ACCESS TO AND USE OF ELECTRONIC JOURNALS BY POSTGRADUATE STUDENTS AT THE NATIONAL UNIVERSITY OF RWANDA LIBRARIES

By

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DECLARATION

DECLARATION BY CANDIDATE

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DEDICATION

To the Almighty God, the most merciful and compassionate for his abundant blessings throughout my study; to my beloved wife Marie Goretti and our children: Alida, Léilla, Scheillah, Charline and Celce Manzi Shema who endured long absence from husband and "daddy" during my study. To my late parents; Védaste Ruhinyanyura and Mrs Mukandutiye Thérèse for their constant encouragement to pursue my dreams and for helping me be who I am today (Lord, rest their souls in eternal peace).

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ABSTRACT

Information and Communication Technology (ICT) has transformed the way information is produced, processed, stored, accessed, disseminated, and used in contemporary societies. Consequently, several academic libraries, including the National University of Rwanda (NUR) Library and its branch libraries have introduced electronic journals to support learning, teaching, and research. However, there has been doubt whether the NUR communities, especially postgraduate students have been fully utilizing the electronic journals available at the University Library. The aim of this study was to investigate access and use of electronic journals by postgraduate students at the National University of Rwanda and propose measures to improve the access and use of e-journals at the institution. The specific objectives were to identify the ways used by postgraduate students to access information; to determine the databases containing e-journals preferred by postgraduate students; to analyze access and use of e-journals by postgraduate students; to identify factors that hinder the use of e-journals; and finally to suggest measures for improvement of access and use of e-journals at NUR. The study was guided by Borgman's three elements of accessing the network. A mixed method approach was used in the collection of data, whereby both quantitative and qualitative approaches were applied. From a total population of 688 postgraduate students, a sample of 87 students, 18 library managers and trainers were selected for the study. Data was collected using interviews and questionnaires. The study findings indicate that postgraduate students use different branch libraries and Main Library sd4sd4to access information for the academic purposes. Postgraduate students access e-journals through NUR computer labs, their laptops and cyber café (internet). They also face problems in searching and retrieving information. It was also observed that inadequate awareness of the existence of e-journals, inadequate qualified staff, inadequate training, low skills in searching and retrieving and computer skills, poor infrastructure; insufficient number of computers and, poor power capacity and internet connectivity are limitations in the access and use of e-journals at NUR. The study recommends improvement of network connectivity, training users and staff on advanced search and retrieval techniques for both short and long terms, recruiting qualified and competent staff, developing policy for e-journals management, involving users in selection of e-journals and creating awareness of the existence of e-journals.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

1.11. Abbreviation

1. A.D.A.: American Disabilities Act

2. AJOL: African Journal Online

3**. A.M.:** Ante Meridiem

4. A.P.S.: American Physical Society

5. ASABE: American Society of Agricultural and Biological Engineers

6. A.S.A.: Acoustical Society of America

7**. B.B.A.:** Bachelor's in Business and Administration

8. **B.L.D.S.C**.: British Library Document Supply Centre

9. **BITAM:** Bachelor's in Information Technology Application in Management

11. **CAS**: Current Awareness Services

12. **CDP**: Collection Development Policy

13. **CD-ROM**: Compact Disc, Read-Only-Memory

14. C.I.T.: Centre for Information Technology

15. C.N.L.G.: Commission Nationale de Lutte contre le Génocide

16. **E-journals**: Electronic Journals

17. **E-library**: Electronic library

18. **FAMCO**: Family and Community Medicine

19. **GIS**: Geographical Information Systems

20. **HINARI**: Health Internetwork Access to Research Initiative

21. HTML: Hyper Text Mark-up Language

22. ICT: Information, Communication and Technology

23. **ICTR**: International Criminal Court for Rwanda

24. **IEEE**: Institute of Electronic and Electrical Engineers

25. INASP: International Network for the Availability of Scientific Publication

26. INFORMS: Institute of Operations Research and Management Science

27. **IT**: Information Technology

28. **KIST:** Kigali Institute of Science and Technology

29. **MSC**: Master in Science

30. **NUR**: National University of Rwanda

31. **OECD**: Organization for Economic Cooperation and Development

32. OPAC: Online Public Access Catalogue

33. O.U.P.: Oxford University Press

34. **PDF**: Protected Document Format

35. P.M.: Post Medium

36. S.P.S.S.: Statistical Packages for Social Science

37. TCP/IP: Transmission Control Protocol/Internet Protocol

38. **URL**: Uniform Resource Locator

40. WREM: Water Resources Environment Management

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1. Introduction

Information and Communication Technology (ICT) has transformed the way information is generated, processed, stored, accessed, disseminated, and used in contemporary societies. Scholarly communication, learning and teaching styles have radically changed. Libraries as sources of information are coming to terms with their conventional role. It is in this regard that the National University of Rwanda (NUR) Library and its branch libraries introduced e-resources including e-journals to support learning, teaching and research.

The awareness and use of electronic information sources by faculty members depend mainly on skills and interest of each individual to locate discrete knowledge elements. E-Journals have been defined in different ways. The most common definition is a journal that is provided by any electronic means, e.g. Internet or CD-ROM, although not necessarily exclusive by electronic means (Ashcroft and Collin, (1999).

Electronic journals are documents in electronic formats containing relevant, reliable and up-to-date information. They are readable and downloadable through the computer. These documents might be in fuller use in networked environment. At the beginning, as for several e-resources, e-journals were criticized and underestimated. In this regard, Crawford and Bormann (1995) argue that e-journals will fail eventually if they are just a means of distributing the production costs. In addition, Tenopir

(1997) argues that e-journals cannot replace print journals because only a fraction of scholarly documents are available in electronic format. With the habit of regular use of electronic journals, the users have discovered the advantages of e-journals and e-resources in general.

However, Stewart (1996) observed that the success of scholarly electronic journals highly depends on the user's ability and enthusiasm to assimilate and integrate them into their daily work habits. A lot of studies confirm that the use of electronic journals is necessary for users mainly because the electronic resources provide better, faster and easy access to information than information accessed through print media. Nowadays, they overcome successfully the geographic limitations associated with the print media. They are becoming a basic need for the academic research scholars every day. Speed publication and availability on the desktop are the key advantages that attract researchers and scholars. Electronic journals and e-resources in general can be relied upon for timely information which upholds the quality of the right information to right user at right time in right place.

Access and use of e-journals by researchers, extension personnel, policy makers and farmers are some of the strategies that the universities are using in making available information for the development of research and eradication of ignorance. Such access and use provides up-to-date information and motivates the use of library materials and the e-journals in general.

The success or path taken by an individual in various aspects can be traced to the person's encounter with specific information. The power of e-journals is evident, and access to up-to-date information contained in the e-journals is crucial to transformation and development of a region or a nation and even the world. In emerging information societies, availability and use of up-to-date information provides a basis for knowledge and a vital component for decision making. It is an essential input for social, economic, educational and technical development of a society. The NUR Library and its branch libraries' e-journals are accessible anytime and anywhere for the users who possess the password.

In addition, the enhancement of access and use of e-journals have been addressed in various domains of education for instance teaching, learning, research, health, agriculture, commerce, good governance and in decision making. The augmentation efforts have been made in view of the fact that enhanced access and use of e-journals results in improved output in the respective domains. Three elements are required to success on access to e-journals: the situation and users' role(s), availability of the required content, and the appropriateness of the access databases.

E-journals are required in a university setting for a number of reasons, the most common being research, learning and teaching. The availability of e-journals in a university library intensifies the consumption of e-journals which in turn translate into knowledge generation. Commonly, e-journals are generally accessible through electronic communication devices or telephone lines. E-journals explosion in libraries has increased the amount of electronic information sources available on the web. In

addition, electronic information resources help to expand access, increase usability and effectiveness and establish new ways for individuals to use information to be more productive in their endeavours.

In addition, awareness of the existence and access of e-journals may aid users in keeping abreast with current developments in their respective subject fields. The use of e-journals is necessary for users mainly because they provide good, fast and easy access to information. E-journals are relevant and accurate because as the right information gets to right user at the right time. Therefore, access to e-journals as a source of information is a basis of transformation of the world in different domains scientifically and socially.

Cynthia (1990) noted that, "The existence of numerous interlocking computer networks, collectively known as the internet, presents an opportunity for academic and research libraries to offer their patrons access to a wide range of electronic information resources". Library users can view e-journals even when the library is closed if they have access to a network terminal. Since postgraduate students are every time in need of information for their research and daily studies, e-journals become helpful, effective and efficient in providing them with the required information.

However, Hannagan (1992) observed that for library users to use an information service, they must know that the service exists and the benefits they would derive from using the service. Consequently, the right and intended clientele's consciousness

of information services and their purposes contribute to the appreciation of these sources as crucial sources of information. As a result, they may end up using them effectively.

Furthermore, it has been observed that although e-journals are available to academic staff, postgraduate and undergraduate students at NUR Library and its branch libraries, they do not utilize the resources enough. In order to make available these resources, a lot of funds have gone into. Although, the factors influencing active usage of these resources and ways of stimulating their active usage have not been empirically established, this study investigated the factors affecting the access and use of e-journals at the National University of Rwanda Library and its branch libraries.

1.2   Background to the study

1.2.1   Historical background to the National University of Rwanda

In 1963 by the government of Rwanda in cooperation with the Congregation of the Dominicans from the Province of Quebec created the National University of Rwanda (NUR). When it was established in 1963, the NUR had 143 students registered in three divisions namely the Faculties of Medicine, Social Sciences, and a Teacher Training College.

Due to the political situation that plunged the country to the 1994 genocide, the National University of Rwanda closed in 1994. It was reopened in April 1995. Since then, the National University of Rwanda continues to grow. By the time of carrying this study, NUR had 7 faculties and 2 schools. They are Faculties of Medicine,

Agriculture, Arts, Media and Social Sciences, Applied Sciences, Law, Science, Economics and Management and School of Public Health and the School for Foundation Language Skills. For the academic year 2011 the National University of Rwanda had a student population of 11,449 all enrolled for various degree courses in all its seven faculties and two schools. The NUR has an estimated number of 1000 employees (academic and administrative and technical staff).

NUR has also started postgraduate programs in Law, Clinical Psychology and Therapeutic. The Schools of Public Health, Conflict Management, and Genocide Studies are located in Kigali. NUR also has a branch in Rusizi district, Western Province that offers an undergraduate program in Information Technology.

1.2.2. NUR's mission and vision

According to the NUR website (www.nur.ac.rw), the National University of Rwanda (NUR) has the following as its mission and vision:

1.2.2.1. Mission of National University of Rwanda

To generate and disseminate high quality multi-disciplinary knowledge and promote effective research, skills training and community service for national competitiveness and sustainable socio-economic development;

1.2.2.2. Vision of the National University of Rwanda

To become an innovative, world class and self sustainable university that is responsive to national, regional and global challenges.

1.2.3 Programs

1.2.3.1 Undergraduate

The NUR has two schools and the following faculties that offer several undergraduate programs:

1. The faculty of Economics and Management. This has two departments namely Economics and Management and offer BBA, BITAM, Statistics, and Accountancy.

2. The faculty of Law has two departments. These are civil law and penal law.

3. The faculty of Arts, Media and Political and Social Sciences hosts the departments of: English, Media, Social Sciences, Political science and Public Administration.

4. The faculty of Medicine constitutes: General Medicine, Pharmacy and Clinical Psychology.

5. The faculty of Agriculture has: Animal Production, Crops Production and Horticulture, Soil and Environmental Management, Agricultural Economics and Agribusiness.

6. The faculty of Applied Science comprises of the departments of: Computer Science, Civil Engineering and Electricity and Electronics.

7. The faculty of Science has the departments of: Chemistry, Biology, Physics, Applied Mathematics and Geography.

8. The School of Public Health manages the cohort of postgraduate students in different domains related to public health and

9. The School of Modern Language with the departments of English and French. This school prepares students in performing languages before joining different faculties at NUR.

1.2.3.2 Postgraduate programs

Since 2007, the NUR has introduced its Postgraduate programs in the following fields:

1. L.L.M – Master of Legal Law

2. Masters in Water Resources and Environment Management (WREM)

3. Masters in Agro-forestry and Soil Management

4. Masters in Public Health

5. Masters in Applied Field Epidemiology

6. Masters in Clinical Psychology and Therapeutics

7. Masters in ICT

8. Masters of Medicine (MMED)

9. Postgraduate Diploma in Irrigation and Drainage

10. Masters in Economics

11. Masters in ICT Policy and Regulation through NUR-NetTel@ Africa collaborative programs.

12. Masters of Arts in Development Studies

13. Masters of Arts in Peace and Conflict Studies

14. Master in Business Management

15. Masters of Arts in Genocide Studies and Prevention

16. Masters in Applied Mathematics

17. Postgraduate Certificate in Applied Geo-Information, (GIS)

18. Masters in Biodiversity Conservation

19. Masters in Accounting

20. Masters in Applied Field Epidemiology

21. Masters in Family and Community Medicine (FAMCO)

22. Masters program of Pharmaceutical Sciences

1.2.4 NUR Library services

The NUR Library began in 1963 with the opening of the university and has been extended and updated according to the needs of users. It used to serve only the print documents, but the number of services has grown progressively. Presently, the NUR Library comprises the Main Library and nine faculties/school documentation centres.

In addition, the NUR ICT centre has facilitated the NUR Library services to get access to electronic resources. This enables the library to be connected to all international electronic documents via ICT servers and to exchange information with other partners of the libraries across the world. The National University of Rwanda main Library has nine faculties/school libraries, each of which has Information, and Communication Technology (ICT) computer labs with 25 computers connected to the internet with access to electronic resources.

ICT section based at Main Library controls two ICT computer labs containing 68 computers in total all connected to the internet. The two computer labs are opened every day and remain accessible as per the Main Library's timetable for the availability of information to the students and the users in general. According to the NUR Library website, in order to provide accurate, relevant and reliable information

to the users (students, lecturers and researchers), and NUR Library has subscribed to a number of electronic journals that embrace all fields of teaching in NUR. There are also 174,203 print documents and 80,000 e-books that NUR Main Library and its branch libraries manage (www.lib.nur.ac.rw).

The NUR Main Library brings together the following sections: Acquisition, Cataloguing and Classification, Serials, References, Circulation and ICT sections and a section Rwandan for special documents on Rwanda.

Nowadays, academic libraries no longer restrict themselves to print services such as collection development, cataloguing and classification, and circulation, but they have extended their efforts to the use of information and communication technology, such as automation. In general, the digital technology has revolutionized not only the way information is packaged, processed, stored, and disseminated, but also how users seek, search, retrieve and access information (Anunobi 2008). Since 1998, the NUR Library and its branch libraries have undertaken an automation process that can improve the effectiveness and efficiency in the service delivery.

1.2.5 The mission of the NUR library

The NUR Library's mission is to satisfy any request from its users and provide the up-to-date, relevant and reliable documents in order to support teaching, learning and research activities to all NUR community such as academic staff, researchers, administrative and technical staff and students both postgraduate and undergraduate.

The NUR Library and its branch libraries have the following services:

1. Reference and information services

A reference desk is available at NUR to assist in answering users' reference queries and assist them to access the documents.

2. Current Awareness Services (CAS)

In order to create awareness on new or relevant documents, the following channels are used: notice boards, email, brochures, posters and telephone calls for identified persons.

3. Online/Internet services

The NUR Library has computers set aside for accessing online databases and the OPAC. In addition, it has computer labs used in access and use of e-journals, e-resources and e- books.

Furthermore, for the improvement on the efficiency of service delivery, the NUR Library has automated its documents since 1999. The Cross Ref software has been in use since 2005. This software assists all users in accessing the OPAC.

1.2.6 Technical services section

The different sections used by the library staff to assist users in their requests are as follows:

a) Acquisition

This section of the library is responsible for the selection and purchase of materials or resources. The department receives requests from different faculties and processes orders for purchases. It provides current awareness services through dissemination of new acquisitions such as purchases, donations or gift. In collaboration with teaching staff from different faculties, the head of Acquisition gathers orders for the proposed documents and compiles the final list that is sent to the procurement for purchasing after the approval of the director of the library. The stamping and assigning of bar-codes to print material are done in this section.

b) Circulation desk

This section is located at the entrance of the Main Library. The borrowed books are recorded and discharged at this point. The list of overdue books is compiled and kept in this section with a copy to the Deputy Director in charge of external services. A title can be loaned for a period of 15 days renewed two times. The library charges a fine for overdue books at the rate of 200 Rwandan francs per day.

However, lecturers are allowed a long loan of one month renewed two times. If they delay in returning the book, they are also charged a fine equivalent to the above amount.

c) Cataloguing and classification section

This section is in charge of the following:

1. Creating of entries of items in the collection.

2. Assigning class numbers.

3. Creating authority files to include accepted form of access points. Used for consistency and uniformity when assigning index terms e.g. subject headings.

4. Production of catalogue cards (main and added)

5. Checking of duplicate entries.

d) Special collection section

This is a closed access research area. Materials from this section are not given for loan except with a special authorization from the NUR Library managers. In that case, students and lecturers are authorized for a short loan. This section hosts all documents on Rwanda written by Rwandan and/or any other author, about Rwanda. The major documents include government publications, Rwandan culture, theses and dissertations, novels and any other information on the people, land, and climate of Rwanda.

e) Periodicals section

This section manages the current and retrospective periodicals such as magazines, journals, newspapers; bought or donated to the library. The loaning of materials in this section is not allowed. Users borrow for using within the periodical section and reading room. Library users use this section for research purposes and also for current awareness purposes.

f) Membership

The NUR Library and its branch Libraries are open to librarians, academic staff, administrative and technical staff and both undergraduate and postgraduates students.

Non-members of the University are not allowed to borrow documents as it is stipulated in the library regulation 2010 except those who have special permission from the NUR's authorities.

The below table indicates the opening hours at Main Library and its branch libraries.

Table1.1: Opening hours

Days	Time	Place	Observations
Monday to Friday	8.00 AM to 22.00 PM	Main Library	Closed after 22.00 PM
Weekend	8.00 AM to 13PM	Main Library	Closed afternoon
Every day	8.00 AM to 22.00 PM	ICT computer labs	Enables access and use of e- journals
Holidays	No work	No work	Opened only on a special request

Source: Researcher

The working hours as described above could be extended on the direction of the Vice-Rector academic affairs of the National University of Rwanda as per pressing demand of the National University of Rwanda Students Association Unit (NURSU) subject to the availability of staff.

1.2.7. Library staff

According to the NUR concept note (2010), the Main Library and its branch libraries have 62 staff divided in two teams. These are the day team and the evening team. Out

of the above number of staff, only 16 are qualified librarians. Out of the 16, 7 are pursuing training at Bachelor's level while two at Master's. The shortage of qualified staff impacts negatively on the library activities. The managers of computer labs are not qualified in librarianship. This alters the desired efficiency in helping NUR library's users because they cannot service all requests that several users put forward.

1.3 Statement of the problem

E-journals were first suggested some years ago as a possible means of revolutionizing the world of research and learning. In this regard, Rowland, (1997) described the major advantages of e-journals as follows: direct accessibility from the user's desktop, the prompt availability, and the possibilities of downloading the desired documents, the currency and up-to-date information. E-journals provide print versions and full text retrieval possibilities and facilitate scholarly research in their function and learning as the basis for primary scholarly research and information. Therefore, the purpose of making e-journals available and usable is to support and stimulate research and teaching, particularly at postgraduate level. The extent to which e-journals are used, and the demand for them consequently depends on the level of research, culture, ability in manipulating computers and skills in retrieving and searching.

However, usage statistics at the National University of Rwanda Library where e-journals are available to all NUR students and staff show that these target users have been underutilising the e-journals available to them (INASP Report 2006, 2007, 2008, 2009, 2010). This, then, raises the following questions:

a) Could the problem be the lack of information on the existence of e-journals?

b) Does the lack of adequate skills in identifying, retrieving, selecting, synthesizing and using e-journals contribute to their underutilization?

c) Or, could it be lack of awareness of e-journals or inadequate tools such as insufficient number of computers, slow internet connectivity which demotivates and discourage users in this particular case, postgraduate students at NUR because they cannot get what they require at some given time?

d) Are postgraduate students taking a lot of time to satisfy informational needs and thus frustrating their efforts?

e) Could the shortage of the staff in charge of the computer labs, and their lack of prerequisite skills and computer knowledge required in order to assist postgraduate students in accessing and retrieving information in e-journals, and the lack of enough space be the barriers to access and use of e-journals at the NUR Library?

In order to address the above questions, this study gathered helpful facts that should assist in the establishment of easy use and accessibility systems and services to ensure that e-journals are used efficiently and effectively at the NUR Library and its branch libraries.

1.4 Aim of the study

The aim of this study was to investigate access and use of e-journals by postgraduate students at the NUR Library and its branch libraries and propose measures for improvement.

1.5 Specific objectives

The specific objectives of the study were as to:

1. To identify the ways used by postgraduate students to access to information at NUR Library and its branch libraries.

2. To determine the databases containing e-journals that postgraduate students at NUR prefer.

3. To analyze access and use of e-journals by postgraduate students at NUR.

4. To identify and describe factors that hinders the use of e-journals at NUR.

5. To suggest measures for improvement of access and use of e-journals at NUR.

1.6 Research questions

The study was guided by the following research questions:

1. For what purposes do postgraduate students use electronic journals available at NUR Library and its branch libraries?

2. How are postgraduate students made to know of the existence of e-journals in NUR Library and its branch libraries?

3. How do Postgraduate students access and use e-journals subscribed by NUR Library and its branch libraries?

4. What challenges do the postgraduate students encounter in accessing and using electronic journals at NUR?

5. What can be done to enhance the effective access and use of electronic journals at NUR Library and its branch libraries?

1.7 Assumptions

The study was based on the following assumptions:

1. That NUR postgraduate students do not adequately access and utilize the available e-journals to satisfy their informational needs due to challenges of infrastructure and management of electronic journals by NUR Library and its branch libraries.

2. It is possible to increase the accessibility and use of e-journals by postgraduate students of NUR by increasing infrastructure and raising the level of awareness.

1.8 Significance of the study

This study attempts to clarify the issues surrounding the access and use of e-journals at the NUR Library and its branch libraries by postgraduate students. The study recommends the ways of enhancing the access and use of e-journals to postgraduate students of the National University of Rwanda and extends to the other categories of users.

The research results are important and valuable:

1. Library: The findings are expected to be used by the NUR Library and its branch libraries in improving access and use of e-journals.

2. Communication: The results provide advice to the library to develop a method of communicating to the users the availability of the documents and new services for a better utilization.

3. Users: The results are expected to provide postgraduate students with the opportunity to know the existence of different materials and services hosted in the NUR Library and its branch libraries especially the new arrivals.

4. Other institutions of higher learning: The results can serve as model to other institutional libraries which manage e-journals and other e-resources in Rwanda.

5. Managers and decision makers in ministry in charge of education: The results are likely to help in managing and advising the managers on how access and use of e-journals can be well managed in order to be useful to all users.

1.9 Scope and limitations of study

It may not be possible to apply some of the findings of this study to the settings in other institutions in the country. The study is limited to one institution because of the wide geographical distribution of the institution. It has branches in different areas of the country such as in Kigali and Rusizi. The study covers the NUR postgraduate students in main campus at Butare and in different branches in Kigali who are in permanent use of rich, reliable and updated e-journals.

1.10. Definition of terms

1. Access: It is the ability of people to successfully identify, search, seek, retrieve and use the information contained in different electronic resources within the computer systems. It is a term that incorporates accommodation of philosophical, technical and policy issues. In addition, the term can be used to extend beyond the use of computers and incorporate all information systems and resources.

2. Collection development: It is a process of planning a library's program for acquisitions and disposals, based on building of the collections in the sense of the library's collection management policy (Fordham 2008).

3. Collection Policy: It is based on two types of policies such as a collection management policy and a collection development policy.

4. **A collection management policy** can be viewed as a statement guiding the systematic management of the planning, composition, funding, evaluating and use of library collections.

5. **A collection development policy** is a statement of general collection, building principles that delineates the purpose and content of a collection in terms relevant to both external audiences (such as readers and funders) and internal audiences (or staff), written statements that provide clear and specific guidelines for the selection, acquisition, storage, preservation, relegation and discard of stock.

6. Computer: A computer is an electronic device that can accept, store, process and retrieve data following the instructions contained in a pre-written program that has been installed into its memory. Computers now exist everywhere, and are of particular importance in all aspects of information management including librarianship (Encyclopedia, 2007).

7**. Connectivity:** It is the ability of a computer to communicate to other computers and information sources. It can connect people to the internet and many computerized data banks and other sources of the information that lie well beyond their desk.

8. Electronic Journal: It is a journal that is available in electronic form through an online host. E-journals have existed experimentally since the late 1970s and were developed with the growth of internet and the development of the World Wide World (WWW) around 1990s. Its great benefits are that the user can access directly its information typically from his proper workstation without having to find a part or volume in a library.

9**. Electronic Resources:** They are materials consisting of adaptations and or computer programs encoded for reading and manipulation by a computer, by the use of a peripheral device directly connected to the computer, such as a CD-ROM drive, or remotely via a network, such as the internet.

However, Buckland (1991) considers information access as a combination of intellectual, physical, and social elements that affect the availability of information to individuals.

10**. Information use:** The "information use" refers to the way in which the managers or the researchers use information (Buckland 1991).

11**. Information and communication technology (ICT):** According to Feather and Sturges (2003) the term ICT is used to describe the design and application of systems and equipment for exchanging data by electronic means between two or more stations. It is a gamut of industries and service facilities, including internet service provision, telecommunication services and equipment, information technology (IT) equipment and services, media and broadcasting, libraries and documentation centres, commercial information centres, network-based

information services and other related information and communication activities.

12. **Information need:** It is a gap in knowledge that a person experiences that gives rise to an individual searching for an answer, Reitz (2007).

13. **Internet:** The Internet is a network of networks, which links up agglomeration of computer resources for public access.

14. **Network:** is a communication system connecting two or more computers. The largest computer network is the internet (Encyclopedia 2007).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the literature related to access and use of e-journals and focuses on access and use of e-journals by postgraduate students at the NUR. It reviews relevant literature and empirical studies on access and use of e-journals.

According to Kan (2008) a literature review is a systematic, explicit and reproducible method to identify, assess and interpret the existing recorded work produced by scholars. This allows the researcher to place the works in the context of what has already been done. In this regard, the Wesleyan University (2008) library indicates that the literature review is a critical summary and synthesis of the current knowledge of the topic.

2.2 Theoretical framework

A theoretical framework is a theory which answers the problem and why the used approach is a feasible solution. Furthermore, a theory is a basic explanation of some aspect of the natural world, an accepted knowledge applied in most circumstances to certain specific set of phenomena (Princeton University 2006). Several researchers have found out the importance of a scientific theory. According to Kemoni (2002) a theory shows commonalities in phenomena that may be isolated. It helps in making predictions and controlling events; organizes isolated findings from different research

studies into an explanatory framework and assists researchers to maintain consistency in field of study. According to Cozby (2001) theories have four purposes in scientific research such as description, explanation, prediction and control. The author argues that theories produce new knowledge and hypotheses about behaviour which could be confirmed or rejected after research and this one could show the weakness in a theory and force researchers to elaborate or modify a new comprehensive theory.

 In this case, it will show the main use of e-resources including e-journals, its purpose such as to seek, search and retrieve relevant, reliable, up-to-date and current information for solving or discovering the solutions of problems which are surrounding the world.

The study will be based on Borgman's (2003) three elements of accessing information in networked world. The three elements are:

1. **Connectivity** which is a prerequisite for using a computer network and the resources and services it supports.

2. **Content** is very fundamental for documents to be used, it plays an important role in learning and research and motivates the usage of a document;

3. **Usability** is the ability to manipulate the computer and the computer networks, for this, three elements are required such as features of the computer, skills and utilization of the content. This model has been chosen because it shows the basic elements to access and use e-resources. They are important, fundamental and crucial to support access and use of e-journals.

2.3 Accessibility

Accessibility needs some elements which support it; Borgman (2003) enumerated a number of elements which characterize accessibility in defining access to e-journals in the context of information infrastructure:

a) Connectivity is crucial for using computer, a computer network, the resources and the services it supports.

b) Content and services - here the connectivity doesn't have sense without the above device (computer, computer network and resources) which facilitates the downloading of the documents.

c) Usability: for the facility to manipulate the computer and the computer network, its achievement necessitates three aspects such as:

1. Features of the computer: to be considered accessible, the network must be usable by users instead of being designed for technical specialists.

2. Skills or literacy: the users must be able to manipulate the system or be trained. When the users are not capable of accessing the information they need in order to fill the gap or to resolve a particular problem, the usage will be low and it will be high when the users are capable of manipulating the materials available for their use. People's ability to access can limit the use of the technology and access to the e-journals available. This leads to the importance of training before the implementation of new technology or policy in every domain. Without this, they intended implementation of the innovation will fail.

3. Utilization of content or the quality: the e-journals must be retrieved, used and disseminated in order to be read, reviewed and support research.

2.4 Measures taken to enhance access to e-journals

A variety of methods must be employed and implemented by the library to make electronic journals available and useful to the students both undergraduate and postgraduate, researchers and academic staff and all university community. The use of ICT and the increase in the number of computers and the transformation of infrastructure as well as the installation of required equipment are the basic necessities in enabling users to access e-journals. This could motivate access and use of e-journals and e-resources in the academia.

Wainwright (2005) enumerated the problems libraries need to address for a better utilization as:

a) Offering effective learning experiences for students who spend short time on campus, who require services remotely from the place of academic staff and skilled support such as information professionals who face the challenge of acquiring more generic skills, using a greater range of technology and different multiple varieties of electronic journals.

b) Offering effective teaching and research support to the academic staff that is ever growing and are serve the skilled support staff remotely. The academic staffs are in most cases characterized by poor technological and information management skills. They are less informed and ineffective in accessing the

variety range of relevant research and teaching materials that are available electronically.

The ICT is coming up and helps to make e-journals accessible to researchers and NUR postgraduate students in particular. This can be considered a response to the vast number of e-journals available and affordable on the internet through the network in different libraries especially in the NUR Library website where 46 On-line Full Text Journals and Databases are located (http//www.lib.nur.ac.rw/inasperi.htm).

2.5 Factors influencing and motivating the use of e-journals

Any document to be used effectively must present some characteristics which motivate and influence its users. Its content, relevance and accuracy will justify the users' choice.

Eason (1999 a) observed users access an e- journal service by cost or benefit decisions. The user has to know first what to use and how to use it. This needs consideration of various factors that are considered as facilitators or barriers. Many studies have shown the main factors influencing and motivating user acceptance and its success within the scholarly communication system. Bishop (1995) identified the following factors: awareness, ease of access, usefulness of content, usability and new functionality as the main factors affecting e-journals usage. In addition, Meadows (1997) indicated user- friendly and easy access, and portability.

In this regard, Kim (2000) argued that the perceived quality and level of credibility are the most important factors affecting and motivating the acceptance of e-journals within the academic community.

After analyzing the above factors, scholars conclude that they are divided into two categories:

1. Firstly, the relevance, accuracy and reliability of the materials and the ease of access and use were the most important factors for users.

2. Secondly, the value added features such as browsing, searching, links, alerts can be considered at the second level.

However, to access the content, users are facing problems such as technical difficulties in accessing the service; the latter can generate frustration and leads to rare usage of e-journals.

2.5.1 Awareness

Many authors confirm that awareness and ease of access are the most important indicators influencing the success of utilization of e-journals and any other new product. Bishop (1995) argued that if scholars are not aware of the existence of e-journals and any existing documents nobody will use them as sources of information. This is because, they are not known to users and the scholars are reluctant to publish their work through a medium they judge as too limited. Bishop (1995) added that the resources playing a key role in improving user's awareness of e-journals are library

discovery systems and standard indexing and abstracting sources. The user perception of easy access means the availability at any time and from any location. To speed access to users, user-friendly interfaces and technologies are a requirement since technological problems experienced in these areas may lead to delays, frustration and discouragement.

According to Kim (2001), dependence on network and appropriate hardware and software, lack of standardization of data formats, poor efficiency in terms of readability, portability and manipulability can influence easy access. In addition, the amount of helpfulness of instructions offered to readers; the local technical resources needed to access the services and the knowledge necessary to use it also influence easy access of e-journals.

However, users consider the passwords as obstacles to access. For this reason, they perceive the systems incorporating user authentication and registration process such as: technical problems with access, privacy concerns, and length of registration process as additional obstacles.

According to Rogers (2001) enhancement in design and delivery are still needed by e-journals to achieve full acceptance among the academic community. The reason is because the use of e-journals is still new in some places, especially in developing countries where internet is rare or non-existent in some cases.

2.5.2 Content

The content of a document in academic area is very crucial and plays an important role in motivating its use. That is why, the first users' approach to e-journals service is the evaluation of the materials offered. It entails making sure that the content available through the service is sufficiently relevant. In that case, the user can judge whether it is worth the effort to use it.

In this regard, a good content should present the following characteristics:

1. The materials should be relevant. This is important because the users want to access the right e-journals for their information need at the right time. This motivates users and can increase the number of users and enhance the habit of using e-journals in research, learning and teaching due to the value of their content.

2. The coverage of the service. In this case users want electronic access to back issues. Deeply, the content considers also the volume and the quality of the contributions published in single e-journals. Arnold (1998) recognized that the need to offer a critical mass of e-journals in order to enhance user motivation leads to quality of service delivery and the development of research habit and avoid the need to search both electronic and printed collections.

2.5.3 Training

Training plays a critical role in enhancing access and use of e-journals or other new policy in its implementation. It contributes in transforming the users and improving the level of comprehension and the curiosity of knowing and manipulating new

equipment. The training is equivalent to information literacy that Zurkowski developed in 1974. Zurkowski was the President of United States Information Industry Association (Council of Australian University 2001). In his philosophy, he described "information literate" individuals as persons trained in the application of information resources to their work. In addition, Owusu-Ansah (2005) defined information literacy or training as transforming it into a sample of the education enterprise. Furthermore, the Council of Australian University Libraries (2001) enumerated what a trained person is able:

1. To locate information needed in e- journals;

2. To recognize a need for information and its purpose;

3. To access to the information needed and use it efficiently;

4. To assess and re-assess the content and the sources of documents;

5. To integrate in its knowledge the selected documents such as e-journals and e-resources;

6. To enhance economic, social, and cultural and political issues in the utilization of e-journals;

7. To access and use e-journals ethically and legally;

8. To consider training as a foundation in learning and implementing new innovation such as the use of e-journals or other kind of documents.

Consequently, a number of analysts such as Mutula (2004) observed that a lot of studies have proved that lack of information literacy is partly the cause of underuse of existing ICTs and information resources. In many developing countries, library users and most students at all levels are unfamiliar with different information sources and services in and outside the library because the used facilities are not familiar with

them. The absence of or insufficiency of libraries at school level, poor reading habits and inadequate materials and qualified staff aggravate the underuse. However, it is a responsibility of the Library to let users know about its electronic resources and services and give all library users basic instruction on how to use these e-resources and e-journals in particular. In information age, students who do not know how to manipulate ICT equipment retrieve, and search e-resources and e-journals will have a serious disadvantage in their studies against others because the world is moving from the paperless society to information age as Lancaster (1995) predicted.

Information literacy and the ability to seek effectively the electronic resources and e-journals have become crucial in the information age. Academic libraries have an important role to play in equipping students with the ability to access and use information. In this regard, training students to use electronic journals and e-resources constitutes a powerful hook into all kinds of library research.

2.5.4 Searching, browsing and other value-added features

The above elements are crucial to access and use of information and also permit users to locate relevant and accurate information when the user is able to manipulate the ICT facilities. The following benefits are considered: communication functionalities between authors and readers, search and navigation tools, improvement in dissemination of published materials. In general, many users are often not aware of the powerful search- engines e-journals offer. Technical problems, lack of appropriate skills and the number of e-journals available may influence the searching.

Browsing is an essential function, but many users especially the older ones who are not familiar with the ICT complain that browsing e-journals is often time consuming and frustrating. They argue that one has to pass several and different levels, varied interfaces and types of lists to browse.

However, the e-journals offer other value added features such as alerting, customizing, saving, communicating and linking with external resources, which allow users to access information they need (Eason 1999b).

2.5.5 Reading and printing

Printed journals are difficult to locate in library, and are time consuming but are easy to read, while e-journals are always available in large amounts of texts on screen once browsed and are easily readable. The identification of e-journals is most difficult for users who are not trained in manipulating ICT equipment.

2.5.6 Credibility and prestige of electronic journals

The major barrier to the successful transition from the paper to e-journals in the academic community is the acceptance and the credibility of e-journals. This is more a sociological factor than a technical one. It is related to the role of the scholarly journal within the scholarly communication system. According to Kling and Covi (1995) the prestige of a journal in which scholars' work is published enhances their reputation. This plays an important role in selecting e-journals. Yamamoto (1997) is of the opinion that digital libraries can play a major role in promoting acceptance of e-journals among authors and readers by helping e-journals to gain visibility and by

providing an archival site. In this way, libraries would be helping to transform the scholarly communication system by making those publications more easily available to a larger readership than expensive print publications.

2.5.7 Local factors

Local factors play a major role in the success of e-journals service. Dijkstra (1998) confirmed that the user behaviour towards e-journals seems to depend on the local conditions in which a user is operating and to the individual experiences within the information management. Some of the local factors affecting the use of e-journals include: accessibility of traditional library services, promotion of the e-service by librarians, access to e-services provided and integration with the OPAC; the number of passwords required; the computer equipment available, the degree of training and support provided; types of discipline represented and recovered in different programs institutions offer.

However, the individual factors play an important role for e-journals publishers and providers who need to provide flexible products to meet the needs of different organizations and librarians, who must find appropriate ways of introducing electronic services in order to support and serve university community. For instance, at NUR, the two computer labs located in main library contain a small number of computers (68) which are not sufficient to serve 11,449 students (http://www.nur.ac.rw).

2.6 Advantages of use of e-journals

E-journals present advantages for their users. They include:

2.6.1 Speed in distribution and production

Lancaster (1995) predicted that the printing processes are eliminated and the authoring and publishing systems can be integrated easily by computer readable texts. He adds that electronic transmission and dissemination, especially in the review process, saves time and establishes network communication among authors, editors and referees. The speed and availability on the desktop facilitate the accessibility of e-journals and motivate researchers and create enthusiasm in use of e-journals. Kaur (2006) reported that e-resources can be good substitutes for conventional resources if the access speed is fast, access to all the important e-journals is provided and more computer terminals are installed to provide access to e-resources. The e-journals' accessibility and desktop access, home access, ease of retrieval and hyperlinks to outside content motivate, capture and attract users.

2.6.2. Access

Due to the availability of equipment and connectivity, users can access and use a particular article or journal because e-journals are not time or geographic bound. E-journals can be reached, searched, retrieved simultaneously and instantly without consideration of user's location. The active dissemination of e-information creates motivation to the users and pushes them to use the e-journals if they are connected to the network. The dissemination mechanism needs the acceptance of new articles by the database. In that case the readers are alerted at their desktop. Rogers (2001)

stipulateed that e-journals allow intelligent full text retrieval based on past use and interest. Searching is the important advantage of a digital format.

2.6.3. Subscription cost

The elimination of printing and postage costs saves a portion of library budget. Wooldfrey (1993) estimated an amount equivalent to 24 percent to 36 percent. The reason is that e-journals are published electronically rather than in paper hence no new costs are introduced. This situation leads to the decrease of subscription cost of print journals. According Tenopir, King and Amy (2004) on price of scholarly publishing in the United States, they presented evidence showing economic difficulties of traditional scholarly publishing. This explains the increase in the subscription of e- journals'.

2.6.4. Multimedia and interactive capabilities

Electronic page layout has the possibility of supporting full text, figures, graphics and other innovative ways of presenting research results. For this reason, e-journals contain all features and have information for any scientific domain or any field of research.

2.6.5. Internal and External links

According to the ICT systems, the publishers, research groups, and authors can be contacted through electronic mail. The network created between the above groups allows users the possibility of finding items of interest irrespective of the publisher. Links are important for users to provide faster, more direct access to more information

and for librarians by supporting more effective information retrieval, especially from large archives. Users have more creative ways to have their information queries answered.

After analyzing the links, three main links have been identified:

1. Citation links - this is linking on references in papers.

2. Keyword links - This is indexing links for individual journals or collections of journal links to dictionaries or glossaries.

3. Portable document format (PDF) links - These enable Open Journal links without modification. We have to note that citation links and keywords links can be added to materials in PDF format in the same way as they are for Hyper Text Mark-up Language (HTML).

2.7. Collection development Policy

Several authors have defined collection development Policy in different ways but with common elements. According to Evans (1987), a collection development Policy is a written statement which guides the manager to collect the materials in the ways planned by the institution.

Furthermore, a Collection Development Policy is defined as an official statement which contains the aims and objectives of an Institution in organization and its management during a period of time. The policy can be established for five years or

more depending on the Institution Management. A policy statement is a guide and a set of parameters within staff and users work.

The aim of Policy is to indicate the period and the modality in collecting, selecting and disseminating documents for a specific library. The collection development policy and criteria must fit with the goals that the library has to attain. E-journals or other library materials must meet the information needs by all library users. The selection of documents considers the field of study or programs and other additional requests from researchers in academic institution in order to support the diversity of academic programs in academic systems.

In this case, the goals of a library's task are to select, maintain, provide access to relevant and reliable documents and disseminate information available for its effective and efficient use.

However, the collection development policy can be up-to-date and amended according to the program of study in use and the library management system.

2.7.1 The role of collection development policy

The collection development policy guides the organization and the library in particular to plan, to select, to purchase, and to disseminate information and information resources. It therefore assists the organization in planning for other future activities. Program managers of a University develop the development policy in order to provide any necessary information library users need.

2.7.2. E-journals documents

The electronic journals are the documents sent electronically and accessed through computers and internet devices. They must cover all programs of studies existing at the learning institution. Below are different steps to follow for processing e-journals:

2.7.2.1. Selection

In order to meet the user's needs, the library in collaboration with the faculties and schools should select the documents according the users' needs. The selection is the process used in choosing materials for a library and involves evaluating materials to add to the library stock. Bombak (1992) and Duranceaus (1996) posited that the responsibility of selecting e-journals should rest upon libraries and its librarians. For a better choice, the selection criteria should be established in order to meet the users' needs and to cover all fields of study in an institution for which the selection is done.

Kumar (1986) stressed that the responsibility of selection should rest on the library staff because the staff is conversant with all aspects of a library's collection. In addition, the range of materials from which selection must be made is wide.

According to Ocholla and Ojiambo (1993) all staff involved such as subject librarians, library liaison officers, other university library staff and users may offer suggestions appropriate to collection manager. Corbett (1978) argued that in every library, there should be a specific policy regarding library materials. The policy should orient the selection according to the objectives of an institution. For a university, the selection will consider all subject fields and special collections relevant to the programs of study in the concerned university. Selection also takes into consideration the needs of staff and students at any level including postgraduate students. To purchase and to increase documents which cover all programs, the whole university community must

be involved in selection and suggestion of documents because librarians are not specialists in developing programs and identifying the content of the subjects of each field. The following considerations must be taken into account for e-journals: subscription scheme, ordering procedure, standards, effectiveness of the search engine, ability to limit to local holdings in case of not full text, and hardware and software compatibility. In addition, Ernie (1998) cautioned the academic librarians to take care of free e-journals because the free status can change anytime. Some factors are very important such as the support of the journals in teaching and research, current portfolio, preference to the weak collection areas and the interdisciplinary nature of e-journals.

In addition, when selecting e-journals or transferring a subscription from print to electronic, Ernie recommends that the following criteria be considered:

1. Coverage and timely availability of electronic journals;

2. Enhanced content and additional functionality of e-journals as compared with print;

3. Convenience for users such as unrestricted access in terms of location and time

4. Reliability of access;

5. Full-text availability in PDF and or HTML;

6. Cost-effectiveness such as subscription savings lowers handling and overhead costs, numbers of simultaneous users included in license terms;

7. Guaranteed access to a complete file of titles for the years of subscription;

8. Publishers commitment to maintaining web access to a permanent archive of back- issues;

9. Availability of usage statistics to enable rationale decisions on future title additions or deletions;

The selection reviews ongoing products to re-assess relevance of the collections, currency, ease of use, and cost.

2.7.2.2. Ordering and Acquisition

The selection of information sources can be acquired through purchases, donations and legal deposits. Ocholla and Ojiambo (1993) recommended that librarians observe the following guidelines when acquiring selected information sources:

1. Ensure that information collected is checked for relevance and duplication of the users when acquiring new items.

2. Keep abreast of changing research interests and information needs of the users.

3. Periodically conduct formal surveys or questionnaires on users information needs.

4. Review announcement of publications, select and place orders for them either directly from publishers or through book dealers in both format i.e. print and electronic.

5. Review the library collections from time to time, identify any deficiencies and develop the collection along these areas.

6. Establish and maintain specialized collections such as government publications, theses, electronic (computerized) information sources, archival documents, manuscripts, audio-visual items and research papers.

2.7.2.3. Users

The users access the library e-journals through remote systems by using computers connected to internet. The hardware and software to be used must fulfil the minimum requirements for advanced technology tools. For the libraries which provide access to e-journals through home pages, Moothart (1996) emphasized security adherence to licensing agreements and active maintenance to assure efficiency and effectiveness. He added that any content retrieved from the e-information sources, such as full text files, or other data, should be provided in formats which are accessible.

Libraries should be free to include such URLs in their catalogue records, e-journals holding lists, or any other service designed to enhance user access to e-journals.

The links to all e-journals should be through the university libraries' home page.

2.7.2.4. Promoting library materials

Various methods of promoting the information materials are recommended to be used for print and e-journals and e-resources. Promotion plays a major role in enhancing the use of library materials by users because the users are aware of the existing documents in the library. Kaane (1985) argued that publicity programs are vital in

making and disseminating large information to users. In this case the users will be interested in making effective use of collections. He added that libraries have to make a strong desire and the ability to spark interest in users via current awareness service, bibliographical publications, establishing good relations with teaching faculties and comprehensive user education programs. This is supported by Woodward (2001) who observed that publicity has to be done to capture more clients, clear and precise communication focusing on a subject or usage of e-journals which is a major advantage. Furthermore, the library must consider the importance of promoting services and remember that when advertising resources, the library ensures that materials are in extensive use.

Promotion: Communication is a better description of materials and according to Kotler (1997) it contributed in "promotion" of the activities involved in library's management system. Communication is one of the things which librarians and information professionals tend to be very good at. The promotion of materials is very important in disseminating existing and new acquisition documents. Below are promotional steps that Kotler recommended:

(i). Awareness (the cognitive stage) - the first step in communication is to attract attention for instance through the ringing of a telephone, or telephone bleeps or flashing of a light. It needs repeating that libraries for too long have relied on the knowledge that they will offer reliable services to build awareness of the library and information service.

(ii) Interest and desire (the affective stage) - the chosen segments will have been analyzed to identify what characteristics of communication will attract interest. The

benefits are a careful use of illustration; situation and people will aid self- recognition and move the audience or the next stage.

(iii) Relations with media - a good relationship with the various forms of media will produce results in making the public aware of the library or information service. Librarians as information professionals can quickly contribute in producing effective releases by communicating and making aware all users the advantages of access and use of e-resources.

(iv). Exhibitions - need to be assessed on their potential to the public. A library then presents its new arrival and the new system used in disseminating information such as e-journals.

(v) Displays - these will provide the information units with a library window and could be positioned at the entrance hall of the Institution or organization and the library depending on the public aimed at and the unit's objectives. In this case, the librarians will reach a wider audience.

(vi). Talks - organizing public lectures by specialist speakers in the library on a given topic benefits library users. The libraries can attract a wider audience than just the existing library users.

(vii) Open days - Face to face is the strongest of all influences on public relations. This involves an open discussion between the participants and the librarians. It can be particularly successful if the library opens and explains activities to its users.

(viii) Sponsorship - it is considered in the context of who might be approached for funding for creating awareness. The library will establish a list of stakeholders and organize the agenda on what is necessary and why it is a priority.

(ix) Advertising - the channels of communication range from a small classified advertisement in the local press, through billboards and posters, radio and cinema advertisements. This is very important to attract large public because some users are not interested in reading lists fixed on library board.

(x) Direct communication - is the use of non-media advertising to introduce new arrivals of library's materials or service by mail or telephone. The communication strategy must ensure the building-up of database of existing users and potential users as part of the overall disseminating information system.

(xi) Publications - are elsewhere discussed as products. Examples include abstracting and indexing services, local history studies, specialist monographs, calendars, statistical surveys business reports. These are important in enhancing image of the library or information service.

(xii) The sales force -Concise Oxford dictionary defines using library materials as to "advertise, or publish merits, give information on value of something, inspire with desire to buy or acquire or agree to something". It is suggested however, that all librarians be encouraged to recognize their real role as staff of a library. The role is to make user- care a high level priority, while presenting a professional face at all times. It is also to endeavour to establish and develop good public relations. The librarians must be convinced of their own worth and value to the library and information service. The user will be back if the service is good, if the documents offered are current, reliable and meet the users' information need. The librarian is made to feel comfortable while welcoming visitors.

(xiii) Press conferences and press releases - a press conference is no more than a meeting to which representatives of the media are invited to learn of a major event or new items. The media are provided with written support material, photographs, and sometimes the opportunity to question key figures involved in what is being drawn to the media's attention.

2.8. Personnel management

The personnel in charge of e-journals require specialized skills. They must be aware of the importance of e-journals in teaching, learning and research. They should know the provision of materials and equipment as normal aspects of library service. The functions related the e-journals should be well defined in the organization of the library. The use of e-journals has crucial and great impact on education and research in particular, that is why the librarians have to take care in the utilization and management of e-journals. Ennis (1995) argued that highly qualified personnel are important for effective exploitation of library's e-journals. This enables the library to achieve its goals, increase the quality of service delivery and motivates the library's users. Ennis adds that the motivation of staff by paying them a good salary and enhancing the work conditions including the staff development, long and short training contribute to the active access and use of e-journals and e-resources in general because the staff are motivated and will do their best to achieve libraries' goals. To this existent we can note that the effective and efficient access and use of NUR library e-journals and e-resources depend on many factors.

It has been observed that the researchers can potentially access e-journals, e-information resources from all over the world without entering the library. This could promote the library's consummation of e-journals. This could be true but the variety of e-journals being published and the number of different interfaces, more sophisticated searching and retrieving skills are needed. The library staff must provide adequate training and assist the library users in order to access and use e-journals and be aware of new development of technology, more flexible and suitable services can be available for patrons. The information provider of libraries remains important. The services delivery must be adapted to technology system and users' needs.

2.9. Summary

The chapter reviews literature that supports this work based on Borgman's three elements which guided this study. The literature demonstrates the merits of successful access e-journals documents. It also defines the theories which relate the factors influencing and motivating access and use of e-journals documents in any Institution. It also shows the importance provided by the use of e-journals, barriers and the role played by the librarians in promoting e-journals for a better utilization.

CHAPTER THREE

RESARCH METHODOLOGY

3.1. Introduction

The chapter presents the methodology that enabled this research to respond to our research questions, and meet the objectives, as well as the aim of the study. It shows the research design, target population, sampling method, and data collections instruments, data collections methods, data analysis method and ethical considerations observed during the research. The details of each element are presented below.

3.2. Research design

A research design is an arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. A research design must at least have the following elements:

    a) Statement of the research problem

    b) Techniques and procedures

    c) The study population

    d) Method used in processing and data analysis.

For this research design shows the plan on how the problem investigated was carried out. In this research, a combined or mixed method approach applied. According to Tashakkori and Teddlie (2003) the qualitative and quantitative approaches were used

in some type of questions, research method, data collection and analysis procedures. This research design was preferred due to its advantages such as is ability to capture the diverse views on user interaction. The opinions and suggestions of postgraduate students at National University of Rwanda could contribute in developing searching and retrieving system of e-journals and e-resources. The identification of problems is followed by practical recommendations for improvement and enhancement on access and use of e-journals.

3.2.1 Quantitative and Qualitative method

The Quantitative and qualitative methods guided the data collection and data analysis of this study**.**

3.2.1.1. Qualitative method

The qualitative method is an approach used by a researcher when he seeks to establish the manner that helps him to capture the views of the participants in his study. The key elements of collecting data focus on observing participant's behaviour by participating in their activities.

 According to Creswell (1994), in using qualitative method, the researcher could consider the following:

a) The qualitative study allows the questions to start by a how or a what. This permits the researcher to gain depth data.

b) The topic needs to be explored. This study current explores the access and use of electronic journals at NUR Library and its branch libraries by postgraduate students.

c) It allowed the study to collect data regarding the access and use of e-journals at NUR Library and its branch libraries.

d) The current method needs enough time and patience in data collection and data analysis.

Creswell (2002) recommended the following characteristics presented by qualitative methods:

a) Qualitative method takes place in a natural setting. This means that the researcher meets the interviewees at their work place.

b) The qualitative research uses multiple methods that are interactive and humanistic. Here, the methods of data collection are growing and involve active participation by participants. The researcher seeks to build rapport and credibility with the individuals in the study.

- Qualitative research is fundamentally interpretative. In this case, the researcher makes an interpretation of the data.

- The qualitative researcher views social phenomena holistically. In this case the studies appear as broad, panoramic views rather than micro-analysis.

- The qualitative researcher uses complex reasoning that is multifaceted, iterative, and simultaneous.

The qualitative researcher adopts and uses one or more strategies of inquiry as a guide for the procedures in the qualitative study.

3.2.1.2. Quantitative Methods

The quantitative method is an approach used by a researcher for testing a theory by specifying narrow hypotheses or research questions and the collection of data to support or refute the hypotheses. The quantitative research can be descriptive. In this case, the subjects are measured once. It can be also experimental where the subjects are measured before and after a treatment. In addition, a quantitative research quantifies the relationships between variables.

In this study, the description of survey method and interview were adopted. It permitted capturing diverse views in the access and use of electronic journals by Postgraduate students at the National University of Rwanda. The data collected are the situation of information on the opinion of postgraduate students as participants at the National University of Rwanda library for the access and use of e-journals, their availability, and problems encountered of infrastructure and equipment, and the quality of service delivery and behavioural staff when assisting and helping clients using e-journals at the NUR Library and its branch libraries.

3.2.1.3. Mixed methods approach or combination of qualitative and quantitative

In this case, the researcher started with a survey in order to generalize results to a population. After, the focus shifted to a detailed qualitative, open-ended interview to collect in depth information from participants. This phase helped to collect all information needed for the study because it is done face to face, and has allowed the researcher to orient his questions according to the predetermined objectives. This

method guided our study in gathering the opinion of postgraduate students and library managers on access and use of e-journals at NUR Library and its branch libraries.

3.3. Target population

Target population is the population which a researcher wants to generalize the results of the study for the entire group of individuals, events or objects having a common observable characteristic. In this regard Cooper and Schindler (2001) formulated that a population is the total collection of elements on which the researcher does some inferences.

The target population for this study was postgraduate students at Master's level enrolled during the Academic year 2011 in all fields of the study at the National University of Rwanda. Their number is 688 postgraduate students (http://www.nur.ac.rw). This category of students was chosen because it needs relevant and adequate information at anytime and anywhere. It is in this regard that we judge the use of e-journals could be helpful in their daily academic activities such as learning and advanced research, assignments and self documentation.

3.4. Sampling method

According to Kombo (2006) sampling is the process of selecting a number of individuals or objects from a population such that the selected group contains elements representative of the characteristics found in the entire group. Within the current research, a representative number of 87 students were taken as a sample from

688 students enrolled during the academic year 2011 at NUR for the study. The sample was determined by applying Yamane's (1967) formula:

N= number of total population = 688

Where e=10% which is the level of precision

n is the sample size which is the representative group

$$n = \frac{N}{1+N(e)^2} = \frac{688}{1+688(0.1)^2} = 87.$$

In addition, interviews were conducted for computer lab managers and trainers; NUR Library managers on access and use of e-journals and library's trainers in order to complete the responses from the survey.

3.5. Data collection instrument

The research has used two methods in collecting information from respondents: questionnaire and interviews.

3.5.1. Questionnaires

The questionnaires on access and use of e-journals were distributed to collect opinions of Postgraduate Students at the National University of Rwanda. The use of questionnaire was considered appropriate for studying the opinions, skills, interest in using e-journals by postgraduate students at the NUR. In order to collect information from a large number of participants, the researcher distributed four same forms of questionnaires in each program and three additional copies were distributed to three

largest groups of the whole programs. The respondents were requested to respond to questions on: access and use of e-journals, facilities to access e-journals, infrastructure, content and quality of e-journals available for postgraduate students. The 87 questionnaires for postgraduate students from different NUR programs were distributed as shown in table 3.1.

Table 3.1: Sample size for questionnaires

Programs	Number of questionnaires	Responsdents	Percentage (%)
1. L.L.M Business Law	4	4	100
2.Masters in Water Resources and Environment Management (WREM	4	4	100
3. Masters in Agro-forestry and Soil Management	4	4	100
4. Masters in Public Health	4	4	100
5. Masters in Applied field Epidemiology	4	4	100
6. Masters in Clinical Psychology and Therapeutics	5	5	100
7. Masters in ICT	4	4	100
8. Postgraduate Diploma in Irrigation and Drainage	4	4	100
9. Masters in Economics	5	5	100
10. Master's in ICT Policy and Regulation through NUR-NetTel@ Africa collaborative programs.	4	4	100
11. Master of Arts in Development Studies	5	5	100
12. Master of Arts in Peace and Conflict	4	4	100
13. Master in Business Management	4	4	100
14. Master of Arts in Genocide Studies and Prevention	4	4	100
15. Masters in Applied Mathematics	4	4	100
16. Postgraduate Certificate in Applied Geo-Information, (GIS)	4	4	100
17. Masters in Biodiversity Conservation	4	4	100
18. Masters in Accounting	4	4	100
19. Masters in Applied Field Epidemiology	4	4	100
20. Masters in Family and Community Medicine (FAMCO)	4	4	100
21. Master's program of pharmaceutical sciences	4	4	100
Total	87	87	100

Source: Researcher

As shown in the table 3.1 above, all questionnaires were returned and analyzed.

The questions were open expressions, and multiple choices. However, Peil (1995) observed that questionnaires suffer from a low response, illegible and ambiguous answers. He points out that an interviewer should explain why a study is important. He also examines if all questions have been responded to which cannot be done in questionnaires. This is the reason for choosing the mixed method because they complement each other.

3.5.2. Interview

An interview was organized to one NUR Library director, two deputy directors, one NUR ICT manager, four computer help desk and ten trainers in searching and retrieving e-resources and e-journals. A total of eighteen (18) staff members were interviewed.

Table 3.2: Sample size for interview

Category	Number	Respondents	Percentage
Library director	1	1	100
Deputy director	2	2	100
NUR Library ICT	1	1	100
Computer help desk	4	4	100
Trainers	10	10	100
Total	18	18	100

Source: Researcher

The interviewees were reached at their work place because they are supposed to be at their offices every day. Interview as a tool for collecting research data is powerful and helps in qualitative investigation. Busha and Harter (1980) observed that an interview is the best method in collecting data from the respondents, their experiences, opinions, their knowledge on the case study, and their improvement and suggestions. This approach allowed the researcher to collect more detailed information and to meet all expected staff. In addition, the interview allowed the opportunity to establish rapport and flexibility in collecting information because the interviewee and the interviewer were both present (Odini 1993 and Ojiambo 1989). In addition, Interview techniques allow in depth questioning which would not take place in questionnaires. Peil (1995) observed that interviews have a disadvantage of great expenses in finance and consumes a lot of time and energy. However, the data collected from interviews provided clarification of responses from the survey, and additional information which was not captured by the use of questionnaire and hence complemented the information collected from the questionnaire.

3.6. Data Collection Methods

After distributing the questionnaires and interviewing the library managers, the responses from the participants were collected according to an agreed schedule and the availability of the respondents. The methods were preferred by the researcher because they enabled the researcher to come face to face with the respondents.

3.7. Data Analysis Methods

Data analysis was guided by a quantitative analysis method and complemented by grounded theory method.

Data collected from the questionnaires and interview have been analyzed, interpreted and presented. The results will allow the NUR Library and branch libraries in to know in depth the real situation on the access and use of e-journals in the concerned libraries. The collected information will permit to know the factors that hinder the effective and efficient use of e-journals at NUR. May be the outcome of the research will point out the weakness and strength on access and use, and suggests the way NUR Library and branch libraries can enhance the efficient and effective use of e-journals and e-resources.

3.7.1. Quantitative analysis

A quantitative analysis is the way the data are analyzed when the researcher chooses to use quantitative method in data analysis. The researcher followed these steps during data analysis:

1. Data Preparation - the researcher checks the data accuracy, enters the data in the computer, transforms the data, develops and builds a database structure which contains measures.

2. Descriptive statistics - here the researcher describes the basic features of the data being studied. The simple summaries about the sample and the measures are provided. In this case, the data are represented in graphic formats.

3. Inferential Statistics - these were used to make judgments of the probability of the results.

In the current case, SPSS software has been used in data analysis and provided the results in different forms such as graphics.

3.7.2. Grounded theory technique

Grounded theory is applied in qualitative data analysis where the researcher tries to derive a general abstract theory of a process, action, or interaction grounded in a view of participants in a study. Strauss & Corbin (1990, 1998) stipulated that this process uses multiple stages of data collection and the refinement and interrelationship of categories of information. The characteristics of this design are the constant comparison of data with appearing categories and theoretical sampling of different groups to maximize the similarities and the differences of information. The following are the stages followed by the researcher in applying grounded theory techniques to complete the results from quantitative data analysis:

a) Open coding - it is a process in which the researcher names the categories from the analysis of the data. It starts in data acquisition, describes the phenomenon features on the study. The variables involved are identified, labelled, categorized and related together in an outline.

b) Axial coding - In this stage, the researcher puts in new ways. He utilizes a system of coding that seeks to identify causal relationships between categories.

c) Selective coding - this stage involves the process of selecting and identifying the core category and systematically relating it to other categories. The main activity is validating those relationships, filtering in, and refining and developing those categories.

3.8. Ethical considerations

In order to protect the rights of participants in research especially those who were requested to respond to the survey, interview and discussion. The following considerations were put in place.

1. The principle of voluntary participation requires that people are not coerced into participating in research. Those who participated did so voluntarily.

2. Confidentialit**y** - the participants were assured that the information will not be made available to anyone who is not directly involved in the study (no risk of harm, physical and psychological as a result of the participation).

3. The principle of anonymity which essentially means that the participant is remaining anonymous throughout the study even to the researchers themselves.

3.9. Summary

The chapter presents the target population, sampling method, research instruments, data collection and analysis, and ethical issues that were used in the study. The target population has provided enough information related to the current use of e-journals at the National University of Rwanda library. Supported by the data, research instruments and methods applied, the researcher collected and analyzed data leading to the expected goals of the study.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter presents an analysis of data collected as per the objectives and the research questions. The data have been tabulated, analyzed, and recorded as frequencies and percentages where applicable. The data emanating from all NUR campuses (KIST, CNLG and Butare) were analyzed together.

4.2. Characteristics of the respondents in the survey and interview response rates

The study targeted eighty seven (87) NUR postgraduate students for the survey. The group of interviewees was composed of 18 staff such as library managers and trainers among which 27.8% were males and 72.2% females. The questionnaire was distributed to all the participants and the response was 100% of the sample population.

4.3. The libraries used by NUR postgraduate students to access information

The identification of the branch libraries used by NUR postgraduate students helped the researcher analyze the frequency of the usage. The National University of Rwanda has three campuses: Butare (main campus), CNLG and KIST. All these campuses have postgraduate students. The latter can use any of the university libraries depending on its location or the type of documents they need. Table 4.1 shows the different libraries used by NUR postgraduate students, the frequency and the percentage of usage are indicated in the table 4.1:

Table 4.1: Usage of Library

N= 87

Library	Frequency	Percentage
NUR Library	51	58.6
Faculty Library	24	27.6
CNLG Library	9	10.3
Others	3	3.5
Total	87	100.0

Source: Researcher

The study indicates that 51 (58.6%) of NUR postgraduate students prefer to use Butare NUR Library because of its many current resources with different formats (print or electronic). In addition, this library is automated, which makes the accessibility to its resources easier.

From the responses 24 (27.6%) of postgraduate students frequently visit the faculty libraries to get the resources for their area of specialization and most of those resources are recommended by the lecturers. As these libraries are near the faculties, students do not have to walk a long distance to access them.

It was also observed that 9 (10.3%) of postgraduate students get information on Genocide Studies and Prevention, Peace and Conflict studies from CNLG Library (based in Kigali). As reported by the respondents during the field work, the CNLG campus does not have enough up-to-date resources. Both equipment and network in

the computer labs are not enough and this makes postgraduate students use only the CNLG library and the e-journals to explore their area of specialization. The study revealed that 3 (3.5%) use ICTR (International Criminal Tribunal for Rwanda) documentation centre because it has relevant, reliable and up-to-date resources in both print and electronic formats in their area of specialization. According to the survey, this centre has powerful internet connectivity and it is permanent. This allows postgraduate students to easily locate the information they need. One of these postgraduate students expressed the following:

"I feel comfortable when I am using ICTR documentation centre because its e-journals meet my information need".

4.4. Purposes of using NUR Library and its branch libraries

The study found out that 87 respondents use the library for academic purposes (research, assignments, self documentation and thesis writing). The frequency and the percentage of usage are presented in table 4.2:

Table 4-2: purposes of usage of NUR Library and its branch libraries

N= 87

Purposes	Frequency	Percentage
Assignment	63	72.4
Research	52	59.7
Writing thesis	49	56.3
Self documentation	39	44.8

Source: Researcher

a) *Research purpose*

Fifty two (59.7%) of postgraduate students responded that they use the NUR Libraries and its branch Libraries for research because as postgraduate students, they want to be researchers. According to the respondents, research articles are an important ingredient in their work. For this reason, NUR Library and its branch libraries have made available computer labs to help researchers and postgraduate students to freely access and use e-journals. These computer labs managers also train users on how to search and retrieve e-journals.

b) *Assignment purpose*

The study revealed that 63 (72.4%) of postgraduate students use NUR Library and its branch libraries for assignments. This is a requirement for students; they cannot study without being assessed. Assignment is part of the evaluation and it is a way of practicing the theories and applying the formulas. Postgraduate students must then use relevant, reliable and up-to-date resources found in the library, especially the e-journals available in the different databases and web sites of NUR Library and its branch libraries.

c) *Self documentation*

Thirty nine (44.8%) of postgraduate students use NUR Library and its branch libraries for self documentation, to supplement the lecturers' notes, or to develop their general knowledge. These are some of the reasons which push students to consult the current unit. Some participants said that the notes given by lecturers are just guidelines which need to be supplemented by reading other up-to-date resources such as e-journals. Postgraduate students conduct self documentation to fill a gap in their knowledge, to

experience and give rise to individual search for a particular answer. Self documentation will help students at their different levels of study and it will provide an open mind in various areas such as education, academic purposes, recreation, cultural activities or personal development. The above information can be searched from the branch libraries by accessing and using e-journals if the users are aware of their availability.

d) *Thesis writing*

Forty nine (56.3%) of postgraduate students pointed out that they use NUR Library and its branch libraries resources for thesis writing. It is a serious work in which students mostly need information on their topics and on scientific communication. They need a lot of references which can fit their research. Thesis writing needs reliable, relevant and up-to-date resources. These resources are available in computer labs where they can easily be accessed through the use of ICT facilities. ICT skills, computers and internet connectivity help locate those resources because no one can access e-journals without adequate computer utilization skills.

4.5. Awareness of the availability of e-journals

Such awareness would depend on the way NUR Library and its branch libraries inform their clients about the availability of the academic materials it has. According to the participants, it has been observed that at NUR Library and its branch librarie, the awareness of the availability of electronic journals is very low. When asked what they do to get people aware of the availability of these e-journals, the library managers replied that they only use notice boards, emails, posters and leaflets and telephone line.

Still on awareness, 54 (62.1%) of the students said they got the information about the availability of e-journals at NUR Library and its branch libraries from their lecturers, colleagues, notice boards, librarians and emails. Thirty three (37.9%) of postgraduate students (especially those from KIST campus) said they are not aware of the availability of these e-journals. According to the survey, the availability of e-journals at NUR Library and its branch libraries have not been done adequately. NUR Library and its branch libraries should make a strong desire to spark interest in the users via current awareness services, bibliographical publications, collaboration with the faculties and comprehensive user education. The awareness of the availability of the e-journals at NUR Library and its branch libraries are very important because e-journals are too new in the academic community to be accepted, especially in the developing world where there is shortage of ICT facilities and regular interruption of power and internet connectivity. The success of a strong and powerful awareness requires the enhancement in designing and planning how to implement different means of advertisement to achieve full acceptance among the university society. The NUR Library and its branch libraries have the potentiality to develop the level of awareness by using different means of communication such as mass media, exhibitions, talks, open day, NUR Radio called "radio Salus", direct communication, publication, distribution of brochures to students and announcements made in public places like "restaurant, church service among others."

When asked about the impact of low awareness in the use of e-journals, most library managers said that it plays a negative role in the dissemination of information. The low awareness causes underutilization of the resources available in the library, which leads to undesirable quality of education and research in particular.

The low awareness also contributes to the imperfection and bad image of an institution which is an obstacle to the development of a community or an academic society. It causes insufficient use of existing information, brings about poor performance and develops laziness of the staff because when the personnel does not have people to serve, it does not bother to search and retrieve the information users request. They therefore fail to get the opportunity to exercise the knowledge they learnt during their training.

The low awareness of the availability of e-journals discourages the users in visiting the institution because most clients may neglect the quality of the documents or the service delivered by an institution with bad reputation.

4.6. Subscription to e-journals

An interview with the library managers found out that the subscription is done annually by INASP which is a UK based organization. It informs the country coordinator and the latter convenes a meeting with all the institutions of higher learning (Public and Private) and the research centres. During the meeting, the country coordinator informs the participants about the lists of e-journals, e-resources and e-books available for the current year. The directors of the libraries and research centres collect the lists and bring them to their institutions where they are distributed to different units according to their area of specialization. When the different units and faculties have finished selecting the materials they need, the lists are sent back to the library director's office where they are compiled and sent back to the country coordinator for further execution. The library does not select documents but it collects

the needs and opinions of its users and processes for getting the chosen electronic resources and e-journals for an effective use.

In line with the above clarifications in selecting documents, the access and use of e-journals could be high because the units and faculties are informed and invited in suggesting the resources needed in each institution of higher learning and research centres and have played a role in selecting these academic materials.

As indicated by the participants, the faculties do not invite postgraduate students to participate in the selection process. The selection involves all staff members, librarians, library liaison officers and other university library staff. The users may only offer suggestions to appropriate collection managers. The study has revealed that postgraduate students do not play any role in selecting the resources, except some who are workers in the faculty's documentation centre. The respondents, mainly postgraduate students suggested that their exclusion in the selection process creates barriers in the access and use of any documents including e-journals and e-resources. Table 4.3 shows how postgraduate students at NUR expressed their opinions on the selection of e-journals and e-resources.

Table 4.3: Selection of e-journals

 N= 87

Responses	Frequency	Percentage
Yes	3	3.4
No	81	93.2
Sometimes	3	3.4
Total	87	100

Source: Researcher

Table 4.3 points out that only 3 (3.4%) postgraduate students have participated in selecting e-journals and 3 (3.4%) of postgraduate students have rarely participated. The remaining 81 (93.2%) of postgraduate students at NUR have not participated at all in the above activity. Normally, working in transparency is good and it develops good management and friendship. If these 81 (93.2%) or their representatives could participate in the selection process, they would have conducted a wide dissemination of information and most students would have been aware of the availability of e-journals at NUR Library and its branch libraries due to the collaboration between colleagues and even curious about how to access and use these e-journals. This could have avoided the low attendance because students would be informed about the availability, the importance and the content of the e-journals. The participation of students in the selection of e-journals and other e-resources could increase the level of awareness from the classroom to the apex levels of the institution.

4.7. Databases containing e-journals preferred by postgraduate students at NUR

NUR Library and its branch libraries have subscribed to various databases whose content meets the information needs of its users. The appreciation of contents is detailed in table 4.4.

Table 4.4: Appreciation of e-journals content by NUR postgraduate students

Responses	Frequency	Percentage
Yes	21	24.1
No	27	31.0
Not all	39	44.9
Total	87	100.0

In the academic area, the quality of a document motivates its users and makes it very usable. The study revealed how the content of e-journals meets the information needs of postgraduate students. Twenty one (24.1%) of postgraduate students said they got all the information they needed, 39 (44.9%) said they did not get all the information needed and 27 (31%) failed to get any information at all.

However, NUR Library and its branch libraries' On-line Full Text journals and Databases contain various resources for different domains of study. When participants were asked if NUR Library and its branch libraries' databases meet the information need, a big number of postgraduate students replied in affirmative and cited the databases they regularly visit and the reasons for visiting. They used them because they found them rich, reliable and varied. The mostly preferred database cited by the

students is: EBSCO. It has been cited by 60% of postgraduate students participating in the survey. They said it contains various resources which meet the information need. As reported by the respondents EBSCO is multidisciplinary, i.e. users can access 8 major databases such as Academic Search Premier, Business Source Premier, Eric, Masterfile Premier, Newspaper Source, Health Source (Nursing & Academic), Health Source (Consumer Edition) and Medline.

Other databases were also said to be rich and able to meet the students' information need according to their specialization. For instance, the IEEE (Institute of Electronic and Electrical Engineers) was cited by 47 (54%) and contains full text documents in electrical engineering and computer science. In this regard, Springer e-journals were cited by 37 (43%) postgraduate students because they cover a wide range of subjects including biomedicine and the life sciences, clinical medicine, physics, engineering, mathematics, computer science, human sciences, social sciences and economics. The various contents render these e-journals very usable and preferable for most postgraduate students in different domains learned at NUR but who are familiar in searching and retrieving.

In addition to the above databases, the following databases were also pointed out depending on the faculties and the area of specialization.

1. HINARI - It was pointed out by 31 (36%) of postgraduate students and it is for health in general. It was cited especially by students who are pursuing Medicine and Public Health. It covers the information they need and provides additional current e-journals in health area.

2. Emerald Group Publishing Ltd - It was cited by 37 (43%) of postgraduate students studying in various disciplines. Most of these students said they prefer Emerald because it presents many varieties such as Emerald management Xtra 140 features, and Emerald engineering 15, peer-reviewed and fully searchable full text journals plus reviews from the world's top 300 management journals. Furthermore, it provides the information needed for different students from different faculties.

3. ASABE (American Society of Agricultural and Biological Engineers) - 27 (31%) of the respondents (postgraduate students) indicated that it includes a range of contents including textbook materials, Journals, monographs, standards and proceedings as well as the important reference work-in-progress and Design Topics. Its content motivated regular usage by postgraduate students especially in sciences and agriculture.

4. JSTOR: 21 (24%) of postgraduate students access full-text journal articles as searchable, scanned page images from over 800 important scholarly journals in 48 disciplines. Through this database, various postgraduate students confirmed that they get satisfaction because they find the information needed for the academic purposes.

5. Other databases cited were Oxford University Press 20 (23%) of postgraduate students; Policy Press Journals 19 (22%) of participants, Wiley Online Library (21%) and World Bank Development Finance 27 (31%) of respondents. These databases also have a lot of information for postgraduate students from various domains.

Furthermore, the respondents also pointed out other databases which have the information they need but at a low level.

All the different opinions gathered show that NUR Library and its branch libraries' website contains rich, reliable and various databases containing different e-journals and e-resources which cover the academic information needed by postgraduate students in their different areas of specialization.

4.8 Access and Use of e-journals

4.8.1 Access to e-journals

The easy access and use of e-journals plays vital role in the information age especially in the academic world where most University libraries have changed the manner information is disseminated. They have moved from print to electronic format as a result of ICT. As the implementation of the use of electronic format, the NUR Library and its branch libraries, through INASP/ PERI, have subscribed to various On-line Full Text Journals and Databases in order to provide relevant, reliable and up-to-date e-journals. This made high quality e-journals available at NUR and affordable. When asked if postgraduate students easily access e-journals, the respondents (postgraduate students) replied as shown in table 4.5.

Table 4.5: Frequency of access to e-journals

N= 87

Responses	Frequency	Percentage
Yes	36	41.4
No	39	44.8
not totally	12	13.8
Total	87	100.0

Source: Researcher

The study has revealed low access to e-journals: only 36 (41.4%) of the respondents (postgraduate students) indicated that they access them easily; this number is still too low for an institution which accommodates 688 postgraduate students that are supposed to spend most of their time reading, writing, searching and retrieving.

The findings also indicated that 39 (44.9%) do not access at all NUR Library's e-journals for various reasons such as the inadequate awareness, lack of skills and lack of infrastructure. Twelve (13.8%) of postgraduate students said they partially access the e-journals and they provided the following reasons:

1. *Poor internet connectivity* - This discourages users especially those who are not interested in the use of e-journals, i.e. people who still have resistance towards change and who prefer the use of print documents as reported by the survey. The impact of

this is the low utilization of e-journals at NUR Library and its branch libraries in general.

2. *Password- -* The password is very important but anyone can easily access e-journals without a password. It is a key in the computer usage. Most of the time, in the computer labs, when the password is required, it is given by the computer labs manager or the computer helpdesk. Sometimes the password fails when there is a mismanagement of IP adress. In that case, all NUR computer labs are paralyzed until the IP adress manager comes. As the postgraduate students have reported, such cases regularly appear at NUR Library and its branch libraries. It is a situation which makes users frustrated, discouraged and they sometimes consider it as a waste of time. This weakness has led some students to prefer print documents which do not require a lot of procedures to access the information needed.

3. *Lack of skills in searching and retrieving -* Users confuse knowing how to manipulate computers and information retrieving and searching. The latter is a science which needs advanced training, especially for the postgraduate students who need to proceed to advanced search. Logically users cannot access e-journals without adequate computer skills, including information retrieving and searching system. It requires adequate and necessary training in the right place, with the right professional trainers.

4. *Limited time in computer labs -* Most of the postgraduate students are employees. They spend most of their day working, and when they come to school in the evening, they meet some undergraduate students who did not visit the computer labs during the day. This situation frustrates them and does not allow them to access e-journals. Some of them, when they enter the computer labs, they do not have enough time to

search and retrieve at their satisfaction due to limited time given by the computer lab manager. The impact of this is the low utilization of e-journals and the lack of desire to visit computer labs which might cause the postgraduate students to only use the syllabuses given by their lecturers. The postgraduate students need their own computer labs, where they can concentrate and spend the maximum of time for their academic activities such as research, note-making, reading, writing and doing assignments. The limited time cited by the participants is frustrating and it can lead to poor service delivery and poor academic quality.

5. *Documents in abstract format -* Twelve (13.8%) of postgraduate students indicated that most of the time, they find documents in abstract format and they meet a message which asks for subscription. Thirty nine (44.8%) of postgraduate students who do not have access to e-journals are from KIST campus, where there is a problem of internet connectivity. According to the respondents, the existing internet connectivity is not working properly.

As indicated, these students feel discouraged and do not have enough skills to retrieve and search. They said that the password given by NUR Library and its branch libraries does not work. They prefer to use Google or Wikipedia, which provide them with affordable resources without taking into account the quality of the contents. This situation thwarts postgraduate students quest to reach updated and reliable documents because the updated and reliable scientific e-journals are accommodated in a known database and require subscription (not as in Wikipedia where they are free of charge and out of date).

4.8.2 Use of ICT facilities to access e-journals

In addition to computer skills such as searching and retrieval, the use of e-journals, e-resources and e-information needs ICT facilities such as those in NUR computer labs (desktop, own laptop, cell phone, cyber café and internet). These are commonly used in the developing countries in general and at the National University of Rwanda in particular. When NUR postgraduate students were asked how they access e-journals , they provided a range of responses as detailed in figure1:
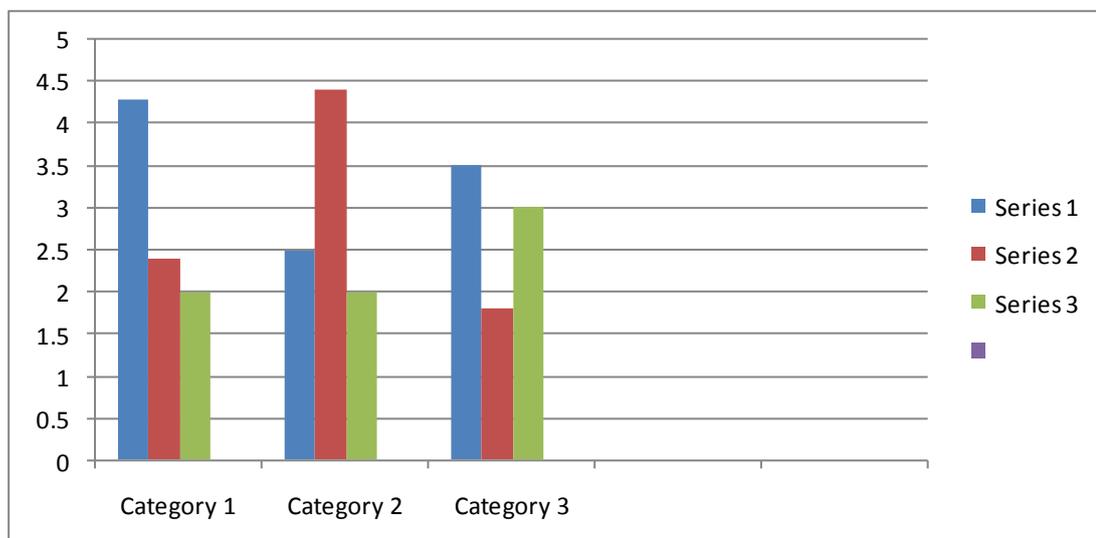
Figure1: Frequency of access, use of ICT facilities and level of searching and retrieving

1. Category1:Access to ICT facilities

2. Category 2: Frequency in using ICT facilities

3. Category 3: Level in searching and retrieving

The findings represented in figure1 indicate that 42 (48.2%) of postgrauadate students access e-journals by using NUR computer labs; 36 (41,3 %) access them using their own laptops and 9 (10.5%) access them using the internet of cyber cafés.

The findings pointed out that the postgraduate students who use NUR Library computer labs do not have their own laptops and this is why they always need to go to NUR computer labs. It means that they cannot search and retrieve any document while at home. Such a situation does not allow the postgraduate students to work in good conditions because travelling to NUR for the computer labs seems a difficult task for them. Students who have their own laptops can save both time and money because they do not have to go to NUR computer labs or library for documentation. Those who use internet of cyber cafés 9 (10.5%) of postgraduate students have to face both the queue and the noise. That condition cannot allow postgraduate students to work easily and stimulate the use of e-journals because the academic work actually needs enough concentration.

To access e-journals, users need ICT facilities and know how to manipulate them. The study has revealed that the majority of NUR postgraduate students use ICT facilities to access e-journals for their academic purposes enumerated previously such as research, assignement, self documentation, thesis writing and note-making. Figure 1 points out the frequencies of usage of ICT facilities. When analysing the above figure, it shows low frequency in the use of ICT facilities. Fifty one (59%) of postgraduate students occasionally use ICT facilities to search and retrieve e-journals for their research, assignment, self documentation, notes making.

As indicated by NUR Library managers during the interview, this category of students who occasionally use ICT facilities are those who are not interested in the use of e-journals. The following are some of the reasons they advanced:

1. Some postgraduate students manifest resistance towards change. When asked the documents they prefer to use, the answer was the print documents or syllabuses given by lecturers. Nothing indicates their will to use e-journals. As revealed by the study, 51 (59%) of postgraduate students are those who occasionally use ICT facilities.

2. The lack of skills in searching and retrieving is still an obstacle as it was pointed out by most students. They are unable to reach the information they need and this leads to low usage of e-journals.

3. The lack of own ICT facilities like own laptop or other facilities also constitutes a barrier. Students are obliged to go to NUR computer labs to have access to ICT facilities. This situation discourages students and pushes them to adopt the use of print documents as the last option.

4. As indicated by the interviwees, most NUR students manifest the lack of reading habits. This is also an element which can lead to low usage of e-journals. The interviewees justify the lack of reading by giving the example of INASP report for five consecutives years on the Rwanda indicating the number of consummed e-resources: 2,495; 18111; 34,095; 12,451; 22,451 for 2006, 2007, 2008, 2009, and 2010 respectively. This justifies the low usage of e-journals at NUR. The same library managers said that NUR lecturers could play a vital role in integrating e-journals in their daily teaching materials, and in mobilizing students to the use of e-journals. In general, the library managers accuse postgraduate students and NUR community in general of lack of reading habits.

The findings have shown that 27 (31%) of postgraduate students use e-journals frequently and 9 (10%) very frequently. They are already familiar, interested, well trained and well skilled. They sometimes inform their colleagues about the availability of the e-journals and their importance. They also sometimes help and train them in searching and retrieving e-journals.

4.8.3 Level of searching and retrieving

In order to find out the reasons for the low usage, the researcher investigated the level of postgraduate students in searching and retrieving.

The study revealed that 69 (79.3%) of postgraduate students are less competent in searching and retrieving, 15 (17.3%) are competent and 3 (3.4%) are quite competent. Less competent students meet a lot of problems in their searching and retrieving e-journals for their academic purposes as they expressed. It is important to note that the ability of students to effectively search and retrieve information is a transferable skill useful for their future life as well as enabling the positive and successful use of e-journals. Furthermore, in the digital era, any student at a higher level who intends to get better achievements should have the ability to explore the digital environment without strong skills in advanced searching and retrieving system.

Based on the survey, some of the problems revealed by the study concerning the level of searching and retrieving are the following:

1. Due to the lack of skills in searching, students fail to reach documents in full text; this is because they may have used wrong technical methods or wrong Boolean operators.

2. A poor skills in searching and retrieving leads information seekers to outdated documents because they use wrong databases or they miss a password allowing them to reach the right websites.

3. In addition, they get confusion in selecting and seeking documents because they use the wrong key words.

The above problems among others could discourage the students, and even decrease the will to use e-journals and thereafter disqualify the use of e-journals and e-resources in general.

4.9 Training on access and use of e-journals

Training is a learning process that involves the acquisition of knowledge, sharpening of skills, concepts, rules, or changing of attitudes and behaviours to enhance the performance of trainees (in this particular case the postgraduate students in developing access and using e-journals at the NUR Library and its branch libraries).

When asked if they were all trained and where they got trained, the respondents replied that they were all trained but in different places. When the researcher further asked them questions to find out if lack of training had hindered the effective utilization of e-journals, the response was YES. They said that training helps trainees to know how to manipulate new technical systems. It is obvious that training could

have helped these students in their use of e-journals. It could have strongly determined their usage in searching information systems and the e-journals in particular.

As far as the area of training is concerned, the study has shown that postgraduate students who were trained at NUR Library, CIT and with the support of their colleagues are respectively 24 (27.6%), 21 (24.1%) and 15 (17.3%). Those trained in ICT and CGIS are respectively 18 (20.7%) and 9 (10.3%). They were trained on using computer technical skills for ICT and in Geographical Information Systems.

NUR library should reach a position where the acquisition of information competence is acknowledged as one of the crucial learning objectives for every postgraduate student entering the library. For this reason, no postgraduate students should leave without being fully equipped to cope with the intensive information available at NUR Library website.

Sometimes the users (presently postgraduate students) do not know what exactly an electronic source such as e-resources, e-journals can provide, how it can help them in their studies. They do not know how to access and use this electronic source. Once users are equipped with the skills and become knowledgeable and motivated in searching and retrieving, they will access and use e-journals.

Library trainers should change the misconception believed by students (and sometimes by the faculty) that knowing how to use a computer is the same as knowing how to find information. This matches with the opinion of NUR

postgraduate students who got trained on ICT and CGIS instead of attending the training organized by the library which is qualified in the domain of librarianship especially in searching and retrieving. Computer training is offering the core skills needed to manipulate the computer and does not allow to access and retrieve information. Therefore, teaching postgraduate students and other categories of students especially NUR Library and its branch libraries' users in general to use electronic journals and e- resources should be seen as powerful tools which permit all users to access, search and retrieve all needed information through computers.

However, during the interview, the trainers pointed out the low level of attendance in the training on the access and use of e-journals and e-resources. Nowadays the training and the ability to seek effectively the electronic resources and e-journals in particular have become crucial in the information age. For this reason, the academic libraries have an important role to play in equipping students with the ability and skills to access and use e-journals and e-resources in general.

As reported by the interviewers at NUR, the level of attendance is very low: 8 (44.5%) of interviewees have observed low attendance while 6 (33.3%) indicated medium attendance; only 4 (22.2%) are high, this demonstrates the low usage of e-journals identified at NUR Library and its branch Libraries because no one can search and retrieve without the skills gained during regular attendance of training. Trainees should know that the absence in the training provokes disadvantages in any service at any level such as low-grade level of services and low revenues of technologies in addition to further expenses. The worry of library managers indicates that the low

attendance not only will reduce the pace in the use of e-journals but also will cause the following negative impacts:

1. NUR library's e-resources are supported by SIDA project and INASP. If they are not exploited enough, the sponsors may withdraw their support because students do not want to be trained for better utilization of e-journals and e-resources in general.

2. The participants criticize the quality of training offered to students. They spend a lot of time on theories instead of allowing enough time for practical sessions. This can discourage the trainees and decrease the level of attendance.

3. The absence of training creates a lack of skills in searching and retrieving e-journals because the users do not know the techniques and are called to learn how to reach a document or information needed very fast through ICT facilities.

4. The low attendance will provide poor results in seeking information because of lack of searching and retrieving skills.

4.10. Hindrance of the access and use of NUR Library's e-journals

The study also revealed the factors that hinder access and use of e-journals at NUR. These were grouped in two categories such as the use of ICT facilities and lack of skills in searching and retrieving e-journals.

4.10.1. Use of ICT's facilities

During the collection of data, postgraduate students were asked the challenges they meet in their use of ICT's facilities. The answers to this question are summarized in table 4.6.

Table 4.6: Challenges in the use of ICT facilities
N= 87

Challenges	Frequency	Percentage
Internet connectivity	72	83
Slow computer running	36	41
Regular power interruption	48	55
Limited time	35	40
Insufficient number of computers	54	62
Interference computer viruses	17	20
Lack of technical assistance	19	22
Old computers	29	33

Source: Researcher

The challenges enumerated in the above table have a negative impact on the access and use of e-journals. They create a low usage of e-journals and frustrate the students when using a computer. For instance, the internet connectivity has been cited by 72 (83%) of respondents; the slow computer running by 36 (41%) of participants; and the frequent power interruption by 48 (55%) of postgraduate students. The e-journals may become unavailable due to poor facilities. As reported by the respondents, the users spend a long time waiting for the computer to run. Such a situation can disqualify the material people are intending to access and use and the service offered.

The lack of technical assistance paralyzes the service and the students who need support to access e-journals may get discouraged.

4.10.2. Searching and retrieving information

It was observed that searching and retrieving are not achievable for anybody. When asked about the challenges they meet when searching and retrieving the information, NUR postgraduate students gave the following responses in table 4.7.

Table 4.7: Challenges in searching and retrieving

N= 87

Challenges in searching	Frequency	Percentage
Slow computers	45	52
Document out of date	32	37
lack of skills in searching	41	47
Document in abstract format	29	33
Problem of space	32	37
Limited time	37	43
Problem of awareness	31	36
Lack of assistance	30	34
Insufficient number of computers	54	62

Source: Researcher

The participants stated the challenges they faced in the following percentages: slow computer: 45 (52%); insufficient number of computers 54 (62%); lack of skills in searching and retrieving 41 (47%); limited time 37 (43%). The current condition does not offer the possibility to work fast and reach relevant, reliable and up-to-date e-journals. Some of participants said that due to the insufficient number of computers, they prefer to use print formats instead of e-journals because they spend a lot of time on the queue waiting to enter the computer labs while it is free access in the collection of print books.

These problems such as insufficient space, lack of skills in searching and retrieving cited by 41 (47%) of the participants create barriers to satisfy information need. The problem of the low level of awareness brings about the low usage of e-journals because students cannot visit a service or a resource they do not know if it actually exists.

When asked about the issue of lack of assistance cited by 30 (34%) of the participants, the library managers reported that there is always a person in charge of assisting students in the computer labs. The lack of assistance contributes to the underutilization of e-journals because when users fail to get assistance they feel discouraged and leave without trying other methods which can permit them to reach the information they need. It was observed that some staff in the computer labs are unqualified and they are trainees. The lack of qualification of staff leads to poor results in the use of e-journals.

Furthermore, the limited time pointed out by 37 (43%) of respondents is a big problem created by the insufficient infrastructure. NUR is using a library built in 1963 which was planned for 1500 students and presently, it has 11,449 students registered for both day and evening programs for the academic year 2011. This indicates that this institution is facing problems of infrastructure because the number of students is increasing while the number of premises is not increasing to match the pace of students' enrolment. Therefore, the majority of postgraduate students do not access e-journals easily due to infrastructural hindrances.

4.11. Library staff

The quality and the qualification of the staff play a vital role in the improvement of services and the reputation of the institution. The interviewers indicated that NUR Library needs qualified staff to enhance service delivery. On the issue of staff, library managers responded that NUR Library and its branch libraries have 62 staff members assuring day and evening services. Among these people, only 16 are qualified librarians holding a university degree; 7 are on Bachelor's degree training, while another 2 are on Master's training and 7 are diploma holders, the remaining are not qualified. They add that the need for qualified librarians is one of the factors of the low usage of e-journals as reported by the library managers. The latter adds that a qualified librarian should actually be characterized by the following desires:

a) To help teachers, users and others:

b) To have an interest in information research

c) To have an interest in a wide variety of resources, especially e-journals and e-resources, materials and subjects

d) To have advanced computer skills and adapt quickly to new technology

e) To assist users in locating the materials. This responds to the lack of assistance cited as a challenge by 30 (34%) of the participants.

Therefore a qualified librarian can enhance student's achievements. NUR Library and its branch libraries have missed staff members who fit the above characteristics for the improvement of the access and use of e-journals for a better service delivery and enhancement of NUR academic quality. This missing has led to the underutilization of e-journals and e-resources in general.

4.12. Suggestions for improvement from the respondents

The users are facing problems in the use of materials they manipulate. The following are the suggested ways to alleviate the challenges faced in the access and use of e-journals.

1. Increasing materials purchased

The NUR Library and its branch libraries must purchase all materials which address the needs of NUR Library and its branch libraries users in general and postgraduate students in particular. This will avoid wasting time by students while seeking where to get the information they need especially when NUR opens new branches in other districts such as CNLG and KIST. The materials purchased must be reliable, up-to-date, and should ideally cover all academic programs at NUR.

2. Increasing level of access and use of e-journals

1. Development of reading habits because it was observed that most postgraduate students do not regularly visit NUR Library and its branch libraries and website for their own reading.

2. Sensitization on integrating e-journals and e-resources in the materials used by lecturers in their preparations. This will increase the use of e-journals because lecturers will recommend students to search and use e-journals.

3. NUR Library and its branch libraries have to work closely with other units such as directorate of research centre, Centre for Instructional Technology (CIT), faculties, and research centres for the whole country in order to integrate the utilization of e-journals in the academic materials they use for their research.

4. The collaboration between NUR Library and its branch libraries and the different schools and faculties is necessary in order to develop the spirit of research at NUR by using e-journals available in NUR Library and its branch libraries' databases.

5. The expension of the library to accommodate the increasing student population at NUR in collaboration with the planning Unit is necessary and can enhance access and use of e-journals.

6. The sensitization of students to the use of computer labs for research and academic purposes only (as there are those who may use them for pornographic purposes or social matters).

7. The appointment of qualified and competent personnel in computer labs will solve the problem of technical assistance cited by postgraduate students. It will also

enhance information searching and retrieving, or guide the users to access and use of e-journals.

8. The replacement of all old computers will facilitate the access and use of e-journals because new computers are fast and cannot make the users wait for a long time. This will increase the number of students who will seek to access and use e-journals.

9. The empowering of internet connectivity will avoid wasting time when users are logging in. This will allow users to reach e-journals fast and will motivate postgraduate students and other categories of users to access and use e-journals without interruption.

10. The extension of computer labs to avoid queues will increase the number of users because most of them are discouraged by the queues, especially the postgraduate students who only have evening time for studying or doing other academic purposes.

11. The intensification of power capacity will help postgraduate students work any time during the working hours. This will enhance the access and use of e-journals because students are sure that they can easily reach the information they need thanks to the network availability.

12. The need for training in computer skills and in information searching and retrieving is important and will allow postgraduate students to access and use easily the e-journals available in NUR Library website.

13. The participants suggested the development of the level of awareness about the availability of e-journals in order to increase the access and use of e-journals at NUR Library by the use of different Media and exhibitions.

3. Subscription of e-journals

Including postgraduate students in selection of e-journals will increase the level of awareness because the study revealed that majority of postgraduate students 81(93.2%) does not participate in the selection of e-journals while they are the most concerned on the usage of the e-journals at the NUR Library.

4. Development of a policy for management of e-journals at NUR Library and its branch libraries

The development of the policy regulating the use and management of e-journals at NUR Library and its branch libraries will help the library to make aware the users of the existence of e-journals, new e-journals subscribed and to up-to-date the NUR Library website on time.

When solving the above problems, the users will be able to access and use e-journals available at NUR Library and its branch libraries databases and website and the usage will be increased.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings of the study in relation with the aim, objectives and research questions with a view to reaching a sound conclusion. Based on the findings of the study, it offers recommendations that can help develop access and use of e-journals for NUR postgraduate students.

5.2 Summary of research findings

Based on the research questions, the findings can be summarized as follows.

1. Research Question One: For what purposes do NUR postgraduate students use electronic journals?

The findings revealed that NUR postgraduate students use the following libraries: NUR Main Library, faculty libraries, CNLG library, ICTR and others. The study has indicated that the choice of the library to be used depends on the location of the postgraduate students, their specialties, the content and accessibility of the documents.

The students use the above libraries for the following purposes:

a) Assignment - this needs relevant, reliable and up-to-date e-journals. That is why postgraduate students have to select the libraries they use to reach information need.

b) Research - A research necessitates a lot of materials such e-journals, e-resources, e-books treating different domains in different periods to reach the potential elements which fit with their topic.

c) Thesis writing - It is the most work in postgraduate study. It needs a variety of materials, e-journals, scientific publications and other materials supporting the work. To reach this, postgraduate students have to read and make comments on different readings which will allow them to produce their own work. That is why they select the libraries which will allow getting information need**.**

d) Self documentation- A postgraduate student needs to have an open mind and this will be reached by reading different documents and materials treating different domains. In addition, they have to complete the notes given by the lecturers to render them consistent.

The reason for choosing any of these libraries is when it meets the information need in their area of specialization. Furthermore, the access to a document in these libraries is very easy.

2. Research Question Two: How are NUR postgraduate students made aware of the availability of e-journals in the library?

The study established that some of the postgraduate students are aware of the availability of e-journals but others are not. Fifty four (62.1%) of postgraduate students are aware of it and were made aware in the following ways:

a). *Colleagues-* some postgraduate students were informed by their colleagues who were familiar with the use of e-journals and found them rich and reliable for their work.

b). *Lecturers* - lecturers who have integrated the use of e-journals in their academic materials recommended the postgraduate students to use e-journals because they knew that they are up-to-date and can meet the information need.

c). *Notice board* - postgraduate students visit the NUR Library and its branch libraries and read announcements on notice boards. The notice board is one of the ways used by NUR Library and its branch libraries to make its users aware of the availability of new arrivals including e-journals.

d). *Librarians -* they inform the library's users by communicating the availability of new technology and the way it operates. This is normally done through the current awareness service.

e). Email - The library, through user group, sends messages to its users to inform them about the documents available (especially the new arrivals).

However, the findings have indicated that 33 (37. 9%) of postgraduate students are not aware of the existence of e-journals.

3. Research Question three: How do NUR Postgraduate students access and use e-journals from NUR library databases?

The study revealed that NUR postgraduate students access and use e-journals located in NUR Library and its branch libraries databases as follows.

a) *Access to e-journals*

Easy access to e-journals is very fundamental and helps satisfy the information need very fast. The study findings have established the following results on access:

A category of 36 (41.4%) confirmed that they access e-journals easily and meet the information need. Another category of 39 (44.8%) do not access e-journals at all. This is a big challenge in the information age where information is gotten where it is needed thanks to the use of ICT. The last category (composed of 12 (13.8%) access e-

journals but not easily. This requires effort, computer skills and developed skills in searching and retrieving.

b) *Use of ICT Facilities*

The use of e-journals requires an ICT facility connected to the internet (own laptop, public facilities such as NUR Library computer labs or cyber café). The study has pointed out the facilities used by NUR postgraduate students to access and use e-journals. There is a category composed of 42 (48.2%) of participants who use NUR computer labs to access and use e-journals. These people need to visit the campus. The other category is composed of 36 (41.4%) of respondents, they use their own laptops to access and use e-journals. They can access them wherever they are. The last category is composed of 9 (10.4%) of postgraduate students who use Cyber café to access and use e-journals. It is a public place which does not allow good conditions to work in.

c) *The level of frequency of use of ICT facilities*

Due to the lack of computer skills cited, the researcher investigated the level of frequency in using the ICT facilities and finds the following. 51 (58.6%) of postgraduate students use ICT facilities occasionally to access and use e-journals, 27 (31%) of postgraduate students frequently use ICT facilities to access and use e-journals and 9 (10.4%) of participants use ICT facilities very frequently to access and use e-journals. Those who use e-journals frequently and very frequently are familiar with them and know their importance in the academic work.

d) *Search and retrieve information need*

The access and use of e-journals need specialized skills in searching and retrieving. At NUR Library and its branch libraries the postgraduate students have different levels of

skills in searching and retrieving. A few of them 3 (3.4%) of postgraduate students are quite competent in searching and retrieving e-journals. They are capable of searching any document because they have enough skills and are familiar with searching methods and use of key words.

Fifteen (17.2%) are competent in searching and retrieving e-journals, which makes them successful. They know how to manipulate the key words and Boolean operators to meet the information need.

The last group of users (composed of 69 (79.3%) is less competent in searching and retrieving e-journals. This is a big challenge for the users of this category in the information age because they cannot easily access e-journals unless they work together with those who are either competent or quite competent.

4. Research Question four: What are the challenges encountered by NUR postgraduate students in the access and use of electronic journals?

The findings of the study revealed that access and use of e-journals at NUR branch libraries have met various challenges as described below:

a) *Use of ICT facilities*

The study revealed that NUR postgraduate students meet different problems in accessing and using e-journals available at the library. As access and use of e-journals need a new or maintained facility, it was indicated that 36 (41%) of participants use slow computers, whereas 72 (83%) of respondents are faced with low network connectivity which cannot allow successful searching and easy location of e-journals. In addition to that, 48 (55%) participants affirm that there is poor power capacity.

This also is an obstacle to information searching and retrieving because power is one of the most important necessities to access and use e-journals. The problem of insufficient number of computers was cited by 54 62%, while 33% complained about old computers. The possession of own facilities is an advantage in searching and retrieving e-journals as indicated by 54 (62%) of postgraduate students.

Other challenges have been enumerated at different rates such as the interference by computer viruses (cited by 17(20%) of participants and the lack of technical assistance (cited by 19 (22%) of respondents.

b) *Challenges in searching and retrieving e-journals*

Most NUR postgraduate students are not skilled in searching and retrieving e-journals as indicated by 41 (47%) of participants. The need of enough time was pointed out as an obstacle and it was indicated by 37 (43%) of respondents. Due to the lack of skills in information searching and retrieval, 29 (33%) of postgraduate students confessed their ignorance of documents in abstract formats as results. The problem of infrastructure was also indicated by 32 (37%) of participants, while 31 (36%) of respondents revealed the problem of awareness and 32 (37%) of postgraduate students indicated out-of-date documents probably due to the lack of skills in searching or the use of wrong databases.

5. Research Question Five: What can be done to enhance effective access and use of e-journals at NUR Library?

In order to enhance the access and use of e-journals at NUR Library and its branch libraries, the participants in the study recommended the following:

Recommendations from the library managers

1. Establish a policy regarding the development and management of e-journals at NUR Library.

2. Develop in collaboration with lecturers the culture of reading habit for students both at postgraduate and undergraduate levels by integrating e-journals in their reading lists.

3. Mobilize lecturers to integrate e-journals in the academic materials they use while developing the modules to be taught.

4. To work closely with other units which use regularly e-journals like directorate of research commission and other existed centres at NUR.

5. To work closely with the faculties to create the interest in the usage of e-journals by lecturers and researchers at NUR.

Recommendations from postgraduate students

6. Expand the library according to the number of students admitted at NUR to avoid the queue while entering the computer lab.

7. Appoint qualified and competent staff in computer labs in order to enhance service delivery.

8. To organize and update regularly NUR Library databases. This will create the motivation for library's users because they will get current and reliable information.

9. To replace all old computers with new ones in order to speed up the users to access e-journals.

10. Increase the internet connectivity capacity to avoid time wastage for users.

11. Increase the power capacity to avoid interruption while searching.

12. Train NUR Library and its branch libraries' users on information searching and retrieving. This will allow users to reach information need efficiently and effectively.

13. Develop the level of awareness. This is very important and will increase the use and accessibility of e-journals because people made aware will know the importance of e-journals in research and academic activity.

14. Subscribe to the materials according to the programs of study at NUR. The availability of relevant materials within the institution aid in getting information needed on time and contributes in saving users' time.

15. Involve the postgraduate students in the selection of documents to improve the level of awareness. The participation of postgraduate students will ameliorate the level of awareness and the increasing of access and use of e-journals because they are the most concerned of the use of e-journals in their daily activities.

5.3   Conclusion

The study investigated access and use of e-journals by postgraduate students at the National University of Rwanda. It also sought to assemble helpful facts that will assist users in establishing accessibility systems to ensure efficient and effective use of e-journals. Most of the respondents pointed out that the lack of awareness, lack of skills in searching and retrieving, lack of assistance, lack of training, insufficient space, use of old computers, poor internet connectivity and poor power capacity are the main obstacles to access and use of e-journals for NUR post graduate students.

5.3.1 Branch Libraries used by postgraduate students to access information

NUR post graduate students use different libraries. Most students use the main library, others the faculty libraries. But students who are doing Peace and conflict Studies and those who are in the program of Genocide Studies and Prevention use CNLG. A Few of them also use the ICTR documentation centre. The choice of any of the library is conditioned by its content, location, availability or age of the documentation.

5.3.2 The databases containing e-journals preferred by postgraduate students at NUR

The regular use of document depends on the quality of contents, its accuracy and reliability. The findings from the study have revealed that NUR Library website and databases contain documents of quality and e-journals in particular, which cover the information need for most postgraduate students. The majority of postgraduate students in different disciplines confirm that EBSCO covers totally the information they need and that it is multidisciplinary. Furthermore, most postgraduate students in engineering confirm that IEEE (Institute of Electronic, Electrical Engineers) is their preferred database. They add that they are satisfied and comfortable when visiting and using IEEE's database.

Emerald Group Publishing Ltd also contains various documents treating different domains. It is appreciated by majority of postgraduate students. It satisfies almost all postgraduate students' information need and contains materials of quality, up-to-date, reliable, accurate and relevant information.

Springer e-journals is one of the NUR Library's databases, it covers a wide range of areas such as sciences in general, medicine, social sciences and economics and computer science among others. The e-journals contained in this database are appreciated by especially postgraduate students because they are in full text and match their information needs.

In general, most of NUR's databases like ASABE, JSTOR, Oxford University Press, Policy Press Journals, Wiley Online Library, World Bank Development Finance among others. These databases contain quality e-journals which cover and satisfy the users' needs in their academic activities as revealed by the study.

From the findings, it is rational to conclude that the low usage of e-journals at NUR Library do not correlate to the quality of content of e-journals contained in the different NUR Library's databases but to other parameters because most participants agreed that they are contented with the quality of NUR Library's databases.

5.3.3 Access and use of e-journals at the NUR

a) *Access of e-journals at NUR*

The access to documents allows the users to find easily the information they need. The findings indicate that the access and use of e-journals at NUR Library and its branch libraries is very low. Some postgraduate students access easily e-journals, others access with difficulties, others do not access them at all due to poor internet connectivity, poor power capacity, lack of password, lack of IP address, lack of infrastructure (small computer rooms), documents in abstract format, lack of skills in searching and retrieving.

The latter is supported by Tella (2007) who argues that the students' ability to find and retrieve information effectively is a transferable skill useful for their future life as well as enabling the positive and successful use of e-journals. The impact of the above challenges met by the users is the low use of e-journals as it was described previously.

b) *Use of ICT facilities to access e-journals*

ICT is a tool that facilitates the communication and processing the transmission of information and sharing of knowledge by electronic means. ICT facilities such as computers, own laptops and cell phones allow access to e-journals when connected to internet. Most postgraduate students access e-journals by using these facilities. Students who possess their own laptops registered in ICT centre do access the NUR Library website and databases easily anywhere they are thanks to EZproxy. All students who do not have their own laptops have problems of accessing e-journals, because they always have to move to the university campus, CNLG or to a cyber café.

c) *Level of searching and retrieving e-journals*

It was observed that the level of searching and retrieving is still very low, as a few students are competent or quite competent while the majority of postgraduate students are less competent. The above results have been occasioned by many factors such as the low attendance to the training on searching and retrieving e-journals and e-resources, poor internet connectivity, poor power capacity among others.

The poor infrastructure also has played a role in the low use of e-journals because NUR Library and the faculty libraries are facing the problem of space in accommodating students who are searching and retrieving.

d) *Level of frequencies in using ICT facilities*

The findings indicated the low frequency in the use of ICT facilities. Majority of postgraduate students use occasionally ICT facilities, some use them frequently and few use them very frequently. Easy access and use of e-journals necessitate the ability and regular use of ICT facilities as postgraduate students are supposed to read and use the e-journals in their research, assignment, notes making and self documentation.

The findings lead to a conclusion that there is a need to enhance an effective utilization of e-journals at the NUR Library in general. This will be achieved by the enhancement of computer skills, use of advanced search and retrieval systems, mobilization of lecturers to the integration of e-journals in the teaching and reading materials.

5.3.4 Factors that hinder access and use of e-journals at NUR Library

The easy accessibility of e-journals facilitates their use and permits the researchers and postgraduate students in particular to meet their information needs. The study pointed out the factors that hinder NUR Library and its branch libraries' users to access and use e-journals. They are classified in the following groups:

1. ICT facilities in NUR computer labs

The NUR computer labs present ICT facilities with the following characteristics:

a) Old computers - these facilities do not allow postgraduate students to access e-journals easily because they take time to switch on and are not fast to locate information needed. Hence people waste a lot of time in searching and retrieving. They do not facilitate fast saving of information located, and when power goes off, users sometimes lose information already located.

b) Low internet connectivity - low internet connectivity hinders the speed of access and location of e-journals and contributes to wasting time when postgraduate students are searching.

c) Poor power capacity - the poor power capacity interrupts searching and retrieving when power goes off. It discourages and frustrates postgraduate students in their academic activities especially when they are concentrating on their work.

d) Interference by computer viruses - the interference by computer viruses is the most dangerous in the use of computers. They damage information and other computer equipment. Postgraduate students fear to use their flash disk to save the located information they need because of fear of infection by viruses.

2. *Lack of skills in searching and retrieving -* access to e-journals requires skills in advanced searching and retrieving information. The study revealed lack of skills in searching and retrieving. Bowden (1994) and Gruppen (1990) indicated that lack of computer training generates weak skills in searching and retrieving e-journals in specific databases which will provide low usage of e-journals. This is the case of NUR postgraduate students where most of them are less competent only few are competent and quite competent.

3. *Use of ICT facilities.* A regular use of e-journals necessitates the possession of own laptop connected to internet, cyber café or to use NUR computer labs for NUR postgraduate students. The study indicated that some postgraduate students do not use e-journals because they lack their own laptop and majority use NUR computer labs while minority uses cyber café. However, Zondi (1992) observed that the inability to effective exploitation of e-resources in academic libraries was attributed to lack of competence in the use of library resources. The majority of postgraduate students use ICT facilities occasionally to access e-journals while the minority use ICT facilities very frequently and frequently.

4. *Infrastructure:* the NUR computer labs cannot accommodate a big number of students. They limit the number of users. This contributes to the low use of e-journals because some of postgraduate students dislike lining up waiting to enter in the computer labs to work during the limited time which does not allow postgraduate students to get concentration and work at their satisfaction.

5. *Resistance to the changes.* Some lecturers fail to integrate e-journals in the materials they use to prepare their lectures and consequently never recommend postgraduate students to read and use e-journals for daily academic work.

6. *The lack of awareness*. The absence of awareness has led to the low use of e-journals because Users are unsure of the materials that exist in the library to be accessed for the academic purposes: research, assignments, self documentation and course work. This is supported by Bloor (2001), when he states that most serious challenges influence use of e-journals is lack of awareness. In this regard Majid and Mansoor (1996) in their study point out that majority of library users did not use e-resources because they were not informed of their existence.

*7. **Lack of qualified staff***. The development of good service delivery depends on the qualification of the library staff that manages daily services. It was observed that the NUR Library is facing qualified staff: only 16 out of 64 personnel are qualified as mentioned earlier. A qualified librarian is able to express the desire to help users including lecturers and all university communities to have interest in a wide variety of resources, materials and e-journals in particular; to have advanced computer skills and adapt quickly to new technology. These characteristics are needed at NUR Library and its branch Libraries to enhance access and use of e-journals which are still underutilized due to factors detailed above.

5.3.5 Recommendations from respondents on how to improve access and use of e-journals

In order to alleviate the challenges the postgraduate students face in access and use of e-journals, the participants pointed out the following:

1. The need for reinforcement of the quality of training by giving emphasis on the practice during the training session in order to allow users themselves to manipulate new technology facilities.

2. The replacement of old computers with new ones to minimize waste of time while logging in.

3. An increase of the power capacity and the internet connectivity to facilitate access and of use of e-journals at NUR.

4. The recruitment of qualified staff that would assist users in all their activities regarding the access to and use of e-journals.

5. Integrate e-journals into daily academic materials for both postgraduate students and other categories of users including lecturers.

6. The expand computer labs in order to avoid the queues and limited time and allow postgraduate students to get concentration for their daily academic activities.

7. The updating of NUR Library and its branch libraries' website (this is one of the elements to be revised because relevant and reliable documents encourage users and trigger high use and high frequency).

8 An increase of the level of awareness about e-journals in the university community (people usually use what they know or what they have heard of from others).

9. Searching and retrieving should include the research methodology course to increase access and use of e-journals by postgraduate students. The integration of searching and retrieving in the research methodology course will motivate postgraduate students to attend massively because they know that the course will be examinable, and then students will attend according to NUR academic regulations.

5.4 Relating NUR practices with Borgman's three elements in the network world

Borgman (2003) after analyzing how access to information in the network world, and how to ensure that information continues to be accessible, presents three essential elements. These are connectivity, content, and usability whose availability will permit permanent access to information.

1. *Connectivity*. This is the capacity of the computer to communicate to other computers and information sources. It can connect users to the internet and many

computers data banks and other sources of information lie well beyond the user's desk.

2. *Content*. The author emphasizes on the content of materials and the quality which must be characterized by the relevance, reliability, accuracy and the coverage of the materials because users want to access the right journals.

3. *Usability.* This is the capability to manipulate the computer and the computer network. The achievement needs three elements such as features of computer, skills or literacy and utilization of content.

1) Features of computer. For the network to be considered accessible, it must be usable by most users in need of its use instead of being designed for technical specialist.

2) Skills or literacy. This means that users need skills allowing them to manipulate the system. Its achievement necessitates the training to facilitate access and use.

3) Utilization of content. Here the author means that for the e-resources and e-journals to be utilized, they need to be searched and retrieved for viewing, reading for the research purposes. The content of materials and their quality must be characterized by relevance, reliability, accuracy and coverage.

However, the author reveals that usability is the most problematic because it is limited to the ability of non-specialists to use technology and the information available.

Based on three Borgman's elements, the findings revealed that the study on "Access to and Use of e-journals by postgraduate students at the National University of

Rwanda Library" points out weaknesses and strengths presented by the NUR Library and its branch libraries to its users in accessing and using e-journals as shown below:

1. Strengths

a) *Connectivity***.** The NUR Library has a computer lab in each faculty library and two in NUR Library, all of which are connected to the internet with server which links them with World Wide World. These allow users to search and retrieve information at their satisfaction.

b) *Content.* The study pointed out that the NUR Library and its branch libraries' databases contain relevant, reliable, accurate and up-to-date e-journals that some users appreciate and who are capable of accessing and use e-journals. The content was chosen in the ways recommended by Borgman's three elements.

c) *Usability.* Some NUR Library and its branch libraries' users access e-journals and use them for their academic purposes. The NUR Library and its branch libraries have also a team of trainers who train users to increase the level of accessibility and usability.

2. Weaknesses

a) *Connectivity.* Many postgraduate students do not possess their own laptops to be connected to the NUR network. This limits easy access and use of e-journals.

The computers installed in the NUR computer labs are old and run slowly. This also denies users faster access to and use e-journals.

The NUR internet connectivity and power capacity are far much below the demand of the users hence it fails to facilitate access and use of e-journals at NUR Library and its branch libraries.

The NUR computer rooms are very small and do not accommodate all postgraduate students. The above obstacle hinders access and use of e-journals as recommended by Borgman (2003).

b) *Usability***.** NUR postgraduate students present weaknesses in this area as revealed in the study. Some are lacking in searching and retrieving skills. Others are lacking in computer skills. A big number of postgraduate students are less competent in searching and retrieving which deter their access and easy use of e-journals for their academic purposes.

In a nutshell, access and use of e-journals at NUR have been characterized by a lot of factors that hinder the effective use of e-journals such as lack of skills, old computers, and insufficient number of computers, poor power capacity, and poor internet connectivity among others. The above elements do not match with Borgman's (2003) three elements in the network world. The usability and the connectivity do not reach the level recommended by Borgman (2003). Based on the findings, the following will enhance the active use of e-journals: the increase of power capacity, internet connectivity, extension of computer labs, training methodology, new computers, level of awareness about e-journals and e-resources in particular among others have been considered as catalyst to speeding up access and use of e-journals. In addition, the high level of reading habit, the integration of e-journals and e-resources in the

academic teaching materials are some of the most important elements to be implemented for an effective use of e-journals at NUR Library and its branch libraries, and this will highly develop the exploitation of e-journals at the National University of Rwanda in general. In order to enhance and improve access and use of e-journals at NUR Library and its users, the researcher recommends the following:

5.5. Recommendations

The NUR administration must be willing to support the library and its activities both financially and morally. The support may be in the form of provision of adequate funds to permit the library to provide the necessary facilities and resources; motivate staff through remuneration and continuous training. On the other hand, the library staff should acquire, organize and offer services and resources relevant to the library's users; train the users on how and where to access and retrieve and search e-resources and e-journals from different websites. For instance, in the case of motivation, as the NUR does not have enough qualified staff, it has implemented the training policy and capacity building by sending some of staff to study outside the country. This allows the staff an opportunity to get trained and to be qualified and the remaining staff has the hope that they will also get the occasion such a scholarship. The qualified staff will develop the quality of service delivery, perform the quality of work and develop the level of dissemination of materials existing in the library, especially e-resources and e-journals which are new systems of getting information in developing countries. In those conditions, the staff will still be motivated and competitive. The staff will also be innovative regarding the achievement of the library's goals and implementation of new method for enhancing access and use of e-journals and library management in general.

In modern libraries, e-resources in general and e-journals in particular play a fundamental role in teaching and research and are affordable and reachable anywhere and at any time. In order to enhance and improve access and use of e-journals at NUR Library and its branch libraries, the researcher recommends the following:

5.5.1 Library services should be tailored to users' needs

The library managers should update the databases regularly to weed out documents which are out of date. The connectivity, the content and the accuracy of e-journals are the major elements which could speed up the use and inspire credibility of a library and its e-journals.

For better improvement, the library manager should work closely with the publishers in order to provide updated and reliable academic materials such as e-journals which meet the information needs of the students and the programs taught in all NUR campuses. The library managers and the faculties should emphasize on the quality of e-resources and e-journals in particular. This will speed up the use of e-journals and other e-resources.

5.5.2 Improve organization of databases at the NUR Library and its branch libraries

The organization of e-journals should facilitate the users to easily identify and locate the information they need. For this reason, a standard method for organizing access to e-journals in the libraries found the catalogue is the most suitable access tool for both print and e-journals. Therefore, to avoid the lack of organization of e-journals at NUR

Library and its branch libraries, the researcher recommends the following for an effective use of e-journals:

1. The list of all databases should appear on the home page of the library website. This will help users to choose the database to use because all of them are visible.

2. A searchable database and a library catalogue: this means that NUR Library and its branch libraries have to organize all e-journals up getting easy searchable database.

3. To regularly update NUR Library and its branch libraries' databases and website: The library must keep up-to-date all its e-journals and keep the out of date materials in its archives for further research.

4. To subscribe to e-journals which cover NUR study programs: the subscription must consider the programs of study at NUR.

The above elements will increase access and use of e-journals because they are not scattered and their accessibility and location will be easy.

5.5.3 Develop capacity for access and use of e-journals

Access and use of e-journals are conditioned by the connectivity which is a prerequisite for using computer networks and the capacity of manipulating new technology to get resources and services. The results of the study have shown that there is a gap in technical systems. For better utilization of e-journals by NUR postgraduate students and other categories of users, it is recommended to emphasize the following:

1. NUR Library and its branch libraries should reinforce training for its users. This will permit them to search and retrieve easily the information they need from NUR Library and its branch libraries' databases to access e-journals.

2. The staff training is a requirement to increase the quality of service delivery; the staff must be able to satisfy the user's need and create user's motivation in the use of e-journals.

3. The managers of NUR Library have to formulate a policy of training for users and staff which is responsive to NUR Library and its branch libraries challenges.

4. The Organization of training must take into account the trainees' needs and the period of training must be known in advance.

5. The training must be adapted to the level of the trainees because inadaptable training program doesn't help them. The content must be planned and verified by the Director of NUR Library and its branch libraries.

6. The trainers must create an interest in the trainees' mind, and then the latter can be motivated, which helps him/her assimilate the techniques learnt.

7. Trainers must allow enough time for practice sessions and invite the trainees to search on their topics in order to verify if they can meet information needed during their searching and retrieving when they will be back.

8. Evaluation and monitoring must be planned because trainees can meet problems during their work and be blocked.

5.5.4 Develop ICT infrastructure

The availability of ICT facilities permits easy access and effective use of e-journals. The National University of Rwanda should organize a scheme to purchase a fleet of laptop computers whereby users would be able to pay for their laptops on instalment

basis. In addition, wireless facilities should be empowered in order to satisfy the increased demand from the laptop owners who need to access and use e-journals.

For better utilization, NUR must build computer labs and install its accessories before starting the program in order to avoid the lack of materials during the course sessions. All old computers should be replaced by new ones and the latter must be maintained regularly with a powerful anti-virus system to protect them and their documents.

The following elements should keep the computers powerful, helpful and make them run rapidly for the effective access and use of e-journals:

1. To increase the power capacity in order to avoid regular interruption and loss of downloaded documents.

2. To increase the number of computers in order to allow majority of users access information simultaneously.

3. To expand the number of computer labs and increase the number of ICT facilities.

4. To build specific computer labs for postgraduate students to avoid time limited due to the small space in existing computer labs and to allow enough space for concentration in their academic activities.

5. To appoint permanent staff to assist the users when technical problems occur and for a regular maintenance.

6. To reinforce the EZproxy system which gives access to NUR website regardless distance and the location of the user, hence allow postgraduate students to work to their satisfaction.

5.5.5 Involve users (postgraduate students) in the selection of e-journals

The subscription is done before the purchase order and the use of e-journals; a transparent subscription plays a vital role in library management because it needs suggestions from most of the users. The findings have revealed that postgraduate students (93.1%) do not participate in giving suggestions on e-journals while 3.4% sometimes participate.

In order to avoid the exclusion of certain categories of users in the selection of e-journals and other documents, the researcher recommends the following:

1. To involve students (especially the postgraduate students) or their representatives in selecting e-journals, because their skills allow them the ability to suggest any documents which address their information needs and the topics for their future research.

2. To organize a meeting when selecting e-journals and other resources at the faculty level because when they send an email, some lecturers do not act or underestimate its value.

3. To establish a committee at the department and at the faculty levels for verification of all selected documents in accordance with the faculty programs.

4. To approve the content quality for the development of teaching quality (this could be done by NUR Library Board in collaboration with the Director of Quality and a specific appointed committee).

The above suggestions could enhance and improve access and use of e-journals and their integration in the daily materials used for academic purposes at NUR.

5.5.6 Increase postgraduate students' awareness of e-journals

The awareness is the most important part in marketing because users need to be aware of the existing documents. A wide dissemination is needed at NUR Library and its branch libraries for an effective and efficient use of e-journals. The findings from the study have indicated that e-journals are not fully exploited due to the lack of awareness. For example 37.9% of postgraduate students are not aware of the existence of e-journals at NUR Library and its branch libraries. There is a need for a well organized plan for the enhancement of access and use of e-journals. This is supported by Linda and Colin (1999) who noted that a number of methods could be used to create awareness of e-journals and other resources in general. The implementation of the following activities is recommended:

1. To create a common email or a network in which all users can access and find the information they need regarding library materials.

2. To organize an open day and show the new arrival including new technology.

3. To prepare a talk and invite someone who is a specialist in that domain to come and give a lecture on a topic related to the library, access and use of e-journals etc, this could be done every three months at maximum.

4. To use NUR's radio called Salus to advertise the existing documents in the library and organize a weekly special emission on the library (importance, service, new technology, mission, e-resources, and role of a library in the academic area and in the rural community).

5. To organize an exhibition where users and staff will discuss face to face and respond to the users' questions.

6. To prepare brochures, leaflets and distribute them during a talk or when there are visitors in the library.

7. To fix posters in public places within the University (at the restaurant, at the entrance of the main campus, at the library and in the different faculty libraries.

8. To distribute brochures to students before they enter their classrooms and at the beginning of the academic year.

9. To organize games, like drama which plays how users search and retrieve e-resources, e-journals and their importance in the academic activities.

10. To organize press conferences where different media will largely disseminate the new documents and how to reach them using different ICT methods of searching and retrieving.

11. To make available a specific budget for the advertisement of e-journals and new documents.

5.5.7 Developing capacity of library staff in usage of e-journals.

The staffs are the pillars and managers of any institution at different levels. Their weakness creates the low use while their competence increases the quality of service delivery.

Good management raises the level of performance of the institution. This means that for an effective use of e-journals at NUR Library and its branch libraries, there is a need for adequate staff that is well experienced and qualified to run the institution and develop service delivery.

NUR Library and its branch libraries need adequate and qualified staffs that are committed to the provision of e-journals. The computer labs staff should lead the postgraduate students in searching and retrieving e-journals this will enable these students to have easy access to e-journals for all the areas. The low use of e-journals has been contributed by the lack of qualified staff which could help achieve the standard levels, enhance and improve the effective use of e-journals. For this reason, the NUR Library and its branch libraries need:

1. To organize regular training for staff and users when a new technology is introduced.

2. To update the staff's knowledge by sending them to different seminars, conferences or short and long courses in and out of the country.

3. To develop the capacity building of library staff by offering facilities for studying.

4. To organize field trips for the staff to exchange and update their experience with their colleagues from other institutions.

As the study has shown 79.3% of postgraduate students are less competent in searching and retrieving. The library is then recommended to create an electronic journal help desk for daily assistance to the users who may need help on how to access and use e-journals.

5.5.8 Formulate NUR Library and its branch libraries' e-journals policy

A policy is a set of rules, formal and informal, that directly restrict, encourage, or otherwise shape flows of information and guide the management of e-journals. NUR Library and its branch libraries should establish the collection and development policies for e-journals as guidelines. These policies will provide guidelines for the

selection and acquisition of e-journals and allow the facilities to access and use e-journals.

The policy will support the library in increasing access and use of e-journals through cataloguing of each e-journal, loading the necessary software and hardware, and appropriate staff.

These policies will need to be reviewed regularly to reflect the changing information need when necessary. Their implementation will help NUR Library and its branch libraries to know how to manage and enhance the use of e-journals at the NUR.

5.6. Suggestions for further research

The current study proposes the following areas for further research:

1. Further studies should be conducted to establish the impact of access and use of e-journals by postgraduate students at NUR.

2. Studies should be carried out to verify the most preferred used documents between e-resources and print documents at NUR.

3. Studies should be carried out to determine the impact of e-journals in developing agriculture in Rwanda.

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APPENDICES

Appendix I: Letter

Dear Sir/ Madam

Eldoret, 29th, September 2011

RE: **Research questionnaire /interview**

I am an Msc student at Moi University, School of information Sciences in Kenya. I am carrying out a study on Access and Use of electronic journals by postgraduate students at the National University of Rwanda Library as part of my post-graduate degree program.

The purpose of this letter is to kindly request you to assist me in terms of providing and sharing your knowledge and experience to this study.

Please note that your participation and cooperation will go a long way in assisting in the improvement of access and use of e-journals at the National University of Rwanda Library.

I take this early opportunity to assure you that the information you provide will be used only for the purpose of this study and will be treated with strict confidence.

Thank you.

Yours sincerely.

Charles RUGENGAMANZI

Postgraduate student

Moi University

Kenya

APPENDIX II: Questionnaires

I. Personal data

Course studied:..……………..Year of study:………..Sex:…………Age:…..

II. General information

1. Which library do you use to access information?

Explain your response:…………………………………………………………….

…………………………………………………………………………………………

……………………………………………………………………….................

2. For what purposes do you use the NUR library?

…………………………………………………………………………………………

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…………………………………………………………………………………………

3. Are you aware about the existence of electronic journals at NUR library? Explain your response.

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…………………………………………………………………………………………

4. How did you know about them?

…………………………………………………………………………………………

…………………………………………………………………………………………

………………………………………………………………………………………

5. How does the NUR library subscribe to e-resources and e-journals?

....

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6. Did you participate in suggestions of subscription of electronic journals subscribed by the library?

……………………………………………………………………………………………

……………………………………………………………………………………………

Explain…………………………………..………………………………………………

7. Do you regularly use e-journals from the NUR library website? Yes [ ] No [ ] sometime [ ]

Explain…………………………………………………………………………………..

………………………………………………………………………......................

......…………………………………………………………………………………….

8. What databases do you consult to access e-journals? Why are they your preference?

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9. Do electronic journals from NUR library meet the information you need? Explain.

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

10. What do you prefer to use between print and electronic journals?

Explain your responses…………………………………………………………………..

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…………………………………………………………………………………………

III. Access and Use of e-journals

11. Are you charged when using NUR's electronic journals? Explain your response.

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…………………………………...

12. Do you access these electronic journals easily?

…………………………………………..

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

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

Justify your response.

…………………………………………………………………………..............................

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13. Does access need a password?   Yes [ ]   No [ ]

14. If yes, how do you get it?

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

15. If no, why?

………………………………………………………………………………………………

………………………………………………………………………………………………

16. How do you access electronic journals?

    NUR computer labs [ ]   Own laptop [ ]   Cell phone [ ]

    Internet [ ]

17. What is the frequency of use of the above chosen equipment?

	Never	Occasionally	Frequently	Very frequently
Computer				
Laptop				
Cell phone				
Internet				

18. If never, why do not you use it?

....

....

19. Do you have any basic training or skills to enable you to effectively use the listed technologies? Yes [ ]   No [ ]

20. If yes, where were you trained?

……………………………………………………………………………………………

……………………………………………………………………………………………

....

21. What is your level in retrieving and searching electronic journals? Tick the appropriate of your choice: Competent [ ] Less competent [ ] Competent [ ] Quite competent [ ]

22 Justify: ……………………………………………………………………………

…………………………………………………………………………………………..

....

23. What problems do you meet in accessing electronic journals at NUR library?

……………………………………………………………………………………………

…………………………………………………………………………………………..

....

24. What challenges do you get when using ICT facilities?

……………………………………………………………………………………………

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……………………………………………………………………………………………

25. What can you suggest to the NUR library in enhancing the access and use of electronic journals?

……………………………………………………………………………………………

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……………………………………………………………………………………………

26. Do you have any other comments or recommendations for improving access, use and managing electronic journals at NUR library?

……………………………………………………………………………………………

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THANK YOU

Appendix III: Interview for library staff

I. Personal Information

Position: Director [ ] Deputy Director [ ] Computer labs managers [ ]

Head of section[   ]

II. Information needs

1. How do you proceed in subscribing electronic journals?

2. What databases do users visit to access electronic journals?

3. Do they cover all programs of study for postgraduate students at NUR?

4. How do you proceed to make aware library's users to the existence of electronic journals?

5. What can be the impact of low awareness of the access and use of e-journals?

6. Do electronic journals' content meet the needs of NUR library's users? Explain

7. Are you satisfied with the use of e-journals at NUR library?

8. Justify your responses in details.

9. What are the reasons of low use of electronic journals observed in NUR library?

10. What can be the impact of the low use of e-journals at NUR library?

11. How do you facilitate the library users in accessing and using electronic journals?

12. How do library users get the password to enable them to use NUR library electronic journals?

13. Are library users trained in accessing and using electronic journals? Yes [ ] No [ ]

14. If yes, what is the impact of that training?

15. What is the level of attendance when organizing training? Low [ ] Middle [ ]

High [ ]

16. What can be the cause of low and medium attendance?

17. What is the impact of this?

18. Which service program do you have to help postgraduate students and other users to learn how to retrieve electronic journals?

19. How did the above program assist the library users?

20. Do postgraduate students have their own computer labs? Yes [ ]   No [ ]

21. If none, do you think that can be a reason of low use because they need attention?

22. What challenges do postgraduate students encounter the access and use of electronic journals at the NUR library?

23. What are the critical problems when managing electronic journals to the post graduate students at NUR library?

24. What can be done to enhance the access and use of electronic journals at NUR library?

25. Do you have any additional comments or recommendations can improve the access and use of electronic journals at NUR library?

THANK YOU

Appendix IV: Determining Sample Size

Table 1: sample size for $\pm 3\%$, $\pm 5\%$, $\pm 7\%$, and $\pm 10\%$ precision

Levels where confidence level is 95% and P= 5

Size of	Sample size (n) for precision (e) of			
Population	$\pm 3\%$	$\pm 5\%$	$\pm 7\%$,	$\pm 10\%$
500	A	222	145	83
600	A	240	152	86
700	A	255	158	88
800	A	267	163	89
900	A	277	166	90
1000	A	286	169	91
2000	714	333	185	95
3000	811	353	191	97
4000	870	364	194	98
5000	909	370	196	98
6000	938	375	197	98
7000	959	378	198	99
8000	976	381	199	99
9000	989	383	200	99
10000	1000	385	200	99
15000	1034	390	201	99
20000	1053	392	204	100
25000	1064	394	204	100
50000	1087	397	204	100
100000	1099	398	204	100

Source: Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. PEOD-5, 1992

Appendix V: Work plan

Activities	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov.	Dec	Year
Submission Research topic				■									2011
Concept paper					■								2011
Writing research proposal						■							2011
Writing research proposal							■						2011
Submission for correction								■					2011
Correct. & defense									■				2011
Data collection										■			2011
Data Analysis & Interpretation											■		2011
Submission for correction												■	2011
Finalis. & Submis thesis			■										2012
Correction		■											2012
Submission final report	■												2012

Source: Researcher

Appendix VI: Budget for the research thesis

N°	ITEM	DESCRIPTION	Unit Cost (KES)	Qty	TOT Cost (KES)	TOT Cost in USD
1	**Stationery**	Printing (drafts + finals)	5	5280	26400	**290**
		Binding draft	100	20	2000	**22**
		Binding Final	600	10	6000	**66**
2	**Equipment**	Stapler	500	1	500	**5**
		Pins	80	3	240	**3**
		Portable Digital recorder	15000	1	15000	**165**
		Flash Disk	3500	1	3500	**38**
3	**Transport and communication**	Return ticket Butare-Eldoret –Moi University	5000	2	10000	**110**
		Transportation Butare- Kigali (7 Trips)	800	7	5600	**62**
		Transportation within Kigali (13 Trips)	700	13	9100	**100**
		Internet Subscription (monthly)	3230	3	9690	**106**
		Telephone subscription (monthly)	3100	3	9300	**102**
4	**Food and Accommodation**	Meals [(6 days x 3) +1]	500	19	9500	**104**
		Beverage [(6 x3)+1] =19	50	38	1900	**21**
		Accommodation (6 nights)	2400	6	14400	**158**
5	**Research Personnel**	Field assistant (30 days)	2110	30	63300	**696**
		Editing	28500	1	28500	**313**
	GRAND TOTAL				214930	**2362**

N.B. Exchange rate: 1USD = 91 KES

Appendix VII: List of available databases responsive for the NUR's program of studies

1. Acoustical Society of America (ASA)

2. African Journals Online (AJOL)

3. American Institute of Physics

4. American Physical Society (APS)

5. American Society of Agricultural and Biological Engineers (ASABE)

6. American Society of Civil Engineers

7. Annual Reviews

8. Beech Tree Publishing

9. British Library Direct

10. British Library Document Supply Centre (BLDSC)

11. Cambridge University Press

12. Cochrane Library

13. De Gruyter LIS Books

14. De Gruyter LIS Journals

15. Duke University Press

16. EBSCO Host Research Databases

17. Edinburgh University Press

18. Emerald Group publishing Ltd

19. Gale Cengage Learning: Expended Academic ASAP

20. Gale Cengage Learning: Health &Wellness Resource Centre

21. Gale Virtual Reference Library

22. Geological Society

23. HINARI

24. Institute for Operations Research and the Management Sciences (INFORMS)

25. Institute for Electronic and Electrical Engineers (IEEE)

26. IOP Publishing

27. JSTOR

28. JSTOR (ALUKA)

29. Mary Ann Liebert, Inc.

30. NPG- Nature

31. NPG-Palgrave Macmillan Journals

32. Optical Society of America (OSA)

33. Oxford Journals (OUP)

34. Policy Press Journals

35. Project Euclid

36. Project Muse

37. Royal College of Physicians

38. Royal Society

39. Royal Society of Chemistry: RSC Journals Archive

40. Sage Publication

41. Springer journals

42. Symposium Journals

43. Taylor & Francis eBestseller Packages

44. University of Chicago Press

45. Wiley Online Library (formerly InterScience)

46. Wiley Online Library (formerly Synergy)

47. World Bank Development Finance (GDF) Database/ World Bank- Global Economic Monitor/ World Bank: Africa Development Indicators