include, for example, studies conducted by Lazinger, Bar-Ilan and Peritz (1997); Lancaster and others (1998); Majid and Abazova (1999); Hewitson (2002); and Bar-Ilan, Peritz, and Wolman (2003).

- c) The third category, in turn, includes those studies that have targeted only students as their objects of analysis. These includes studies conducted by, for example, Lubans (1998); Baruchson and Shor (2002); OCLC (2002); Ajuwon (2003); Ogunyade and Oyibo (2003); Waldman (2003); Aman (2004); Crawford, De Vincente and Clink (2004); Urquhart and others (2005); Crawford (2006); and Ramlogan and Tedd (2006).

As far as the topic of use of EIS is concerned, all these previous studies are related and have informed this study. It is, however, the third category that has direct relevance to this research project because it contains studies that have investigated the student population. It is also important to emphasise that since this research project sought to investigate the use of EIS by undergraduate nursing students, its literature review placed great emphasis on studies that have focused on medical and health sciences students, in particular undergraduate students, as their objects of analysis. There are many studies that have investigated the use of one or more EIS by the medical and health sciences students. These include, for example, studies conducted by Bachman and Panzarine (1998); Hollander (1999); Mattheos and others (2002); Ajuwon (2003); Ogunyade and Oyibo (2003); Cole and Kelsey (2004); Dørup (2004); Samuel and others (2004); Komerik (2005); Romanov and Aarnio (2006); and McDowell and Xiping (2007). Furthermore,

there are other studies that have targeted students not only from the medical and health sciences, but also incorporated students from other disciplinary subject areas. These studies have also been critically reviewed and they include, for example, studies conducted by Crawford, De Vincente, and Clink (2004) and Crawford (2006). Notwithstanding the growing body of literature on the use of EIS by medical and health sciences students, surprisingly this researcher did not find a single study that had investigated the use of EIS by medical and health sciences students in Namibia and therefore this study is indeed relevant.

It is important to note that several studies have focused their investigations on different electronic information services and resources. While some studies, for example, the studies conducted by D'Esposito and Gardner (1999); Lubans (2000); Cmor and Lippold (2001); Ajouwon (2003); Badu and Markwei (2005); and Komerik (2005) have placed a major emphasis on the Internet as an important tool in finding information, other studies have examined a wide range of electronic information resources, including scholarly resources. These include, for example, studies conducted by Hollander (1999); Baruchson and Shor (2002); Rowley and others (2002); Appleton (2004); Ali (2005); Urquhart and others (2005); Crawford (2006); and McDowell and Xiping (2007).

With regard to the use of various EIS by students, there appear to be a disparity between different educational institutions. Obviously, students from educational institutions that are poorly equipped with modern information technology (IT) are definitely disadvantaged as far as the provision and use of EIS are concerned. Referring to the IT

challenges faced by remote educational institutions, Lancaster and others (1998:4) have argued that institutions that are located in a remote area are usually characterized by limited resources and often their students may not have computers at home. It thus appears that the problem of limited ICT resources and facilities is still prevailing at some universities and colleges, particularly in the developing world.

The literature has shown that students in institutions with poor IT facilities cannot fully benefit from EIS. For example, a study that has investigated the use of EIS at academic and research institutions in Tanzania found a very large number of students (78%) who reported to have access problems to EIS because of inadequate computer facilities (Manda, 2005:280). This finding is very interesting to this researcher since the UNAM Northern Campus, the site of this study, is also located in a remote area of Namibia and the majority of nursing students surveyed come from communities with poor ICT infrastructures and facilities.

Moreover, it appears that older students are sometimes disadvantaged with regard to EIS usage because of poor background in computer skills, and Waldman (2003) has argued that because older and returning students may not have had as much exposure to modern IT, they are likely to experience problems with using computers. It should however be emphasized that the use of EIS by students is influenced by many factors. These include not only the necessary skills but also individual interests, availability of computers as well as the realisation of the benefits that can be derived from the use of the various EIS. Many researchers have examined these factors and several other aspects related to the use

of the various EIS by the student population. The section that follows critically reviews the findings reported in the previous studies in relation to the research questions raised by this study (cf. 1.6).

#### **2.4.2 Extent of use of the various EIS by the student population**

The findings of several studies suggests a wide variation in the extent and level of the use of EIS among the student population and as expected, this variation is primarily being manifested in students of different disciplinary subject areas. In their review of several studies related to students' use of EIS, Griffiths and Brophy (2005:543) have observed that patterns of use of electronic information services and resources varied widely among students in different courses. Similarly, a study that compared the use of selected scholarly electronic databases between students in engineering, humanities and social sciences programmes at the University of West Indies has concluded that social sciences students had made the most use of the electronic databases (Ramlogan and Tedd, 2006:38). However, with regard to the use of the Internet, the same study found that the most frequent Internet users were engineering students when compared to social sciences students (Ramlogan and Tedd, 2006:35). These findings clearly demonstrate that the extent of students' use of the various EIS varies not only according to the specific disciplinary subject area but depends also on the type of electronic information resource and tool being used by a student.

It is therefore important for researchers in Library and Information Sciences (LIS) to understand the several factors that have an impact on the extent of use of EIS. Whitmire

(2002:637) has stressed that "... a one-size-fits-all model of delivering academic library services is not advisable because the failure to recognize distinctive disciplinary differences in information-seeking behaviour patterns will favour some groups, and result in an underutilization of academic library services by other groups". The above statement has practical implications for policymaking, planning, and the provision of library and information services. The recognition of the variations in terms of users needs would help libraries to design appropriate services taking into account the needs of different categories of users.

Some of the studies provided further evidence to suggest that the extent of the use of EIS varies even within the nursing discipline itself. For example, Dee and Stanley (2005:215) found that while 96% of nursing students they investigated used the Cumulated Index to Nursing and Allied Health Literature database (CINAHL), only 4% of clinical nurses used this resource and whereas the MEDLINE database was used by 40% of the nursing students, again only 4% of clinical nurses used it. The reason for this huge difference could, however, be attributed to the fact that unlike nursing students, clinical nurses may be inhibited by time constraints rather than their ability or need to use EIS.

It is widely recognised that MEDLINE is one of the most valuable databases for medical and health sciences students and the literature reveals mixed results with regard to the use of this important database. While Ogunyade and Oyibo (2003) found that only 24% of the students they surveyed at the University of Lagos in Nigeria have used MEDLINE, Crawford (2006:36) has noted the MEDLINE database was among the top most

frequently used electronic databases by undergraduate students at the Glasgow Caledonian University. In spite of the mixed results, it appears that the majority of students in medical and health sciences programmes would use the MEDLINE database if they are given training to effectively search this database.

As far as the frequency of use of electronic databases by medical and health sciences students is concerned, the results from the literature appear to be consistent, especially in developed countries. For example, Romanov and Aarnio (2006) have revealed that 32% of the medical and 24% of the dental students in Finland searched the MEDLINE database for academic information twice or more on a monthly basis. De Groote and Dorsch (2003:234) reported similar results in the United States of America (USA) and specifically noted that approximately 41% of nursing students, compared to about 38% of medical students searched the MEDLINE database on a monthly basis. Similarly, Dee and Stanley (2005:215) found that 33% of nursing students at the University of South Florida used several electronic databases on a monthly basis. These findings appear to suggest that students in the developed countries make more use of their library's electronic databases and this could be ascribed to better EIS facilities and infrastructure. Another possible explanation would be that students in the developed countries might have gone through advanced training in the use of EIS.

In addition to electronic databases, another important electronic information resource that has existed for a long time in academic libraries is the Online Public Access Catalogue (OPAC). The OPAC is important because it points the library users to the location of

documents within the library's collections. The literature again reveals mixed results with regard to students' use of OPAC systems. For example, Rowley and others (2002:118) have observed that the OPAC was used consistently by the student population in the UK. Waldman (2003) found similar results in the USA and has reported that 36% of students at Baruch College Library were regular users of the OPAC. In contrast, the EDNER (Evaluation of the Distributed National Electronic Resource) study has suggested that relatively few students (10%) used the OPAC systems in their respective universities and colleges (EDNER, 2002:1). This finding is consistent with the results of another study that focused on students in further education in the UK, which indicated that their use of the OPAC is comparatively low (Urquhart and others, 2005:353). It is surprising to note that so many students are not fully utilizing the OPAC systems at their libraries because the modern OPAC systems have many other useful features beyond that of document locating device. Other key features of modern OPAC systems include, for example, electronic reserve collections, renewal and reservation of library materials as well as student records. It is thus reasonable to argue that if these new features are promoted, the use of the OPAC by students might increase.

In general, however, it seems that the student population in developing countries is not making effective use of all the EIS. For example, Samuel and others (2004) found that medical students in Tanzania possessed a low level of ability to use ICT facilities. This compares well with the results of Ajuwon's study that has assessed computer skills among the nursing students at the University College Hospital, Ibadan in Nigeria. This particular study has specifically concluded that the "first year clinical and nursing

students have not fully utilized the opportunities that the use of computer and Internet offer for medical education” (Ajuwon, 2003). This could be explained by the fact that over half of these students (58%) at this university were found to be computer illiterate (Ajuwon, 2003). As illustrated in the conceptual framework of this study (cf. figure 2.1), there is a clear relationship between computer literacy and EIS use. It can thus be argued that being computer illiterate is one of the major constraints that hinder students to effectively use EIS.

It should, however, be noted that the low level of EIS usage among the student population can also be attributed to several other factors such as the lack of skills, problems related to computer access, poor publicity and time constraints. Computer and information skills are, however, very important factors that have a major influence on the students’ ability to effectively use electronic information services and resources. It is therefore reasonable to argue that computer skills are important factors that determine whether students do or not use the various EIS, particularly the electronic library resources (ELR). Dee and Stanley (2005:217) have noted that the nursing students who were skilled and comfortable with using computers were the ones who made the most use of electronic databases, while the less skilled students tended to go for the easier-to-use Internet. There is thus a necessity to prioritize information and computer training programmes for students, as this will afford them the opportunity to broaden their skills and experiences in using the various EIS. It is equally important to intensify promotional activities in order to trigger interest in students to use these resources.

### **2.4.3 Electronic information services that are used the most by students**

With regard to which of the electronic information resources students use the most, the literature provides evidence to suggest that the Internet tops the list. For example, the EDNER report noted that the majority of students preferred the Internet search engines as their first choice to meet their information needs (Brophy and others, 2004:11). Ramlogan and Tedd (2006:35) found similar results and have specifically noted that 68.5% of the undergraduate students they investigated used the Internet daily and only less than 10% did not use the Internet. Urquhart and others (2003:8) reinforce these findings and have reported that 64% of the students they investigated preferred using the Internet search engines compared to only a relatively few (9.3%) who favoured searching many of the bibliographic databases available on their library's intranets. It seems therefore that most students hold a positive attitude towards the Internet because they think it is easy to use. For example, Brophy and others (2004:12) quoted a student who said that "using Google to search an article could be easier and quicker than using library resources". Another student at Duke University was quoted by Lubans (2000) as saying that "any courses that I have to do research, I usually start my research at the Net".

The above findings clearly testify to the fact that the Internet is highly regarded by undergraduate students. This is not surprising because the Internet is a powerful tool that allows students easy access to up-to-date information that could be relevant to their academic and personal information needs (Dee and Stanley, 2005:217; Komerik, 2005). It appears, however, that even if the Internet provides up-to-date information, less experienced students often become frustrated when they have to sift through a large

number of hits that are usually retrieved from a single search. In other instances, students end up not getting the information they were looking for, although they have actually spent a lot of time searching the Internet. Unfortunately this experience defeats the whole purpose of benefiting from the Internet.

It is therefore important for students to be mindful of the fact that, in spite of its popularity over other electronic information resources, the Internet ought to be used cautiously and Lancaster and others (1998) have warned that the Internet also “creates the potential for academic disasters as students tend to misinterpret, misrepresent and misuse [the Web-based] information”. This powerful statement by Lancaster and others is indeed a major concern in tertiary education, and both academics and librarians have expressed great concern about students’ abilities to evaluate the information they find on the Internet. For example, Herring (2001:251) has asserted that academic librarians at the Alabama Institutions of Higher Learning have observed that students often use the Web inappropriately and seem not to be aware of its drawbacks, failing to recognize issues of reliability, validity, and credibility. Moreover, in her analysis of how lecturers rate students’ skills to use EIS for academic purposes, McDowell (2002:261) echoes this point and has stated that

“many doubts were expressed about student use of the unregulated electronic information resources of the Internet and the Web. There are few restrictions on anyone who wishes to create a Web site and sites may contain poor or misleading information which, crucially, students may not be able to determine”.

It is thus important to emphasize that in order to make optimal use of the Internet as a research tool, undergraduate students need to possess critical thinking and evaluation

skills that would enable them to effectively distinguish between quality and misleading information they find on the Web.

Another major concern being raised by both lecturers and librarians in educational institutions is the possibility of plagiarism. Comor and Lippold (2001) have specifically noted that “students do not bother to determine the quality [of the Web-based information], they cut and paste”. These valid concerns call upon librarians and academics to assist students by guiding and teaching them appropriate skills in order to cautiously use EIS, particularly the Internet. Such training should include not only searching skills, but also evaluation skills of information on the Internet as well as ethical issues regarding the use of information.

It appears that the ability to recognize quality information is one of the important academic conventions that most of the undergraduate students are struggling with, especially for information in electronic environments. This situation can be attributed to the fact that many students lack the necessary skills to determine the accuracy of information they find on the Internet. It is encouraging however to note that the OCLC’s study has reported that some of the students it investigated believed that the Web falls short of delivering accurate information (OCLC, 2002:4). It is equally interesting to note that another study conducted at Duke University in the USA found that the first-year students hold a balanced view about the accuracy of the Web-based information (Lubans, 1998). These findings are positive developments because, as stated earlier, the

indiscriminate use of Web-based information by undergraduate students is one of the major concerns being persistently expressed by academics and librarians.

It is understandable though that many academics and librarians continue to express concern about students' use of the Web. This is so because a significant part of information available on the Web does not go through the peer-reviewed mechanism traditionally applied in academia. The Web, therefore, contains too much low quality information due to self publishing. Hodson-Carlton and Dorner (1999) have argued that "information from the Internet, which has not established a reputation for validity, requires advanced evaluation skills". In order to reduce the effect of this problem, McGuigan (2001:42) recommends that library instruction programmes should alert students to the difference between filtered and unfiltered information on the Web. It should therefore be stressed that if students lack the skills related to evaluating information, they are likely to face difficulties in determining the quality and accuracy of information on the Web.

As mentioned earlier, there is thus an urgent need to equip students with a wide range of skills related to information literacy, computer literacy, ICT literacy and the use of EIS as advocated in the conceptual framework of this study (cf. figure 2.1). Without the appropriate skills to use EIS in an effective and efficient manner, students are likely to waste their limited time surfing through an overwhelming amount of information available in EIS, particularly on the Internet. To solve this problem, Urquhart and others

(2005:352) have recommended that students should be directed to the Web sites that are relevant to their studies as this would avoid wasting their time.

It is evident from the above discussions that there are serious limitations in relying solely on the Internet to search for academic information. Yet, these limitations do not appear to deter students to resort to the Internet as their first choice in obtaining information for whatever purpose. Crawford's study points to this fact and specifically noted that 607 Web sites, compared to 228 databases were reported by students to be useful for their studies, "showing a continuing preference for Web searching over database searching" (Crawford, 2006:36). Cmor and Lippold (2001) have suggested that students need "guided experiences for engaging with [the] Web information in structured ways that support learning, and develop critical thinking skills". The skills needed to effectively search the Internet are therefore critical for today's nursing students during their studies and beyond.

It is also worth noting that some studies have indicated that students' reliance on the Internet diminishes as they progress from one academic year to another. For example, a recent study that has investigated the use of EIS at the Glasgow Caledonian University found that 38.4% of first year students, compared to 18.5% of fourth year students relied heavily on the Internet for their academic information and only a few (1.6%) advanced students used the Internet on a regular basis (Crawford, 2006:35). In Finland, Romanov and Aarnio (2006) found similar results and has noted that only a small number of students in their fifth- and sixth-years were using the Internet on a regular basis. The

reasons for the reduction in the extent of students' use of the Internet as they progress towards the final year of their studies remain unclear. But it is reasonable to assume that increased awareness of other electronic resources, which are far more scholarly in nature, could be one of the reasons for the students' reluctance to continue to rely on the Internet for academic information. Another possible reason could be that students in their final year are usually required to write dissertations or relatively advanced projects, which in turn put them under pressure to consult widely from a diverse range of scholarly electronic information resources. McDowell and Xiping (2007:33) has evaluated ICT competencies among nursing students in the USA over a period of eight years and found that students' abilities to search bibliographic databases improved significantly as they progress from the first academic year to subsequent years. It should, however, be noted that the students preferences of one electronic resource over another differ due to various factors, which is the subject of the next section.

#### **2.4.4 Factors influencing students' use of EIS**

The literature review has indicated that there are a number of factors that influence students to use the various EIS. A recent study by Urquhart and Rowley (2007) identified general macro (organizational) and micro (individual) factors that influence student information behaviour. They have stated that the micro factors are "information literacy, search strategies, academics' information behaviour, discipline and curriculum, pedagogy, and support and training" (Urquhart and Rowley, 2007:1191). In contrast, the macro factors are "information resource design, information and learning technology

infrastructure, access, organizational leadership and culture, and policies and funding” (Urquhart and Rowley, 2007:1193).

It is clear from the above quotation that while the macro-factors involve general influential aspects that students cannot directly control, most of the micro-factors relate to several aspects that students can, to a large extent, influence.

Many studies have also revealed several other micro-factors that influence students to use EIS. One of the predominant factors that inspire students to use EIS is a recommendation by their lecturers, librarians, other students and friends (Tenopir, 2003a; Urquhart and others, 2003:13; Ramlogan and Tedd, 2006:38). It appears, however, that lecturers are the ones who exert the greatest influence on students to use EIS. For example, in their analysis of several studies, Griffiths and Brophy (2005:543) have noted that “academic staff exerted a greater influence over undergraduate and postgraduate use of electronic information systems than library staff”. Another survey conducted under the JISC Usage Surveys: Trends in Electronic Information Services (JUSTEIS) project in the UK has specifically reported that recommendations by lecturers influenced 23.1% of students, compared to 16.8% who were influenced by friends or colleagues (Urquhart and others, 2003:13). Holley and Powell (2004:48) have, in turn, revealed that “only 18% of the students had learned about electronic resources from library publicity or librarians, compared to 40.7% who found EIS by themselves and 38.3% who were informed by professors.

The above findings are, however, not unexpected because it is obvious that in any tertiary institution the lecturers are the people who have regular contacts with students. Thus this researcher wishes to argue that it is highly likely that the lecturers-students relationship would be much stronger as opposed to, for example, the librarians-students relationship. It is therefore essential for lecturers and/or tutors to play a major role in motivating their students to use EIS. This can be achieved by including references to documents from electronic resources in students' projects and assignments, and also by encouraging them to seek assistance from librarians. Rowley and others (2002:120) found that instructions which direct students to use specific electronic information resources in their projects and assignments are the significant drivers in improving their experience. Moreover, academics from the College of Health and Human Services (CHHS) at Southeast Missouri State University have observed that "integration of materials from the Internet as a classroom requirement has resulted in increased students interest and creativity and enhanced student research efforts" (Lancaster and others, 1998).

It should, nevertheless, be pointed out that because of their information skills, librarians can play a key role in helping the students to search and successfully obtain relevant information from the various EIS. Yet, it seems that many students tend to ignore librarians and instead rely heavily on their classmates when they need assistance related to the use of EIS. A study that focused on the Web-based information habits of college students in the USA has, for example, revealed that 61% of students relied upon their friends or classmates for the assistance related to searching for information on the Web, compared to only a relatively few (21%) who would ask librarians (OCLC, 2002). It is,

however, not advisable for students to rely solely on their friends and classmates for the assistance they need when they experience problems with EIS because they would deny themselves an opportunity to benefit from the more skilled librarians. Dee and Stanley (2005:217) attributed a high usage of electronic databases by the nursing students to the fact that they were trained by librarians to search these databases. This researcher thus argues strongly that in order for students to improve their experiences in using the various EIS, they should seek assistance not only from their friends but also from librarians and teaching staff.

Other influential factors that motivate students to use the various EIS include convenience, awareness of EIS, availability of computers, searching skills, as well as time available. In her review of the literature, Tenopir (2003b:45) has concluded that students base their decisions to use a particular EIS upon convenience. Another study that measured the use of online journals and databases at Peoria Health Sciences Library of the University of Illinois has reported that students considered awareness and convenience as important factors when selecting whichever information resources to use (De Groote and Dorsch, 2003:237). On the other hand, a study conducted in Tanzania has concluded that access to computers has a major influence on the students' use of the various EIS (Manda, 2005:272).

In addition, as stated earlier, information retrieval skills have a major impact on the students' ability to use EIS. The skills that students require to effectively find information in electronic formats are very important because without such skills, students would not

be able to use the EIS in a meaningful way even if they are directed and encouraged to do so. Ramlogan and Tedd (2006:38) found that “students recognize the importance of search skills when using the electronic information sources”. Similarly, Romanov and Aarnio (2006) have reported that information searching skills and general computer literacy were some of the major influential factors which motivated the medical and dental students to use the MEDLINE database. It should however be realised that electronic databases are much more difficult to search and hence require advanced searching skills. It is thus important for librarians to train students on how to effectively formulate search queries.

Another influential factor that has a major effect on students’ use of the various EIS is time constraint and as a result, they rush to the Internet at the expense of the scholarly databases. Lubans (1998) has, for example, reported that over half of first year students at Duke University indicated that the Web saved them time when searching for information. An interesting factor that has received little attention from researchers is self-efficacy. Waldman (2003) has noted that self-efficacy is another key factor that influences students to use the library’s electronic resources. According to Bandura (1997, quoted by Waldman, 2003), “self-efficacy is part of an individual’s beliefs in one’s capability to organize and execute the course of action required to manage prospective situations”. Waldman’s study has concluded that students who did not experience many problems in using the library’s electronic resources had higher self-efficacy scores as compared to those who considered electronic resources to be difficult to use (Waldman, 2003).

A better understanding of the factors that influence students to use EIS is an important objective of this study. This researcher believes that understanding these factors would guide both librarians and academics at the UNAM Northern Campus to better plan and accordingly develop strategies that would motivate the nursing students to effectively use EIS and ultimately benefit from the various EIS that are available. Another aspect that was investigated by this researcher is the purposes for which the nursing students at the UNAM Northern Campus used the various EIS that are available to them. The next section reviews the literature in relation to this important aspect of EIS usage.

#### **2.4.5 Purposes for which students use EIS**

There has been great interest among researchers in the Library and Information Science (LIS) field to examine the purposes for which the student population uses the various EIS. For example, Lubans (1998); Baruchson-Arbib and Shor (2002); Ogunyade and Oyibo (2003); Urquhart and others (2005); and Crawford (2006) have analysed the purposes for which the undergraduate students used the various EIS. The great interest in understanding the purposes for which this population uses the various EIS is not surprising because researchers, librarians and administrators in institutions of higher learning would like to determine whether the investments made in the acquisitions of EIS are justifiable. As Hewitson (2002:44) has noted “as EIS becomes more central to the information sources provided by academic libraries, there is a need to evaluate as to what extent these services are offering value for money”. This is also one of the reasons why this researcher was interested to discover the purposes for which the nursing students at the UNAM Northern Campus used the various EIS.

The literature has shown that students used the various EIS for many purposes. With regard to the Internet, Cmor and Lippold (2001) have revealed that students used the Web-based information for everything. A study that examined the perceptions of students towards the Internet at Monmouth University in the USA has specifically observed that “in their free time, students used the Internet for a variety of functions, including communicating with and locating friends and relatives, downloading music, and locating information about various subjects, for example, performance schedules, sports, courses, scholarships, stocks, and consumer issues” (D’Esposito and Gardner, 1999:458). Another study conducted in the UK has reported that students searched the Internet for a variety of reasons including shopping and the use of online catalogues to check various products, including electronic products (Urquhart and others, 2005:355). It was also reported, in a recent study at the Glasgow Caledonian University, that 84.5% of students used the Internet for their studies (Crawford, 2006:35). This finding concurs with Wang and Artero (2005:74) who also revealed that about 88% of the students they surveyed made use of the Web to access information relating to their studies.

Electronic mail (email) also features prominently among the reasons for which the student population uses the Web-based services, and it has become one of the important communication mediums used by students. The literature suggests that many students used the email facility for social reasons. For example, a study of Internet use among students and academics at the University of Ghana found that a high proportion of students (45.7%) used email for social reasons, compared to only 26.7% students who used it for educational purposes (Badu and Markwei, 2005:264). It thus appears that

students would only use the email to communicate with their lecturers about issues that are pertinent to their studies and they use it to communicate with their friends and relatives for a variety of purposes.

As far as the library's electronic resources are concerned, the literature has revealed that students use them to obtain information for their studies. A study conducted at the University of Lagos reported that the medical students used the MEDLINE database for a variety of educational activities, including "research 24%, preparing for examination 22%, preparation of assignments or clinical cases 26%" (Ogunyade and Oyibo, 2003). Baruchson-Arbib and Shor's study (2002:256) also found a high proportion of students (40.7%) who used EIS for academic purposes, compared to only 10.3% who used EIS for personal purposes. Tenopir (2003a:616) has however stated that "even within the realm of digital resources, a majority of undergraduate students seem to choose Web sites or digital resources that include full text often without regard to how appropriate the source is for their assignments". Herring (2001:257) has recommended that "a special emphasis should be placed on effective search techniques and evaluation skills focusing on quality criteria ...". It is therefore important, as stated earlier, that librarians and academic staff should intensify their efforts that are aimed at developing students' skills related to the evaluation of information stored in electronic formats.

In general it seems that the purpose why a particular student needs specific information will to a large degree determine his / her choice of using a specific electronic information resource. Hence, it is unlikely to find a student searching a scholarly database such as the

EbscoHost database for non-academic information. It is thus reasonable to assume that most students would search the Internet for a variety of information, but would restrict their use of library's electronic databases to searching for information of an academic nature. It should further be noted that there are a number of barriers that impede students to effectively use EIS and this is the subject of the next section.

#### **2.4.6 Barriers to students' use of EIS**

While there is a general agreement among researchers that EIS have improved access to information, there are also numerous barriers that prevent students to benefit from the various EIS. Among these are the lack of searching skills, slow Internet connectivity at some educational institutions, shortages of computers and limited access to information technology (IT) facilities. Urquhart and others (2005) have highlighted a number of other factors that prevent students from using EIS. These include, for example, "difficulties [in] finding information, information overload, and lack of confidence, time constraints, and the slowness of the network" (Urquhart and others, 2005:352). In addition, in their review of literature Holley and Powell (2004:44) have noted that "the reasons most often given by students for not using electronic resources [are] related to access problems and relevancy of the material".

Several other researchers, for example, Ray and Day (1998); Rowley and others (2002); and Badu and Markwei (2005) have observed that the difficulty experienced by students to find relevant information from EIS is one of the key factors that prevents students from enjoying the benefits offered by the various EIS. These difficulties are mainly attributed

to the lack of searching skills among the student population. Baruchson and Shor (2002:257) offer one way of solving this problem and have suggested that “more efforts need to be made to increase library instruction on the use of electronic information sources”. It should be emphasized though that library instruction should not only focus on improving the searching skills among students but it must also be developed in such a way that it sharpens their abilities to become critical thinkers. Manda (2005:279) found a positive relationship between EIS training and the extent of their use and has specifically noted that 70% of the respondents who were trained were regular users of the electronic resources compared to 64% who were not using the electronic resources because they were not trained. It is therefore not surprising that many researchers have urged librarians and academics to develop training programmes that will improve the students’ information literacy, computer literacy and ICT literacy skills. It is equally important for lecturers to continuously direct their students to use EIS appropriately. This will not only encourage students to use EIS, but will also expose them to the various EIS and ultimately increase their experiences of using EIS.

As stated earlier, it has been reported that time constraint is a major hindrance that affects students’ use of EIS. For example, Dee and Stanley (2005:216) have revealed that insufficient time was reported by nursing students and clinical nurses to be key barriers that impeded them to search electronic databases. Another study that examined the use of electronic books at the Edge Hill College of Higher Education in the UK has reported that midwifery students considered the use of electronic books to be “far more time-consuming than using printed books” (Appleton, 2004:248). The time factor comes into

the picture because often students are required to invest adequate time in order for them to retrieve relevant information from EIS. In some cases students do not know how to formulate search strategies, while in other cases the speed of the network, which has major implications for an effective operation of EIS, is slow. Obviously, in both these cases more time will be needed to conduct successful searches from EIS. Manda (2005:274) has observed that Internet connectivity was a major impediment to effective access to electronic resources in a number of Tanzanian academic institutions. The problem of access to electronic resources is likely to demoralize students because they are usually not prepared to spend a lot of time searching EIS due to other commitments. The literature also indicated that another major impediment to the students' use of EIS is the lack of awareness of what electronic information services and resources are available to them. For example, Holley and Powell (2004:55) have noted that almost 40% of the students at Wayne State University were not aware of the electronic resources that are available to them. This finding suggests that libraries need to continuously promote the various EIS to their users.

It is evident from the above discussion that there are many barriers that prevent students from effectively using the various EIS. It is therefore important for librarians to understand the difficulties and problems which students are facing in using EIS as this will help to develop the necessary strategies to improve EIS usage. Despite the barriers highlighted above it seems that most students regard EIS as useful resources of information and the section that follows discusses students' perceptions of EIS.

#### **2.4.7 Students' perceptions of EIS**

The perception that students have of EIS is another important aspect that has received a great deal of attention from many researchers. It was also important for this study to gain a better understanding of how the nursing students at the UNAM Northern Campus perceive the various EIS that are available to them. This researcher believes that the level of students' perceptions of EIS will, to a large extent, determine the extent of their use of EIS.

A review of the literature has revealed mixed results regarding the students' perceptions of EIS. There is, however, sufficient evidence to suggest that many students consider EIS as extremely useful resources in terms of locating information they need for both their studies and other purposes. Ray and Day (1998) have, for example, found that 21.1% of the students they investigated had a positive attitude towards EIS and felt that these resources are useful because they offer fast access to information, and only 16.4% of these students felt that it was time consuming to use EIS. These results are consistent with findings of Crawford (2006:36) who has revealed that 66.3% of students he investigated regarded EIS as very useful, compared to only a few students (0.5%) who thought to the contrary. These results clearly illustrate that a large proportion of students consider EIS to be extremely useful sources of information.

At the moment, however, it appears that when considering the various EIS, the Internet is considered by many undergraduate students as being the most important source of information. For example, Badu and Markwei (2005:266) found that 49.6% of the

students at the University of Ghana regarded the Internet as a very useful tool, compared to only 8% who reported that the Internet is not very useful. This particular finding suggests that most students attach great importance to the Web. Another study has, however, reported an academic staff member who commented that “many students believe that research begins and ends with only what is on World Wide Web (WWW), which is most untrue” (Herring, 2001:256). It seems that most of the undergraduate students prefer the Internet search engines because they believe that search engines would satisfy all their information needs. Griffiths and Brophy (2005:552) have however cautioned that “while the preference for very simple search engine approaches is prevalent, it is important to note that this does not mean that students are necessarily best served by this approach”.

In addition to the Internet, other electronic resources such as electronic databases and OPACs were also reported by students to be useful sources of information. Appleton (2006) who has rightly distinguished between the Internet and electronic library resources (ELR) has reported that “students were able to state confidently that they thought the standard of their work had improved throughout their study, the more they made use of ELR” (Appleton, 2006:628). Holley and Polley (2004:56) found similar results and concluded that the students they investigated were generally satisfied with the library’s electronic resources.

Although it seems that students’ populations worldwide are generally satisfied with EIS, it should be stressed that there is a great need to promote the use of all the electronic

information services and resources. This is important because, as mentioned earlier, the literature has shown that most students prefer the Internet over the other electronic information resources such as the OPAC systems, electronic journals and databases. Therefore, in order to reverse this trend, libraries need to intervene by promoting the less used EIS. Equally important is a need for lecturers to continuously encourage students to consult a wide range of information sources as part of their assignments and projects.

#### **2.4.8 Research methodologies used in previous studies**

With regard to research design and methodology, a review of the literature has revealed that both quantitative and qualitative approaches have been employed and several studies have thus used a wide range of methods to collect the data pertaining to the various aspects of EIS. In her extensive review of the literature about the use and users of electronic library resources, Tenopir (2003b:2) has observed that studies use a variety of research methods, including observation, surveys, interviews, experiments, and transaction log analysis. The mixed methods approach whereby a variety of data collection instruments are employed is becoming popular and is increasingly being used by many researchers. These researchers include, for example, Rowley and others (2002); Banwell and others (2004); Crawford, De Vincente and Clink (2004); Ali (2005); Dee and Stanley (2005); Manda (2005); Urquhart and others (2005); and Ramlogan and Tedd (2006).

It is, however, not unusual to employ a single instrument to collect research data related to EIS usage, especially for small scale and cross-sectional studies. It is usually the

research problem of a particular study that would greatly influence the researcher's choice of a particular research method. Moreover, other factors such as the availability of time and financial resources will also have a major influence on the researcher's decision to either employ a single or mixed methods approach. It is therefore not surprising that some researchers have employed a single instrument, notably the self-administered questionnaire, to collect the data for their studies. These researchers include, for example, Ajuwon (2003); Ogunyade and Oyibo (2003); Waldman (2003); Holley and Powell (2004); Samuel and others (2004); Badu and Markwei (2005); Komerik (2005); Crawford (2006); and McDowell and Xiping (2007).

It is also interesting to note that some researchers, for example, Lubans (2000); De Groote and Dorsch (2003); Dørup (2004); and Romanov and Aarnio (2006) have used the online survey method, whereby a Web-based questionnaire is distributed electronically to the respondents. It should, however, be pointed out that online surveys have a major limitation in the sense that students who are not users or who make less use of EIS could be left out, which raises the possibility of not getting their views, unless the study's objectives are only confined to heavy users of EIS. In their Web-based survey that investigated the use of electronic scientific information resources among the medical and dental students at the University of Helsinki in Finland, Romanov and Aarnio (2006) acknowledge this limitation and have stated that their "result may overestimate the usage of electronic resources by students, since the low-users of electronic resources may be under-represented ...". However, as stated earlier, every researcher will take into

consideration a number of factors before making a decision about what approach or research methodology suits his or her particular study.

## **2.5 Summary of the review of the literature**

From the review of the literature it clearly emerged that the definition of EIS is not consistent, and this would explain why several researchers have formulated their own definitions to apply to their particular studies. It is equally important to note that numerous terms have been used interchangeably to refer to resources of information in electronic formats. Some researchers have, however, made a clear distinction between electronic information services (EIS) and electronic library resources (ELR). While the former has been defined to include almost all services that provide information via electronic formats, the latter has been defined to include strictly electronic resources that are acquired through library subscriptions, such as CD-ROMs, electronic databases and journals, but not the Internet.

With regard to the actual use of EIS, the review of the literature has clearly shown that university and college students are increasingly using the various EIS to meet both their academic and personal information needs. There is thus no doubt that the various EIS are increasingly becoming popular sources of information among the student population worldwide. Several studies have revealed that the extent of EIS usage among the student population varies widely mainly because of the different subject areas of studies. Moreover, there is a general agreement from previous studies that the Internet search engines dominate EIS usage and other EIS such as electronic databases, OPACs and e-

journals were found to be less used by the student population, in particular undergraduate students.

It is unfortunate to note that most students were making infrequent use of scholarly electronic resources, which are primarily meant to meet their academic information needs. It emerged however that many students were not using EIS because they either lacked the skills or they were not aware of the EIS available to them. It further emerged from the literature that the other major impediments to students' use of EIS include computer access-related problems, lack of encouragement by lecturers and librarians, and time constraints.

The literature further revealed that students used EIS for a variety of purposes. The need to complete projects and assignments is one of the main purposes for which most of the students used the various EIS. Other students used the EIS for personal needs, for example, to search for employment opportunities, shopping and entertainment. With regard to the students' perceptions of the various EIS, the literature suggests that the majority of undergraduate students hold a positive attitude towards the Internet.

With regard to research designs and methodologies, the literature suggests that a mixed-method approach is increasingly being used by many researchers and has proved to generate rich data. It should, however, be noted that EIS vary widely and are very complex in nature. In addition, the pace of technological development is moving fast in an unpredictable manner. In turn, this affects the use of EIS, since sometimes searching

features also tend to change. Consequently, this would also affect the research methodologies used to investigate the various aspects related to the use of EIS. However, attempts are being made, notably in the UK, to establish the best research methodologies that would address several aspects related to the use and users of EIS in higher education.

## **CHAPTER THREE RESEARCH DESIGN AND METHODOLOGY**

### **3.1 Introduction**

As stated earlier in chapter one, the purpose of this study was to describe the use of electronic information services (EIS) by undergraduate nursing students at the University of Namibia's (UNAM) Northern Campus. This chapter, therefore, presents the methods used by the researcher when he conducted the empirical study.

The chapter starts with a general discussion relating to the concepts of research design and methodology. The chapter then discusses the survey research method used by the study and justifies the reasons for adopting that particular method. It further examines the concepts of validity and reliability within the context of this study. The chapter concludes with several aspects relating to the research techniques and tools that have been employed by this researcher in collecting the necessary data. These aspects include the population of the study, sampling methods and sample size, the instruments used to collect the data, and the pilot study conducted to test the instruments used in the collection of the data.

### **3.2 Research methodology**

Some researchers have often used the terms research design and research methodology interchangeably. It is, however, also possible to distinguish between these two important terms in research as can be seen from Babbie and Mouton's (2001) clear distinction. They have defined research design as a plan or blueprint of how one intends to carry out

the research project and argued that research methodology “involves the actual process of research and the types of techniques and tools to be used” (Babbie and Mouton, 2001:74-75). It is thus clear from the above that while a research design is concerned with the broader perspective of the research project and provides guidance to the researcher to address the research problem, research methodology is much narrower in scope because it focuses on the specific procedures and tools that are employed to facilitate the data collection process.

In order to address the research problem of this study, the researcher has chosen a mixed-methods approach as the most appropriate research method. A mixed-methods approach involves the use of multiple research strategies in the collection of data to address a particular research problem. Another term that is commonly used to describe the use of multiple strategies in the collection of data is triangulation. According to Babbie (1995:105-106) triangulation “involves the use of several different research methods to test the same finding”. These research methods could be quantitative and/or qualitative depending on the objectives of the study and the nature of the data that are required to address a research problem. Liebscher (1998:673) supports the use of multiple research strategies in Library and Information Science (LIS) research and has argued that “because many phenomena in LIS are highly complex, it makes sense to employ multiple perspectives to expand understanding”. He has thus urged LIS schools and departments to teach both quantitative and qualitative methods in Masters Programmes, emphasizing that “researchers are beginning to recognize that resorting to a single methodological

paradigm in LIS research does not provide the understanding needed to design and maintain effective services" (Liebscher, 1998:670).

It appears though that the above suggestion has not fallen on deaf ears. As noted earlier in chapter two, many researchers who have investigated one or more aspects related to the use of EIS by students and other categories of users have also adopted the triangulation technique in collecting their data. In their study of user behaviour in relation to EIS in the United Kingdom (UK), Rowley and others (2002) echoed this observation. They have noted that "the existing methodology uses an array of quantitative and qualitative approaches to lend a variety of different kinds of insights into user behaviour in EIS" (Rowley and others, 2002:115).

There is no doubt that the use of triangulation offers many advantages, such as, that it allows the researcher to overcome the weaknesses associated with each single method of data collection. Jick (1983:138) stresses this point and has argued that "the effectiveness of triangulation rests on the premise that the weaknesses in each single method will be compensated by the counter-balancing strengths of another". He further stated, in relation to triangulation, that "it can also capture a more complete, holistic, and contextual portrayal of the unit(s) under study" (Jick, 1983:138). Punch (1998:247) adds another advantage and has asserted that "the results of a qualitative investigation might be checked against quantitative study and the aim is generally to enhance the validity of the findings". It is, nevertheless, imperative to realise that no data collection method is superior to the other. The choice of research design and a particular data collection

method will depend on various considerations. As mentioned earlier, these include, for example, the purpose and objectives of a study, the questions raised by each particular study, the size of the target population, and the availability of adequate time and finance.

The nature of the problem addressed by this study necessitated gathering both quantitative and qualitative data. According to Punch (1998:61) quantitative data are concerned with information about the world in numerical form, while qualitative data entails information about the world in the form of words. A questionnaire was mainly used to collect the quantitative data, and interviews were primarily used to gather the qualitative data for this study.

### **3.3 The survey method adopted by this study**

As stated above, the researcher has used a survey design and employed a mixed-methods approach in order to address the research problem of the study. According to Powell and Connaway (2004:83) “the word survey literally means to look at or to see over or beyond or, in other words, to observe”. In research context, however, a survey is defined by Baker (1988:165) as “a research method of collecting data in which a specifically defined group of individuals are asked to answer a number of identical questions”. The survey is generally regarded as one of the most frequently used research methods by social science researchers (Babbie and Mouton, 2001:230) to investigate contemporary issues, phenomena and events (Powell and Connaway, 2004:83).

For many years, the survey has proved to be an appropriate research design to use to collect diverse data, and as Baker (1988:196) has argued surveys are “useful for a great range of study topics and lend themselves to wide-ranging forms of analyses”. Surveys are amongst others suitable for gathering a wide range of information related to opinions, attitudes and experiences of individuals or groups, and according to Cozby (2005:125) they “provide us with a methodology for asking people to tell us about themselves”. Moreover, the survey design has established itself as a research method that can reach a large number of respondents in the most cost-effective manner. This study covered a wide range of aspects related to students’ use of the various EIS. In addition, it studied a sizeable population, a total of 275 nursing students. It is for these reasons that the survey research was chosen as the most appropriate research design that would answer the various questions raised by this study and also reach many respondents in the most efficient manner.

With regard to time dimension, this survey follows a cross-sectional design. According to Bless and Higson-Smith (2000:66) a research design is cross-sectional “when all data are collected at the same time”. Furthermore, this survey is descriptive in nature, and Marshall and Rossman (1999:33) have stated that “the purpose of descriptive studies is to document and describe the phenomenon of interest”. Referring to descriptive surveys Gray (2004:100) has argued that “they are designed to measure what occurred, rather than why”. Bickman and Rog (1998:117) have further noted that a “descriptive research is the core of many survey research projects in which estimates of population characteristics, attributes, or attitudes are [the] study objectives”. This survey is, therefore,

descriptive in the sense that it sought to describe various aspects that are related to the use of EIS by the population of this study (cf. 3.5.1).

### **3.4 Validity and reliability of the study**

The concept of validity refers to whether the research conclusions are indeed trustworthy and valid. It is concerned with the appropriateness of the data collection instruments, as it addresses a central question of whether the instrument used in a particular study has actually measured what it was supposed to measure (Gray, 2004:90).

As already mentioned above, this study employed a questionnaire and interviews to collect the necessary data. In order to ensure the validity of the data collected through the interviews, the researcher followed the suggestion made by Gray (2004) that “in the case of structured and semi-structured interviews, the issue of validity can be directly addressed by attempting to ensure that the questions content directly concentrates on the research objectives” (Gray, 2004:219). With the assistance of the supervisor of this study, the researcher made all the necessary efforts to align the questions included in the research instruments with the research objectives listed in chapter one (cf.1.5).

With regard to the questionnaire, the researcher enhanced the validity of the instrument by pre-testing it during the pilot study (cf. 3.7). Gray (2004:207) has argued that “the validity of a questionnaire can be affected by the wording of the questions it contains”. The analysis of the responses obtained in the pilot study enabled the researcher to review the questionnaire, and as a result some of the questions that appeared to be unclear and

confusing were simplified. Moreover, the validity of the results for this study was further increased by the triangulation technique used in the collection of data. External validity refers to the extent to which results obtained can be generalised beyond the specific research project from which they were derived, that is, whether the results have “greater validity than merely for the project in which they were generated” (Mouton and Marais, 1988:51). A researcher who aims to achieve external validity should thus adopt random and representative sampling techniques to ensure that the conclusions and findings can be generalised to the defined population. The probability sampling technique adopted by this study ensured that the results could be generalised to the entire population of the undergraduate nursing students at the UNAM Northern Campus.

In contrast to validity, reliability is concerned with “whether a particular technique, applied repeatedly to the same object, would yield the same result each time” (Babbie and Mouton, 2001:119). In other words, reliability refers to whether the findings of a particular study would be consistent if the same study is conducted again under similar circumstances and using the same research design and methodology. While qualitative research methodologies are designed to be situation specific and generally cannot be repeated under similar conditions, quantitative studies by the very nature of their rigorous design lend themselves to consistency and replication. One way of overcoming the problem of attaining reliability, particularly with qualitative data, is to conduct consistency checks by comparing the results obtained with those reported in the literature, and another is to adopt a triangulated approach to collect essentially the same data by means of various methods and to compare the results (Glazier, 1992:211). The researcher

thus tried to counteract as many of the threats to reliability as possible by adopting a rigorous research design to collect the quantitative data, using a triangulated approach, and by comparing his results with findings reported in the literature.

It is clear from the above discussion that validity and reliability are very important concepts in research because they have major implications on whether the results of a particular study would be valid and trustworthy. Powell and Connaway (2004:43) have pointed out that “research is considered to be valid when the conclusions are true and reliable when the findings are repeatable”. In this respect, the researcher has taken the necessary steps as discussed above in order to ensure that both instruments used to collect data are designed in line with the key objectives of the study (cf.1.5).

### **3.5 Definition of the population**

Busha and Harter (1980:56) have defined a population as “any set of persons or objects that possess at least one common characteristic” and in a research context, the term is used to refer to those objects from which a researcher selects the sample he / she intends to investigate. It should, thus, be emphasized that a population of a study must first be defined clearly before the researcher considers selecting the sample. That is why Babbie and Mouton (2001:174) have described a study population as the “aggregation of elements from which the sample is actually selected”.

Defining the population is important in research because it demarcates and delimits the subjects of analysis of a particular study and thus provides an unambiguous boundary of

people or objects on which a particular study would place its primary focus (Leedy, 1989:142). Furthermore, it is also necessary to clarify the study's population if the results obtained from a sample of the population are to be generalised to that particular population.

### **3.5.1 Population and sampling frame for this study**

The population of this study is defined as all the full-time undergraduate nursing students registered for the undergraduate diploma in Comprehensive Nursing and Midwifery Science at the University of Namibia's (UNAM) Northern Campus during the 2007 academic year. A sampling frame is defined by Babbie and Motoun (2001:174) as "the actual list of sampling units from which the sample or some stage of the sample is selected" and it is often used interchangeably with the term 'population list' (Powell and Connaway, 2004:93). The researcher obtained his sampling frame from the Department of Medical and Health Sciences of the UNAM Northern Campus, and it was clear that during the 2007 academic year there were a total of 275 undergraduate nursing students enrolled for the above-mentioned nursing diploma on a full-time basis. Hence, the population of this study consists of all the 275 undergraduate nursing students that were listed in the sampling frame.

### **3.5.2 Definition of a sample and types of sampling methods**

Sampling is concerned primarily with the selection of a small number of respondents from the entire population of a particular study, and according to Powell and Connaway (2004:92) it is one of the important steps in survey studies. Babbie (1995:226) has

defined a sample as “a special subset of a population observed for the purposes of making inferences about the nature of the total population”. Baker (1988:144) has described it as “a selected set of elements or unit drawn from a larger whole of all the elements, the population”.

The need for sampling arises due to the fact that many research studies are constrained by financial resources and time. It is thus often not economical and practically possible to study the entire group of people or objects and hence the need for sampling (Groves and others, 2004:57). The smaller unit that is drawn to represent the entire population is used and, if applicable, inferences are made of the findings that can be generalised to the entire population.

In order to generalize the findings, however, it is also necessary to determine the sample's size according to well-established criteria. Powell and Connaway (2004:83) have argued that through a cautious utilization of certain scientific procedures, it is possible to make inferences about a large population from a relatively small number of respondents selected from that population and the correct determination of the sample size (cf. 3.5.4) thus has major implications for generalising the results of the research (Bless and Higson-Smith, 2000:85).

In the broadest sense, sampling methods can be categorized as probability and non-probability methods. With regard to the probability sampling methods, each member of the population has an equal chance or specifiable probability of being included in the

sample (Cozby, 2005:140). According to Hernon (1994:172) the purpose of probability sampling is to select a portion from the population that is representative of that population. The logic behind probability sampling is, therefore, to ensure that the sample is indeed representative of the population from which it was selected.

The common types of probability sampling include simple random sampling, stratified random sampling and systematic sampling. Simple random sampling occurs when the researcher assigns a single number to each member of the population and then uses a table of random numbers to select the sample (Babbie and Mouton, 2001:189-190). In contrast, systematic sampling “is based on the selection of elements at equal intervals, starting with a randomly selected element on the population list” (Bless and Higson-Smith, 2000:88). Whereas, stratified random sample involves dividing the population into subgroups or strata and then randomly select sub-samples from each group or stratum (Powell and Connaway, 2004:100).

In contrast to probability sampling, non-probability sampling is a method in which “there is no way of forecasting, estimating, or guaranteeing that each element in the population will be represented in the sample” (Leedy, 1989:152). It should thus be realized that “a non-probability sample does not permit generalising from the sample to the population because the researcher has no assurance that the sample is representative of the population” (Powell and Connaway, 2004:94). Despite this limitation, there are some instances whereby non-probability sampling could be justified. These include, for example, when a researcher is interested in gathering specific data from a known group

of experts in a particular field, in which case a purposive sampling method would seem to be an appropriate one. Non-probability sampling would also be appropriate when the population under investigation is fairly small, which makes it practically impossible to use the sampling techniques.

The types of non-probability sampling include accidental sampling, quota sampling, and purposive sampling. According to Powell and Connaway (2004) accidental sampling is whereby the researcher “selects the cases that are at hand until the sample reaches a desired, designated size”. On the other hand, “quota sampling is the same as accidental sampling except that it takes steps to ensure that the significant, diverse elements of the population are included”. Whereas, purposive sampling involves “selecting a sample based entirely on one’s knowledge of the population and the objectives of the research” (Powell and Connaway, 2004:94-95). It is also important to stress that each type of the sampling method has its own strengths and weaknesses. For example, probability sampling would be appropriate when the researcher wishes to generalise the results to the population. Bless and Higson-Smith (2000:86) have argued that “probability samples are of a much higher quality because, when properly constructed, they are representative of the population”. “The use of non-probability sampling is, however, quite common and very useful in many situations” (Cozby, 2005:140).

### **3.5.3 Sampling methods used in this study**

Since the respondents to the questionnaire and interviews were different, it was therefore necessary to select two samples. The study has thus used stratified random sampling for

the questionnaire sample, while purposive sampling was used to select the sample for the interviews.

This researcher opted for stratified random sampling for the questionnaire sample in order to ensure a balanced proportion of the population, in terms of students' years of registration or enrolment. The nursing students from each year of enrolment were therefore represented in the sample, thus reducing the sampling error. Moreover, it was also important for this study to find out whether the use of EIS by senior and junior students varies. Gray (2004:87) has pointed out that "stratified random samples are used because the researcher believes that the identified sub-groups are likely to markedly differ in their responses".

Being a probability sampling method, stratified random sampling guarantees an equal opportunity to every member of the population to be selected in the sample. As noted in the preceding section, stratified random sampling involves dividing the population into subgroups or strata from which a random sample is selected. Powell and Connaway (2004:100) have emphasized that "the strata should be defined in such a way that each element appears in only one stratum". For the purpose of this study, the strata were constituted according to the students' years of enrolment, and the researcher verified that no student's name appeared in two or more strata. It is also important to mention here that, in this study, stratified random sampling was used in conjunction with simple random sampling. The latter method was used to actually draw the members of the sub-samples from each stratum.

Table 3.1 below, provides the number and percentages of students' enrolment per year at the Department of Medical and Health Sciences of the UNAM Northern Campus during the 2007 academic year.

Table 3.1. Enrolment of nursing students during 2007

<b>Students year of enrolment</b>	<b>Number of students enrolled per year</b>	<b>Percentages %</b>
1 <sup>st</sup> Year	81	29.5
2 <sup>nd</sup> Year	64	23.3
3 <sup>rd</sup> Year	68	24.7
4 <sup>th</sup> Year	62	22.5
<b>Totals</b>	<b>275</b>	<b>100</b>

Having decided on the strata, the researcher then selected sub-samples from each stratum, using a table of random numbers available in Babbie and Mouton (2001:576-578). It was also essential to ensure that the quantity of students represented in each sub-sample corresponds to the quantity of students in each of the stratum. To achieve this, the researcher used disproportional stratified sampling. According to Powell and Connaway (2004:101) a disproportional stratified sample is appropriate when there are significant variations within individual strata or when some strata are small to be at risk of being under-represented in the total population. Although there were no major variations in the quantity of students in strata, the researcher decided to use disproportional stratified sampling so that each sub-sample is constituted according to the quantity of students in each stratum.

As mentioned above in relation to the sample for the interviews, the researcher has used purposive sampling. This is a non-probability sampling method, which according to

Walliman (2005:279) “is where the researcher selects what he / she thinks is a typical sample”. The sample for the interviews was thus selected independently, and the respondents to whom the questionnaire was distributed were purposely excluded from this sample. An important reason for using the purposive sampling method for the interviews was that the researcher wanted to interview at least four students from each year of registration. In turn this allowed the researcher to obtain a general picture about whether students’ proficiencies in using EIS varied as they progressed from one year to another. Moreover, this helped to ensure that the qualitative data gathered represent the views of students from all the years of enrolment.

#### **3.5.4 Sample sizes for this study**

In order to determine a representative sample size for the questionnaire survey, the researcher used Table 2 to determine the sample size. This table 2 was developed by Isreal (2003) of the Institute of Food and Agricultural Sciences at the University of Florida. This table, which is available online at <http://edis.ifas.ufl.edu/PD006>, provides sample sizes for specified population sizes. According to this table, if the population size is 275, a sample size of 163 would be sufficiently large. This sample size represents about 59% of the total population of 275 nursing students at the UNAM Northern Campus. Furthermore, the above-mentioned table provides degrees of accuracy for specified sample sizes. The sample size for this study (163) was indicated in the above-mentioned table to have a degree of accuracy of 95% and a 5% for confidence level. The sample size for this study is therefore sufficient to allow for statistical analysis.

As stated already in the preceding section, the study used a disproportional stratified sampling method for the questionnaire study, and table 3.2 below depicts the composition of strata and sub-samples that have been selected from each stratum.

Table 3.2. Composition of strata (percentages and sub-samples)

<b>Strata</b>	<b>Number of students enrolled per year</b>	<b>Percentages %</b>	<b>Sub-sample</b>
1	81	29.5	48
2	64	23.3	38
3	68	24.7	40
4	62	22.5	37
<b>Totals</b>	<b>275</b>	<b>100</b>	<b>163</b>

The percentages represent the proportion of respondents in each stratum and the size of each sub-sample was arrived at by multiplying the total size of each stratum with the corresponding proportion (in percentages) for each stratum.

With regard to the interviews, four students from each of the four strata were selected based on the purposive sampling method. The total size for the interviews was thus 16 students, representing about 5.8% of the total population. However, as indicated in the next chapter, the researcher only managed to interview 15 students (cf. 4.3). Although the sample for the interviews was relatively small, it is quite acceptable because interviews collected qualitative data, and Punch (2000:55) has argued that qualitative approaches do not necessarily need to have large sample.

### **3.6 Data collection**

As its name implies, data collection involves the actual utilisation of the instruments that are employed to collect the necessary data. As stated earlier in the section that discussed

the research methodology in this chapter, the study has employed a mixed-methods approach. It was also noted already that many researchers have shown great interest in the use of mixed methods to investigate the use of EIS. This interest can be attributed to the fact that a single method may not reveal as much relevant information as a variety of methods. For example, a self-administered questionnaire tends to be an inappropriate instrument to collect data pertaining to students' perceptions of EIS. In addition, data collected by a self-administered questionnaire could sometimes fail to represent a true reflection of the level of individuals' skills, as some respondents tend to glorify their competences and skills in using EIS. A study that investigated computer literacy among dental students in Europe concluded that "a proportion of students often overestimate their competence with computers when asked to self-assess their skills" (Mathheos and others, 2002:34).

In contrast, interviews alone may not be appropriate to reveal, for example, the extent to which students use EIS. Hence, a variety of data collection methods will compensate for the weakness associated with each method. As Rowley and Urquhart (2007:1171) have observed

"questionnaires provide a way of identifying trends, but qualitative data from face-to-face interviews with students revealed problems that might have been overlooked in the interpretation of the terminology, and very often the qualitative data suggested new trends in information use that could then be verified against quantitative data".

For these reasons, this researcher has adopted a triangulated approach and used both a questionnaire and interviews to collect the necessary data for this study. Since these two data collection instruments were used in complementary manner, they were therefore

administered concurrently. Copies of the questionnaire and the interview guide are included as appendices C and D respectively.

The researcher sought approval from the Management of the Northern Campus before carrying out the study (cf. Appendix A). Similarly, approval was also secured from the Faculty of Medical and Health Sciences at the main campus of the University of Namibia where the data collection instruments were piloted (cf. Appendix B). Furthermore, a cover letter that explained the purpose of the study accompanied each questionnaire that was distributed to the respondents. This letter also provides a definition of EIS and highlighted the importance of completing the questionnaire, emphasizing that the data that are being sought will be solely used for educational purpose. The respondents were not required to provide their names in the questionnaire and were also not asked their names during the interviews. Thus, all the respondents were assured of anonymity and confidentiality.

### **3.6.1 Questionnaires**

The questionnaire is perhaps one of the most commonly used data collection instruments in survey research. As Kidson (1985:133) has noted “the questionnaire is a very common method of gathering information about such difficult-to-measure subjects as library usage or information needs”. Powell and Connaway (2004) have enumerated many of the advantages that a questionnaire, as a research tool, offers. Among these is the fact that “questionnaires can facilitate the collection of large amount of data in a relatively short period of time”. Another advantage is that “questionnaires are usually relatively

inexpensive to administer” (Powell and Connaway, 2004:125), since the researcher does not necessarily need to be present when respondents complete the questionnaire. There is also a new approach whereby researchers can distribute questionnaires by means of electronic mail or the Web and this can enhance the advantages outlined above.

However, like other data collection instruments, questionnaires also have disadvantages. The most obvious one is that with self-administered questionnaires clarification cannot be provided if, for example, the respondent does not understand a question because there is no personal contact between the researcher and the respondent. Despite these disadvantages, the researcher was convinced that using a questionnaire was an appropriate instrument to collect the data needed in order to address the research problem of this study.

A semi-structured questionnaire was developed and although the researcher obtained permission to base it on the questionnaire used in a similar study that was conducted by Ms Ramlogan at the University of West Indies, it was necessary to specifically design and tailor it to suit the specific needs of this study. The questionnaire thus comprised of 35 questions divided into the following 7 sections: demographic information, use of the various EIS, purposes for using EIS, barriers to the use of EIS, skills to use EIS, benefit of using EIS, and the students’ perceptions of EIS (cf. Appendix C). The questionnaire consisted of mainly closed questions supplemented with a few open-ended questions to elicit students’ perceptions and opinions related to the provision and use EIS at the UNAM Northern Campus.

One hundred and sixty-three questionnaires were administered to the respondents during the last week of August and the first week of September 2007. This particular time was decided upon because the respondents had just begun the second semester and were thus not very busy with examinations or major projects. In addition, most of the nursing students were on campus during that particular time, including those who went on attachments for their practical sessions. In order to achieve a high response rate, this researcher approached the Department of Medical and Health Sciences to assist in distributing the questionnaires, and as a result the department's secretary and some of the lecturers helped in distributing the questionnaire to the students at the end of lecture sessions. Once they completed the questionnaires, the students were asked to drop them in boxes located in the library and the office of the department's secretary.

### **3.6.2 Individual Interviews**

As mentioned earlier, the study also used interviews to collect data of a more qualitative nature. According to Gray (2005:213) an interview "is a conversation between people in which one person has the role of researcher". Like the questionnaire, interviews also have advantages and disadvantages. However, some of the disadvantages in the questionnaire can be addressed by interviews. For example, the problem of the lack of researcher-respondent interaction in a mail questionnaire is solved in the interviews. Interviews, therefore, allow the respondents to seek clarifications of ambiguous questions. However, interviews have problems too, especially their vulnerability to the possibility of bias distorting the results, and Powell and Connaway (2004:149) have pointed out that "bias

presents a real threat to the validity of interviews”. The researcher recognized this threat and tried to counteract it as far as possible.

Conducting face-to-face interviews can be very expensive and time-consuming, and they are usually only feasible if the sample size is fairly small, and when there is justification for face-to-face interaction (Cozby, 2005:136). One of the main reasons for conducting interviews was to enable the researcher to gain a richer understanding of the questions raised by this study, and as confirmed by Punch (1998:174) “it is a very good way of accessing people’s perceptions, meanings, definitions of situations and constructions of reality”. Thus, the data from interviews consolidated the data that had been collected by the questionnaire with rich data and interesting insights particularly about their perceptions of the various EIS, being provided by the interviewees.

The researcher designed the interview guide with 29 questions that guided the interview process (cf. Appendix D). The researcher personally conducted 15 face-to-face individual interviews, lasting about thirty minutes each, during the first week of September 2007. The researcher obtained the telephone numbers for the respondents that were included in the interview sample from the Department of Medical and Health Sciences. Appointments were then arranged with each respondent, and the interviews were carried out at a time and place that was convenient to each respondent. During each interview, the researcher encouraged respondents to provide as much information as possible, and other than for the two of the interviews that were audio-taped (permission being granted

by the respondents), the researcher manually recorded the main themes and concepts that emerged as the interviews progressed.

### **3.7 Pilot study**

It is usually recommended to carry out a pilot study prior to administering the research instruments to the respondents. Piloting research instruments, particularly the questionnaires and interview guides, is essential to test whether the questions would be well understood by the intended respondents. Rudestam and Newton (2001) have urged researchers to conduct a pilot study regardless of whether they have designed their own instruments or have used standard ones. They have stressed that “every person can misread or misunderstand something different” (Rudestam and Newton, 2001:101). The pilot study thus avoided or at least minimized the possibility of misinterpreting the questions contained in both the questionnaire and interviews schedule. It is equally important to pilot research instruments so that the researcher can get an indication of how long it would take to complete, for example, the questionnaire or an interview. Moreover, the appropriateness of the data collection instruments were tested in order to ensure that only the data that were useful to the research questions raised by this study were collected. This was important particularly for the self-administered questionnaire because the researcher did not have any direct contacts with these respondents.

Commenting on piloting a questionnaire, Walliman (2005:282) has argued that “it is best to test it on people of a type similar to that of the intended sample, so as to anticipate any problems of comprehension or other sources of confusion”. In addition, Gorman and

Clayton (2005:98) have emphasized that it is best to conduct a pilot study at a neutral location that will not be used as the location from which actual data for addressing the research problem would be collected. Therefore, while the main study focused on the undergraduate nursing students at the UNAM Northern Campus, the pilot study was conducted with the undergraduate nursing students at the UNAM Main Campus in Windhoek.

Permission was obtained from the Dean of the Faculty of Medical and Health Sciences to conduct the pilot study, and with the assistance from the Faculty, the pilot questionnaires were distributed to 10 undergraduate nursing students at the main campus in mid July 2007. The interview guide was also pre-tested with 4 undergraduate nursing students of the same Faculty during the same period. The results of the pilot study were analyzed and consequently some of the questions that seem incomprehensible in both the questionnaire and the interview guide were simplified.

## CHAPTER FOUR

### DATA ANALYSIS AND PRESENTATION OF THE RESULTS

#### 4.1 Introduction

The purpose of this chapter is to describe the approaches and strategies employed by the researcher to analyse the data that were collected. It further presents the results that emerged from the data analysis process. Data analysis can be viewed as the process that involves the use of statistical tools and / or analytical approaches in order to examine the variables under investigation, and ultimately extracts useful information that would assist to address a research problem. Marshall and Rossman (1995:111) have aptly argued that “data analysis is a process of bringing order, structure, and meaning to the mass of collected data”. The researcher, however, wishes to add the most important objective of providing answers to the research questions that underpin the study (cf. 1.6).

This chapter thus presents the several steps taken by the researcher to analyse the data collected. This includes both the statistical analysis of the quantitative data (mostly collected by means of the questionnaires), and the analytical approaches and strategies that were followed by the researcher to analyse the qualitative data from the interviews. In the following chapter the researcher will discuss the main conclusions that he came to, and which he based on the results of the analysis of the data as outlined in this chapter.

#### **4.2 Analysis of the results from the questionnaire survey**

The data collected with the questionnaire were analysed using the Statistical Package for the Social Sciences (SPSS) version 15.0 for windows 2006. Out of 163 questionnaires that were distributed, a total of 132 were completed, representing a good response rate of 81%. After all the questionnaires were received, the researcher firstly checked them for accuracy of the responses and missing data. Secondly, the researcher developed a codebook that illustrated the codes for each variable, and he then ultimately entered the data into SPSS. The codebook proved to be an extremely useful instrument in terms of speeding up the data entry process. Furthermore, the flexibility of SPSS allowed the researcher to modify the codes when necessary.

Taking into account the objectives of the study (cf. 1.5), the data from the questionnaire were primarily analysed using descriptive statistics, and this enabled the researcher to obtain frequencies and percentages for each variable. In turn, this permitted the researcher to identify the general tendencies and patterns of use of the various EIS that were investigated in the study. This was further amplified by cross tabulating these results as dependent variables with the respondents' demographic details as independent variables. These cross-tabulations were then subjected to Chi-Square significance tests and only results with a significance level of  $\leq 0.05$  have been selected for discussion. The results of the analysis are presented below in the form of tables and graphs, and are reported as frequencies and percentages of the use of the various electronic information services (EIS). The structure of this chapter follows the order in which the research questions raised by this study are outlined in chapter one (cf.1.6), and of the

questionnaire (cf. Appendix C) that was based on these research questions. However, before embarking with this discussion, the researcher will present the results with regard to the respondents' demographic details, which also, as mentioned above, represent the independent variables of age, gender, course and year of registration.

#### 4.2.1 Demographic analysis

Table 4.1 to 4.3 show the sample's distribution according to the respondents' age range, gender and year of registration (cf. questions 1 to 4, Appendix C). With regard to the courses they were registered for, it was discovered that although UNAM offers a number of nursing diplomas, its Northern Campus, where this study was conducted, only offers one Diploma in Comprehensive Nursing and Midwifery Science. As a result, all 132 respondents indicated that they were registered for the above-mentioned diploma and 'course of registration' thus becomes a constant as opposed to a variable.

Table 4.1 below portrays the results of the respondents' age, and it can clearly be seen that the majority of the respondents (54.5%) were in the age range of 17 to 21, while 33.3% were between 22 and 25 years, and only a few respondents (12.1%) were 26 or older. It appears that these results are fairly typical of the age distribution found amongst undergraduate students worldwide.

**Table 4.1. Respondents' age range (n = 132)**

	<b>Age range</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	17 to 21	72	54.5	54.5	54.5
	22 to 25	44	33.3	33.3	87.9
	26 and up	16	12.1	12.1	100.0
	<b>Total</b>	<b>132</b>	<b>100.0</b>	<b>100.0</b>	

With regard to the gender of the respondents, the results (table 4.2 below) demonstrate that female students dominated the sample with 87.1% of the respondents being females, as opposed to only 12.9% being males. The low percentage of male respondents is however not surprising as this is a general trend worldwide within the nursing profession.

**Table 4.2. Respondents' gender (n = 132)**

<b>Gender</b>		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	Male	17	12.9	12.9	12.9
	Female	115	87.1	87.1	100.0
	<b>Total</b>	<b>132</b>	<b>100.0</b>	<b>100.0</b>	

Table 4.3 below displays the results of the respondents' year of registration, and it can be seen that 28% of the respondents were in their first year, 20.5% were in their second year, 27.3% were in their third year, and 24.2% were in their fourth year. It is evident that slightly more students were in their first year than in the other years of registration. This could be attributed to the general tendency for student attrition to increase with years of study at most universities in the world.

**Table 4.3. Respondents' years of registration (n = 132)**

<b>Year of registration</b>		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	First year	37	28.0	28.0	28.0
	Second year	27	20.5	20.5	48.5
	Third year	36	27.3	27.3	75.8
	Fourth year	32	24.2	24.2	100.0
	<b>Total</b>	<b>132</b>	<b>100.0</b>	<b>100.0</b>	

#### **4.2.2 Analysis of the extent of use of the various EIS**

The extent of use of the various EIS was an important research question for this study, and in order to avoid ambiguity the respondents were given a definition of what was

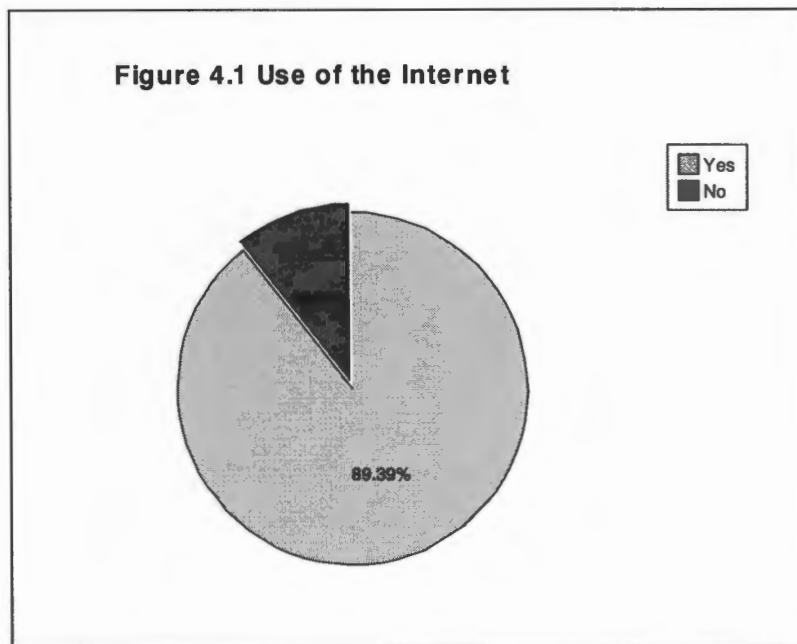
meant by EIS in the cover letter that was attached to the questionnaire (cf. Appendix C). The EIS investigated in the study were the Internet; electronic mail (email); the library's electronic databases (EbscoHost databases, the Sabinet Online database, and the Namibian literature database); the Web-based OPAC at UNAM Libraries (Innovative Millennium or INNOPAC); and the Oxford and SpringerLink electronic journals.

In order to determine the extent of use of the various EIS, the respondents were firstly asked to indicate whether they used each of the above mentioned electronic information resources and tools, and then further to indicate the frequency of use of these resources and tools (cf. questions 5 to 22, Appendix C).

With respect to frequency of use of EIS, the respondents were essentially given the option to choose from 'daily', 'weekly', 'monthly', 'rarely' and 'do not use'. The results pertaining to the extent of use of the various EIS and the cross-tabulations with the independent variables that produced significance results for the Chi-Square tests are presented below.

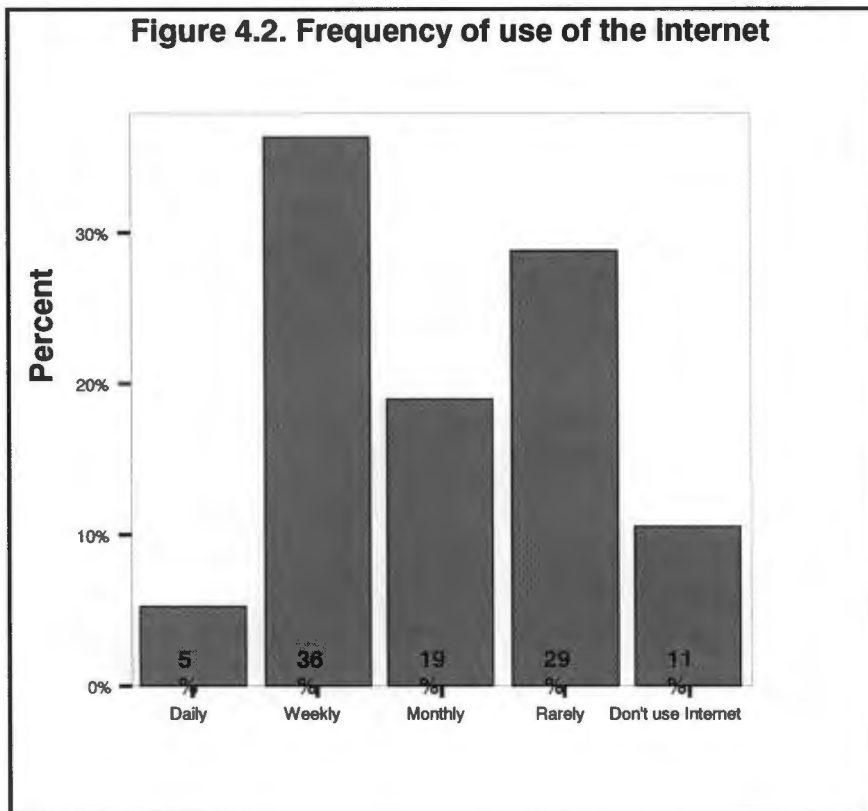
#### **4.2.2.1 Extent of the use of the Internet**

The respondents were firstly queried on their use of the Internet (cf. question 5, Appendix C). Figure 4.1 below depicts the results returned by the 132 respondents, and it can be seen that an overwhelming majority of the respondents (89.4%) reported that they used the Internet, compared to 10.6% who did not use it.



The respondents were further asked to indicate their frequency of use of the Internet (cf. question 7, Appendix C).

The results are shown in figure 4.2 below, and it can be seen that only a few respondents (5%) used the Internet on a daily basis. The largest proportion of the respondents (36%) used the Internet on a weekly basis, while 19% used it on a monthly basis. It is also interesting to note that a significant number of the respondents (29%) revealed that they rarely used the Internet, while 11% did not use the Internet at all (see also previous paragraph).



Cross tabulations were created between these results and the independent variables, and subjected to Chi-Square significance tests. The only results that yielded a significant statistic were for variation by age (highly significant at .000). Variation by gender and year of registration generated significance levels that exceed the 0.05 threshold level (respectively 0.868 and 0.995) and were thus rejected.

Table 4.4 illustrates the results of the cross-tabulation between the use of the Internet and the respondents' ages. These results show considerable variations in Internet use that range from 98.6% for the youngest age group (17-21 years of age), to 86.6% for the 22-25 years age group, to 50.0% for the oldest age category (26 and up). It is thus clear that

Internet use decreases from a very high usage for the younger age categories to a much lower rate for the oldest age category.

**Table 4.4. Use of the Internet by respondents' age range**

			Use of the Internet		
			Yes	No	Total
Respondent's age range	17 to 21	Count	71	1	72
		% within Respondent's age range	98.6%	1.4%	100.0%
	22 to 25	Count	39	5	44
		% within Respondent's age range	88.6%	11.4%	100.0%
	26 and up	Count	8	8	16
		% within Respondent's age range	50.0%	50.0%	100.0%
Total	Count		118	14	132
	% within Respondent's age range		89.4%	10.6%	100.0%
	% of Total		89.4%	10.6%	100.0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.667	2	.000
Likelihood Ratio	25.408	2	.000
Linear-by-Linear Association	27.280	1	.000
N of Valid Cases	132		

The respondents were further questioned on their use of search engines when searching the Internet (cf. question 6, Appendix C). More than one search engine could be indicated, and the responses from these questions were thus treated as multiple response sets and analysed with the SPSS multiple response feature<sup>1</sup>. As shown in table 4.5 below, the results demonstrate that the respondents only used Google and Yahoo (with 94.9% using Google and 72.6% using Yahoo – the normalised usage percentages were respectively 56.6% and 43.4%<sup>2</sup>).

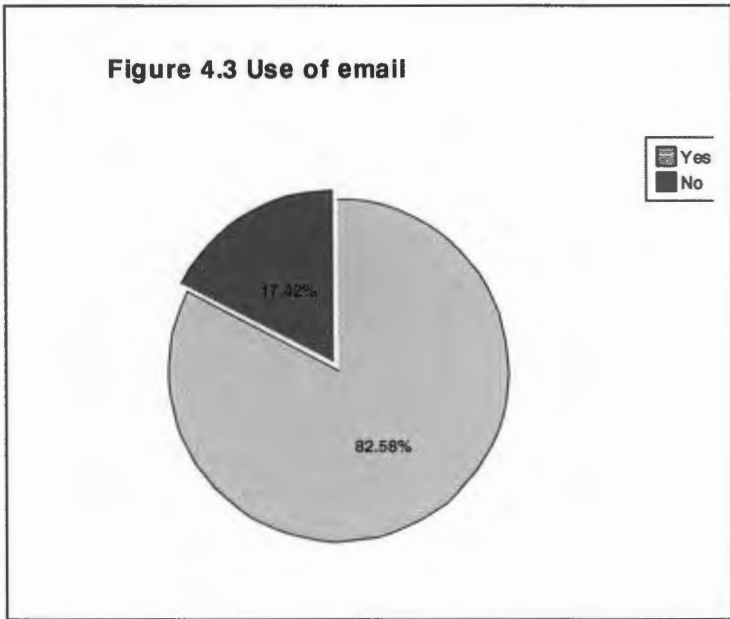
<sup>1</sup>This multiple response feature of SPSS was used in all the analyses where more than one option could be returned by the respondents.  
<sup>2</sup>Normalised percentages as well as percent of cases are presented when it was possible for respondents to indicate more than one option resulting in a total response of over 100%. In the subsequent sections reference will be made to either the normalised percentages (i.e. adding up to 100%) or the actual percent of cases (adding up to more than 100%) or both where deemed most appropriate.

**Table 4.5. Respondents' use of Internet search engines**

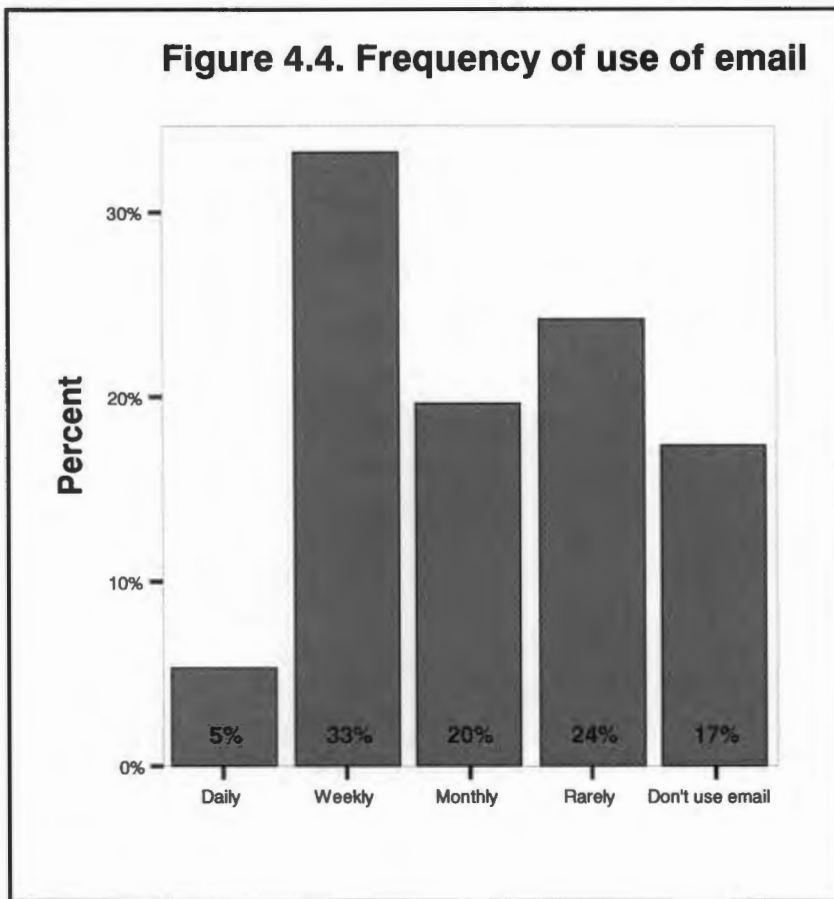
		Responses		Percent of Cases
		N	Percent	
Use of the search engines	Use of Google	111	56.6%	94.9%
	Use of Yahoo	85	43.4%	72.6%
	<b>Total</b>	<b>196</b>	<b>100.0%</b>	<b>167.5%</b>

#### 4.2.2.2 Extent of the use of emails

In order to determine the extent of the use of the email facility, the respondents were questioned on their use of email. Figure 4.3 below illustrates the results of the question investigating to what extent the nursing students used the email facility (c.f. question 9, Appendix C). The results clearly indicate that an overwhelming majority of the respondents (82.6%) reported to have used the email facility, compared to only (17.4%) who reported to the contrary.



The respondents were further questioned on their frequency of use of the email facility (c.f. question 11, Appendix C) and the results are depicted in figure 4.4 below. These results show only a small proportion of the respondents (5%) who reported to have used email on a daily basis. The largest proportion of the respondents (33%) used email on a weekly basis, followed by 20% who used it on a monthly basis. Surprisingly, a relatively large number of respondents (24%) reported that they rarely used the email facility, while 17% did not use this facility at all.



The researcher further performed cross-tabulations between the use of email facilities and the independent variables. The Chi-Square significance tests for these cross-tabulations again only produced statistically significant results for variation in age ( $p = 0.000$ ). The variation by gender and year of registration yielded results well above the 0.05 level (respectively  $p = 0.477$  and  $p = 0.571$ ), which is a clear indication that these variations were not statistically significant.

Table 4.6 below depicts the results of the cross-tabulation of the use of email facilities and the respondents' ages, and this use varied from 88.9% for the youngest age category (17-21 years), to 88.6% for the 22-25 age category, to only 37.5% for the oldest age

category (26 and up). It is therefore evident that once again the older students used the email facility far less frequently than the younger students.

**Table 4.6. Use of email by respondents' age range**

			Use of email		
			Yes	No	Total
Respondent's age range	17 to 21	Count	64	8	72
		% within Respondent's age range	88.9%	11.1%	100.0%
	22 to 25	Count	39	5	44
		% within Respondent's age range	88.6%	11.4%	100.0%
	26 and up	Count	6	10	16
		% within Respondent's age range	37.5%	62.5%	100.0%
Total	Count	109	23	132	
	% within Respondent's age range	82.6%	17.4%	100.0%	
	% of Total	82.6%	17.4%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.712	2	.000
Likelihood Ratio	19.555	2	.000
Linear-by-Linear Association	14.842	1	.000
N of Valid Cases	132		

The respondents were further questioned on the email service providers they subscribed to (cf. question 10, Appendix C). From the normalised results shown in table 4.7 below it can clearly be seen that Yahoo was by far the most popular service provider used (50.6%). The other service providers were clearly used far less frequently (Webmail 14.3%; UNAM Mail 13.1%; Hotmail 7.1%; and other less known providers that are freely available on the Web such as Teenmail 14.9%). It was also interesting to note that a

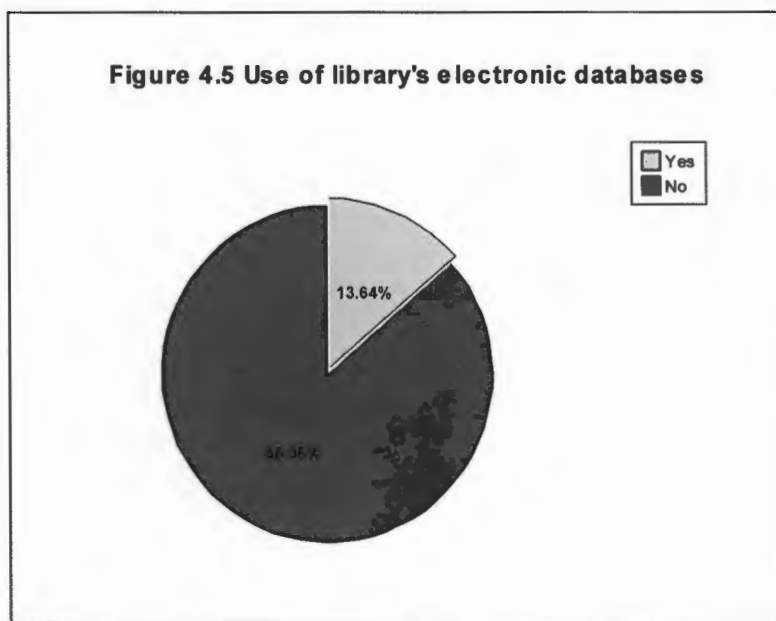
number of the respondents reported to have subscribed to more than one email service provider.

**Table 4.7. Respondents' email service providers**

		Responses		Percent of Cases
		N	Percent	
Email account	Hotmail	12	7.1%	11.0%
	Webmail	24	14.3%	22.0%
	Yahoo	85	50.6%	78.0%
	UNAM mail	22	13.1%	20.2%
	Other emails	25	14.9%	22.9%
	<b>Total</b>	<b>168</b>	<b>100.0%</b>	<b>154.1%</b>

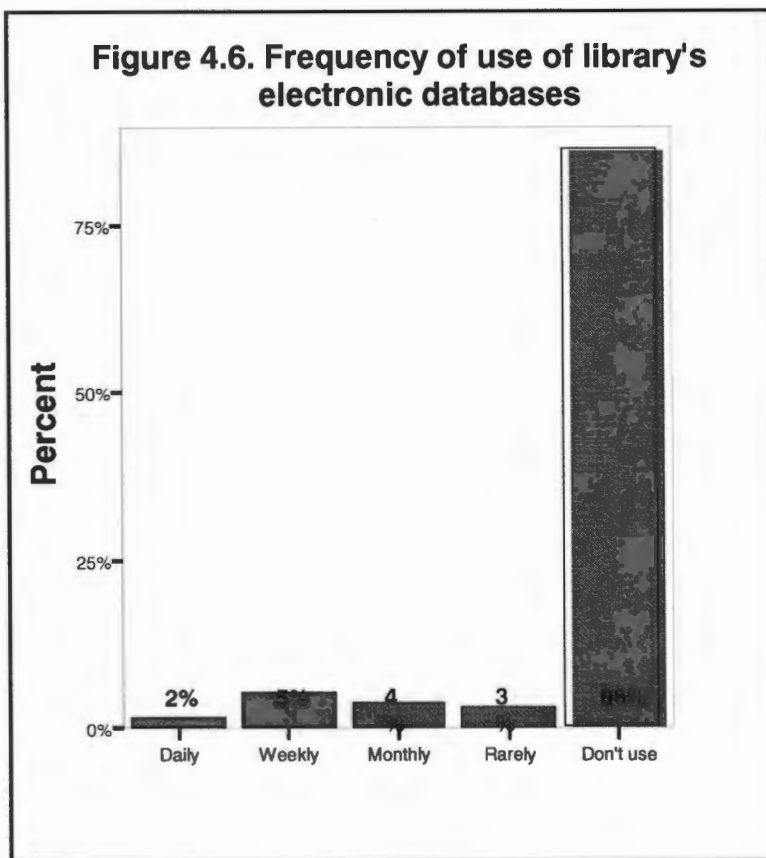
#### 4.2.2.3 Extent of the use of the library's electronic databases

The use of the scholarly databases that are accessible via the UNAM Libraries' Web site were also examined (c.f. questions 13, Appendix C). From the results depicted in figure 4.5 below it can be seen that only a small proportion of the respondents (13.6%) reported to have used the library's electronic databases, while the majority (86.4%) did not use these important resources of scholarly information.



The respondents were further questioned on their frequency of use of the library's electronic databases (cf. question 16, Appendix C).

It can be seen from figure 4.6 below that only 2% of the students indicated that they used the databases on a daily basis, 5% reported that they used the databases on a weekly basis, and 4% said they used the databases on a monthly basis, while 3% revealed that they rarely used these databases. It was a surprising outcome that the vast majority of the respondents (86%) reported that they did not use these databases.



The researcher further performed cross-tabulations between the use of the library's electronic databases and the independent variables, and subjected these to Chi-Square significance tests. None of these cross-tabulations however produced statistically significance results (variation by age:  $p = 0.236$ ; by gender:  $p = 0.606$ ; and by year of registration:  $p = 0.060$ ).

The respondents were also asked to state which of the following electronic databases of the library they used: EbscoHost, NAMLIT (Namibian Literature), SABINET Online (cf. question 14, Appendix C). It can be seen from the normalised results presented in table 4.8 below that out of those respondents who reported to have used the databases the most

favoured database was EbscoHost (59.1%), followed by NAMLIT (31.8%), while only a small proportion (9.1%) reported that they used SABINET Online.

**Table 4.8. Respondents' use of library's electronic databases**

		Responses		Percent of Cases
		N	Percent	
Library's electronic databases	EBSCOHOST	13	59.1%	72.2%
	NAMLIT	7	31.8%	38.9%
	SABINET	2	9.1%	11.1%
	<b>Total</b>	<b>22</b>	<b>100.0%</b>	<b>122.2%</b>

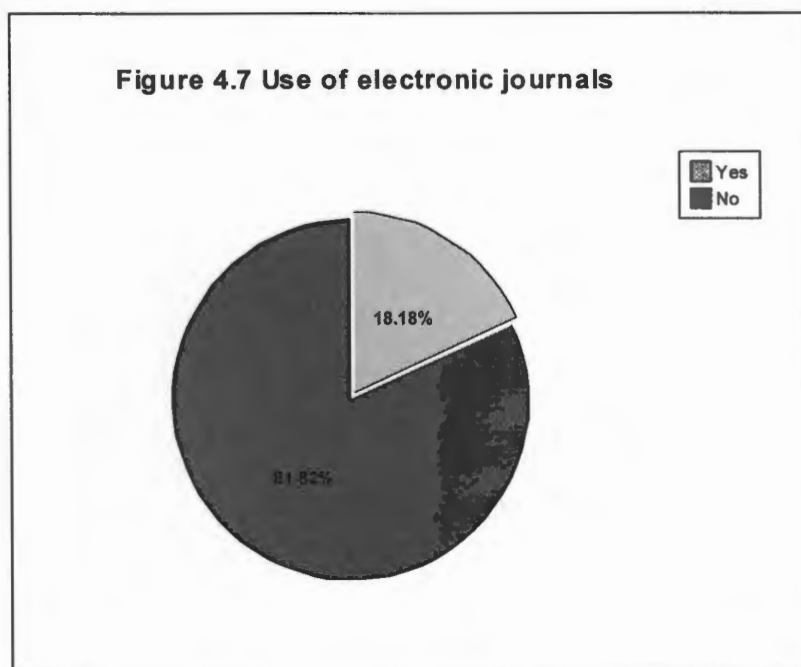
It is also important to mention here that the EbscoHost database package includes a number of databases, such as MEDLINE, Academic Search Premier, and Health Source, and all of these provide comprehensive coverage of the nursing and health sciences literature. The researcher therefore examined the extent to which the respondents used these individual databases (cf. question 15, Appendix C). Table 4.9 below illustrates the results, and it can be seen that of those respondents who reported to have used these databases, all used Health Source (100%), and only 50% used Academic Search Premier. It came as a surprise that none of the respondents reported to have used MEDLINE despite the fact that it is the most prestigious medical database and an important database for nursing education.

**Table 4.9. Use of the EbscoHost databases**

		Responses		Percent of Cases
		N	Percent	
Use of EbscoHost databases	Health Source	12	66.7%	100.0%
	Academic Search Premier	6	33.3%	50.0%
	<b>Total</b>	<b>18</b>	<b>100.0%</b>	<b>150.0%</b>

#### 4.2.2.4 Extent of the use of the electronic journals

To establish the respondents' use of the electronic journals which are available on the UNAM Libraries Web site, they were asked to indicate if they used the Oxford and SpringerLink electronic journal services (cf. questions 21, Appendix C). Figure 4.7 presents the results, and it can clearly be seen that only a few (18.2%) of the nursing students indicated that they did use these journals, and 81.9% reported that they did not use e-journals. Although the respondents were given an option to specify other electronic journal services at the UNAM Libraries, they did not specify any.



The respondents were further queried on which of the electronic journal services they used the most (cf. question 22, Appendix C). The results are illustrated in table 4.10 below, and it is evident that of those who used the e-journals services, an overwhelming

majority (91.7%) indicated that they used the Oxford Electronic Journal Services, compared to only a few (8.3%) who used the SpringerLink Electronic Journal Services.

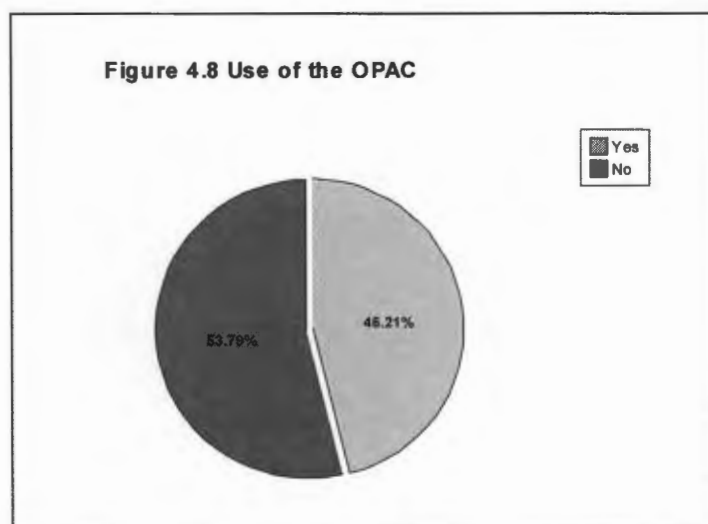
**Table 4.10. Use of electronic journals services**

		Responses		Percent of Cases
		N	Percent	
Electronic Journals Services	Oxford e-journals	22	91.7%	91.7%
	SpringerLink e-journals	2	8.3%	8.3%
	<b>Total</b>	<b>24</b>	<b>100.0%</b>	<b>100.0%</b>

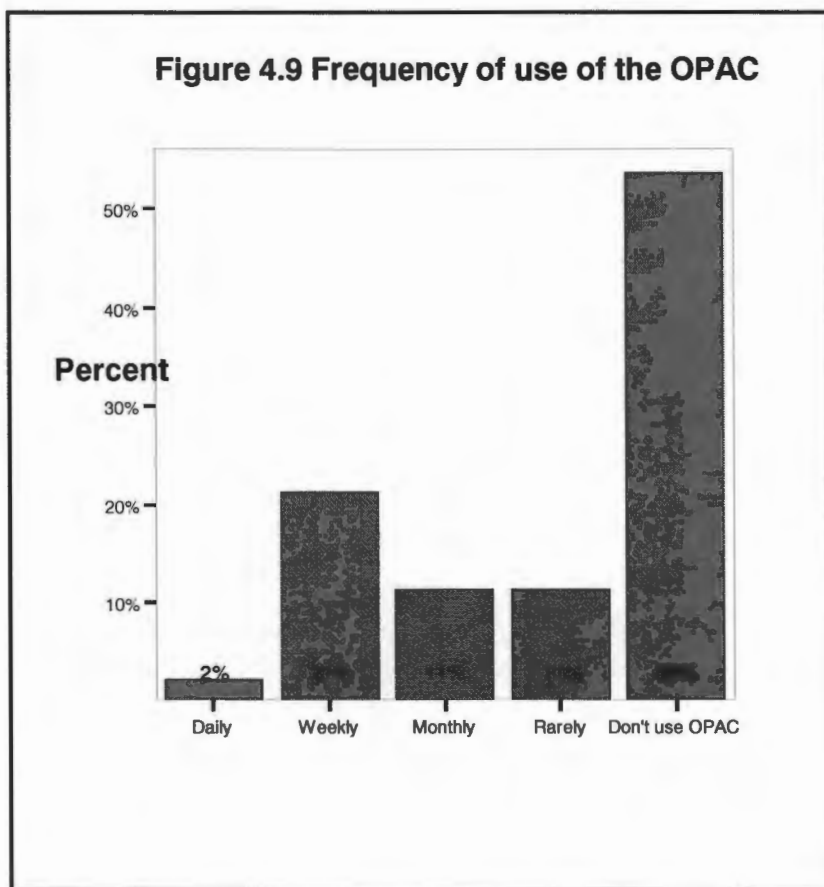
Cross tabulations and Chi-Square significance tests were also performed between the use of the electronic journals and the independent variables, but none of the results were statistically significant (age variable:  $p = 0.415$ ; gender:  $p = 0.462$ ; and year of registration  $p = 0.831$ ).

#### 4.2.2.5 Extent of the use of the OPAC

The results relating to the extent of the respondents' use of the OPAC (cf. questions 18, Appendix C) are displayed in figure 4.8 below. It can be seen that more than half of the respondents (53.8%) did not use the OPAC, and 46.2% indicated that they did.



With regard to the frequency of the use of the OPAC (cf. question, 19, Appendix C), it can be seen from figure 4.9 below that only a few respondents (2%) used the OPAC on a daily basis, 21% used it on a weekly basis, 11% used it on a monthly basis, and (11%) rarely used it. It was a surprising outcome that more than half of the respondents (54%) did not use the OPAC at all.



The cross-tabulations between these results and the independent variables yielded only one significant result for gender ( $p = 0.031$ ), and these results are presented in table 4.11 below. It is clear that far more male students (70.6%) than female students (42.6%) used the OPAC. The Chi-Square for age produced a  $p = 0.104$  and for the year of registration a  $p = 0.688$ .

**Table 4.11. Use of the OPAC by the respondents' gender**

		Use of the OPAC			
		Yes	No	Total	
Respondent's gender	Male	Count	12	5	17
		% within Respondent's gender	70.6%	29.4%	100.0%
	Female	Count	49	66	115
		% within Respondent's gender	42.6%	57.4%	100.0%
Total	Count	61	71	132	
	% within Respondent's gender	46.2%	53.8%	100.0%	
	% of Total	46.2%	53.8%	100.0%	

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.665	1	.031		
Continuity Correction(a)	3.607	1	.058		
Likelihood Ratio	4.734	1	.030		
Fisher's Exact Test				.038	.028
Linear-by-Linear Association	4.629	1	.031		
N of Valid Cases	132				

a Computed only for a 2x2 table

The researcher further performed a comparative analysis in order to provide a better picture regarding which of the various EIS was used the most. The results are summarised in table 4.12 below, and it is evident from the normalised results that the use of the Internet tops the list with 35.8% of the responses, closely followed by the use of email services at 33%, and then at a much lower use level the OPAC at 18.5%. The least used EIS were the electronic journals at 7.3%, and the library's electronic databases at only 5.5% of the responses.

**Table 4.12. Comparison of the use of the various EIS**

		Responses		Percent of Cases
		N	Percent	
Use of EIS	Internet	118	35.8%	93.7%
	Email	109	33.0%	86.5%
	Library's electronic databases	18	5.5%	14.3%
	OPAC	61	18.5%	48.4%
	Electronic journals	24	7.3%	19.0%
	<b>Total</b>	<b>330</b>	<b>100.0%</b>	<b>261.9%</b>

### **4.2.3 Analysis of the purposes for which the various EIS were used**

The researcher further queried the respondents on the purposes for which they used the various EIS. More than one purpose could be indicated, and the responses from these questions were thus once again treated as multiple response sets and analysed with the SPSS multiple response feature. These results are presented below as both normalised percentages and percent of cases.

#### **4.2.3.1 Purposes for which the Internet was used**

Table 4.13 below depicts the results of the question investigating the purposes for which the Internet was used (cf. question 8, Appendix C).

It can be seen that the Internet was predominantly used for educational purposes (87.3% of the respondents indicated that they used it for class assignments), while 54.2 % reported that they used it to read online newspapers, 28.8% said they used it for other

purposes including email and downloading music, and 21.2% revealed that they used it to read sports news.

**Table 4.13. Purposes for which the Internet was used**

		Responses		Percent of Cases
		N	Percent	
Purposes for using the Internet	Newspapers	64	28.3%	54.2%
	Class assignments	103	45.6%	87.3%
	Sport news	25	11.1%	21.2%
	Other	34	15.0%	28.8%
	<b>Total</b>	<b>226</b>	<b>100.0%</b>	<b>191.5%</b>

#### 4.2.3.2 Purposes for which the email facility was used

The respondents were further asked to indicate with whom they communicate when they used the email facility (c.f. question 12, Appendix C).

From table 4.14 below it can be seen that the most popular use (82.6%) of the email facility was to communicate with fellow students, 48.6% used it to get in touch with other sources, including friends, relatives and organisations that are sponsoring their studies, 19.3% used it to contact their lecturers, and 10.1% used it to communicate with administrative staff.

**Table 4.14. Purposes for which the email facility was used**

		Responses		Percent of Cases
		N	Percent	
Communicating with	Other students	90	51.4%	82.6%
	Lecturers	21	12.0%	19.3%
	Administrative staff	11	6.3%	10.1%
	Other	53	30.3%	48.6%
	<b>Total</b>	<b>175</b>	<b>100.0%</b>	<b>160.6%</b>

#### 4.2.3.3 Purposes for which the library's electronic databases were used

The reasons why the respondents used the library's electronic databases (cf. question 17, Appendix C) are presented in table 4.15 below. It is not surprising to see that the most frequent use (83.3%) of the databases was to find information for class assignments, and 72.2% used these databases for research purposes. As expected, the respondents only used the databases for academic purposes and no other purpose was indicated in the 'other' option response category that was provided.

**Table 4.15. Purposes for which the library's electronic databases were used**

		Responses		Percent of Cases
		N	Percent	
Purposes for using library's electronic databases	Class assignments	15	53.6%	83.3%
	Research	13	46.4%	72.2%
	<b>Total</b>	<b>28</b>	<b>100.0%</b>	<b>155.6%</b>

#### 4.2.3.4 Purposes for which the OPAC was used

The purpose for which the students used the OPAC systems (cf. question 20, Appendix C) was mostly to search for books in the library (91.8%), and only a few respondents (27.9%) indicated that they used it to search for journals (cf. table 4.16 below).

**Table 4.16. Purposes for which the OPAC was used**

		Responses		Percent of Cases
		N	Percent	
Purposes for using the	Search for books	56	76.7%	91.8%

OPAC	Search for journals	17	23.3%	27.9%
	<b>Total</b>	<b>73</b>	<b>100.0%</b>	<b>119.7%</b>

#### 4.2.4 Analysis of the barriers that students faced in their use of the various EIS

The study also examined the barriers encountered by students in their use of both the Internet (cf. questions 23, Appendix C) and the library's electronic databases (cf. questions 24, Appendix C). The respondents were once again given an opportunity to indicate more than one barrier, and to indicate other barriers that were not specified. The responses from these questions were analysed as multiple responses and the results are shown below.

##### 4.2.4.1 Barriers to the use of the Internet

Table 4.17 presents the results of the constraints that the students experienced in using the Internet. The shortage of computers is clearly the most predominant barrier (89.1% of the respondents), followed by the lack of time (67.2% of the respondents) and the slow speed of the network (65.6% of the respondents). The lack of skills was the least cited barrier (11.7% of the respondents). Although the respondents were given an option to specify other barriers, they did not.

**Table 4.17. Barriers to the use of the Internet**

		Responses		Percent of Cases
		N	Percent	
Barriers to use Internet	Slow speed of the network	84	28.1%	65.6%
	Shortage of computers	114	38.1%	89.1%
	Lack of time	86	28.8%	67.2%
	Lack of skills	15	5.0%	11.7%
	<b>Total</b>	<b>299</b>	<b>100.0%</b>	<b>233.6%</b>

#### 4.2.4.2 Barriers to the use of the library's electronic databases

Table 4.18 below displays the results of the barriers faced by the students in their use of the library's electronic databases. These results demonstrate again that the shortage of computers was the main barrier (cited by 62.9% of the respondents), followed by the lack of time (49.5%), lack of skills (42.3%) and the slow speed of the network (37.1%). Eleven percent of the respondents reported that they did not get useful information from the library's electronic databases, and they considered it as a barrier and 5.2% cited other barriers including the lack of awareness of EIS, limited time allocated to students to use computers, and the frequent interruptions of the Internet connection.

**Table 4.18. Barriers to the use of the library's electronic databases**

		Responses		Percent of Cases
		N	Percent	
Barriers to use databases	Slow speed of the network	36	17.8%	37.1%
	Shortage of computers	61	30.2%	62.9%
	Lack of time	48	23.8%	49.5%
	Lack of skills	41	20.3%	42.3%
	No useful information	11	5.4%	11.3%
	Other barriers	5	2.5%	5.2%
	<b>Total</b>	<b>202</b>	<b>100.0%</b>	<b>208.2%</b>

#### 4.2.5 Analysis of the students' development of EIS skills and assistance given

The researcher further investigated how the nursing students acquired the necessary skills to effectively use the various EIS. In addition, it was important to establish who helped the students when they needed assistance in using the various EIS (cf. questions 25 and

26, Appendix C). These questions were also analysed with the SPSS multiple responses feature and the results are presented below.

#### 4.2.5.1 How EIS skills are acquired

It can be seen from table 4.19 below that the students mostly (74.2%) acquired their EIS skills from their lecturers, while 57.3% indicated that fellow students had helped them, and 50% had learnt EIS skills on their own. Only 15.3% said that they acquired these skills from the library staff, and 9.7% reported other sources such as former teachers and family members.

**Table 4.19. How EIS skills are acquired**

		Responses		Percent of Cases
		N	Percent	
Sources of learning EIS skills	Myself	62	24.2%	50.0%
	Other students	71	27.7%	57.3%
	Library staff	19	7.4%	15.3%
	Lecturers	92	35.9%	74.2%
	Other sources	12	4.7%	9.7%
	<b>Total</b>	<b>256</b>	<b>100.0%</b>	<b>206.5%</b>

#### 4.2.5.2 Assistance in using EIS

Table 4.20 below portrays the results of the question investigating who the students turn to for assistance when they experienced problems with the EIS.

It can be seen that by far the most favoured source of assistance was their fellow students (87%), while 63.4% reported that they sought help from their friends, 47.2% indicated that they approached library staff and 18.7% obtained help from their lecturers. Only a mere .8% of the respondents indicated that they did not approach anybody for help. It is

thus clear that the majority of the students would indeed seek assistance when they face problems relating to the use of the various EIS.

**Table 4.20. Assistance in using EIS**

		Responses		Percent of Cases
		N	Percent	
Sources of assistance to use EIS	Friends	78	29.2%	63.4%
	Other students	107	40.1%	87.0%
	Library staff	58	21.7%	47.2%
	Lecturers	23	8.6%	18.7%
	Nobody	1	.4%	.8%
<b>Total</b>		<b>267</b>	<b>100.0%</b>	<b>217.1%</b>

#### 4.2.6 Analysis of the perceived benefits of using the various EIS

It was further an important objective of this study to establish whether the students feel that they gained benefits from their use of the various EIS. The respondents were specifically asked to indicate the benefits they derive from using the Internet (cf. questions 27, Appendix C) and the library's electronic databases (cf. questions 28, Appendix C) and the results are presented below.

##### 4.2.6.1 Perceived benefits of using the Internet

Table 4.21 below indicates that the most important benefit for the respondents of the Internet was that it provides useful information (95.1%), while 36.9% indicated that it saved them time, and 35.2% reported that it is easy to use.

**Table 4.21. Perceived benefits of using the Internet**

		Responses		Percent of Cases
		N	Percent	
Benefits of using the Internet	Ease of use	43	21.1%	35.2%
	Saving me time	45	22.1%	36.9%

Internet	Useful information	116	56.9%	95.1%
	<b>Total</b>	<b>204</b>	<b>100.0%</b>	<b>167.2%</b>

#### 4.2.6.2 Perceived benefits of using the library's electronic databases

Table 4.22 depicts the results of the benefits that the students said they derived from using the library's electronic databases. These results show a similar pattern to the previous section with 81.6% of the students indicating that the electronic databases of the library are an important source of useful information, while 51% said searching the databases saved them time, and 40.8% considered ease of use as an important benefit of using these databases.

**Table 4.22. Perceived benefits of using the library's electronic databases**

		Responses		Percent of Cases
		N	Percent	
Benefits	Easy of use	20	23.5%	40.8%
	Saving me time	25	29.4%	51.0%
	Useful information	40	47.1%	81.6%
	<b>Total</b>	<b>85</b>	<b>100.0%</b>	<b>173.5%</b>

#### 4.2.6.3 Analysis of the students' perceptions of the usefulness of the information contained in the various EIS

The respondents were further specifically questioned on whether they obtained useful information from the various EIS, (cf. questions 29, Appendix C) and these results are presented below.

Table 4.23 below clearly shows that an overwhelming majority of the respondents (86.4%) reported that they obtained useful information from the EIS, compared to only a

few (3.0%) who indicated the contrary, and 10.6% who indicated that they did not use the EIS.

**Table 4.23 Obtaining useful information from EIS**

		Frequency	Percent	Cumulative Percent
Valid	Yes	114	86.4	86.4
	No	4	3.0	89.4
	Don't use EIS	14	10.6	100.0
	Total	132	100.0	

#### **4.2.6.4 Usefulness of the various EIS**

The respondents were further asked to rate the usefulness of the Internet, EbscoHost databases, OPAC and the email facility (cf. question 30, Appendix C). This question also included an option to specify other electronic information resources that were not listed and the results are shown below in table 4.24. It can be seen that an overwhelming majority of the respondents (84.7%) rated the Internet as a very useful tool, while 4.6% rated it as useful, and no single respondent considered the Internet as not useful. About 11% of the respondents said they did not use the Internet, and one respondent did not rate the Internet.

The email facility was also rated highly with 68.9% of the respondents rating it as very useful, 21% felt it was useful, and again none of the respondent thought that the email facility was not useful, while 10.1% indicated that they did not use the email. This is however inconsistent with the result reported earlier (cf. 4.2.2.2) where 17.4% of the students indicated that they did not use the email facility. This inconsistency could have

arisen because there were thirteen respondents who skipped this question and they could be among the ones who said that they did not use the email facility.

With respect to EbscoHost, only a few respondents (4.5%) regarded it as a very useful database, 17.4% rated it useful, while 26.5% thought it was not useful, and more than half of the respondents (51.5%) reported that they did not use this database.

As far as the OPAC is concerned, 19.5% of the respondents felt that it was very useful, 26% rated it as useful, and an unexpected 20.3% of the respondents rated it as not useful. A disturbing outcome is that the largest proportion of the respondents (34.1%) reported that they did not use the OPAC and surprisingly this proportion contradicts the findings reported on the questions that asked if the respondents used the OPAC or not (cf. 4.2.2.5). This discrepancy can again be attributed to the fact that perhaps the nine respondents who did not answer this question were among the ones who did not use the OPAC.

**Table 4.24. Rating of the usefulness of electronic information resources & tools**

	Internet		EbscoHost		OPAC		Email	
	Count	%	Count	%	Count	%	Count	%
Very useful	111	84.7%	6	4.5%	24	19.5%	82	68.9%
Useful	6	4.6%	23	17.4%	32	26.0%	25	21.0%
Not useful	0	.0%	35	26.5%	25	20.3%	0	.0%
Don't use	14	10.7%	68	51.5%	42	34.1%	12	10.1%
<b>Total</b>	<b>131</b>	<b>100.0%</b>	<b>132</b>	<b>100.0%</b>	<b>123</b>	<b>100.0%</b>	<b>119</b>	<b>100.0%</b>

#### 4.2.6.5 Usefulness of the Internet search engines

The respondents were further asked to rate the Yahoo, Google and AltaVista search engines (cf. question 31, Appendix C). In addition, the respondents were given an option to specify any other search engines and provide the ratings accordingly.

Table 4.25 displays the results and it is evident that the most favoured search engine was Google with the majority of the respondents (83.8%) indicating that Google was very useful, and only 7.7% rating it as a useful search engine. Twelve respondents skipped this question and none of the respondents indicated that Google was not useful.

Yahoo, although also highly regarded, was rated considerably lower than Google. Sixty eight percent of the respondents indicated that it is a very useful search engine, 21.6% rated it useful, 1.6% felt that it was not useful, and 8.8% said they did use it, while 7 respondents did not provide a rating.

It was interesting to note that although none of the students reported using AltaVista in 4.2.2.1 (in response to question 6 in Appendix C), 50% of the respondents did provide an opinion on their perception of AltaVista. Of those who did answer this question, only 9.1% rated it as a very useful search engine, while 24.2% considered it as useful. Half of the respondents (50%) rated it not useful, and 16.7% reported that they did not use the AltaVista search engine. A possible explanation to this contradiction (i.e. between the results reported in 4.2.2.1 and 4.2.6.5) could be that the few students who thought that AltaVista was either very useful or useful tried to use it a few times, but were perhaps not satisfied with the results and thus stopped using it.

In summary it can be stated that it is thus clear that the most favoured search engines to find information from the Internet were Google and Yahoo, and that of the two Google was viewed more positively.

**Table 4.25. Rating of the usefulness of the Internet search engines**

	Yahoo		Google		AltaVista	
	Count	%	Count	%	Count	%
Very useful	85	68.0%	109	83.8%	6	9.1%
Useful	27	21.6%	10	7.7%	16	24.2%
Not useful	2	1.6%	0	.0%	33	50.0%
Don't use	11	8.8%	11	8.5%	11	16.7%
<b>Total</b>	<b>125</b>	<b>100.0%</b>	<b>130</b>	<b>100.0%</b>	<b>66</b>	<b>100.0%</b>

#### 4.2.6.6 Usefulness of the individual EbscoHost databases

Given the fact that the EbscoHost package at UNAM Libraries comprises a number of databases, the researcher was interested to discover how the students would rate the databases that he thought were the most important for their studies. The respondents were therefore asked to rate the MEDLINE, Academic Search premier, Health Source and Master File databases (cf. question 32, Appendix C).

The results are depicted in table 4.26 below and it is clear that despite the fact that MEDLINE is probably the most important scholarly database for nursing education, only 4.1% of the respondents rated it as very useful, 11.5% considered it useful, 9.8% rated it not useful, and 7 respondents did not answer this question. The vast majority of the respondents (74.6%) indicated that they did not use MEDLINE. This outcome is inconsistent with a previous response where all the respondents indicated that they did

not use MEDLINE when asked which of the individual EbscoHost databases they used (cf. table 4.8 in 4.2.2.3). This contradiction can be explained by the fact that some of the students might have tried to use MEDLINE but lacked the skills to search it effectively and stopped using it.

With regard to the Academic Search Premier database, 13.2% of the respondents rated it very useful, while 9.3% rated it useful, and 7% regarded it not useful. Again the majority of the respondents (70.5%) said they did not use the Academic Search Premier database, and three respondents skipped this question.

The Health Source was the only EbscoHost database that appeared to be used to any extent and 22% of the students rated it as very useful, while 3.1% thought it is useful, and 4.7% rated it as not useful. The vast majority of the respondents (70.1%) however still indicated that they did not use the Health Source database and 5 respondents did not rate it.

The Master File Premier database was only rated by 2.5% of the respondents as very useful, while 9.2% felt that it was useful, and 12.6% rated it as not useful. The majority of the respondents (75.6%) again said they did not use the Master File Premier database and 13 respondents did not answer this question.

**Table 4.26. Rating of the usefulness of individual EbscoHost databases**

	Medline		Academic Search Premier		Health Source		Master File Premier	
	Count	%	Count	%	Count	%	Count	%
Very useful	5	4.1%	17	13.2%	28	22.0%	3	2.5%
Useful	14	11.5%	12	9.3%	4	3.1%	11	9.2%
Not useful	12	9.8%	9	7.0%	6	4.7%	15	12.6%

Don't use	91	74.6%	91	70.5%	89	70.1%	90	75.6%
<b>Total</b>	<b>122</b>	<b>100.0%</b>	<b>129</b>	<b>100.0%</b>	<b>127</b>	<b>100.0%</b>	<b>119</b>	<b>100.0%</b>

#### 4.2.6.7 Comparing the students' preference for the Internet and the library's electronic databases

In order to better understand the student preferences with regard to the Internet and the library's electronic databases, the respondents were asked to indicate which one is more useful to them (cf. question 33, Appendix C).

The results are presented in table 4.27 below and as expected, there is a strong preference for the Internet, with 70.5% of the respondents indicating that it was more useful to them, compared to only a few (2.3%) who said the library's electronic databases were more useful. About 11% of the respondents felt that the Internet and the library's electronic databases were equally useful, and 16.7% reported that they did not know which of the two was more useful.

**Table 4.27. Comparing the students' preference for the Internet and the library's electronic databases**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Internet	93	70.5	70.5	70.5
	Lib.E-databases	3	2.3	2.3	72.7
	Equally useful	14	10.6	10.6	83.3
	Don't know	22	16.7	16.7	100.0
	<b>Total</b>	<b>132</b>	<b>100.0</b>	<b>100.0</b>	

#### 4.2.7 Analysis of the comments from the open-ended questions

The last section of the questionnaire included two open-ended questions that provided an opportunity to the respondents to make comments on what they thought the library ought to do to facilitate their use of EIS (cf. questions 34 and 35, Appendix C).

The responses that emerged from these two questions were more or less the same and hence the researcher decided to analyse them together. There were four main themes that emerged from the respondents' comments and the researcher categorized them as follows:

Problems related to infrastructure and access; promotion of the EIS; training and skills' development; and satisfaction with EIS in the library.

The results are presented below under these themes.

#### **4.2.7.1 Problems related to Infrastructure and Access**

Table 4.28 displays the results of the theme categorized as problems related to infrastructure and access. This category is further divided into the sub-categories of shortage of computers; limited time allocated for PC use; frequent interruption of the Internet connection; slow speed of the Internet network; and need to extend the library opening hours to allow the students more time to use EIS.

It can be clearly seen in table 4.28 below that by far the most pressing infrastructure problem that the students faced related to the shortage of computers (89.6%), 43.5% complained about the limited time allocated for PC use, 39.1% felt that the Internet network was very slow, while 24.3% were concerned about the frequent interruption in

the Internet connection, and 21.7% expressed the need to extend the library opening hours.

**Table 4.28. Problems related to infrastructure and access to EIS**

		Responses		Percent of Cases
		N	Percent	
problems related to infrastructure and access	Shortage of computers	103	41.0%	89.6%
	Limited time allocated for PCs use	50	19.9%	43.5%
	Frequent interruptions of the Internet connection	28	11.2%	24.3%
	Slow Internet network	45	17.9%	39.1%
	Extend opening hours	25	10.0%	21.7%
	<b>Total</b>	<b>251</b>	<b>100.0%</b>	<b>218.3%</b>

#### 4.2.7.2 Promotion of EIS

Table 4.29 presents the results of the theme categorized as promotion of EIS and this category is subdivided into the categories of publicising the EIS, and the lack of awareness of the EIS. The results show that the vast majority of students (94.5%) felt that the library needs to do more to publicise the EIS, and this perhaps justifies why 76.4% indicated that they lacked awareness of the EIS.

**Table 4.29. Promotion of EIS**

		Responses		Percent of Cases
		N	Percent	
Promotion of EIS	Lack of awareness	42	44.7%	76.4%
	Publicising the EIS	52	55.3%	94.5%
	<b>Total</b>	<b>94</b>	<b>100.0%</b>	<b>170.9%</b>

### 4.2.7.3 Training and Skills Development

Table 4.30 below depicts the results of the theme categorized as training and skills' development. This category is further divided into the subcategories of training needs and the need for an IT Assistant, and it is evident that the vast majority of students (85.5%) expressed the need for more training, and 44.9% reported that there was a need for an Information Technology (IT) Assistant in the computer laboratories.

**Table 4.30. Training and skills' development**

		Responses		Percent of Cases
		N	Percent	
Training and skills' development	Training needs	59	65.6%	85.5%
	Need for an IT Assistant	31	34.4%	44.9%
	<b>Total</b>	<b>90</b>	<b>100.0%</b>	<b>130.4%</b>

### 4.2.7.4 Satisfaction with EIS in the Library

Table 4.31 below portrays the results of the theme categorised as satisfaction with EIS in the library. The results clearly indicate that an overwhelming majority of the respondents (89.4%) were not satisfied with the EIS being provided in the library, and only a few (9.1%) indicated that they were satisfied, while 1.5% did not comment on this question.

**Table 4.31. Satisfaction with EIS**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	satisfied	12	9.1	9.1	9.1
	not satisfied	118	89.4	89.4	98.5
	no comments	2	1.5	1.5	100.0
<b>Total</b>		<b>132</b>	<b>100.0</b>	<b>100.0</b>	

### **4.3 Analysis of the results from the Interviews**

This section presents the results that emerged from the interviews that were conducted with a total of 15 students. While most of these results are reported in the form of descriptive notes, including key quotations from the interviewees, the results pertaining to demographic details of the interviewees and their acquaintance with the various EIS are reported in the form of percentages. The researcher used Marshall and Rossman's analytical approach of analysing qualitative data, which involves "organizing the data; generating categories, themes, and patterns; ... searching for alternative explanations of the data; and writing the report" (Marshall and Rossman, 1995:113).

Essentially, the data gathered from the interviews were firstly transcribed in Microsoft Word and analysed by reading the notes and listening to the recorded audiotapes several times. Secondly, the researcher identified the key themes and concepts from the interview notes, and coded them into categories and ultimately into constructs and meaningful conclusions. It is thus clear that the researcher followed an inductive analytical approach whereby the key themes and concepts emerged from the data analysis process rather than there being preconceived concepts. However, in order to avoid the possibility of diverting from the focus of the study, the interview questions (cf. Appendix D) were purposefully formulated in line with the research questions that formed the basis for the study (cf. 1.6). As a result the responses from the interviewees also reflected the focus of the research problem (cf. 1.4).

The key themes and concepts that came out of the analysis of the interviews were categorized as follows:

Use of EIS for a variety of purposes; problems of access to EIS; multiple sources of learning EIS skills; lack of training and inadequate EIS skills; and poor promotion of EIS. The respondents also highlighted some important points about their acquaintance with the various EIS.

The interviewees' demographic details and acquaintance with the various EIS are discussed in the next section, and then the focus shifts to the above-mentioned key themes and concepts that emerged from the interviews.

#### **4.3.1 Demographic details of the interviewees**

As mentioned already, out of the original 16 students that were supposed to be interviewed only 15 were available at the time of the interviews. Of this contingent, 33% were males, and 67% were females. All the interviewees were registered for the diploma in Comprehensive Nursing and Midwifery Science. As far as their years of registration are concerned, 20% were from the first year, and another 20% from the second year, while 33.3% were from the third year and 26.7% were fourth year students.

#### **4.3.2 Acquaintance with the various EIS**

The results from the interviews revealed that the majority of the respondents were aware of and were users of the various EIS. Out of the fifteen students that were interviewed, the majority (80%) said they used EIS, compared to only a few (13.3%) who said they

did not use EIS. One student, representing 6.7% of the interviewees, stated that she had used EIS until she had recently lost interest and stopped using it.

The main reasons cited by those not using any of the various EIS were the lack of skills and lack of interest, and this is reflected in the following remarks by the interviewees:

*“No, I don’t use the Internet because I don’t know much about computers. I think I need training and I also don’t have much time” (third year student).*

*“I am not really interested in the Internet and databases because I don’t see any reason for me to use the Internet if I can get all the information I need from books and magazines” (first year student).*

The reason mentioned by the student who had stopped using the Internet had to do with access problems, and is manifested by the following comment:

*“I no longer use the Internet because very often the computers in the library are not working and there is always a notice informing students that the Internet is down and this discouraged me from using the Internet. I only used the Internet during my first year. But now even if I want to use it there is no guarantee because the computer laboratories are either fully booked or the Internet is down” (second year student).*

With regard to the students who used the various EIS, they mainly used the Internet and email. As expected, Google and Yahoo were the most preferred Internet search engines among the interviewees, and this is consistent with the results obtained from the questionnaire (cf. table. 4.5). In this regard, a first-year student remarked:

*“I use Yahoo or Google because they are the most popular ones and help me to get a lot of information and other stuff from the Internet.”* Another student in the fourth year said, *“I use Google all the time because it is popular and gives me the opportunity to find many things on the Internet”.*

The interviews also revealed that a large proportion of the students have email accounts and that the most popular email services were Yahoo mail, Webmail, Teenmail, and Hotmail. This further confirmed the findings from the questionnaire part of the survey (cf. table 4.7).

It was a surprising outcome that the OPAC was not heavily used. A possible reason for this was provided by many of the interviewees who stated that since they already know where the nursing books are located in the library they did not use the OPAC. A second year student, for example, commented:

*"I don't use the OPAC because all the nursing books are located at one place and this makes it easy to find them".*

However, the few students who did use the OPAC all recognized its value in helping them to easily locate the library's materials. For example, a second year student stated that:

*"I use the OPAC because it is very easy to use and it helps me to find the book number on the shelves".*

Almost all the students interviewed appeared to be unfamiliar with the library's electronic databases and consequently did not use them. This is unfortunate as these resources could help them to find scholarly resources. The following comments that were made provide a possible explanation:

*"I don't use the library's databases, because I was never introduced to them, so I don't know how to use them and maybe good formal training will help me" (second year student).*

*"I don't use them and I don't even know anything about these databases" (first year student).*

Even the few students who reported that they used the library's electronic databases did not appear to make effective use of these resources as can be seen from the following comments provided:

*"I use the library databases very rarely and I only used Health Source maybe five times this year" (fourth year student).*

*"Although I know a little bit of how to use Health Source, I don't use much these databases because I only spend a little time on campus and there are no computers at the hospital where I stay" (second year student).*

It is important at this stage to point out that although the students clearly used the various EIS, both the interview and the questionnaire results suggest that the students relied heavily on the Internet for information, and this was thus the main resource they used. The following section will discuss the results that are related to the key themes and concepts as outlined above (cf. 4.3).

#### **4.3.3 The purposes for which EIS were used**

The results from the interviews have clearly revealed that the students make use of the EIS for a variety of purposes. These include obtaining course-related information, to stay up-to-date with current events, for entertainment, as well as for communication purposes.

As a third year student remarked:

*"I use the Internet to get information for my assignments, read current news, and check my emails and also music".*

Another third year student said that although he uses EIS for various purposes, he does not always succeed to get the information for his studies because some Web sites and

databases are restricted with passwords. The results from the interviews also suggest that, for various reasons, some of the students do not really use the EIS for educational purposes. For example, a second year student stated that she did not try to get information from the EIS for her studies because most of the time their lecturers tell them which books they have to read for their assignments. Another student in the third year commented:

*“I don’t really get information for my studies from the Internet as I only use books and lecturers’ notes”.*

While a fourth year student stated that she does not use EIS to obtain study-related information because downloading takes too long and printing is very expensive in the library. The above comments, however, contradict the results from the questionnaire on the use of EIS for education purposes (cf. 4.2.3.1 and 4.2.3.3). It thus appears that although many students attempt to use EIS, they do not really succeed to retrieve the educational information they need.

It further emerged from the interviews that most of the students use the Internet to read the latest news and to communicate with their peers and relatives. For example, a first year student commented:

*“I use the Internet to read news, especially sport news, and magazines, and also to send messages to my friends who are studying overseas”.*

Another student in the fourth year stated:

*“I use the Internet to read news, emails and to get other information, like careers information and on other universities for opportunities to further my studies when I finish here”.*

It is interesting to note that among the reasons why the students used EIS was for careers information, and this provided further insight as this aspect did not surface from the data that were collected with the questionnaire. A small number of the interviewees also indicated that they did not use the email facility, as they communicate with friends and relatives by mobile phones.

As expected, those students who had indicated that they used the library's electronic databases revealed that they used these databases to obtain the information they need for their studies. From the above discussion it is clear that although the nursing students at the UNAM Northern Campus predominantly use the library's electronic databases for academic purposes, this does not necessarily suggest that these students succeed to retrieve the information they need from these databases.

#### **4.3.4 Problems of access to EIS**

The interviewees highlighted several problems and constraints that discouraged students from using the various EIS, and many of these problems clearly had to do with obtaining adequate access to EIS. One of the major constraints expressed by almost all the interviewees is the shortage of computers in the library and the following remarks clearly testify to this fact:

*"The shortage of computers in the library is really a big concern for all the students, just imagine I don't have much time and sometimes I have to queue and wait for a long time before I get a chance to use Internet" (fourth year student).*

*"I think the campus should buy more computers so that students can be motivated to use the email and the Internet" (second year student).*

Another aspect that emerged was that the slow speed of the network is a key factor that discouraged students from using the various EIS. This concern is indeed valid because the slow speed of the network causes slow downloading of information, which in turn increases the student searching time. As a second year student has remarked:

*“Yes, I use the Internet but sometimes it is frustrating because it is very slow and it takes too long to get the information I want”.*

The interviewees also claimed that they are only given one hour to use EIS at a time. This again exacerbates the situation, especially when the speed of the network is slow and when the Internet connection is intermittent with many cut-outs. The following comments clearly underscore these problems:

*“The time allocated to students to use computers is only one hour and sometimes forty-five minutes. This is not enough and why can’t the library buy more computers for students?” (second year student).*

*“Sometimes the Internet is very slow and I don’t always get a computer to use the Internet because when I go to book a computer the library staff [members] say that all computers are fully booked for the day” (fourth year student).*

Other concerns that were expressed related to the age of the computers in the library and the fact that they were very outdated. A further concern was the limited time they had to use EIS, and the need was expressed that the library’s opening hours should be extended until late to enable them to use the Internet. The following comments made by the students reinforce these aspects:

*“The library must consider opening in the evening because during the day we are in classes for lectures and don’t get enough time to come to the library” (first year student).*

*“The library opening hours should be extended so that we get more time to use the Internet and the databases” (third year student).*

*"I have also many assignments to do and the time is not always there to use the Internet, email and databases" (third year student).*

*I only use email and the Internet about once in two weeks because I have no time due to many assignments and clinical practicals" (fourth year student).*

Some interviewees, furthermore, expressed their concern about other people who are not affiliated to UNAM, who are allowed to use the already limited number of computers in the library. As a third year student strongly commented:

*"The main problem in the library is that there are only a few computers and very often the Internet is also not working and I can't get my messages or use the Internet. Unless I have to go outside the campus and pay again while I have already paid UNAM". "Maybe other people who are not UNAM students must not be allowed to use the computers so that we [UNAM students] get a fair chance for what we have paid".*

It is evident from the above discussion that although there are numerous constraints that hinder students to effectively use and benefit from the various EIS, the major impediment is the shortage of computers. This factor came up repeatedly and was mentioned in almost every question about the use of EIS. It must be mentioned here that the problem of the shortage of computers also featured prominently in the results from the questionnaire part of the survey as well (cf. 4.2.4.1 and 4.2.4.2).

#### **4.3.5 Learning EIS skills**

The responses relating to how they learn EIS skills suggest that students rely on multiple sources to learn and improve the skills that would enable them to use the various EIS. While some students claimed to have learnt EIS skills themselves, others again indicated

that they had acquired EIS skills from tutors, librarians, friends, and other students or more than one of these options. The following comments illustrate these aspects:

*“I learnt these skills on my own and also I attended a computer training course offered by a UNAM tutor when I started nursing at UNAM” (first year student).*

*“I attended [an] Internet course at the high school before I came to UNAM but I was also shown how to use the Internet, email and OPAC by the library staff at the library orientation in the first year. The problem is just that it was too short and we had to share computers because there are not enough computers in the library and I think the library orientation did not help many students to really learn the Internet and databases” (second year student).*

There were also a number of interviewees who have stated that they did not undergo any formal training to learn how to use the various EIS, and have expressed the need for regular training in order to update their EIS skills. As a fourth year student stated:

*“my classmates taught me to use the Internet because there was just a short orientation in the library a long time ago but maybe the library staff can organize the training on a regular basis”.*

Another third year student expressed the same sentiment, saying that there is a need for regular training, and further said that she only attended a computer course in the first year and since then she has been learning informally from either librarians or other students. It is also interesting to note that a second year student had claimed that she had learned to use the Internet and email at home. It is thus clear that students acquire EIS skills from a variety of sources, and perhaps this has resulted in different levels of EIS skills among the nursing student population at the UNAM Northern Campus.

#### **4.3.6 Lack of training and inadequate EIS skills**

The results from the interviews further revealed that the lack of formal training in the use of EIS negatively affected the students' ability to effectively use of EIS. As a result many of the interviewees considered the lack of skills as one of the main obstacles that prevented them from deriving optimum benefit from the various EIS, in particular the library's electronic databases. Referring to the library's electronic databases, a first year student made the following comment:

*"Although I understand that they [library's electronic databases] have a lot of information that is relevant to the nursing courses, I don't know how to use them and I don't even check the library's Web site that much. I think some one needs to teach me how to use the information on the library Web site. Maybe I can find useful information for my course. It would really help if the library staff can organize to train students how to use these databases, especially during the holidays when we don't come to classes".*

Several other students also expressed this sentiment about the library's electronic databases. It is, however, encouraging to note that the students are eager to learn to use these scholarly databases. As a third year student remarked:

*"Sometimes I ask the librarians to help me to use databases because I don't know how to use these new technologies, but I am willing to learn if someone trains me".*

Another student in the fourth year stated that she needs more training to use databases but she is not sure if that will ever happens because she is about to complete her studies. The interview results further showed that the students are not satisfied with the current orientation programme that is supposed to equip them with the necessary skills to use the EIS. The lack of adequate skills is clearly reflected in the following remarks from the interviewees:

*“Sometimes I search something on the Internet but I get a lot of information that is not relevant at all to what I want, so I think I need regular training to use it better” (second year student).*

*“I think I only struggle with the skills, if I had enough skills I could use the databases and Internet to get relevant information for my studies because the library has only few books, especially microbiology books” (first year student).*

*“I want to learn more about databases and also the Internet but the present situation where there are only few computers makes it difficult for me to practice and improve my knowledge” (third year student).*

Several other interviewees further reported that because they personally lacked the necessary skills to use the OPAC they usually ask the librarians to conduct searches for them. It was however reassuring to note that most of the interviewees expressed their willingness to learn how to use the OPAC as well as the other EIS. The lack of training, which resulted in inadequate EIS skills, is clearly a major problem facing the nursing students at the UNAM Northern Campus. It should be emphasised that although the majority of the nursing students make heavy use of the Internet and email they need formal training to better equip them with the necessary skills to more effectively use the scholarly databases.

#### **4.3.7 Lack of support to use EIS**

Another factor that emerged from the interviews was that many students are not satisfied with the support they get from the library in relation to their use of EIS. As a second year student critically remarked:

*“The library staff are stationed very far from the computer lab and when I go to them downstairs at the help desk to ask them to come and help me they sometimes tell me that they are alone at the desk and cannot come. This means I will just have to ask other students and sometimes other students are also busy and can't help me, so most of the time I just struggle on my own”.*

Additionally, some students also mentioned that the library staff were not always readily available to help them when they required assistance. As a second year student who gave up using the Internet commented:

*“Even when I used the Internet, no one really helped me, so I think the library is not providing good Internet facilities”.*

Some of the students, however, acknowledged that they received the assistance and support from the library staff to use EIS. For example, a third year student reported that he makes use of the librarians in order to get assistance and support related to obtaining the relevant information for his assignments from the various EIS. Interestingly, some of the interviewees have suggested that the library should appoint an Information Technology (IT) Person or Student Assistant to be stationed in the computer laboratory at all times in order to provide the necessary support to the students. As a fourth year student opined:

*“The IT person would ensure that the few computers that are currently in the library are always functioning properly”.*

The need for an IT Assistant was also mentioned by students who participated in the questionnaire part of the study (cf. 4.2.7.3). Another fourth year student suggested that the library must also produce leaflets with instructions on how to use EIS.

The findings discussed above suggest that although the library provides some support and assistance to the students to use the various EIS, many of the students were not satisfied

with the current situation relating to EIS support, and this is congruent with the results from the questionnaire (cf. 4.2.7.4).

#### **4.3.8 Perceptions of EIS**

The interviewees, while generally regarded some of the EIS, particularly the Internet and email as useful tools that helped them to obtain and share information, were of the opinion that the library's electronic databases were complicated to use. The following are some of the specific remarks made by the students:

*"I think the Internet is more useful because many Web sites are straightforward, [whereas] the library's databases are too complicated, and they always need password and most of the time are very slow" (fourth year student).*

*"I feel that the Internet is useful because it gives me direct answer to my questions, but the databases are too difficult and waste a lot of time" (fourth year student).*

It is also interesting to note that some students were very careful to only book the computers in order to use the EIS in the afternoon because they felt it was much faster. A third year student commented as follows:

*"The Internet is useful because it is fast and quick, unless the speed is slow that day, but in the afternoon it is always quick. I normally book to use the Internet in the afternoon but then there is the problem of the library closing early".*

Some of the students felt, however, that EIS are not important for their studies since they use the books that are being recommended by their lecturers. A couple of third year students stated:

*"I don't use the Internet[because] I think my studies come first and I mostly use the books that are recommended by lecturers".*

*"I don't know if the Internet or databases are useful because I don't use any of those. I prefer the books, but sometimes I use the computers in the library to type my assignments but not to use the Internet. It wastes my time".*

Although these students seem to rely solely on printed sources of information, some of them expressed a keen interest to learn to use EIS if they are afforded the opportunity to do so.

The interviews have indicated that in general most of the students feel that the library needs to improve EIS-related services by installing more computers in the library, and providing training as well as improving the speed of the network. It appears that these three factors have a major influence on students' perceptions of the various EIS in the library. These factors were reinforced by the following comments that were made by the students:

*"Yes, I think the library provides good Internet services but the main concern is about the number of computers, which are not enough if you think the number of students on campus" (third year student).*

*"I don't think the library provides good Internet services, because there are [only a] few computers and sometimes you book and don't get a chance to use the Internet, email and other technologies" (fourth year student).*

*"Sometimes it takes a long time to search the Internet, too much information and I don't know really where to start looking" (third year student).*

It is thus clear that the perceptions of EIS among the nursing students at the UNAM Northern Campus vary widely, and it depends on a number of factors such as the students' positive and negative experiences of their engagement with the various EIS that are available at the campus.

#### **4.3.9 Concluding remarks**

It is important to note that not only have the results from the interviews reinforced the findings from the questionnaire study, but in addition many new and interesting insights came to light. It is also evident from the above discussion that the majority of the students who participated in the interviews were users of EIS, in particular, the Internet and email facilities. The interviews strengthened the findings from the questionnaire that the students use these resources for a variety of purposes. The interviews further revealed that there are a number of constraints that students face in their use of EIS, the main one being the shortage of the computers and this is again consistent with the findings from the questionnaire study.

The main aim of interviewing a small sample of the students was to gain further useful insights that could not be revealed from the questionnaire. This aim was indeed achieved as some of the interviewees revealed some important aspects, for example, that students used the EIS for career advancement, which did not come to light in the results from the questionnaire.

In the next and final chapter the researcher will present a synthesis of the conclusions that he came to based on the findings reported in this chapter.

## **CHAPTER FIVE**

### **DISCUSSIONS OF THE KEY FINDINGS, CONCLUSION AND RECOMMEDATIONS**

#### **5.1 Introduction**

The purpose of the chapter is to discuss and interpret the study's key findings that were presented in chapter four. This will be done in relation to the research questions raised by the study (cf. 1.6), and the theoretical framework that was developed for this study (cf. figure 2.1) as well as the findings from previous research as reported in the review of the literature (cf. chapter two). The chapter also highlights the implications of the findings by presenting recommendations aimed at improving the provision and use of EIS at the University of Namibia's (UNAM) Northern Campus library, and concludes the discussion with a number of suggestions of possible areas for future research.

It is important to note that the results from both the questionnaires and interviews have been synthesized and integrated in the discussions of the key findings, and that the generalizations of the results take into account the limitations and delimitations of the

study as stated in chapter one (cf. 1.8). The researcher would, however, like to point out that since he used a probability sampling method for the questionnaire part of study, the outcome of the sample study should be representative of the entire population of undergraduate nursing students at the UNAM Northern Campus and generalizable to that population.

As stated in chapter one, the main purpose of this study was to describe the use of electronic information services (EIS) by undergraduate students registered for the diploma in Comprehensive Nursing Science and Midwifery at the UNAM Northern Campus. The study specifically examined the extent of use of the various EIS by these students, the purposes for which they used the EIS, the barriers they encountered in using the EIS, the sources they used to acquire EIS skills, and their perceptions of the EIS.

## **5.2 Discussion of the students' use of the various EIS**

In general, the results of the study demonstrated that the undergraduate nursing students at the UNAM Northern Campus were making use of the various EIS. However, if the use of the various EIS is compared, it is apparent that the Internet and email dominated their use of EIS. The results further revealed that while the OPAC was used moderately, the electronic databases and e-journals were used by very few nursing students (cf. table 4.12). These findings are however consistent with the results of several other studies conducted elsewhere. For example, the studies conducted by Armstrong and others (2001:253); Baruchson-Arbib and Shor (2002:256); OCLC (2002:3); Rowley and others (2002:117); Banwell and others (2004:311); and Samuel and others (2004) reinforce the

fact that it is a worldwide phenomenon that the Internet is the most preferred electronic information resource among the undergraduate students. In the next section, the use of the various EIS will be discussed in greater detail.

### **5.2.1 Students' use of the Internet**

Internet use is increasingly becoming an integral part of university students' life and UNAM students are no exception to this trend. It was seen that the vast majority of the nursing students who participated in the questionnaire survey (cf. figure 4.1) and those who were interviewed (cf. 4.3.2) indicated that they used the Internet extensively, and that they rated its usefulness as an information source very highly (cf. 4.24). The literature showed similar results and Griffiths and Brophy (2005:550), for example, found that most of the undergraduate students they investigated preferred to use the Internet over other sources of information, while Jones and others (2002) specifically found that the college students they investigated used the Internet far more extensively than the library to search for information for a variety of purposes, including the information they need for their studies.

The popularity of the Internet among the undergraduate students could be ascribed to various factors. These include the general perception that the Internet is easy to use, and the fact that most of today's undergraduates have grown up in an environment where the Internet is widely available. A large number of students surveyed in this study cited 'ease

of use' as one of the important factors that inspire them to use the Internet rather than the library's electronic databases. It further emerged from the interviews that many students have a strong belief that the Internet can meet all their information needs, that it is convenient, and that it saves them time. Specific examples given during the interviews were that they do not require passwords to use the Internet, that it provides direct answers to search queries, and that the Internet allows them to locate and exchange information more efficiently. Wang and Artero (2005:80) underscore these results by stating that "convenience of the Web and ease of obtaining information from the Web are attracting more and more university students".

It should, however, be stressed that academics and librarians have continuously been expressing their concern about the students' use of the Internet to obtain academic information. The fear is that if there is too much dependence on the Internet this would compromise the quality of students' research papers and projects. This is indeed a valid concern because of the fact that unlike the traditional sources of information, the Internet contains a vast amount of information that is neither structured nor evaluated. Lubans (1998), for example, likened the Internet with a flea market where everything bad or good can be found, while Wang and Artero (2005:79) cautioned that "there is good and bad information, accurate and inaccurate information, reliable and unreliable information, useful and useless information, and true and false information". This particularly presents many challenges to many undergraduate students who generally lack the necessary skills to evaluate the information they find on the Web. It is thus imperative to emphasise that in order for students to make optimal use of the information they find on the Internet they

must be equipped with information literacy, computer literacy, and information and communication technology (ICT) literacy skills (cf. recommendations outlined in the conceptual framework of this study in figure 2.1).

With respect to Internet search engines, this study found that Google enjoys a far higher popularity rating and is valued far more highly than Yahoo, the only other search engine the students indicated they consistently used (cf. table 4.25, 4.2.2.1, 4.2.6.5, and reference made to AltaVista in 4.2.6.5). This is congruent with findings from studies conducted in the United Kingdom (UK) that found a marked preference for Google among the student population (Banwell and others, 2004:311; Urquhart and Rowley 2007). Another study that examined the students' use of EIS in the UK over a period of five years also found that undergraduate students relied heavily on Google to search the Internet (Urquhart and Rowley, 2007).

It is generally accepted that Google dominates the Web today and although these findings were to be expected, the researcher was, however, surprised that the nursing students rarely used AltaVista or any other search engine other than Google or Yahoo. This suggests that students have a limited knowledge of Internet search engines, and that they are possibly preconditioned by the fact that many of the Web sites, including UNAM's site have an automatic link to either Google or Yahoo, making them even more reliant on these search engines. The fact that the students indicated that they usually learn to use EIS mainly from their classmates, would further limit their knowledge of Internet search to what their classmates know.

The results of this study further revealed that while an overwhelming majority of the youngest students reported to have used the Internet, only a few of the oldest students said that they used the Internet (cf. table 4.4). This can be ascribed to the fact that older generations were not as exposed to computers as currently is the case, and the younger generations would thus be more confident and enthusiastic to use the Internet, and also more open to learn new skills.

In terms of the frequency of use of the Internet, the highest proportion of students reported that they used it on a weekly basis, compared to only a few who indicated that they used it on a daily basis (cf. figure 4.2). These results concur exactly with the findings of Aman (2004:68), and Dee and Stanley's (2005:215) study of nursing students. It was, however, revealed that most of the nursing students at the UNAM Northern Campus would use the Internet more often if there were more computers in the library. This suggests that the shortage of computers in the library is a major concern for students at the UNAM Northern Campus.

The study further revealed that although the students used the Internet, for a variety of purposes (for example, communication, obtaining information for class assignments, reading online newspapers, downloading music and career information), the majority used it to search for information that would help them to complete their class assignments (cf. table 4.13). These results are consistent with the findings of Crawford (2006:35), and the study conducted by Waldman (2003) at the Baruch College Library that indicated that

students mostly used the Internet for educational purposes and only a few used it to read newspapers. In contrast, Griffiths and Brophy (2005:550) however found that the use of the Internet for academic information was relatively low. It is thus clear that although the Internet is primarily used for academic purposes, certain studies have also provided contradictory evidence.

The interviews provided further insight into the nursing students' use of the Internet for academic information, and revealed that they were not always successful in getting what they need. It was clear that most of the nursing students did use the Internet not because it necessarily provides quality information, but because they have a perception that it can meet all their information needs. Since it is apparent that the Internet is very appealing to students, librarians and lecturers should therefore see this as an opportunity to guide and encourage students to use the Internet in a meaningful way.

### **5.2.2 Students' use of email**

It is widely accepted that email has dramatically changed the way people communicate by not only cutting the cost associated with sharing large volumes of information, but also by presenting new possibilities for people who live long distances apart to share information of common interest. The use of email facilities by university students has been investigated by many researchers, and there appears to be general agreement that undergraduate students make heavy use of this facility. Examples of such findings are those of the studies conducted by Armstrong and others (2001:253), and Badu and Markwei (2005:262) which revealed that the email facility was extensively used by undergraduate students. This study was no exception in that it was clear that an

overwhelming majority of the nursing students at the UNAM Northern Campus were making extensive use of emails (cf. figure 4.3).

Once again it was clear that the youngest nursing students at the UNAM Northern Campus made far more extensive use of the email facility than the oldest students (cf. table 4.6). This variation can again be attributed to the fact that generally the younger generations have had more computer exposure, and are more enthusiastic to use new information and communication technologies (ICTs).

It was further found that although the nursing students have subscribed to a wide range of email services that are freely available on the Web (for example, Yahoo, Webmail, Hotmail, Teenmail, Penpalnet email services), the majority of the students used the Yahoo email service (cf. table 4.7). The reason for favouring Yahoo email is not yet clear but it seems that many students subscribed to Yahoo email because it is popular among the young people, and it was also one of the first free email services that became available on the Web. It came as a surprise that some of the nursing students indicated that they have UNAM email accounts (cf. table 4.7). This finding was not expected because at the time that this study was conducted UNAM Northern Campus did not provide email accounts to its students. A possible explanation to this finding is that students were probably confused between having a UNAM email account and using UNAM computers to access their emails that are freely available on the Web. The majority of the nursing students were however aware that UNAM does not provide institutional email to them, and have expressed concern about this, arguing that they

would prefer UNAM email accounts because they believe that it would be much more reliable. Rowley and others (2002:118) validate this concern and have argued that the use of Web-based email systems as opposed to the institutional email systems could hinder the use of the email facility for institutional administrative and academic purposes.

With regard to the frequency of use of the email, the study discovered that the largest proportion of the students used the email facility on a weekly basis (cf. figure 4.4). As in the case of the Internet, many students indicated that they would use the email more frequently if they had guaranteed access to more computers. This finding again reinforces the concern regarding the inadequacy of computer access in the library. Many students, for example, stated during the interviews that they were using mobile phones instead of emails to communicate with fellow students because there is a critical shortage of computers in the library. The problem of computer shortage is discussed in more detail later (cf. 5.3) but suffice to say here that it is one of the major impediments that prevented the students from using EIS more extensively.

The study further revealed that although the nursing students used the email facility for a variety of purposes (for example, to communicate with friends and relatives, lecturers and administrative staff at UNAM, and organisations to look for sponsorships), the main purpose was to communicate with fellow students (cf. table 4.14). This concurs with the finding by Manda (2005:272) who found that the majority of undergraduate students in Tanzania primarily used the email facility to communicate with their friends, while Rowley and others (2002:118) revealed that email was widely used by students in the UK

to complement informal communication and provide an easy means of contacting organisations.

It is worrying that the nursing students make minimal use of the email facility to communicate with their lecturers (cf. table 4.14), and this suggests that lecturers do not encourage students to contact them by the email. Another possible reason could be linked to the fact that UNAM does not provide email accounts for its students. There is, however, no doubt that it would be beneficial to both the students and lecturers if they were using emails to exchange academic information. An obvious advantage is that there would be no cost involved if emails are used and that files can easily be exchanged, thus further reducing the cost associated with printing. Some students indicated however that they do not have computers at their residences, and this prevents them from using emails when they want to contact their lecturers.

### **5.2.3 Students' use of electronic databases and e-journals**

The study clearly indicated that the nursing students were under-utilizing the library's electronic databases (cf. figure 4.5). Tenopir and Read (2000:245) found similar results and have stated that "students may be in chat rooms or surfing the Net at all hours, but few are likely to be searching research databases". It was further found, in this study, that the few students who did use the electronic databases mostly used them on a weekly basis (cf. figure 4.6), and primarily with the purpose to find information of academic nature.

The questionnaire results (cf. table 4.18) and interviews indicated that the low level of usage of the databases by nursing students could be attributed to poor access to computer facilities, coupled with the lack of EIS skills. Other factors that inhibit the use of these databases could possibly be the fact that lecturers do not encourage the students to use these important databases, or the perception that these databases were not sufficiently relevant to their studies.

The effect of the lack of EIS skills and training particularly came to the fore during the interviews. It emerged that the nursing students have a perception that the library's electronic databases are difficult to search. Waldman (2003) reinforces this aspect when he stated that one of the major impediments to undergraduate students' use of scholarly database resources is that "they are seen as being not straightforward". In order to counteract this perception, training is thus vital and urgently needed. The library must therefore proactively intensify its activities that are geared towards increasing the usage of its scholarly databases. It is also important to note that the level of computer skills with which students enter colleges and universities has a major influence on whether or not they will use the library's electronic resources (McGuigan, 2001). It is therefore important for the library to find mechanisms to identify students that have poor ICT skills in order to bring them on par with those who are already conversant with the new technologies.

Of specific concern is that the nursing students were not using the MEDLINE database (cf. table 4.9), since it is the most closely aligned to their academic needs. This finding, however, concurs with that of a study conducted by Ajuwon (2003) who found a low level

of usage of scholarly databases among the first year clinical and nursing students at the University of Ibadan in Nigeria. Conversely several other studies reported opposite findings. For example, a study conducted in the UK reported a high usage of the MEDLINE database by students enrolled in the health sciences courses Crawford (2006:36), and the studies by De Groote and Dorsch (2003:233), and Dee and Stanley (2005:215) in the United States of America (USA) further reported a high usage of the electronic databases among the nursing students. Similarly, a study conducted in Finland by Romanov and Aarnio (2006) found a high usage of the MEDLINE database among the medical students. A possible explanation for this discrepancy could be that unlike in developing countries, the nursing students in the developed world might be at an advantage in terms of better access to ICT facilities, greater EIS exposure, and more training which results in enhanced computer skills and use. It is thus this researcher's view that the non-use of the MEDLINE by the nursing students at UNAM was probably due to lack of awareness of the availability of this database and lack of skills (cf. table 4.29 and 4.30).

In general terms, librarians, lecturers and university administrators should be alarmed that the majority of the nursing students at the UNAM Northern Campus did not use and exploit many features of the electronic scholarly databases. These resources are very expensive and are primarily acquired to provide the students with quality academic information. There is thus an urgent need for the library and other stakeholders to take the necessary measures to remedy this situation. These measures should firstly involve the installation of more computers with fast Internet connection in the computer laboratories,

and secondly training to equip the students with the necessary information literacy and computer skills that would enable them to derive maximum benefit from these databases.

There is no doubt that the librarians have an important role to play, not only by transferring EIS skills to the students, but also to proactively encourage and promote database use. Tenopir and Read (2000:245) have, for example, suggested that “librarians can influence the use in a variety of subtle and obvious ways, including mentioning specific products in a user instruction class, advocating use of a specific database in specific class assignments, referring to a database on a library’s welcome screen, or otherwise reminding users about a specific database”. This researcher is thus of the view that such interventions would certainly make a positive impact on the students use of the scholarly databases.

A further disturbing factor that surfaced during the interviews was that some of the students who were interviewed indicated that they did not visit the UNAM Libraries’ Web site. This could be a further factor that contributes to the low level of use of the electronic databases, and it is suggested that a strategy that the library could use to encourage students to make greater use of its Web site is to explore the possibility of loading lecture notes and handouts on the library’s Web site.

In a similar way it was found that the nursing students were under-utilising the electronic journals (cf. figure 4.7). This finding is consistent with the results of the study conducted by Mgobozi and Ocholla (2002) which found that students at the University of Natal and

University of Zululand did not fully utilise the e-journals. The low level of usage of e-journals by the nursing students at the UNAM Northern Campus could be attributed to the fact that these students are undergraduates, and until recently they were not required to do research projects even during their last year. Another possible reason is that many students might not be aware of the availability of e-journals on the UNAM Libraries' Web site.

#### **5.2.4 Students' use of the Innovative Millennium OPAC systems**

The study found that almost half of the nursing students used the Innovative Millennium OPAC systems at UNAM Libraries (cf. figure 4.8), and that a significant proportion of these students used it on a weekly basis, compared to only a few who used it on a daily basis (cf. figure 4.9). Cross-tabulations further revealed the unexplainable fact that the male students were making far more extensive use of the OPAC than their female counterparts (cf. table 4.11).

The literature revealed a number of contradictory results as far as the undergraduate usage of OPAC systems is concerned. On the one hand, the OCLC study conducted in the USA found a relatively high number of students who used the library catalogue (OCLC, 2002:6). Similar results were reported by Griffiths and Brophy in the UK and they specifically noted that

“the library OPAC was chosen for its familiarity, its ease of use, its ability to retrieve relevant information, and mostly because there was a clear expectation among some participants that certain types of information resources would be found there” (Griffiths and Brophy, 2005:547).

In contrast, Baruchson-Arbib and Shor (2002:256) have reported that their study found only a few college students in Israel who used the ALEPH catalogue. Similarly, Urquhart and others (2005:353) have reported a low level of usage of the OPAC systems among the undergraduate students in the UK. A possible reason for these contradictory results could be that while some institutions invest sufficient time and resources to orientate their students to the OPAC systems, others provide only perfunctory training and expect the students to improve their OPAC skills by themselves.

It emerged from the interviews that the main reason why so many of the nursing students did not use the OPAC was because they lacked the necessary skills to do so. This suggests that the orientation programme that is being offered at the UNAM Northern Campus Library is not effective. Other reasons given by the students for not using the OPAC was the shortage of computers, and the fact that because they already knew where the nursing books are located they do not need to use the OPAC. The library's collection at the UNAM Northern Campus is fairly small, and this makes it easy for students to locate the books they need. It is however important for the university students to learn to use the OPAC effectively, as they would then be able to utilise all its additional features such as renewing and reserving books, suggesting a title that could be ordered, viewing new acquisitions, and even changing their personal details online.

It further came to light during the interviews that many students preferred the librarians to conduct searches for them on the OPAC. It is however this researcher's view that the librarians should rather be encouraged to train the students in using the OPAC effectively, and thus inculcate a culture of using the OPAC systems. This way they assist the students

to derive maximum benefit from such an important tool and in the process become independent learners.

### **5.3 Barriers encountered by the students in accessing the various EIS**

The study revealed many constraints that prevented the students from making effective use of the various EIS. These include the shortage of computers, the slow speed of the network, frequent interruptions of the Internet connections, the lack of time, the lack of skills, limited time allocated to students to use computers, and the lack of adequate support and assistance by the library staff. This concurs with the findings of the study conducted at the University of West Indies, which cited the slow Internet connection, shortage of computers, and lack of assistance from library staff as some of the main barriers to students' use of EIS (Ramlogan and Tedd, 2006:38).

In this study, the shortage of computers was cited by the vast majority of students as the main barrier to their use EIS (cf. table 4.17), and it was a recurrent theme in the interviews (cf. 4.3.4). Manda (2003:280) found similar results and has noted that the shortage of computers was a major impediment to students' use of EIS in Tanzania. It appears that many tertiary institutions in the developing nations are struggling to provide sufficient computers to their students because of financial constraints. Very often there is intensive competition among the various departments in tertiary institutions to acquire funds for various projects. Consequently, most academic libraries have to cope with shrinking budgets, and this seems to be the major challenge facing the UNAM Northern Campus Library. The library should nevertheless be mindful of the fact that that even

though it would not be an easy task to secure funding to purchase more computers, it is equally important to realise that the current shortage of computers defeats the whole purpose of expanding the various EIS to students.

At the time this study was conducted there were only 13 computers in the library. Yet, the number of students stood at about 3000 (this includes part time students who have registered for distance education programmes). This implies that the student-computer ratio was about 231:1. The ideal situation would be to have a computer-student ratio of 60:1, and thus the library needs to acquire at least 37 additional computers for students use. The interviews also revealed that many of the students do not have computers at home, and this further exacerbates the situation with regard to the students' use of EIS. A few students even stated that they had lost interest to use EIS because the university does not provide sufficient access to computer facilities. These problems are further intensified by the fact that the students are only allocated limited time slots to use the computers and the slow speed of the network.

Many studies have reported the speed problem as a major deterrent to EIS use (cf. for example, a study conducted by Manda, 2005:280). It was interesting to note that a number of students tried to overcome the speed problem by working in the afternoon when the network is much faster, but here they were once again inhibited by the fact that the library closes at 18:00. This finding points to an urgent need for the library to consider extending the opening hours.

Moreover, the students were frustrated by the fact that the Internet connection at the UNAM Northern Campus is neither stable nor reliable, resulting in frequent interruptions. Aman's study (2004:70) also noted that the frequent interruptions when the Internet server goes off. This causes major dissatisfaction and acted as a disincentive to the use of EIS. It is however important to state that the problems pertaining to the slow speed of the network and interruptions of the Internet connection at the UNAM Northern Campus are rather complex. These problems are difficult to solve immediately because they involve improving the network infrastructure not only by UNAM but also by Telecom Namibia and the Internet Service Provider. Having acknowledged the complexity of the problem, the researcher nonetheless recommends that UNAM should invest in additional resources to upgrade the network and particularly its bandwidth in order to improve the reliability and speed of the Internet connection.

The study revealed that a further factor that prevented the students from using EIS extensively was their tight schedules and time constraints (cf. tables 4.17 and 4.18). In Turkey, Komerik (2005:472) reported that the lack of time was one of the main reasons why the dental students did not use the Internet. Similarly, Dee and Stanley (2005:216) noted that the lack of time was cited as a major impediment to the use of the electronic databases by some of the nursing students they investigated. This suggests an even greater need to upgrade IT equipment and infrastructure to improve and enhance EIS access.

It must also be borne in mind that to only improve access to EIS is not sufficient, and thus the library should introduce more extensive training programmes in order to ensure that the students have the necessary skills to make optimal use of the various EIS. Once the library has addressed the lack of an adequate number of computers and access-related problems, it should then intensify its EIS promotional activities and training. The researcher thus argues that unless the various problems outlined above are adequately addressed, the return on the IT investments made by UNAM would never come to fruition, and the desired results relating to students use of the various EIS may never be achieved.

#### **5.4 Students level and development of EIS skills**

While there were only a few students who indicated that they lacked the necessary skills to use the Internet (cf. table 4.17), many students indicated that they lacked the skills to use the library's electronic databases (cf. table 4.18). These results are consistent with the findings of Dee and Stanley (2005:218) who found that many of the nursing students they investigated lacked the necessary skills to effectively search electronic databases. It is thus clear that many undergraduate students rely far too extensively on the Internet for educational information. This researcher once again wishes to voice his concern and emphasise that the Internet must be used cautiously, taking into account its limitations. He is thus in agreement with McDowell and Xiping (2007:35) who have argued that "competence is needed not only in the areas of email and Web surfing, but more importantly in areas such as database searching ...." It is therefore important for librarians to impart the necessary skills to students so that they can effectively use the scholarly

databases, and in general maximize their use of EIS. Such skills should, as advocated in the conceptual framework of this study (cf. figure 2.1), include not only computer skills but also ICT literacy skill in general, and even more important information literacy skills to equip them with analytical skills and evaluative abilities.

It further emerged from the interviews that the skill deficiencies were prevalent in students across all the years of registration. It seems therefore that the students' proficiency with regard to their use of EIS does not increase as they progress from the first year to subsequent years of registration. It also appears that the current orientation and training programmes do not make a significant impact on improving students' EIS skills. The library therefore needs to review the orientation and training programmes that are currently in place. It was however encouraging to note that many students expressed their willingness to learn and expand their EIS skills if they were to be afforded the opportunity to do so.

With regard to the sources of assistance, the study found that while the vast majority of students relied upon multiple sources to help them to use the various EIS, they preferred to obtain assistance from their classmates and friends rather than from the librarians and their lecturers (cf. table 4.20). Other studies, such as the OCLC's study (2002:5) and the one conducted by Crawford, De Vincente and Clink (2004:115) also found that students rely heavily on classmates and friends rather than librarians for EIS-related assistance. Rowley and others (2002:117), however, caution that "students learn a lot from each

other but ultimately their learning through this route will be constrained by what their friends know”.

The findings of this study and the literature provide sufficient evidence to suggest that most undergraduate students tend to ignore librarians, and in most cases these students would only approach librarians when their peers fail to help them. Yet, librarians have the necessary expertise to help students with problems related to their information needs. Wang and Artero (2005:78) have therefore urged students to seek assistance from librarians to help them to search more effectively. The tendency to ignore librarians could be ascribed to poor promotional strategies. A study that investigated student satisfaction with electronic library resources at Wayne State University concluded that “the library’s efforts to promote directly its electronic resources were not effective because only a few students have learnt about these resources from the library publicity or librarians” (Holley and Powell, 2004:48).

A specific reason that was provided during the interviews for not approaching the librarians for assistance was the unavailability of library staff to promptly provide help. Rowley and others (2002:117) also noted that “students perceive librarians to be remote and not always there when they want them”. While some of the nursing students appeared to appreciate the assistance they obtained from the library staff, others expressed the need to have a full-time IT Assistant based in the computer laboratories to provide immediate support. It is therefore recommended that the library should encourage their staff to provide more proactive assistance, and that it should further employ an IT

Assistant who would be stationed in the computer laboratories to provide assistance to students.

It also emerged from the interviews that EIS skills are generally acquired on an ad hoc basis, and that training programmes are not well coordinated. EIS orientation and computer training programmes are only offered once in the first year and thus do not adequately address and reinforce the information skills needed in the current environment. This is indeed a serious concern and the researcher thus wishes to emphasise that students need regular training and workshops, and also support and encouragement on a continuous basis to enable them to effectively use the EIS.

As stated above, an EIS training programme should not only focus on computer skills, but it should also encompass the skills related to general information literacy (IL) and ICT literacy. Such training must be holistic in nature in order to equip students with the necessary analytical skills to be life-long learners, and enhance their capability to adapt to the new technologies, and ultimately become critical thinkers so that they can make positive contributions at their workplaces when they graduate. This researcher strongly believes that a holistic EIS training programme can also equip students with the necessary skills that would enable them to determine the accuracy and credibility of information, as well as being cognizant of the legal issues pertaining to the use of information. Verhey (1999:259) stated that in today's world which is characterised by ever-increasing information resources in a variety of formats, nursing students need the skills to locate and evaluate the information. Thus, unless a comprehensive formal

information literacy training programme is developed mastering EIS skills will remain a huge challenge for many nursing students at the UNAM Northern Campus.

It will be useful if training programmes are supplemented by computer-based learning packages with practical examples, as this would enable students to learn and practice on their own and at a time that is convenient to them. Such computer-based learning packages would be a very useful adjunct to training courses, especially to improve the use of the library's electronic databases. In addition, the library should publicise their EIS more extensively, particularly the databases, which were found to be under-utilised. One possible promotional strategy is to ask the students to provide their email addresses when they register as members of the library to enable the library to regularly update students on EIS information. Another strategy is to print posters and information sheets for regular distribution to the students and for notice boards around the campus and in the library.

The researcher further urges the lecturers to play a more proactive role in encouraging students to use the library's electronic databases. As D'Esposito and Gardner (1999:458) have argued, students usually follow their instructor's directive regarding the choice of an information source. This can be achieved by integrating the use of electronic resources in the curriculum by, for example, referring students to a specific database to obtain information for a particular assignment. Appleton (2006:630) offers another strategy and has suggested that "lecturers can use a scholarly article as the basis of a handout or getting students to interact with electronic library resource (ELR) within a resource-based

learning context". These strategies can obviously motivate students to use the scholarly databases more effectively in a practical context and further also complement the library's efforts.

The researcher wishes to stress the latter point and thus encourage the librarians and lecturers at UNAM to combine efforts and expertise to enhance the students' EIS skills. For example, they can hold joint classes where the lecturer deals with the subject content and the librarian demonstrates how to use EIS to obtain related information. The success of such joint ventures have been reported in the literature (cf. for example, Bachman and Panzarine, (1998:161) and as early as two decades ago, Kaluzsa (1985:261) stated that library orientation must be taught in conjunction with a programme that is useful to and directed towards specific subject content. It thus clear that both librarians and lecturers have a crucial role to play in motivating students to use the various EIS.

### **5.5 Students' perceptions of the EIS**

According to Wang and Artero (2005:78) university students' perceptions of EIS play an important role in shaping their online information searching behaviours. It is thus essential for librarians to understand how students perceive the various EIS so that strategies aimed at developing positive attitudes towards the EIS can be devised. As stated previously in 5.2, it is clear that although the nursing students obtained useful information from a variety of EIS (cf. table 4.23), they showed a distinct preference to use the Internet and email systems rather than the more scholarly resources (cf. table

4.12). It is thus suggested that this predilection would clearly shape their interaction with EIS.

This study further found that while many nursing students appeared to have a positive attitude towards EIS, only a few indicated that they were satisfied with the electronic information services being offered by the Northern Campus Library (cf. table 4.31). The high level of dissatisfaction of the EIS in the library among the students can be attributed to several factors that were discussed above (cf. 5.3). In addition, there appears to be no formal strategy to market the library services at the UNAM Northern Campus. There is therefore an urgent need to assess the library's marketing strategy and ensure that the library's electronic databases are covered in a satisfactory manner. In fact, the vast majority of nursing students have urged the library to publicise more widely the various EIS (cf. table 4.29). In a study at the University of Zululand, Mgobozi and Ocholla (2002) observed a similar situation and found that because the marketing of the electronic services was insufficient, many students and academics were not aware of what EIS are available to them. Despite the fact that marketing is a very important aspect of any organisation's operation, it is often overlooked in many libraries, and the researcher would thus like to suggest that more proactive marketing strategy be adopted by UNAM Libraries to ensure that more users are made aware of available library services.

The interviews highlighted the fact that because many students held negative views regarding the library's electronic databases they thus under-utilised these resources. They were perceived to be difficult to use and because the students did not have the necessary

skills to use them, scholarly databases were seen to be a waste of time. It is thus clear that unless the library puts more effort into training, many students will retain such negative perceptions. In addition to training, the library should proactively intervene and overcome the apparent disinterest that the students had in using the library's electronic databases (cf. 4.26). The library should promote the use of e-databases for academic purposes, and emphasise their scholarly value and importance by stressing that these databases offer quality information that has gone through a rigorous evaluation process.

It further emerged that the nursing students' perceptions of the OPAC varied widely. While just fewer than 50% of the students considered the OPAC as either very useful or useful, just over 50% either never used the OPAC or felt that it was not useful to them (cf. table 4.24). During the interviews it became clear that these negative perceptions can be attributed to the fact that many of the students lacked the skills to search the OPAC, and it is once again evident that the library needs to urgently revisit its training programmes.

With regard to the Internet search engines, it was clear that the students' perceptions would be shaped by the fact that their knowledge is limited to either Google or Yahoo (cf. table 4.25), and they are generally unaware of other possibilities such as AltaVista.

In summary, it can be stated that the students' perceptions of the various EIS vary widely, and that this is often based on their past experiences with each of the EIS. It is however abundantly clear that the Internet and email facility are the most used and valued EIS among the nursing students at the UNAM Northern Campus, and that the electronic

databases and journals, and the OPAC did not receive good ratings in terms of their usefulness (cf. table 4.24). This later aspect is worrisome as it is this researcher's view that the scholarly electronic databases are important academic resources, and should be seen as an essential component of the students' education.

## **5.6 Conclusion**

It is the researcher's view that the study has succeeded in answering its research questions, and that this is reflected in the results presented in chapter four and in the discussion in the preceding section of chapter five. In summary, the following main conclusions are drawn from the findings of the study with reference to the research questions as outlined in chapter one (cf. 1.6).

- a) The study concluded that the extent of use of the various EIS varies widely among the undergraduate nursing students at the UNAM Northern Campus. It further, clearly, emerged that the vast majority of these students made the greatest use of and attributed the greatest value to the Internet and email facilities, and that the OPAC was moderately used and valued, while the library's electronic databases and e-journals were found to be substantially under-utilised.
  
- b) The study further revealed that the students made use of the various EIS for many purposes and these include obtaining course-related information; communicating with fellow students, friends, university staff and funding organisations; reading online newspapers; and for entertainment purposes. It was however very apparent

that while most students used EIS and particularly, the Internet to search for almost any kind of information the main thrust of using these services was to retrieve information that helped them with their academic programmes (this particularly applied to instances when they used the OPAC, scholarly databases and e-journals.

- c) The study also established that these students encountered many barriers in their use of the EIS, and that these could primarily be categorised into barriers relating to infrastructure problems and secondly into those that relate to personal interaction with EIS. With regard to problems that related to poor infrastructure, the severest and most constraining was the severe shortage of computers in the library, while the slow speed of the network, and frequent interruption of the Internet network connection also constituted a serious impediment. The barriers of a more personal nature that were cited by the students include the lack of skills to effectively search the various EIS, poor support from the library staff, and the lack of awareness of some of the EIS.
  
- d) The results of the study further indicated that the students have learned EIS skills from a variety of sources and that these include fellow students, the library staff and lecturers. It was however very clear that the students mainly approached their classmates to seek assistance in using the various EIS and they rarely asked for assistance from the librarians and lecturers. It was further clear that the current

orientation programme and computer course did not make a significant impact on equipping the students with the necessary skills to effectively use all the EIS.

- e) The study further revealed mixed results with regard to students' perceptions of the various EIS. While many students indicated a positive perception towards the Internet and email, only a few thought that the electronic databases and journals were useful to them. Their perception of the value of the OPAC was almost equally divided between those who regarded it as a useful tool and those who held negative views.

### **5.7 Recommendations**

On the basis of the findings of the study, the researcher would like to make the following recommendations that he suggests could help the library management improve the provision of EIS, and ultimately enhance the students' engagements with the various EIS that are available at the UNAM Northern Campus Library:

- a) In order to ameliorate the problem of access to EIS, the library should purchase and install more computers with high-speed Internet connections in the laboratories;
- b) The campus should increase the bandwidth to improve the speed of the network;
- c) The library, in conjunction with the department of nursing, should develop formal training programmes to equip students with the necessary skills that would enable them to effectively use the various EIS;

- d) The library should extensively publicise the information literacy training programme that is available online on the UNAM Libraries Web site so that students can continuously update their skills, and practice and learn at their own pace and at times that are convenient to them;
- e) The library should appoint a Student Assistant to be stationed in the computer laboratory to assist students when they face problems relating to the use of the various EIS;
- f) The library should consider extending its opening hours;
- g) The library should proactively market its various EIS and promote the use of the various EIS for academic purposes;
- h) The library should periodically conduct user studies related to the use and provision of EIS with a view to closely monitor EIS usage.

### **5. 8 Suggestions for future research**

Further research is needed to investigate whether the nursing students at the UNAM Northern Campus possess the necessary evaluative skills to assess the credibility of the information in electronic environment. There is also a need to investigate the use of EIS by the distance education students at the campus. Another important aspect that needs to be examined is the level of EIS skills among the lecturers at the department of Medical and Health Sciences.

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## **APPENDICES**

### **APPENDIX A**

Joseph Ndinoshiho  
University of Cape Town

Department of Information &  
Library Studies

29 June 2007

Ms P Uugwanga, Director: UNAM Northern Campus  
PO Box 2654, Oshakati

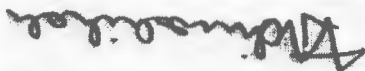
Dear Ms Uugwanga,

**SUBJECT: REQUEST TO CONDUCT RESEARCH AT THE UNIVERSITY OF  
NAMIBIA'S (UNAM) NORTHERN CAMPUS**

As part of the empirical research for my Masters dissertation, I would like to conduct a survey of the use of electronic information services (EIS) by undergraduate nursing students at the University of Namibia (UNAM) Northern Campus. The main purpose of my research project is to assess and describe the extent of use of electronic information services (EIS) by these students. The results of the proposed research project will not only help me to complete my dissertation, but will also provide a better understanding and insights into students' utilization of EIS that are available at the Northern Campus. It is also expected that the results that will emerge from this research project would guide the UNAM Libraries Management team in its efforts to improve electronic information services for the library users.

I am therefore writing to officially request permission to conduct the above-mentioned research project at the Department of Medical and Health Sciences of UNAM Northern Campus. The necessary data will be collected during the month of August 2007. I intend to use a questionnaire and personal interviews as instruments for collecting my data. About 163 self-administered questionnaires will be distributed to nursing students and I will personally conduct approximately 16 face-to-face individual interviews with some of the students. The respondents will not be required to provide any information related to their identification as both instruments are anonymous.

If you need more information or clarifications, please contact me at either the emails or the cellular-phone number provided below. I look forward to your positive response.



.....  
Joseph Ndinoshiho  
Emails: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na) or [ndnj001@uct.ac.za](mailto:ndnj001@uct.ac.za) ; Cell.: 0811283440

**APPENDIX B**

Joseph Ndinoshiho

University of Cape Town,  
Department of Information &  
Library Studies

29 June 2007

Dr L. Haoses-Gorases, Dean: Faculty of Medical and Health Sciences  
University of Namibia, Fax: (061) 206-3922

Dear Dr Haoses-Gorases,

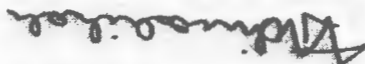
**SUBJECT: REQUEST TO CONDUCT A PILOT STUDY AT THE FACULTY OF  
MEDICAL AND HEALTH SCIENCES, UNIVERSITY OF NAMIBIA**

My name is Joseph Ndinoshiho, a Masters' student in Library and Information Science at the University of Cape Town. As part of the empirical research for my dissertation I would like to conduct a pilot study at your faculty. The title of my research is 'the use of electronic information services (EIS) by undergraduate nursing students at the University of Namibia (UNAM) Northern Campus.' I am, therefore, writing to kindly request permission to pretest my research instruments with the nursing students at UNAM's main campus during the first week of August 2007. Essentially, my pilot study will involve ten (10) self-administered questionnaires and four (4) face-to-face individual interviews with students in your faculty. The respondents will not be required to provide any information related to their identification, as both instruments are anonymous.

The main purpose of my research project is to assess and describe the extent of use of electronic information services (EIS) by nursing students at UNAM Northern Campus. The results of the proposed research project will not only help me to complete my dissertation, but will also provide a better understanding and insights into students' utilization of EIS that are available at the Northern Campus. It is also expected that the results that will emerge from this research project would guide the UNAM Libraries Management team in its efforts to improve electronic information services for the library users.

If you need more information or clarifications, please contact me at either the emails or the cellular-phone number provided below.

I look forward to your positive response.



.....  
Joseph Ndinoshiho

Emails: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na) or [ndnj001@uct.ac.za](mailto:ndnj001@uct.ac.za); Cell.: 0811283440

**APPENDIX C**

**Questionnaire on the use of electronic information services (EIS) by undergraduate nursing students at the University of Namibia (UNAM) Northern Campus.**

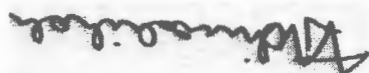
Dear respondent,

This questionnaire forms part of my Masters degree in Library and Information Science at the University of Cape Town. I am conducting a survey to assess the extent to which you, as a nursing student, use the electronic information services (EIS) at the University of Namibia (UNAM) Northern Campus. For the purpose of this research project, EIS are defined as information services and sources that are available online or in electronic formats and that are accessed by means of computers.

Your participation in this research will not only help me to complete my dissertation, but will also provide a better understanding and insights into students' utilization of EIS that are available at the Northern Campus Library. It is also expected that the results that will emerge from this research project would guide the UNAM Libraries Management team in its efforts to improve electronic information services in the library.

You were randomly selected from an official list of the nursing students obtained from your department. You are therefore kindly requested to complete the attached questionnaire and drop it at the Issue Desk in the library. The questionnaire is divided into seven sections, whereby each section asks questions related to a specific aspect of EIS use. You are not required to write down your name or any of your identification information on the questionnaire, as it is anonymous. Kindly note as well that the responses you fill-in to the questions asked will be only used for educational purposes and will be treated as confidential information.

The questionnaire will take about thirty minutes to complete. Your participation in this research project will be highly appreciated



.....  
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Email: [ndnj001@uct.ac.za](mailto:ndnj001@uct.ac.za)  
Personal contact details  
Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)  
Cell.: 0811283440  
Tel.: (065) 221768

Please answer all the questions to the best of your ability. It will take you about thirty minutes to complete the questionnaire.

**SECTION 1: DEMOGRAPHIC INFORMATION**

1. What is your age? (Please tick [√] in the appropriate box).

1. 17 to 21	<input type="checkbox"/>
2. 22 to 25	<input type="checkbox"/>
3. 26 and up	<input type="checkbox"/>

2. What is your gender? (Please tick [√] in the appropriate box).

1. Male	<input type="checkbox"/>
2. Female	<input type="checkbox"/>

3. Which of the following diplomas have you registered for? (Please tick [√] in the appropriate box).

1. Midwifery Science	<input type="checkbox"/>
2. Comprehensive Nursing & Midwifery Science	<input type="checkbox"/>
3. Other (Please specify):	<input type="checkbox"/>

4. In which year of registration are you? (Please tick [√] in the appropriate box).

1. 1 <sup>st</sup> year	<input type="checkbox"/>
2. 2 <sup>nd</sup> year	<input type="checkbox"/>
3. 3 <sup>rd</sup> year	<input type="checkbox"/>
4. 4 <sup>th</sup> Year	<input type="checkbox"/>

**SECTION 2: USE OF THE VARIOUS ELECTRONIC INFORMATION SERVICES  
AND RESOURCES**

**Use of the Internet**

5. Do you use the Internet? (Please tick [√] in the appropriate box).

1. Yes	
2. No	

If you ticked **YES** on question 5, please answer questions 6, 7 and 8. If you ticked **NO** go directly to question 9.

6. Which of the following Internet search engines do you often use? (Please tick [√] as many appropriate boxes as necessary).

1. Google	
2. Yahoo	
3. Altavista	
4. Other (Please specify):	

7. How often do you use the Internet? (Please tick [√] in the appropriate box).

1. Daily	
2. Weekly	
3. Monthly	
4. Rarely	

8. What are your reasons for using the Internet? (Please tick [√] as many appropriate boxes as necessary).

1. Reading newspapers	
2. Class assignments	
3. Sports	
4. Other (Please specify):	

**Use of electronic mail (email)**

9. Do you use email? (Please tick [√] in the appropriate box).

1. Yes	
2. No	

If you ticked **YES** on question 9, please answer questions 10, 11 and 12. If you ticked **NO** go directly to question 13 on page 3.

10. Which of the following email services are you subscribed to? (Please tick [✓] as many appropriate boxes as necessary).

1. Hotmail	
2. Webmail	
3. Yahoo	
4. UNAM mail	
5. Other (Please specify):	

11. How often do you use email? (Please tick [✓] in the appropriate box).

1. Daily	
2. Weekly	
3. Monthly	
4. Rarely	

12. In using email, with whom do you communicate? (Please tick [✓] as many appropriate boxes as necessary).

1. Other students	
2. Lecturers	
3. Administrative staff	
4. Other (Please specify):	
5. Do not use email	

**Use of library's electronic databases (e.g., EBSCOHOST, NAMLIT)**

13. Have you ever used the library's electronic databases? (Please tick [✓] in the appropriate box).

1. Yes	<input type="checkbox"/>
2. No	<input type="checkbox"/>

If you ticked **YES** on question 13, please answer questions 14, 15, 16 and 17. If you ticked **NO** go directly to question 18 on page 4.

14. Which of the following library's electronic databases have you used? (Please tick [✓] as many appropriate boxes as necessary).

1. EBSCOHOST	<input type="checkbox"/>
2. NAMLIT	<input type="checkbox"/>
3. SABINET ONLINE	<input type="checkbox"/>
4. Other (Please specify):	

15. If you ticked the EBSCOHOST above, which of the following EBSCOHOST databases have you used? (Please tick [✓] as many appropriate boxes as necessary).

1. Medline	<input type="checkbox"/>
2. Academic Search Premier	<input type="checkbox"/>
3. Health Source	<input type="checkbox"/>
4. Other (Please specify):	

16. How often do use the library's electronic databases? (Please tick [✓] in the appropriate box).

1. Daily	<input type="checkbox"/>
2. Weekly	<input type="checkbox"/>
3. Monthly	<input type="checkbox"/>
4. Rarely	<input type="checkbox"/>

17. What are your main reasons for using electronic databases? (Please tick [✓] as many appropriate boxes as necessary).

1. Class assignments	
2. Research	
3. Other (Please specify):	
4. Do not use electronic databases	

**Use of the Online Public Library Catalogue (OPAC)**

18. Do you use the library's catalogue (OPAC) to search for books and other materials in the library? (Please tick [√] in the appropriate box).

1. Yes	
2. No	

If you ticked *YES* on question 18, please answer question 19 and 20. If you ticked *NO* go directly to question 21 on page 5.

19. How often do use the library's catalogue (OPAC)? (Please tick [√] in the appropriate box).

1. Daily	
2. Weekly	
3. Monthly	
4. Rarely	

20. For what reasons do you use the library's catalogue (OPAC)? (Please tick [√] as many appropriate boxes as necessary).

1. Search for books	
2. Search for journals	
3. Other (Please specify):	

**Use of electronic journals**

21. Do you search electronic journals on the library Web site? (Please tick [√] in the appropriate box).

1. Yes	
2. No	

If you ticked *YES* on question 21, please answer question 22. If you ticked *NO* go directly to question 23.

22. Which of the following electronic journal services on the library Web site have you used? (Please tick [√] as many appropriate boxes as necessary).

1. Oxford journals	
2. SpringerLink journals	
3. Other (Please specify):	

### SECTION 3: BARRIERS TO THE USE OF THE VARIOUS ELECTRONIC INFORMATION SERVICES AND RESOURCES

#### Barriers to the use of the Internet

23. What discourages you from using the Internet? (Please tick [√] as many appropriate boxes as necessary).

1. Slow speed of network	
2. Shortage of computers	
3. Lack of time	
4. Lack of skills	
5. Other (Please specify):	
6. Do not use the Internet	

#### Barriers to the use the library's electronic databases

24. What discourages you from using the library's electronic databases? (Please tick [√] as many appropriate boxes as necessary).

1. Slow speed of network	<input type="checkbox"/>
2. Shortage of computers	<input type="checkbox"/>
3. Lack of time	<input type="checkbox"/>
4. Lack of skills	<input type="checkbox"/>
5. Cannot find useful information	<input type="checkbox"/>
6. Other (Please specify):	
<input type="text"/>	
7. Do not use the library's electronic databases	<input type="checkbox"/>

**SECTION 4: SKILLS TO USE THE VARIOUS ELECTRONIC INFORMATION SERVICES**

25. Who taught you to use the electronic information services and resources? (Please tick [√] as many appropriate boxes as necessary).

1. Myself	<input type="checkbox"/>
2. Other students	<input type="checkbox"/>
3. Library staff	<input type="checkbox"/>
4. Lecturers	<input type="checkbox"/>
5. Other (Please specify):	
<input type="text"/>	
6. Do not use the electronic information resources	<input type="checkbox"/>

26. Who assists you when you have a problem in finding what you want from the electronic information services and resources? (Please tick [√] as many appropriate boxes as necessary).

1. Friends	<input type="checkbox"/>
2. Other students	<input type="checkbox"/>
3. Library staff	<input type="checkbox"/>
4. Lecturers	<input type="checkbox"/>
5. Nobody	<input type="checkbox"/>
6. Other (Please specify):	
<input type="text"/>	
7. Do not use the library's electronic resources	<input type="checkbox"/>

**SECTION 5: BENEFIT OF USING THE VARIOUS ELECTRONIC INFORMATION SERVICES AND RESOURCES**

**Benefits of using the Internet**

27. What have been your positive experiences in using the Internet? (Please tick [√] as many appropriate boxes as necessary).

1. Ease of use	<input type="checkbox"/>
2. Saving me time	<input type="checkbox"/>
3. Useful information	<input type="checkbox"/>
4. Other (Please specify):	<input type="text"/>
5. Do not use the Internet	<input type="checkbox"/>

28. What have been your positive experiences in using the library's electronic databases? (Please tick [√] as many appropriate boxes as necessary).

1. Ease of use	<input type="checkbox"/>
2. Saving me time	<input type="checkbox"/>
3. Useful information	<input type="checkbox"/>
4. Other (Please specify):	<input type="text"/>
5. Do not use electronic databases	<input type="checkbox"/>

**SECTION 6: PERCEPTIONS OF THE VARIOUS ELECTRONIC INFORMATION SERVICES AND RESOURCES**

29. In using the electronic information resources, do you find useful information for your studies? (Please tick [√] in the appropriate box).

1. Yes	<input type="checkbox"/>
2. No	<input type="checkbox"/>
3. Do not use electronic information resources	<input type="checkbox"/>

30. How useful to you are following electronic information resources? (Please tick [√] in the appropriate box).

	Very useful	Useful	Not useful
1. Internet			
2. EBSCOHOST			
3. OPAC			
4. Email			
5. Other (specify)			
6. Do not use electronic resources			

31. How useful to you are the following Internet search engines? (Please tick [√] in the appropriate box).

	Very useful	Useful	Not useful
1. Yahoo			
2. Google			
3. Altavista			
4. Other (specify)			
5. Do not use search engines			

32. How useful to you are the following EBSCOHOST databases? (Please tick [√] in the appropriate box).

	Very useful	Useful	Not useful
1. Medline			
2. Academic Search Premier			
3. Health Source			
4. Master File Premier			
5. Other (specify)			
6. Do not use EBSCOHOST databases			

33. Between the Internet and the library's electronic databases which one would you say is more useful to you? (Please tick [√] in the appropriate box).

1. The Internet	
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2. Library's electronic databases	
3. Equally useful	
4. Do not know	

34. What do you think the library can do to facilitate your use of electronic information services?

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35. Do you have any other comments about the electronic information services at the library?

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Thank you for taking the time to complete this questionnaire.  
Your participation is greatly appreciated.

**APPENDIX D**  
**INTERVIEW GUIDE ON THE USE OF ELECTRONIC INFORMATION SERVICES (EIS) BY**  
**UNDERGRADUATE NURSING STUDENTS AT THE UNIVERSITY OF NAMIBIA'S (UNAM)**  
**NORTHERN CAMPUS**

1. Do you use the Internet?

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2. If no, why don't you use the Internet?

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3. If yes, which Internet search engines do you usually use?

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4. Who taught you how to use the Internet?

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5. What do you use the Internet for?

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6. How frequently do you use the Internet?

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7. Do you get useful information from the Internet for your studies?

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8. What problems do you experience when you use the Internet?

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9. Who assists you if you cannot get what you are looking for from the Internet?

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10. Do you think the library provides you with good Internet facilities?

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11. Do you have an email account?

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12. If no, why?

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13. If yes, which email services are you subscribed to? (For example, hotmail, Web mail, UNAM mail, Yahoo mail)

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14. In using email, with whom do you communicate?

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15. How often do you use email?

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16. What are the problems that you experience in using email?

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17. Do you search the electronic databases on the library's Web site, for example, Medline for your academic information needs?

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18. If no, why?

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19. If yes, what electronic databases on the UNAM Libraries Web site do you usually use?

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20. How did you learn to use the electronic library databases?

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21. How often do you use the electronic library databases?

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22. What are the problems that you experience in using the electronic library databases?

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23. Between the Internet and the library's databases which one would you say is more useful to you and why?

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24. Do you have any comment about any of the electronic information services or facilities in the library?

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25. Do you use the Innovative Millennium, the UNAM Libraries catalogue (OPAC) to locate the shelf number of books and other materials in the library?

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26. If no, why?

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27. If yes, what has been your experience of using the OPAC?

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28. How did you learn how to use the OPAC?

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29. Do you have any other comment regarding electronic information services at the Northern campus Library?

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Gender: ... ..

Year of Registration: ... ..

Thank you for your time and responses.