

# **The awareness, access and usage of electronic journals among academic staff in KNUST**

By

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## Abstract

The escalating prices of printed journals and the dwindling resources of many libraries have forced libraries across the globe, to take a reflect on how to stay abreast of time.

The introduction of electronic journals provided an avenue for the restocking of periodicals by many libraries. This phenomenon has however provided an avenue for studies to be conducted around the globe to investigate the perception, reaction and use of these electronic materials among scholars. It was in this light that this study was situated. The study sought to access the level of awareness, access, usage and challenges users of electronic journals (academic staff) faced.

The study reviewed literature relating to the definition of electronic journal, its historical development and elaborated on various studies aimed specifically at faculties across the world.

The study was quantitative in design. A questionnaire was used to collect primary data from academic staff from the Kwame Nkrumah University of Science and Technology (KNUST). The survey yielded 109 usable questionnaires, with a response rate of 49%.

The study showed a high level of awareness of the existence of electronic journals on the Internet, as well as electronic journal services provided by the University by the respondents. Majority of respondents used these electronic materials mainly in writing articles for publication. Issues of slow Internet speed and the frequent electrical power outages on campus were some of the challenges hindering usage of electronic journals.

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*“The dream begins with a teacher  
who believes in you, who tugs and pushes and leads you to the next plateau,  
sometimes poking you with a sharp stick called “truth.” Dan Rather*

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# Contents

<b>Declaration .....</b>	<b>ii</b>
<b>Abstract.....</b>	<b>iii</b>
<b>Acknowledgement.....</b>	<b>iv</b>
<b>Chapter one</b>	
<b>Introduction .....</b>	<b>1</b>
1.0 Background to the study.....	1
1.1 Statement of the problem .....	2
1.2 Aims of the study.....	4
1.3 Objectives of the study.....	4
1.4 Significance of the study.....	5
1.5 Scope of the study .....	5
1.6 Limitations of the study.....	5
1.7 Definition of key terms .....	6
1.8 Organisation of chapters.....	6
1.9 Summary .....	7
<b>Chapter Two</b>	
<b>Review of related literature .....</b>	<b>9</b>
2.0 Introduction .....	9
2.1 State of libraries .....	9
2.2 Definition of electronic journals (e-journals) .....	11
2.3 History and development of the electronic journal.....	13
2.4 Studies on e-journals .....	14
2.5 Use of e-journal among academic staff.....	16
2.6 Accessing e-journals.....	19
2.7 Benefits of and concerns raised on the use of e-Journals.....	21
2.7.1 Benefits .....	21
2.7.2 Challenges raised in the use of electronic journals .....	23
2.8 Theoretical framework .....	24
<b>Chapter 3</b>	
<b>Methodology .....</b>	<b>32</b>
3.0 Introduction .....	32
3.1 The focus of the study.....	32
3.2 Research design.....	33
3.3 Population and sample.....	34
3.4 Sample size.....	35
3.5 Data collection instrument and its administration .....	37

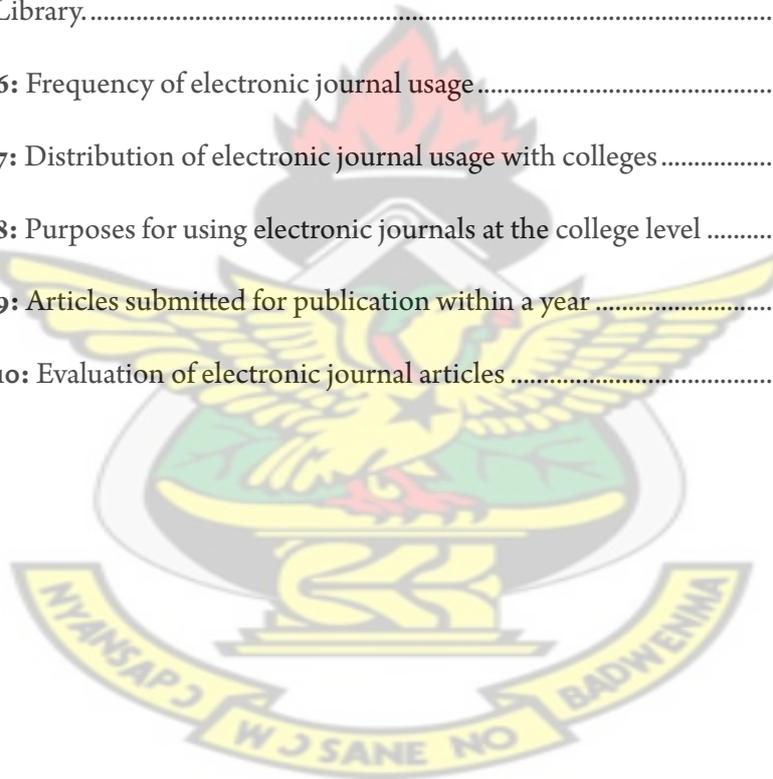
3.6 Pilot study .....	39
3.7 Data analysis .....	40
3.8 Summary .....	40
<b>Chapter 4</b>	
<b>Analysis of data and discussion .....</b>	<b>42</b>
4.0 Introduction.....	42
4.1 Analysis of Data.....	43
4.1.1 Part A: Demographic characteristics of respondents .....	43
4.1.2 Part B: Awareness and access of electronic journal.....	48
4.1.3 Part C: Use of e-journals.....	51
4.2 Summary and discussion of findings.....	60
4.2.1 Access and awareness of electronic journal .....	61
4.2.2 Use of electronic journals .....	64
4.2.3 Challenges in the use of electronic journals.....	66
<b>Chapter 5</b>	
<b>Conclusion and recommendations .....</b>	<b>70</b>
5.0 Introduction .....	70
5.1 Key findings.....	70
5.2 Limitations of the study.....	72
5.5 Recommendations.....	72
<b>References .....</b>	<b>74</b>
<b>Appendices .....</b>	<b>80</b>
Appendix 1: A cross tabulation of faculties and highest educational qualification based on sample of the study. ....	80
Appendix 2: A cross tabulation of years of service and ranks.....	81
Appendix 3: A cross tabulation of ways of accessing electronic journals and ranking. ....	82
Appendix 4: A cross tabulation of usage level of electronic journals within colleges.. ....	83
Appendix 5: Summary of quantity of publications used by academic staff annually. ..	85
Appendix 6: Tabulation of rank, years of service and the number of articles a respondent submits for publication.....	86
Appendix 7: Challenges in the use of electronic journal across colleges in KNUST....	88
Appendix 8: Questionnaire for the survey.....	89

## List of figures

<b>Figure 2.1:</b> Conceptual model for technology acceptance (source: Chuttur, 2009) .....	24
<b>Figure 2.2:</b> Original TAM proposed by Fred Davis (Source: Chuttur, 2009) .....	25
<b>Figure 2.3:</b> Final version of TAM (Venkatesh & Davis 1996, p.453) .....	26
<b>Figure 4.1:</b> Distribution of gender within six colleges .....	45
<b>Figure 4.2:</b> Years of Service in the university .....	46
<b>Figure 4.3:</b> Ranks of academic staff in percentages .....	47
<b>Figure 4.4:</b> Level of computer skills .....	48
<b>Figure 4.5:</b> Ways of accessing electronic journals .....	51
<b>Figure 4.6:</b> Level of use of electronic journal .....	52
<b>Figure 4.7:</b> Purposes of using electronic journals .....	54
<b>Figure 4.8:</b> Purpose of use of electronic journals (percentiles by colleges) .....	55
<b>Figure 4.9:</b> A pie chart of responses on the submission of article for publication in a year. 57	
<b>Figure 4.10:</b> Method of using E-journals .....	58
<b>Figure 4.11:</b> Challenges in use of electronic journal .....	60

## List of tables

<b>Table 3.1:</b> Sample population from the various colleges.....	36
<b>Table 3.2:</b> Sample population with margins of error from various colleges. ....	37
<b>Table 4.1:</b> Distribution frequencies for questionnaires returned (N=109) .....	43
<b>Table 4.2:</b> Distribution of educational qualification in a survey of six Colleges .....	44
<b>Table 4.3:</b> Rankings of academic staff .....	46
<b>Figure 4.4:</b> Locations for accessing internet (N = 109) .....	49
<b>Table 4.5:</b> Sources of awareness of the availability of electronic journal services offered by KNUST Library.....	50
<b>Table 4.6:</b> Frequency of electronic journal usage.....	53
<b>Table 4.7:</b> Distribution of electronic journal usage with colleges .....	53
<b>Table 4.8:</b> Purposes for using electronic journals at the college level .....	55
<b>Table 4.9:</b> Articles submitted for publication within a year .....	56
<b>Table 4.10:</b> Evaluation of electronic journal articles .....	59



# Chapter one

## Introduction

### 1.0 Background to the study

Academic and scientific research has been the backbone to finding answers for the complex questions that affect our environments and societies. Research therefore plays a major role in the quest for information, knowledge and answers to everyday enquiries. Knowledge creation is an expensive venture (Asamoah-Hassan and Frempong, 2008), requiring heavy investment, which is mostly beyond the capabilities of many developing countries (The World Bank, 1999).

Traditionally, the printed matter provided by academic libraries - books and journals - have been the main source of reference for both students and their tutors. However, the dwindling resources of libraries (Dadzie, 2005) have left many especially in the developing countries unable to stock the needed current materials that are required for effective teaching, learning and research.

Ease of storage, access and retrieval of information from the library around the clock, has been the main problem in the traditional library system. The proliferation of technology in recent years however, has dramatically altered how information is accessed, stored and disseminated (Hewitson, 2002).

The limitation posed by the use of the physical library system is gradually being eliminated. With advances in new technology, access to information on a local, regional, national and international level is possible for end users through their desktops (Hewitson, 2002).

Studies on the level of awareness, access and usage of electronic journals (Chandrakumar, 2009 and Nelson, 2001) show conflicting signals. For instance while Science, Engineering

and Health Sciences Faculties at the University of Washington favoured the cancellation of print journals for electronic only, the Humanities and Social Science Faculties of the same University opposed the idea explaining that maintaining the quality of the print collection is their highest priority (Hiller, 2002).

Despite the above situation, many studies (Boukacem-Zeghmouri & Schöpfel, 2008; Ibrahim, 2004; and Research Information Network, 2009) have confirmed the acceptance and use of electronic journals among academic staff. According to Borrenge, Anglada, Barrios and Cornellas (2007), there is evidence of a high proportion of teaching and research staff being aware of the collection of electronic resources in their various institutions, and a necessary preference for the electronic format to the detriment of the printed format especially in the developed world.

This acceptance can be attributed to some of the following characteristics associated with electronic journals: the inclusion of multimedia; improved access to information in terms of convenience, speed, and range of materials; hyperlinking; increased access possible for simultaneous and remote users (Hassan and Frempong, 2008).

On the contrary, some studies on the African continent (Omotayo, 2010; Manda, 2005) show slow progress in the adoption of these electronic materials because of inadequate end-user training, slow connectivity, limited access to connectivity points, poor search skills, and budget cuts.

### **1.1 Statement of the problem**

University campuses all over the world are the centrepieces for innovation, education, discovery and research. The world today is evolving much faster than expected and in a digitised manner. One can no longer afford to waste time with long cumbersome methods of achieving goals whereas there is a shorter and much easier way. Academic research is based

on extensive study and references to stored information. The focus of the research problem lies in the accessibility, availability, portability and constant update of past and current stored data for research purposes.

Electronic journals (e-journals) serve as one of the primary sources of information retrieval and storage for people in the academia in the western world (Hiller, 2002).

The situation is different in most developing countries especially in Africa where people in academia are constantly plagued with problems of insufficient reference materials, in the form of printed books in our libraries. Not only are these books outdated, but they are also insufficient and do not cover a wide range of topics.

To bridge this gap, according to Asamoah-Hassan and Frempong (2008), the Danish Development Agency (DANIDA) provided funds for International Network for the Availability of Scientific Publications (INASP) to negotiate licences and make available online, scientific journals to five (5) institutions in Ghana. These institutions were the University of Ghana in Accra, the Kwame Nkrumah University of Science and Technology, Kumasi, the University of Cape Coast, Cape Coast, University for Development Studies, Tamale, and the Institute for Scientific and Technological Information (INSTI) in Accra. INSTI is the umbrella body for access to information for the research institutes in Ghana.

These e-journals were provided by INASP through the Programme for Enhancement of Research Information (PERI). PERI works with publishers and libraries to grant access to scholarly information to researchers in developing and emerging countries.

This DANIDA initiative led to the establishment of Electronic Resource Centres in these various institutions. According to Dadzie (2005), the PERI programme made available about 7,000 online journal titles free of charge to research and academic institutions in Ghana. Some of the accessible databases included Academic Search Premier, Business Source Premier (EBSCO Host); Academic ASAP, Health and Wellness (GALE); Blackwell-Synergy;

Emerald; OUP. All together about 20,000 online journals are available to researchers in Ghana (Asamoah-Hassan and Frempong 2008).

With the availability of such a wide database for information search, access and retrieval through the INASP initiative at the Kwame Nkrumah University of Science and Technology (KNUST), it is expected that lecturers' lack of access to current materials for teaching, learning and research should be a thing of the past.

However, an interview with the E-Resource Librarian at the University's main library suggests a higher patronage among students (especially postgraduates and doctoral) than lecturers. As a result, this research aims at finding out whether it is indeed the case as pointed out by the Librarian, and if so, why lecturers, who are the main beneficiaries of this facility, are not patronising it.

### **1.2 Aims of the study**

The aims of this research are,

- to identify possible challenges in the information-seeking behaviour of academic staff in KNUST
- to provide data that would help the University formulate policies to improve access to information to its academic staff

### **1.3 Objectives of the study**

The objectives of the study are as follows:

- To assess the level of awareness of the existence of electronic journal and electronic journal services provided by the university library among academic staff
- to ascertain the level of usage of electronic journals among academic staff

- to identify challenges associated with the use of electronic journals among academic staff.

#### **1.4 Significance of the study**

The study would enable the University Library Management to know the extent of usage and challenges faced by academic staff in the use of their electronic services to formulate the needed policies to enhance teaching, learning and research in the University. Data obtained can serve as a basis for further studies to understand the various needs of the various Colleges in the University, with respect to information retrieval.

#### **1.5 Scope of the study**

This research covers only academic staff from the various Colleges in the Kumasi Campus of the Kwame Nkrumah University of Science and Technology, Ghana.

The University currently has six Colleges, a School of Graduate Studies and an Institute of Distance Learning. The Colleges are the College of Agriculture and Natural Resources, College of Architecture and Planning, College of Art and Social Sciences, College of Engineering, College of Health Sciences, and College of Science. These Colleges are spread over 2 campuses in Kumasi and Sunyani. The academic staff population was 714 with 11 stationed at Sunyani (KNUST, 2010).

#### **1.6 Limitations of the study**

The study is confined to the analysis of KNUST academic staff awareness, access and usage of e-journals. The original method for data collection for the study was to use electronic survey through email addresses of all academic staff provided by the University Network Center.

This proved unsuccessful since the response rate was very low. As result, a self – administered questionnaire was used.

### **1.7 Definition of key terms**

Academic Staff – is a full-time member of the instructional staff of a university and may mean, or may be used interchangeably with the word “teacher”, “lecturer”, “instructor”, “faculty” or “faculty member”.

Access – the action or process of obtaining or retrieving stored information. It may sometimes be referred to a location, for example, point of access.

Electronic journal – a digital version of a print journal, or a journal-like electronic publication with or without a print version that is accessible via the web, e-mail, or other means of Internet access.

Academic Work – a work that relates to teaching and teaching-related tasks within the University such as teaching in classes, facilitating teaching, preparing teaching materials, as well as research.

Awareness – One’s knowledge of the existence of something (information sources) and not necessarily using it.

### **1.8 Organisation of chapters**

This thesis is organised to provide a review of relevant information regarding electronic journals, their access, awareness and usage as well as challenges in their usage. The research methodology employed as well as theoretical framework used are discussed. Data collected is analysed through the use of statistical package with the needed inferences all drawn to provide the results needed to accomplish the objectives of the study. The research consists of five chapters, and its framework is presented as follows:

Chapter 1 introduces the background of the study along with a statement of the problem. In this same chapter, the aims, objectives of the study, significance, scope, limitations, key terms and the structure of the study are all spelt out.

Chapter 2 examines related literature and provides background information about theoretical researches done in the area of electronic journals, usage and challenges. It gives detail account of the development of electronic journals, putting more emphasis on studies on the level of awareness, access, and challenges faced by users, and supporting them with usage level statistics.

Chapter 3 presents the research methodology as well as the justification of choices and uses. It also discusses the research process, design, population, sample size, data collection methods, and data analysis.

Chapter 4 presents results and analysis of the awareness, access and usage of electronic journals by academic staff at KNUST. It provides a detail analysis of the collected data, presenting information about the demography, staff's levels of awareness, usage statistics at the collegiate levels and challenges faced by the users.

Chapter 5, the final chapter, highlights the key findings and provides recommendations for the study.

## **1.9 Summary**

This chapter introduces the background to the study, statement of the problem, aims and objectives, scope of the study, significance of the study, limitations, and definition of key terms as well as the structure of the five chapters.

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# **Chapter Two**

## **Review of related Literature**

### **2.0 Introduction**

This chapter aims at discussing existing literature on the awareness, access, and use of electronic journals (e-journals). It gives an overview of e-journals, giving insight into their development. It further discusses opinions about studies on e-journals, their awareness, and usage among academic staff and brings to light, their benefits, and challenges. Databases such as Emerald, JSTOR, ERIC, and DOAJ as well as the Internet, were used to search for information relating to the topic under review. Some of the key words or phrases used in the search and retrieval of information included the following: electronic journals, academic staff, usage of electronic journals (e-journals), and challenges of use of electronic journals (e-journals).

### **2.1 State of libraries**

Good libraries are a critical part of any university's research and teaching environment, whether in physical or digital form. However, as numerous accounts have documented, many libraries especially in developing countries have struggled to maintain good collections in the face of falling budgets and rising purchasing costs. These insufficient collections have severely constrained research, as was repeatedly emphasized by participants at a conference on African social sciences and humanities research, convened by the Association of Commonwealth Universities (ACU) and the British Academy (Harley, 2009).

The developments within information communication technologies and communication infrastructure especially in developing countries have brought about

significant improvements in information availability and accessibility for the purposes of teaching, learning, and research in this information age.

According to Harley (2009),

Poor collections have in the past, been the result of the high cost – relative to African university budgets – of purchasing and shipping books and print journals from abroad, particularly as access to foreign exchange is often limited. Domestic and regional publishing industries, particularly for academic titles, have also struggled to establish themselves, as have university presses. African-published journals often funded, have production, storage and shipping costs typically high, while markets are relatively small, with libraries and individual researchers unable to purchase new books or maintain subscriptions.

This state of affairs as expressed above, has not been the headache of only African countries as many libraries across the global divide have all expressed such sentiments (Robertson, 2003). According to Robertson (2003), “the adaptation of electronic journals is not only as a result of technological innovations but, as a result of budget cuts in funding libraries.”

This has resulted in many universities in recent times moving to the provision of electronic resources in the form of CD-ROMs, Electronic Books (E-books) and Electronic Journals (E-journals) as a means of mitigating the shortfall in the provision of resources for academic and research purposes.

The new opportunities provided by this digital information age, have led to the establishment of access programmes like the Health InterNetwork Access to Research Initiative (HINARI), Access to Global Online Research in Agriculture (AGORA), and Online Access to Research on the Environment (OARE), and International Network for the Availability of Scientific Publications (INASP)’s Programme for the Enhancement of Research Information (PERii) (Harley, 2009). These programmes are all aimed at bridging gaps in information sharing and dissemination.

## 2.2 Definition of electronic journals (e-journals)

There is no definite definition for an electronic journal (e-journal). This has come about because of how it is perceived. It is sometimes regarded as a “paperless Journal,” or as a “virtual Journal” or online Journal. Chakraborty and Banani (2002) pointed out that “the experts of these fields give the definitions on the basis of production and distribution.” To better understand what an e-journal is, it is important to define what a journal is.

Chakraborty & Banani (2002) quoting Young’s (1983) ALA Glossary definition of a journal stated that, it is “a periodical especially one containing scholarly article and/or disseminating current information on research and development in a particular subject field.” Mukesh (2007) supported this definition, but emphasised that a journal should be peer-reviewed and should serve as a forum for the introduction and presentation for scrutiny of new research and the critique of existing research.

From the definition of a journal, it presupposes that any content of a journal produced and stored in electronic form or format is an electronic journal.

In accordance with this, Pullinger and Shakel (1990) defined electronic journals as “those whose text materials are directly entered by file transfer from a computer or by other transfer mechanism in a machine readable form, whose editorial processes are facilitated by computer and whose articles are available in electronic form to the reader”.

Dhingra and Mahajan (2007) underscored the interchangeable use of terms like ‘electronic publishing’, ‘electronic serials’, ‘online journals’, and ‘electronic periodicals’ with ‘electronic journal’. Langscheid (1992) made the early attempt to clarify this issue by distinguishing between e-journals (journals in electronic format only), and online journals (the electronic publication with a printer version available online).

Edward (1997) on the other hand explains that, an e-journal is “one where the text is read on, and/or printed from the end user’s computer rather than as print on paper or online”—

the data is downloaded directly from the host computer rather than via an intermediate medium such as CD-ROM.”

In defining electronic journal, Dhingra and Mahajan, (2007) quoted the following definitions in their work:

“Any serials produced, published and distributed nationally and internationally via electronic networks such as Binet and Internet.” (Macmillan, p. 10)

“E-journals are available electronically via a computer or a computer network that they may or may not be published in some other physical medium, but that are not CD-ROMs.”

According to Rowley (2000), electronic journals take two different forms: journals that are otherwise published in print form, available in digital form; and electronic only journals, which do not necessarily need a publisher, and which can be managed by an editor and a scholarly community. Rowley accentuated that both types of journals may have a significant impact on scholarly communication and the way in which knowledge is created and disseminated.

From the above discussion, it is evident there is no single definition for e-journals. However, various authorities in the field allude to the use of information technology (World Wide Web and Internet) as a base for their definition. It can be postulated that electronic journals are peer-reviewed periodicals made available as individual titles via an electronic medium, typically the World Wide Web.

According to Jones and Cook (2000), electronic journals are not entirely different from their print counterparts in their fundamental editorial process. Thus articles submitted are peer-reviewed by the editorial board members of the journal to be accepted or rejected, before being published. The difference only lies in the distribution mode – digital medium.

On the contribution of e-journals to the information pool, Patra (2006) states that e-journals have added enormous resources to the collection, and improved the services of the

library by enhancing access to journal literature, and decreasing the demand for photocopy services as well as document delivery of single articles. She reiterated that training staff as well as library users and managing the services of the e-journals was paramount to the improvement of information skills and the development of information.

In supporting Patra's (2006) view, Peterson (2006) stated librarians should be at the forefront in championing the use of periodicals and e-journals on the Internet as an alternative, by establishing the smooth flow of information retrieval to themselves and the users of their services.

KNUST

### **2.3 History and development of the electronic journal**

Vannevar Bush is a pioneer in the development of electronic journals. He first described "e-journal" in 1967 as a part of MEMAX proposal. A UNESCO project in 1967 under the name "to test networking computer as means of improving scientific communication" publishing their first product in the form of an e-journal in 1980 named MENTAL WORKLOAD (Chakraborty & Banani, 2002).

The New Jersey Institute of Technology published the first prototype e-journal named CHIMO in 1976. Harter and Hark (1996), citing Turoff and Hiltz (1982), mentioned that e-journals in their non-experimental phase did not start until the 1990s with a few exceptions. They accentuated that "the first peer-reviewed electronic, full-text e-journal including graph was the Online Journal of Current Clinical Trials (OJCCT)" quoting Keyhani (1993).

In recent years, a large number of electronic journals have been launched with or without print version. Medscape, General Medicine Journal, and JCE Internet are all electronic journals without print versions. Other important journals with online versions include Nature, Science, New England Journal of Medicine, British Medical Journal (eBMJ), etc.

The Institute of Electrical and Electronics Engineering (IEEE) has encoded all journals it publishes in markup language for online viewing. The Elsevier Science publishers have also launched Science Direct extending web access to more than 1,100 journals published by them. The American Institute of Physics (AIP) offers only online versions to many of its journals while, American Physical Society (APS) makes electronic versions of its journals available on the Internet at no additional cost to the print version subscribers ((Chakraborty & Banani, 2002).

KNUST

#### **2.4 Studies on e-journals**

Electronic resources and services have become the most popular tools for research and academic activities (Chiraa & Madhusudhan, 2009). The web is influencing the development of new modes of scholarly communication whilst new electronic resources that have emerged have become powerful media of communication for university libraries (Chopra, 2008), providing faster and reliable information for researchers (Kumar & Sampath, 2008).

Literature on e-journals has been reviewed extensively in academic circles. Many of such studies looked at the extent of awareness and usage, particularly in relation to teaching, learning and research.

In the last decade, a number of studies have been carried out on the use of electronic journals and the major consensus has been that academics should find full-text e-journals more convenient than the print versions (Moshi and Priti (2008) in Kubota, 2001). Moshi and Priti (2008), suggest that academicians' use of e-journals might be influenced by many factors such as subject disciplines, academic positions, their local information environment of electronic resources, their awareness of those resources, their age, and their information needs.

According to a study undertaken by Rogers (2001) at Ohio State University, there was a significant progress in the acceptance and use of e-journals, reporting that more than half

of faculty and graduate students used e-journals daily, weekly and monthly. She however explained that improvements in the design, delivery and archiving of e-journals were still needed for the electronic format to achieve full acceptance. On the same issue of acceptance, Rogers iterated quoting Tenopir that “it is an economic issue and that different pricing models, revenue sources, and licensing practices for e-journals will be required.”

A study by Dhingra and Mahajan (2007) revealed that e-journals have become the vital part of information dissemination process and that the younger generation has accepted the digital reading culture, but emphasized that the use of electronic journals required a considerable training exercise. They bemoaned the lack of training among users, and lack of proper infrastructure in libraries as major de-motivating factors in the use of electronic journals.

According to Tenopir as cited by Borrenco, Anglada, Barrios and Cornellas (2007), “there is a rapid adoption of electronic resources in academic spheres, though behaviour varies according to discipline.” According to her, the behaviour pattern in the acceptance of usage has been an issue for a long time.

From Bar-Ilan and Fink’s work (2005), it is evident that there has been an increase in the use of electronic journals with time, but age and/or academic position are inversely related to usage. To understand the level of awareness and usage among researchers and academic staff, many of such studies employed log analyses [(Hamid, Nicholas, & Huntington, 2005); Borrenco et al, 2007; online questionnaire surveys (Rusch-Feja & Siebeky, 1999); and interviews/focus groups (Olsen, 1994)].

On the awareness level, in a study carried out at the Catalan Universities in Spain (Borrenco *et al*, 2007), 95.3% of the respondents indicated their awareness of electronic journals existence, with 52% using them in their academic pursuits. Similar studies at the University of Madra (Chandrakumar, 2009) and Tezpur University (Mukesh Saikia, 2007) in India, also showed high levels of awareness and usage among academic staff and researchers.

Although the awareness level is high, studies on the demographic distribution across academic disciplines show that the sciences are supportive of the electronic journals (Chandrakumar, 2009; Borrenge et al, 2007) than the humanities and the social sciences. According to Borrenge et al, (2007) there is evidence of a high proportion of teaching and research staff being aware of the collection of electronic resources in their institutions, and a necessary preference for the electronic format to the detriment of the printed format especially in the developed world.

On the contrary, studies in many African countries show slow progress in the adoption of these electronic materials. A study by Manda (2005) revealed that due to inadequate end-user training, slow connectivity, limited access to PCs, poor search skills and budget cut, there is low patronage in the use of these facilities in Tanzania.

In a case study by Salaam and Aderibigbe (2010) in the University of Agriculture, Abeokuta, Nigeria, it came to light that many of the academic staff were not aware of such electronic facility (as e-journals). The study further reported that usage was encouraging but emphasized that the library of the institution should intensify its awareness and orientation campaigns since the University recruits new staff on a regular basis.

## **2.5 Use of e-journal among academic staff**

Gowda and Shivalingaiah (2009) citing Herman (2001), hinted that the integration of electronic media into academic work is progressively harnessing the new technologies to scholarly information-gathering endeavours, and characterises the information activity of university faculty in an increasing electronic environment.

The level of use of electronic journals among academic staff has been the subject of research by many libraries around the world. Many of such studies aimed at improving the

provision of such services to these academicians, whose core business are mainly teaching and research.

Tenopir and King (2000) have conducted several studies on information-seeking and readership patterns amongst university academic staff in the following areas:

- a. How readings are identified (for example, browsing, searching, citations,)
- b. The source of the journal used (for example, library, personal subscription.)
- c. The proportion of articles in a journal read per year

In a survey by Smith (2003), seeking to understand changes in faculty reading behaviours at the University of Georgia, Smith concluded that, “electronic access to journals – particularly library funded access – is integral to research activities.” Majority of his respondents reported they read at least one article from an electronic source a week. Within this same study, it became obvious that “junior faculty members used more electronic resources than senior faculty members.”

A report (Brown, Lund & Walton, 2007) on the use of e-journals by academic staff and researchers at Loughborough University indicated that a significant cross section of faculty, academic staff and researchers have the same perception that e-journals perform an increasingly important role in research at the university, since it provided current information needed for teaching and research. They hinted, “the Library is declining in importance as a physical place to consult journals (whether electronic or paper), since the individuals’ offices or labs are the locations frequently used when accessing e-journals.”

Ansari and Zuberi (2010) investigated the use of electronic resources by academics at the University of Karachi, to ascertain the purpose and ability of use. The conclusion was that electronic resources were the best means of having current and up-to-date information and were mostly used for research and lecture preparation. They reported that usage levels were low due to networking problems and lack of training. They stressed that despite the

acceptance of electronic resources by majority of the academics, majority of academics within the institution regarded e-journals as less reliable and only consider those produced by authentic organisations or websites as being authentic and reliable. The researchers however did not provide any clues as to which organisations or websites the respondents considered authentic, or what qualified an organisation or website as one.

In a study involving three faculties in the University of Botswana (Moshi & Priti, 2008), academics in the three faculties – two (2) from the sciences and one (1) from the humanities - used e-journals. The statistics on usage levels however tilted in favour of the sciences. Interestingly, unlike the developed countries (Dhingra & Mahajan, 2007) where junior members used electronic materials frequently, the situation was the opposite in this study; senior members used them more than the junior members did. In the end, they concluded that there was low utilization of electronic services by academic staff due to challenges such as lack of knowledge and awareness, and slow connectivity.

Omotayo's (2010) study on the attitude of academics towards electronic journals revealed that 61% of respondents preferred electronic journals; the reason being quicker access to information than going physically to the library to look for printed journals. Their worry was the non-availability of many titles and appealed to the university to subscribe to more online journals.

McClanahan, Wu, Tenopir, and King (2010), in their study on perceptions of Faculty about e-journals, indicated scholars in the US have enthusiastically embraced the electronic information environment, in spite of some frustrations with its imperfections. Their use of e-journals, Internet resources, and email communication has become indispensable to their scholarly activities, and has profoundly changed the way they interact with information, create new knowledge, and relate to their university library. For these faculty members,

they explained, e-journals have supplanted the print format, because of their convenience, flexibility of work location, advantages for interdisciplinary access, and ease of storage.”

## 2.6 Accessing e-journals

The New American Dictionary defines ‘access’ as,

- obtain, examine, or retrieve (data or a file)
- gain the right or opportunity to use or benefit from (something).

Access to electronic journals can be viewed from two angles namely; “how end-users acquire these journals” and “how these journals are acquired for the end-user”. Relating to the latter, Chen, Wrynn and Rieke (2001), identified four types of access modes;

- Print only – These were titles that are only available in print format
- Electronic priced separately – These were journals with electronic versions that were available with surcharges, or were priced separately from their printed versions
- Combination price – These were the electronic versions of print journals that were offered “free online” with print subscriptions
- Aggregated pricing – Titles that were available for purchase as a collection through publishers, such as Elsevier’s ScienceDirect (SciD), Academic Ideal (Ideal), or through a third party provider, such as MD Consult (MDC), Health Reference Center (HRC), and Ovid were considered aggregated.

Sciences and Mahesh (2009), stated that access types include

- free access or open access – journals that use a funding model that does not charge readers or their institution for access (BI)
- selective access – e-journals are available either free of charge, against print subscriptions or for a nominal fee along with print subscription, or such access

is provided either by the publisher or through their aggregators. (Halijwale, Manjunath, & Pujar, 2004)

- fee-based access – where the institution or individual has to pay through subscription for the electronic journals. Fee-based access operates on three platforms namely:
  - o exclusive subscription (entire journals are subscribed to by the involving institution) and
  - o pay-per-view - where payment is made for specific articles rather than the entire journal, and
  - o consortium or bundled access – where institutions of like-mindedness come together to access journals from a publisher or an aggregator.

According to Sciences and Mahesh (2009), the consortium or bundle access has been the most acceptable access model to many institutions because of the following reasons:

- institutions get more information for their little budget available and are also able to achieve a better cooperation between libraries;
- this model also helps the consortium to get funding from external institutions.

From the end-user perspective, many organisations offer access through a gateway – an interface designed to link to various publishers of journals without the end-user having to move through publishers - by offering the opportunity to both browse and search by keywords, titles, abstracts, authors' names, journal titles, etc. Some of these organisations offered advanced searching, including natural language searching and concept searching. Most of these systems take a simple approach to indexing based on retrieving words by article titles, abstracts, journal titles and publishers' names. Selected articles are either downloaded onto the users' desktop, hand-held devices such as ipads, mobile phones, or delivered by fax or e-mail. It is interesting to note that end-users do not only rely on the gateway for information; many use generic web search engines, mainly Google (Davis, 2004).

The rapid rise in electronic journals has gradually resulted in providing ease in handling complex data and tables, and has allowed the incorporation of multimedia elements such as sound and video clips.

## **2.7 Benefits of and concerns raised on the use of e-Journals**

### **2.7.1 Benefits**

The question at the present is how the people who are the recipients of these services are taking in these new developments. The answer lies in the fact that these electronic materials offer several advantages that cannot be rivalled by their printed versions. They bring many advantages to end-users, publishers, libraries, etc. (Rao, 2004) and these benefits can be found with the use.

These electronic materials can be accessed around the clock across geographical boundaries, making them omnipresent (Dhingra & Mahajan, 2007; Rao, 2004; Halijwale, Manjunath & Pujar, 2004). This allows researchers and faculty members to have uncontrolled access to these materials as compared to going to a library in the case of the printed copy.

The hypertext available in these electronic materials directly link to the areas of greatest interest, allowing users to have access to further readings. These materials provide text-searching facilities making it easy to find passages, keywords and definitions in texts.

Unlike the printed journals, the user of these materials can customize many of its features to suit their preferences. For example, the end-user has the flexibility to change display brightness, font size and style (especially for the visually impaired), and to add mark-up, annotations and links.

With an e-journal, several users can access a journal at a time. Articles can be downloaded and printed simultaneously by multiple users, depending on access rights and permissions.

Through multiple and remote access, e-journals can become available on individual desks. This is a blessing where the institution involved consists of a large geographical area.

Electronic journals offset the missing issue problem; If a particular volume of the print version of the journal is not complete, library staff can download and print all the articles available online, or can save it in digital form till the hardcopy is supplied by the publishers, although permission in some cases may be required (Halijwale, Manjunath, & Pujar, 2004).

Storage is a major problem of printed journals. Electronic journals allow for a potentially large number of titles to be carried around at once, either on a memory device, or on a personal virtual bookshelf on the network.

Through the electronic means, authors are able to include multimedia facilities such audio, video (voice, music, sound, graphics, images or video clips) in their art, and this sometimes provides a more vivid illustration of their thoughts compared to the printed copy.

Electronic materials relieve the libraries of space and provide a solution to the problem of journals and books being at the bindery, in use by someone else, or damaged. Such provisions do not create over-subscription at the library for any book or journal. This process gives equal access to all. However, this is not applicable where licensed electronic resources are concerned.

The benefits in the use of electronic materials is summed up in the 2007 research study published by the University of London which reported users citing availability, convenience, content freshness, and navigation and search capabilities as the format's most important advantages (Renner, 2007).

Despite all the benefits associated with electronic journals, its availability on the Internet has brought about some challenges.

### **2.7.2 Challenges raised in the use of electronic journals**

The proliferation of these electronic materials on the web has easily allowed inappropriate acts, such as plagiarism and contortion. Because of these problems, publishers have put in place mechanisms to verify such abuses. A typical example is the inauguration of CrossCheck, an abuse-detection project in 2008. CrossCheck is a tool that detects similarities in a text with those in other sources, including data from published articles, by using a technology developed by iThenticate to detect copied and pasted sentences.

A strong argument against the use of these electronic materials is screen display resolution (Rao, 2004), thus the limitation of the computer monitor. The typical display resolution for most monitors or viewing devices is 100dpi, which is far below that of the print (300+ dpi), bringing up issues of clarity of texts, contrast, etc.

Many users of these electronic materials complained about their inability to view several of such materials next to each other as can be done with the printed matter. It was noted that to do this, one required several hardware devices, which are very expensive.

To many users, the sense of touch and feel associated with the printed matter seems to be lacking although visualizing the amount of pages that are behind or in front of a current page is relatively easy (Rao, 2004); and the access to these electronic materials requires huge financial commitments especially in developing countries.

For uninterrupted access, users require improvement in connectivity infrastructure and computer facilities. For example, Shaija (2009) citing the World Business Council for Sustainable Development Report (2000) said, Internet use for 20 hours costs USD 117, stating that in 2006, Sokoine University of Agriculture, Tanzania paid one US dollar for 7.63kbps (Shija, 2009).

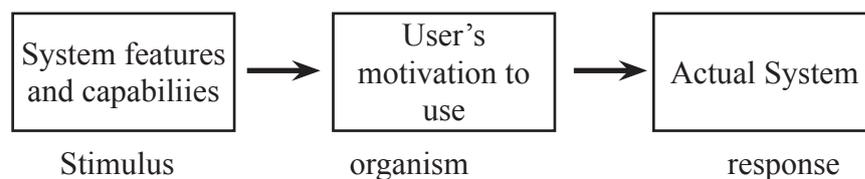
## 2.8 Theoretical framework

The use of technology in academia has been hailed. However, despite the perceived necessity of new and sophisticated technology, the end users of such technology may not readily embrace such tools (Gibson, Harris & Colaric, 2008).

According to Chuttur (2009), “user acceptance of technology has been an important field of study for over two decades now.” Although many models have been proposed to explain and predict the use of a system, the Technology Acceptance Model has been the only one, which has captured the most attention of the Information Systems community (Chuttur, 2009).

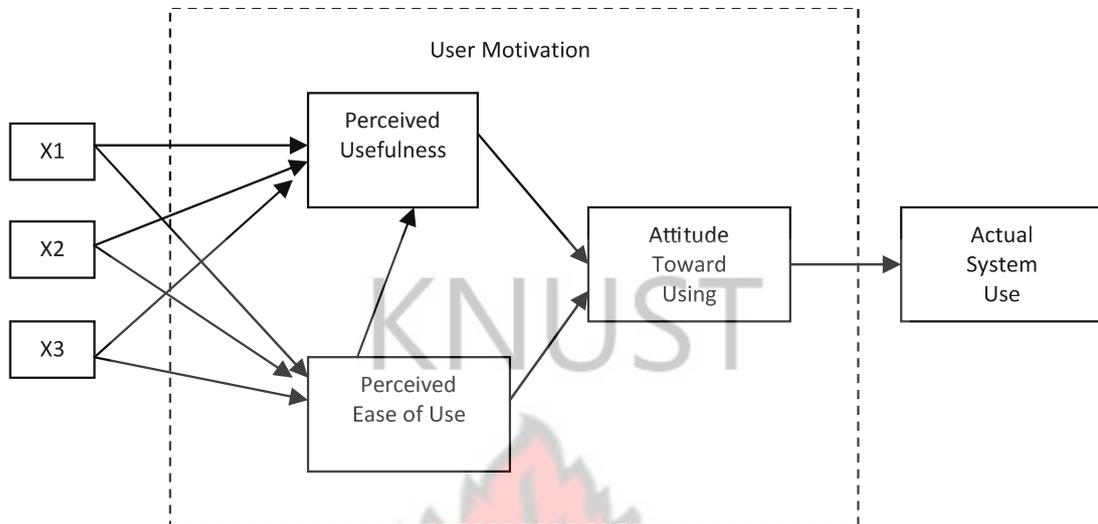
According to Bertrand and Bouchard (2008), citing (Venkatesh, Morris, Davis, & Davis, 2003), the Technology Acceptance Model (TAM), is one of the explanatory models that has influenced the theories of human behaviour. They explained citing Davis, Bagozzi and Warshaw, (1989), that the theory is aimed at “identifying the determinants involved in computer acceptance in general; secondly, to examine a variety of information technology usage behaviours; and thirdly, to provide a parsimonious theoretical explanatory model.”

Fred D. Davis proposed the Technology Acceptance Model in his doctoral dissertation at the MIT Sloan School of Management in 1985. He proposed that, “system use is a response that can be explained or predicted by user motivation, which, in turn is directly influenced by an external stimulus consisting of the actual system’s features and capabilities” as shown in the figure below (Chuttur, 2009).



**Figure 2.1:** *Conceptual model for technology acceptance (source: Chuttur, 2009)*

Davis improved his conceptual model based on Fishbein and Ajzen's (1975) Theory of Reason Action in 1989 (Davis, 1989), and proposed the Technology Acceptance Model as shown in figure 2 below (Chuttur, 2009).



**Figure 2.2:** Original TAM proposed by Fred Davis (Source: Chuttur, 2009)

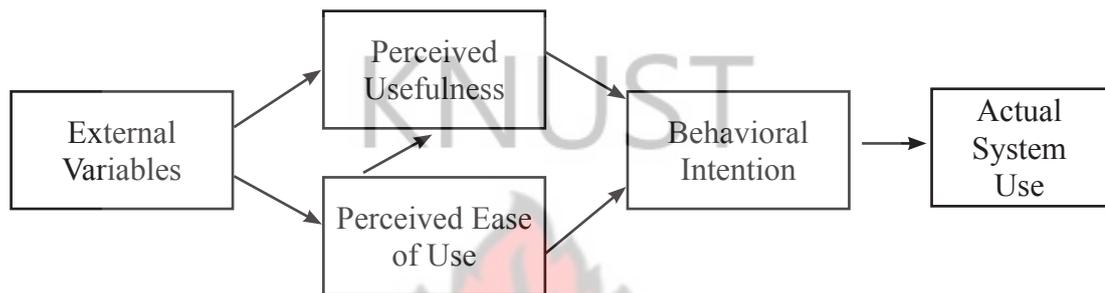
With this modification, Davis explained that users' motivation could be elucidated based on three factors: perceived ease of use, perceived usefulness, and attitude towards using the system (Kripanont, 2007; Chuttur, 2009).

According to Davis (1989) as explained by Lederer, Maupin, Sena and Zhuang, (2000),

- Perceived usefulness is the degree to which a person believes that a particular information system would enhance his or her job performance; i.e., by reducing the time to accomplish a task or providing timely information;
- Perceived ease of use on the other hand is, the degree to which a person believes that using a particular system would be free of effort; and
- Attitude towards use is the user's evaluation of the desirability of employing a particular information systems application.

Davis' conceptual model has undergone evolution to include other determinants over the years. The main determinant added is "Behavioural Intention to Use" (Davis, Bagozzi, &

Warshaw, 1989). The *Behavioural intention to use* is a measure of the likelihood a person will employ the application. It has typically been a self-reported measure of time or frequency of employing the application (Lederer, Maupin, Sena & Zhuang, 2000). The final version of TAM postulated by Venkatesh and Davis (1996) eliminated the attitude determinant and incorporated behavioural intention determinant, the direct results for perceived usefulness on actual system use as shown in figure 3 (Chuttur, 2009).



**Figure 2.3:** Final version of TAM (Venkatesh & Davis 1996, p.453)

According to Gibson, Harris and Colaric (2008), on the use of TAM research, user acceptance is characterised as a combination of a positive attitude toward the technology, intention to use the system, and actual use of the system.

The utilisation of TAM in understanding the uptake of technology is evident in various studies (Bertrand & Bouchard, 2008; Lederer, Maupin, Sena & Zhuang, 2000; Gibson et al, 2008), necessitating its adoption as a means to understanding how academic staffs in KNUST use electronic journals in their day-to-day activities. This study seeks to understand the level of awareness (perceived usefulness) access (perceived ease of use) and usage (behavioural intention) of academics in the use of electronic journals.

Throughout the literature reviewed, it is evident that electronic journals have and are playing a pivotal role in academia. Among academic staff, usage is considered important and popular because of their educational purposefulness, as well as the characteristics they project.

Popular among these characteristics is, its availability and accessibility across geographical divide.

With the promotion of electronic journals in many universities around the world in both developed and developing countries, the issue now is how academic staff at the Kwame Nkrumah University of Science and Technology are adapting to this technology in their pursuit of information seeking for research and teaching purposes. This study therefore seeks to ascertain the level of awareness and use of these technologies by the academic staff on KNUST campus.

KNUST



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# Chapter 3

## Methodology

### 3.0 Introduction

This chapter describes and explains the method used in this study. The study focuses on the use of electronic journals by academic staff in Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi. It begins by stating the research questions that have guided this study and the need for the methodology chosen. The study used questionnaire to collect the needed data. The questionnaire was constructed based on the research questions and was distributed to 232 academic staff across six colleges on the Kumasi campus.

The research questions that guided the study were:

- What is the level of awareness among academic staff in the use of electronic services provided by the University Library?
- How regularly do academic staffs use electronic journals?
- Does the use of electronic journal articles influence them in any way?
- What are the challenges associated with the use of electronic journals?

### 3.1 The focus of the study

According to Stephen (DAS, <http://www.mstat.org>), the decision about what kind of study to conduct depends on what is already known about the issue being investigated. Through the review of existing literature, it came to light that similar studies conducted all employed the survey tool (Omotayo, 2010; Edward, 1997; Rusch-Feja & Siebeky, 1999). In a survey, data is collected using questionnaires, telephone interviews and personal interviews and the main consideration in selecting the appropriate data collection tool are scope and

objective of the study, amount of data to be collected, cost, time, accuracy of data and flexibility (Neuman, 2007).

Questionnaires were used for the study because of the volume of data required, time constraints, the avenue to ask about many things at once, measuring many variables and testing several hypotheses at a go (Neuman, 2007, 167).

### **3.2 Research design**

This explains the population and sample, demographic characteristics, research instruments, data collection procedure, treatment of data, validity and reliability of data collected.

In order to achieve the stated objectives of this study as opined in chapter One, the research is quantitative by design. The population under study is academic staff of KNUST, Kumasi campus, with a homogeneous characteristic – they are all teaching staff. Despite the homogeneity of the population, the study made use of stratified sampling technique to draw the sample size for representativeness since the respondents are scattered across six colleges with different programmes.

Descriptive survey was employed as a data collection method, with questionnaire as a data collection instrument. This provided the means to collect information pertaining to the demography of respondents, level of awareness, access, use and challenges in their use of electronic journals.

Gill and Johnson (2002, p. 97) categorise survey into analytic and descriptive. They explained that:

Analytic or explanatory surveys attempt to test a theory by taking the logic of the experiment out of the laboratory and into the field; hence, in conceptualising and structuring the research, there is the need to emphasise on specifying the independent, dependent,

and extraneous variables. Descriptive survey on the other hand is concerned primarily with addressing the particular characteristics of a specific population of subjects, either at a fixed point in time or at varying times for comparative purposes. As such they do not share the emphasis in analytic designs upon control but they do share a concern to secure a representative sample of the relevant population.

According to Ruane (2005), “a survey is a research instrument that allows us to gather critical information by posing questions.” Thus, researchers use surveys to find out the characteristics, behaviours or opinions of a particular population on a particular subject, seeking to answer specific questions about the topic relating to why, who, where and what (SPSS, 4). It allows for the determination of the status of the defined population with respect to certain variables, inquiring into the status quo and measuring what exists without questioning why it exists (Ary, Cheser & Razavieh, 1990), allowing for a more representative sample of the population to be drawn. Data collected can then be analysed, patterns extracted and comparisons made allowing for the generalisation of the research findings (Bell, 1993).

### **3.3 Population and sample**

The Kwame Nkrumah University of Science and Technology (KNUST), Kumasi succeeded the Kumasi College of Technology established by Government Ordinance in 1957. By an Act of Parliament, Act 80, 1961, the University had the full mandate to award its own degrees and diplomas.

The University currently has six colleges, a school of Graduate Studies and an Institute of Distance Learning mandated to certificate, diploma, degree, and graduate programmes. These colleges are the College of Agriculture and Natural Resources; College of Architecture and Planning, College of Art and Social Sciences, College of Engineering, College of Health Sciences and College of Science spread over 2 campuses in Kumasi and Sunyani.

During the time of study, the population of academic staff stood at 714, 11 were at the Sunyani campus (KNUST, 2010). This study was limited to the Kumasi campus with a population of 703, serving as the population for this study.

### 3.4 Sample size

Kripanont (2007) quoting (Sekaran 2003) stated, “sampling design and sample size are important to establish the representativeness of a sample for generalizability.”

According to Neuman (2007), where there is supplementary information about the population, to ensure representativeness, it is advisable to divide the population into sub-populations (strata). As result of the variation in the distribution of lecturers across the various colleges in the University, the population was stratified to ensure representativeness of the sample used for the study. Gill & Johnson (2002), amplifying the need for representativeness stated, “ensure that those who participate are a representative subset of the research population and thus any findings can be generalised or extrapolated to that target population with confidence.”

As a result there were six strata representing the six colleges namely:

- College of Agriculture and Natural Resources
- College of Architecture and Planning
- College of Art and Social Sciences
- College of Engineering
- College of Health Sciences
- College of Sciences

The population of academic staff of the various colleges are as follows:

College of Agriculture and Natural Resources	75
College of Architecture and Planning	65
College of Art and Social Sciences	172
College of Engineering	118
College of Health Sciences	147
College of Sciences	126
<b>Total population</b>	<b>703</b>

Source: (KNUST, 2010).

To ensure equal representation of the various colleges, 30% of the population of academic staff from each college was used to constitute the total sample size.

**Table 3.1:** Sample population from the various colleges

Name of college	Population of academic staff	Sample population (decimals)	Sample population (round figures)
College of Agriculture and Natural Resources	75	22.5	23
College of Architecture and Planning	65	19.5	20
College of Art and Social Sciences	172	51.6	52
College of Engineering	118	35.4	36
College of Health Sciences	147	44.1	45
College of Sciences	126	37.8	38
Total	703		214

*The sample population from the various colleges were round up to a whole figure.*

With a confidence interval of 95% as postulated by Saunders, Lewis, and Thornhill (2007) for social studies research, the researcher used 6.4% margin of error bringing the sample size to 229. Since 229 questionnaires could not be distributed proportionately among

the 6 colleges based on the 30% factor, the researcher increased the number to 232, which made it possible to add 3 questionnaires to each stratum's quantity.

**Table 3.2:** Sample population with margins of error from various colleges.

Name of college	Population of academic staff	Sample population (round figures)	Sample population (with margin of error)
College of Agriculture and Natural Resources	75	23	26
College of Architecture and Planning	65	20	23
College of Art and Social Sciences	172	52	55
College of Engineering	118	36	39
College of Health Sciences	147	45	48
College of Sciences	126	38	41
<b>Total</b>	<b>703</b>	<b>214</b>	<b>232</b>

With the required sample of each College obtained, the questionnaires were distributed to various lecturers selected on a random basis through the help of Provosts of the various Colleges.

### 3.5 Data collection instrument and its administration

The instrument employed in this study was semi-structured questionnaire. Although questionnaire lacks the personal touch of an interview, it is an extremely efficient data collection tool. Its self-sufficiency makes it the most popular survey option (Ruane, 2005).

The questionnaire covered areas like; the college the academic staff belonged, their highest educational level, years of services, computer skills, level of awareness of the e-journals, level of use, purpose of use, challenges of using e-journals.

Many of the questions were 'closed-ended' – a set of pre-determined response alternatives for respondents to choose from. The close-ended questions were used because they reduce the time and effort needed to code responses for data entry and analyses as well as its ability to cut down on non-response rate (Ruane, 2005).

The few questions that were open-ended required specific information such as the number of monographs, journals and textbooks that respondents have used, and the numbers of articles respondents have submitted to any electronic journal publishers.

The questionnaire was structured in four parts:

- i. Part A: Demographic data of respondents — name of College, gender, year of service, highest education and designation;
- ii. Part B: Access and awareness of electronic journals — access to Internet, knowledge of electronic services provided by the University library, where e-journals are accessed;
- iii. Part C: Use of electronic journals — questions asked pertained to the frequency of electronic journal usage, purpose for use and impact of use or unuse of electronic journals;
- iv. Part D: Characteristics and challenges in the use of electronic journals.

The aims of the questions were to bring to light two major types of information from the respondents:

- a. Personal data for classification of sample as the basis of analyses in the determination of trends or patterns in the use of electronic journals in KNUST by academic staff;
- b. The perception of academic staff in the use or non-use of electronic journals. This was to provide the basis to suggest effective recommendations after the study.

Initially, electronic survey was the main method of delivering the questionnaire. As a result, the researcher used Lime Survey – an online survey tool to prepare the questionnaire.

Through the help of the Network Operation Center (NOC), email addresses of all lecturers were obtained and a link was posted to all of the teaching staff with a mail introducing the researcher and the purpose of the research. This technique though looked more like a census, gave every academic staff equal opportunity to participate in the survey. This would have made generalisation of the results much more easier. However, only ten members of faculty responded to the questionnaire, although a reminder emails were sent to recipients through an auto reminder email system designed by the NOC.

Despite these and other challenges, questionnaires were personally distributed after the population had been stratified and the required sample size chosen from the various colleges. It was during this process that it came to the attention of the researcher that many of the respondents had seen the electronic survey but were reluctant to respond. Many complained of the slow speed of the Internet and as one person put it, *“I only go into my email to check for my correspondence, so why should I spend more than five minutes in responding to a questionnaire?”*

### **3.6 Pilot study**

A pilot study is conducted to detect weaknesses in design and instrumentation and to provide proxy data for selection. It draws subjects from the target population and stimulates the procedures and protocols that have been designed for data collection (Kripanont, 2007).

As such to ensure the validity of the questionnaire, it was pretested with 24 academic staff drawn from the six colleges of the University. Some suggestions were made regarding the wording of some of the questions as well as the structuring of the questionnaire. The necessary corrections were effected before the questionnaire was administered.

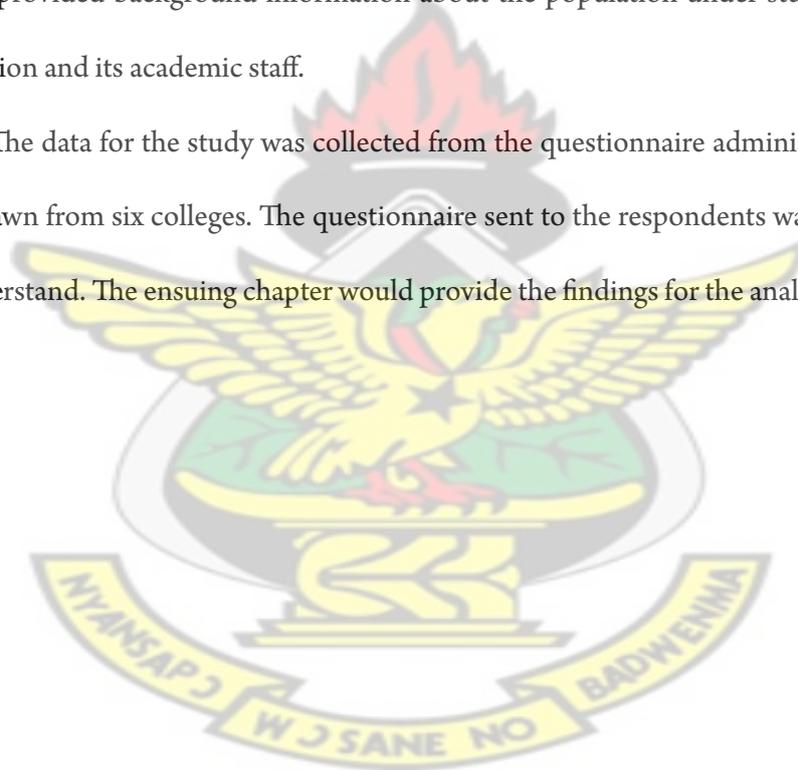
### **3.7 Data analysis**

All data collected were analysed quantitatively using Statistical Package for Social Sciences (SPSS) in performing descriptive statistics analysis. The results were presented in the form of graphs and charts to indicate the levels of awareness, accessibility and usage.

### **3.8 Summary**

This chapter gave a detailed description of how the study was undertaken, providing detailed information on the methodology used as well as the data collection instrument. It also provided background information about the population under study relating to the institution and its academic staff.

The data for the study was collected from the questionnaire administered to a sample size drawn from six colleges. The questionnaire sent to the respondents was simple and easy to understand. The ensuing chapter would provide the findings for the analysis of data for the study.



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# Chapter 4

## Analysis of data and discussion

### 4.0 Introduction

This chapter seeks to find answers to the objectives that were set for the project on the onset, that is

- to assess the level of awareness of electronic journals and electronic journal services provided by the University library among academic staff
- to ascertain the level of usage of electronic journals among academic staff
- to identify challenges associated with the use of electronic journals among academic staff.

This chapter specifically analyses data from the survey that addresses research questions on the level of awareness, levels of usage and challenges involved with the use of e-journals.

The questionnaire was grouped under four sections namely,

- Part A: Demographic data of respondents
- Part B: Access and awareness of electronic journals
- Part C: Use of electronic journals
- Part D: Characteristics and challenges in the use of electronic journals.

The analyses of the data is base on the above sections. 232 questionnaires were distributed among the six colleges with a return rate of 47%. Three (3) of the questionnaires were not coded because of missing data. The distribution frequencies and percentages of the questionnaires returned from the various colleges are shown in Table 4.1.

**Table 4.1:** Distribution frequencies for questionnaires returned (N=109)

<b>Name of college</b>	<b>No of questionnaires distributed</b>	<b>No. of questionnaires returned</b>
College of Agriculture and Natural Resources	26	13
College of Architecture and Planning	23	9
College of Art and Social Sciences	55	42
College of Engineering	39	16
College of Health Sciences	48	10
College of Sciences	41	19
<b>Total</b>	<b>232</b>	<b>109</b>

The percentages of questionnaires returned as per the distribution from the various colleges has the College of Art and Social Sciences (CASS) showing the highest return rate of 39%; this was expected since it is the largest College with more faculties than the others. Responses from the other colleges are, College of Science (CoS) 17%, College of Engineering (CoE) 15%, College of Agriculture and Natural Resources (CANR) 12%, College of Architecture and Planning (CAP) 8% and the College of Health Sciences (CoSH) 9%.

## **4.1 Analysis of Data**

### **4.1.1 Part A: Demographic characteristics of respondents**

This part of the questionnaire obtained background information about respondents such as the college they belonged to, gender, their number of years of service at the university, the highest educational qualification, and their respective ranking in the university.

On the level of academic qualification, the results showed that there were 49 Doctorate/ PhD holders, 55 Masters holders, a Degree holder and 2 had Postgraduate Diploma Certificate

in various fields of study. College of Art and Social Sciences had the highest number of Doctorate/PhDs and Masters qualification among the respondents. Two respondents did not indicate their levels of qualification. The detailed response of the qualification based on colleges is shown in Table 4.2.

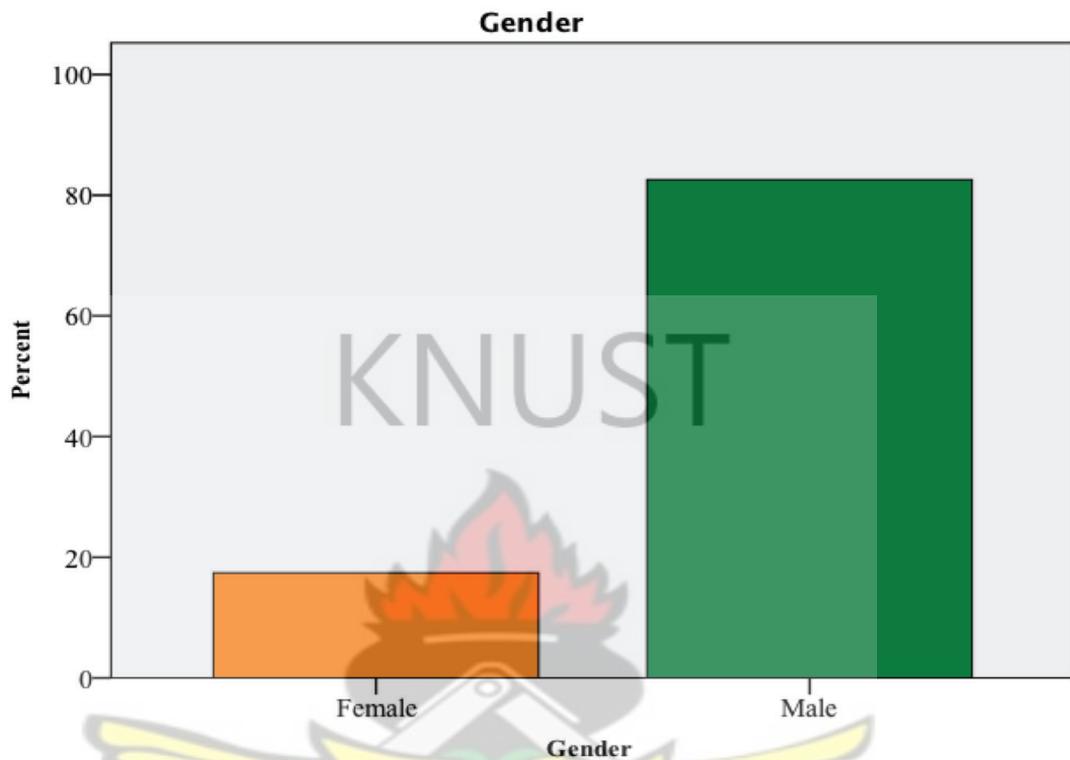
**Table 4.2:** Distribution of educational qualification in a survey of six Colleges

Name of College	Doctorate/ PhD	Masters Degree	Degree	PGDip Cert	Total
College of Agriculture and Natural Resources	10	3	0	0	13
College of Architecture and Planning	1	7	0	1	9
College of Art and Social Sciences	13	26	1	0	40
College of Engineering	12	4	0	0	16
College of Health Sciences	3	6	0	1	10
College of Sciences	10	9	0	0	19
<b>Total</b>	<b>49</b>	<b>55</b>	<b>1</b>	<b>2</b>	<b>107</b>

Respondents were asked to indicate their faculty although the point of concentration for the study was the College level. This was to help understand the levels of qualification of academic staff within the various faculties. The Faculty of Renewable Natural Resources of the College of Agriculture has the highest number of Doctorate/PhD holders among the valid respondents. The distribution of qualifications of academic staff across the various faculties is shown in appendix 1.

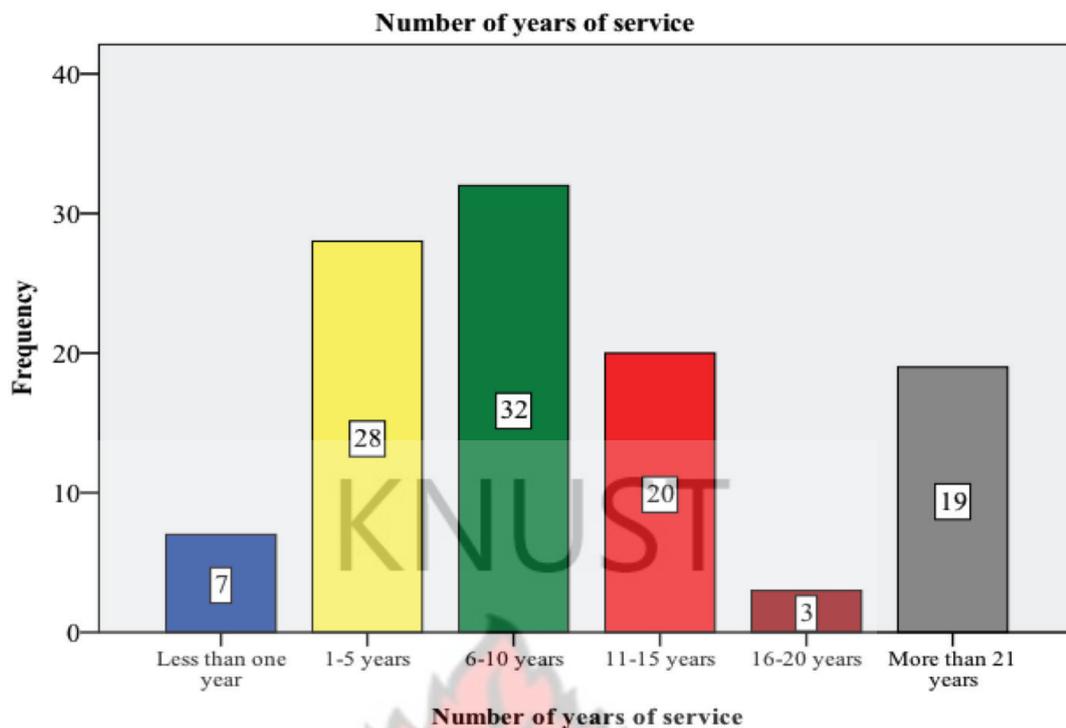
On gender, the responses were as follows: 19 of the respondents were female representing 17% with 90 being male constituting 83% of the total responses of 109. The low level of participation by females in the study reflects findings from many studies conducted at various higher educational institutions across Africa. This phenomenon seems to occur because of the low levels of enrolment as well as other socio cultural factors that affect girl-

child education in the country. A bar chart explaining the distribution in percentiles is shown in Figure 4.1.



**Figure 4.1:** *Distribution of gender within six colleges*

The sample further shows that respondents have varying degrees of working experiences in the university ranging from 6 months to 40 years. Out of the 109 respondents, 7 respondents had been in the university less than one year, 26 respondents 1-5 years, 32 respondents have worked for 6-10 years, 20 respondents between 11-15 years, with 3 respondents serving for 16-20 years. 19 respondents have worked for more than twenty years. The percentage of years spent by academic staff is shown in Figure 4.2.

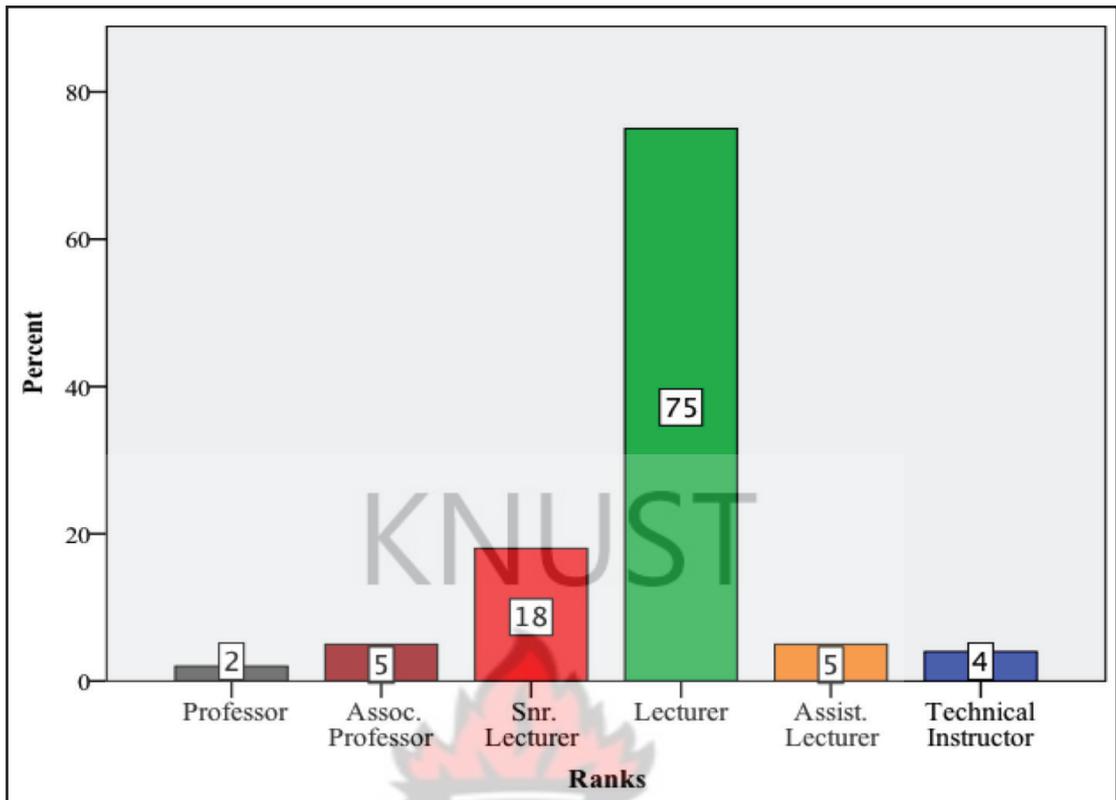


**Figure 4.2:** Years of Service in the university.

On the academic ranks, it became evident from the responses that majority of respondents are lecturers (69%), with 17% being senior lecturers. Table 4.3 and Figure 4.3 give the details of the ranks of respondents. The cross tabulation of responses regarding years of services and rankings are shown in appendix 2.

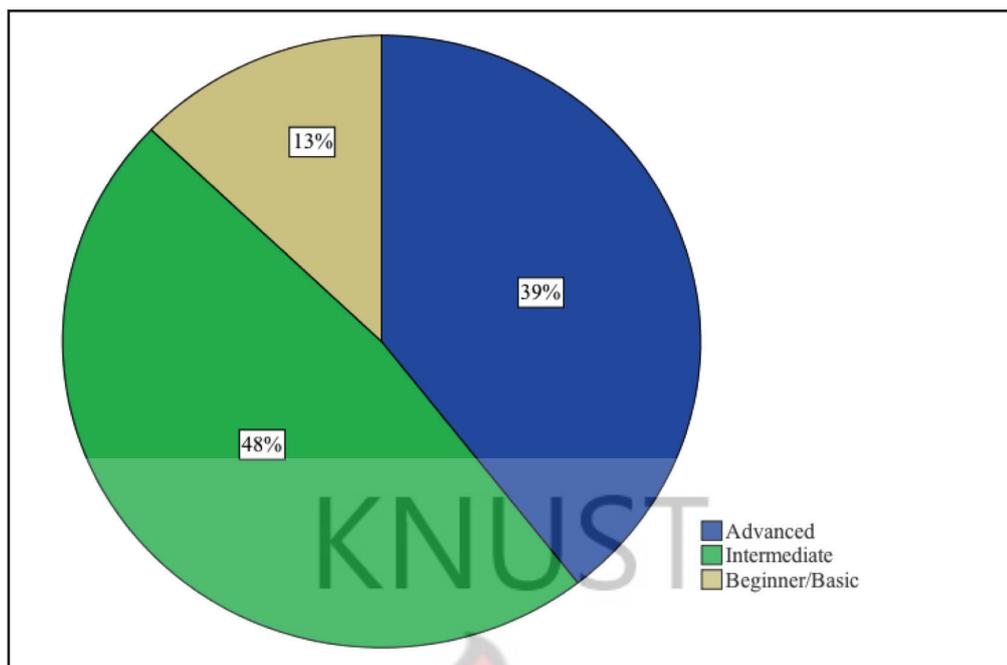
**Table 4.3:** Rankings of Academic Staff

Ranking	Frequency
Professor	2
Assoc. Professor	5
Snr. Lecturer	18
Lecturer	75
Assist. Lecturer	5
Technical Instructor	4
<b>Total</b>	<b>109</b>



**Figure 4.3:** Ranks of academic staff in percentages

On computer literacy, respondents were asked to judge their computer usage skills either as ‘advanced’, ‘intermediate’ and ‘beginner/basic’. Provision was also made to check if some were not using computers at all. From the total response (n=109), 43 respondents said they were advanced users, 52 were intermediate and 14 were beginners/basic users with no records of non-users. The pie chart below gives the percentages of level of computer skills



**Figure 4.4:** *Level of computer skills*

Across colleges, the College of Science leads with 11% of advanced computer skills, and 10% from the College of Art and Social Sciences. On the intermediate level, the College of Art and Social Sciences leads with 20%, while the remaining colleges have an intermediate levels of skills of 5% to 6%. The College of Art and Social Sciences also has the highest beginners/basic skills level.

In summary on the bases of demographic characters, majority of the respondents are males (83%) ranked as lecturers with masters' degrees in various academic disciplines.

#### **4.1.2 Part B: Awareness and Access of electronic journal**

This section addresses questions as regards the awareness and access to electronic journals, place of access, knowledge of availability, asking respondents to respond to questions on internet accessibility, place of access, knowledge of the availability of electronic journals on the internet, and how such information was obtained.

#### 4.1.2.1 Awareness of electronic journals

Since access to Internet forms the backbone to electronic journal usage, respondents were asked to indicate whether they had access to Internet. Out of the valid responses (n=109), 91% indicate they had access, while 9% did not. On the locations for accessing Internet, 89% browsed mainly in their offices, with only 4% going to the KNUST Library Electronic Resources Center. Respondents had the opportunity to indicate other means by which they access Internet and out of which 10% of the total respondents indicated that they use either their mobile phones or a dongle– a wireless modem to access Internet when the need arises. The detail responses are shown in Table 4.4.

**Figure 4.4:** Locations for accessing internet (N = 109)

Locations for accessing internet	Frequency	Percentage (%)
Office	97	89
Home	63	58
Faculty/Department/ICT Centre	10	9
Internet café	16	15
KNUST library Electronic Resources Centre	4	4
Other	11	10

On the awareness of electronic journals on the Internet, of the total responses (n = 109), 3 did not respond to this question bringing the valid response to 105. Out of this, 99% indicated that they are aware of the availability of electronic journals on the Internet and the remaining 1% did not.

On ways respondents had information relating to availability of electronic journals on the Internet, 58% of respondents indicated from colleagues, 53% from browsing the Internet, 34% through workshops organized by the KNUST Library and 5% through their

students. Others stated that they were made aware through their overseas study programs and professional associations.\*

A response on the awareness of availability of electronic journals services offered by KNUST Library was 85% of the total valid response (n=109). The remaining 15% however had no idea of such services.

Respondents were further asked to indicate how they got information on the services offered by KNUST Library. Majority of the respondents (55%) indicated that they had the information through seminars and workshops organised by the University Library and colleagues. Table 4.5 gives the total frequencies of the various means by which academic staff got information about the availability of electronic journal services offered by the KNUST Library.

**Table 4.5:** Sources of awareness of the availability of electronic journal services offered by KNUST Library.

Sources of awareness	Frequency †
Library's website	16
Library brochure	17
The library guide	7
Posters on library notice boards	8
Colleagues	31
Library seminars/workshops	62

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\* Respondents had the opportunity to choose more than one of the options provided or give their own opinion as a result percentiles are base on the number of respondents who choose that options in relation to valid response (n=109).

† It must be emphasized that the summation of the figures in the table above would be more than the numbers of respondents since respondent were give the option to choice more than one option from the list of categories given.

#### 4.1.2.2 Access to electronic journals

On how respondents access electronic journals, majority of respondents indicated, they access electronic journals through common search engines like Google and Yahoo, as well as from the University's database. The rate of responses is shown in the Figure 4.5.<sup>†</sup>

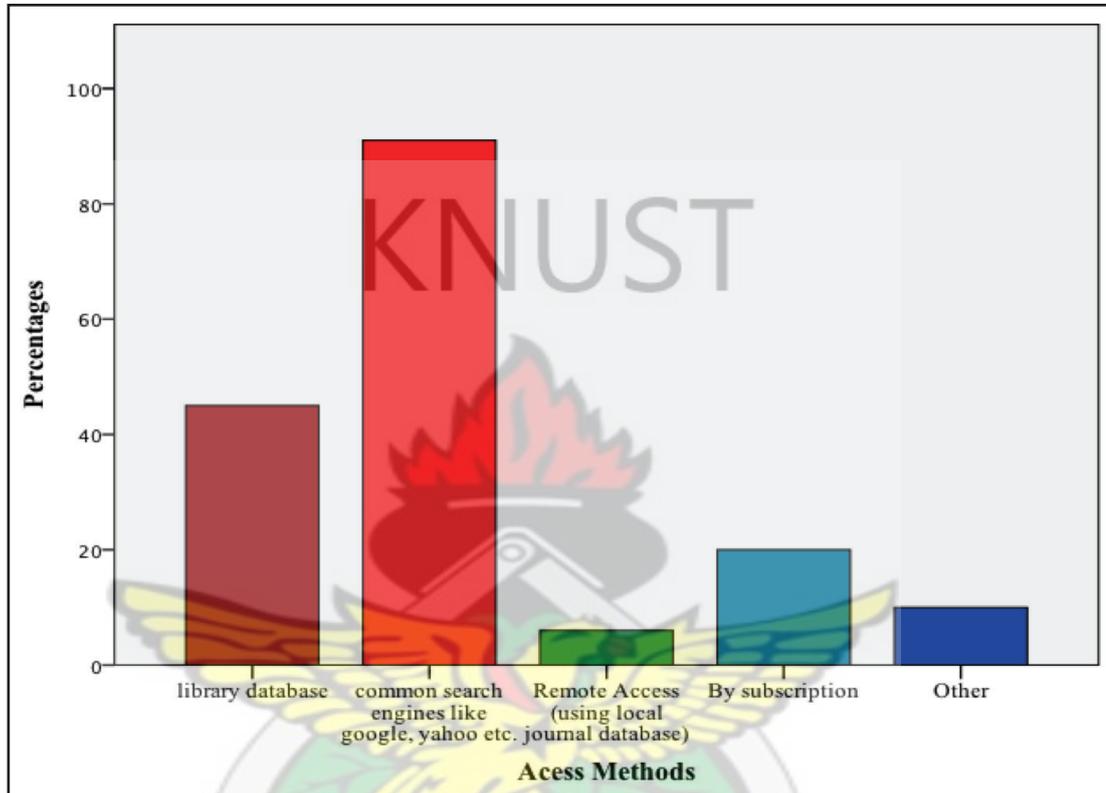


Figure 4.5: Ways of accessing electronic journals

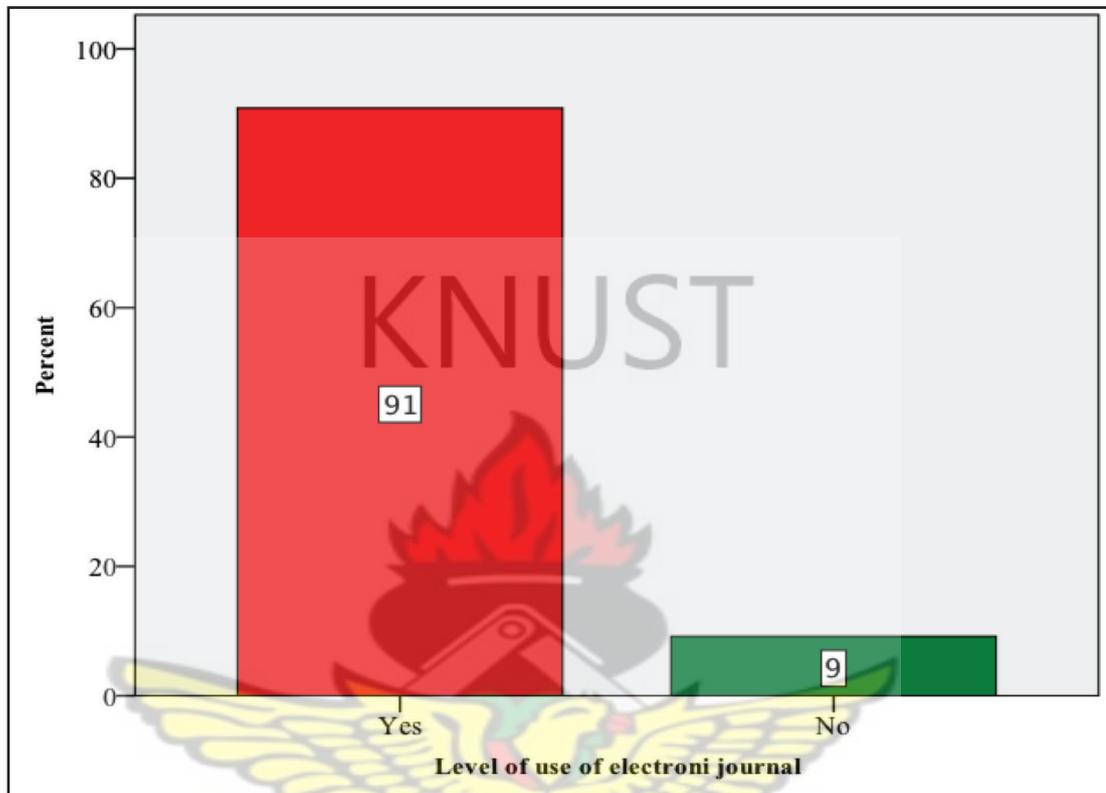
#### 4.1.3 Part C: Use of e-journals

##### 4.1.3.1 Usage levels

On the use of electronic journals, 91% of total of respondents (n=109) indicated their usage of electronic journals as against 9% who did not (Figure 4.6). At the college levels, the College of Art and Social Sciences had usage rate of with 32%, College of Science (20%), College of Engineering (12%), College of Architecture and Planning (8%) and the College of

<sup>†</sup> Respondents had the options to choose from more that one category as a result; a summation of the total exceeds 100%. The percentage is a reflection of the selected variable in relation to the total valid responses (n=109).

Health Science accounting for 7%. Out of the 9% who did not use electronic journals, some of the reasons given for their non-usage included inadequate facilities like Internet connection, exorbitant fees for subscription to desired journals and lack of adequate computer skills.



**Figure 4.6:** *Level of use of electronic journal*

Respondents were asked to indicate the frequency of use of electronic journals so as to understand the levels of usage among academic staff. Data analysed indicate that of the total number of respondents, 32% were daily users with 30% being occasional users. Table 4.6 gives detailed information on the frequency of use.

**Table 4.6:** Frequency of electronic journal usage

	<b>Frequency</b>	<b>Percentage</b>
Daily users	31	32
Weekly users	23	24
Monthly users	14	14
Occasional users	29	30
Valid Total	97	
Non Users	12	

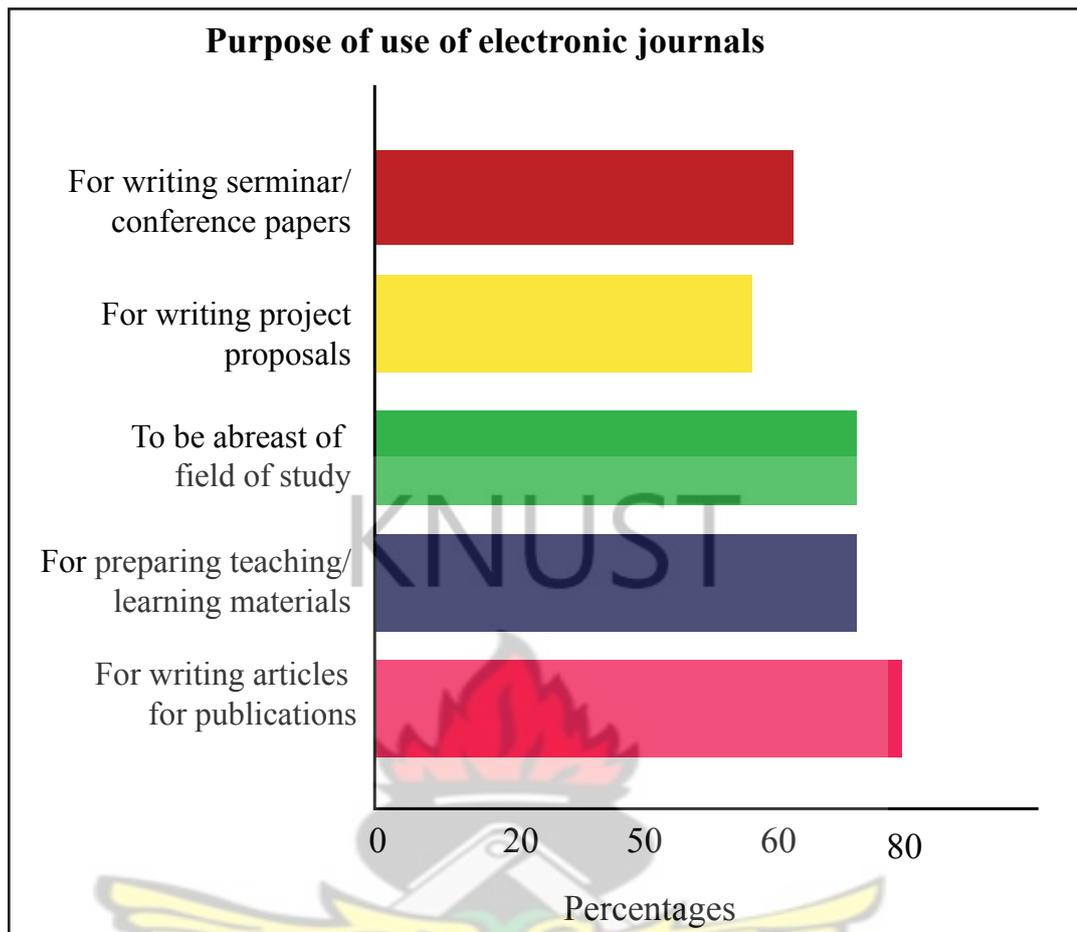
The College of Art and Social Sciences top the list with a daily user level of 29% of the total valid sample, followed by 23% of the College of Sciences. The frequency distribution table at the college level shows a sizeable number of academic staff are occasional users. Table 4.7 gives the entire distribution of user frequencies across the various colleges.

**Table 4.7:** Distribution of electronic journal usage with colleges

	Name of College					
	College of Agriculture and Natural Resources	College of Architecture and Planning	College of Art and Social Sciences	College of Engineering	College of Health Sciences	College of Sciences
Daily	10%	6%	29%	13%	19%	23%
Weekly	22%	13%	35%	13%	9%	9%
Monthly	21%	14%	36%	21%		7%
Occasional	7%	3%	45%	17%	7%	21%

#### **4.1.3.2 Purpose of use of e-journals**

Respondents were asked to indicate their purpose for using electronic journals; 80% cited writing academic papers as their main reason for using electronic journals, staying abreast of their field of study and as materials for lecturing constituting 73% respectively. Figure 4.7 provides the results of the various options given by respondents.



**Figure 4.7:** Purposes of using electronic journals

Table 4.8 and Figure 4.8 show the results of analysis of purpose of use e-journals at the college levels. Abbreviations were used in the table and chart to ensure neatness in data presentation. The abbreviations used are:

FWFP for writing articles for publications

FPL/TM for preparing lecture/teaching materials

AOFS to be abreast of field of study

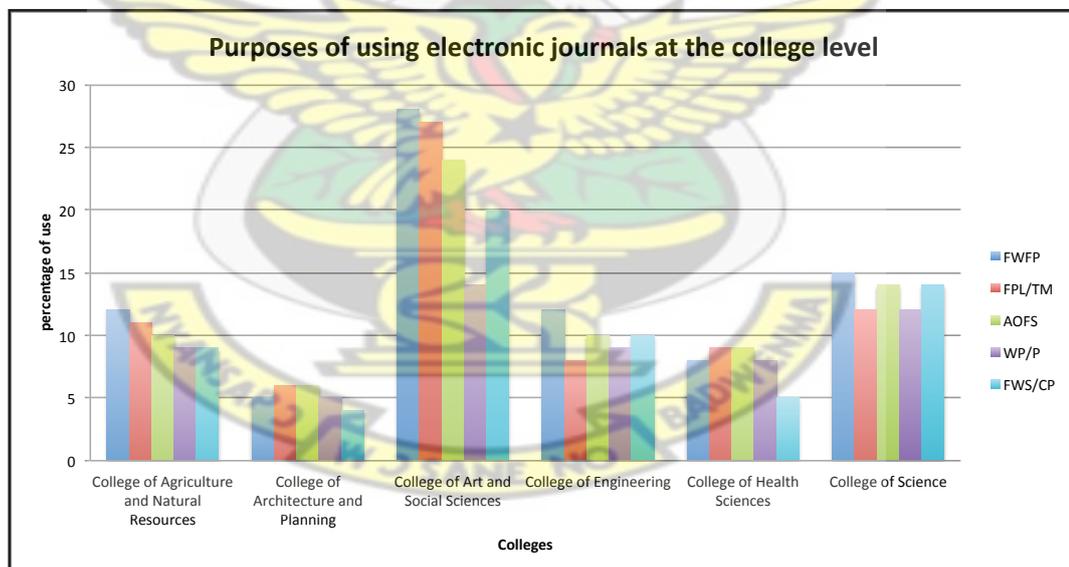
WP/P for writing proposal/projects

FWS/CP for writing seminar/conference papers

**Table 4.8:** Purposes for using electronic journals at the college level

	Name of College											
	College of Agriculture and Natural Resources		College of Architecture and Planning		College of Art and Social Sciences		College of Engineering		College of Health Sciences		College of Sciences	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
FWFP	13	12	5	5	31	28	13	12	9	8	16	15
FPL/TM	12	11	7	6	29	27	9	8	10	9	13	12
AOFS	11	10	7	6	26	24	11	10	10	9	15	14
WP/P	10	9	5	5	15	14	10	9	9	8	13	12
FWS/CP	10	9	4	4	22	20	11	10	5	5	15	14

The table shows that ‘writing articles for publications’ was the highest cited reason among academic staff of various colleges while its usage to prepare lecture/teaching material is high at the College of Art and Social Sciences (27%) but low in the College of Architecture and Planning (6%), College of Engineering (8%) and College of Health Sciences (9%).



**Figure 4.8:** Purpose of use of electronic journals (percentiles by colleges)

A pattern of a high usage of electronic journals for writing articles for publication was expected; as a result, respondents were asked to indicate on the average the numbers of articles they submit for publication within a year. This was to ascertain whether there was a

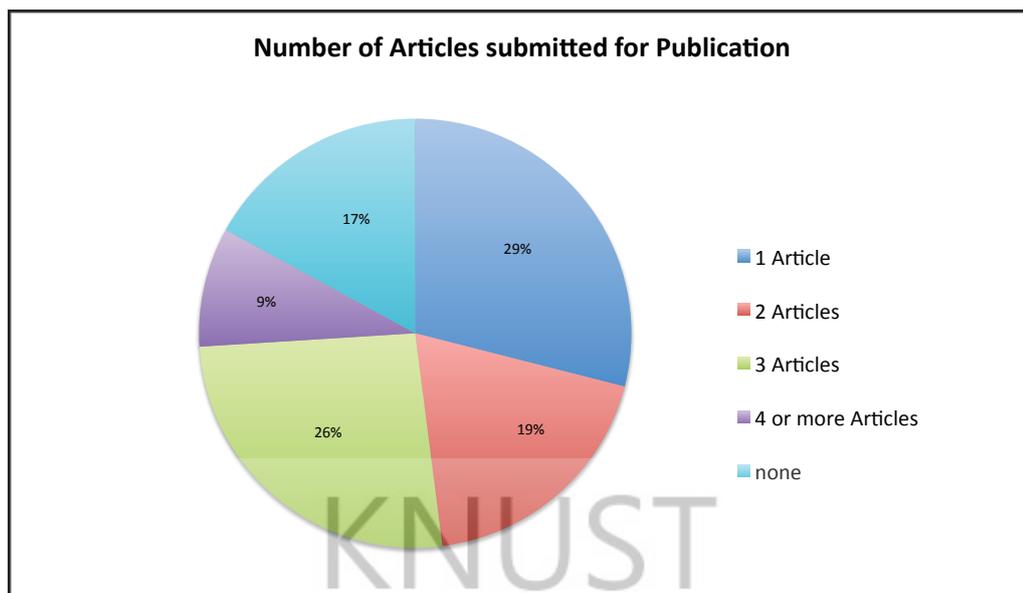
relationship between writing articles for publication and the number of articles submitted. In as much as submission does not translate into publication, it was expected that if the response of usage for publication is high, then there should be a high volume of articles submitted for publication per annum.

Table 4.9 and Figure 4.9 give a pictorial interpretation of the results from the number of articles submitted annually.

**Table 4.9:** Articles submitted for publication within a year

Articles		Frequency	Percentage	Valid Percentage
	1	29	26.6	29.0
	2	19	17.4	19.0
	3	26	23.9	26.0
	4 or more	9	8.3	9.0
	None	17	15.6	17.0
	Total	100	91.7	100.0
Missing	System	9	8.3	
Total		<b>109</b>	<b>100.0</b>	

From the table above, 9 respondents did not respond to this question, bringing the valid sample size to 100 respondents. Although about 80% of respondents stated they used electronic journals for writing articles for publication, only 29% stated that they submitted an article annually, with only 9% submitting 4 or more annually. 17% of respondents indicated that they do not submit any article for publication.



**Figure 4. 9:** A pie chart of responses on the submission of article for publication in a year.

To test whether there was a relationship between writing articles for publication and the number of articles submitted, a chi-square test was performed. Using chi-square test for independence variable, the test statistic value was 32.52 with associated p-value of  $<0.001$ , proving that there is an association.

In order to understand the level of usage, respondents were asked to indicate on the average, the number of scholarly journal articles (both print and electronic) that they use. A total of 2442 articles with a mean of 31 were recorded. Out of these articles, 84.3% were in electronic format showing a high level of patronage of electronic journals by respondents. A detailed result of responses to questions 19 and 20 is presented in Appendix 5. A test on the relationship between electronic journals used and the submission of articles for publication was positive, recording a chi-square statistic of 67.481 with a p-value of  $<0.001$ .

The highest rate of submission of articles for publication was among the lecturers who have been in service from 11 to 15 years whiles, professors submitted 3 articles per annum and 17 of the respondents (lecturers, assistant lecturers and technical instructors) had not

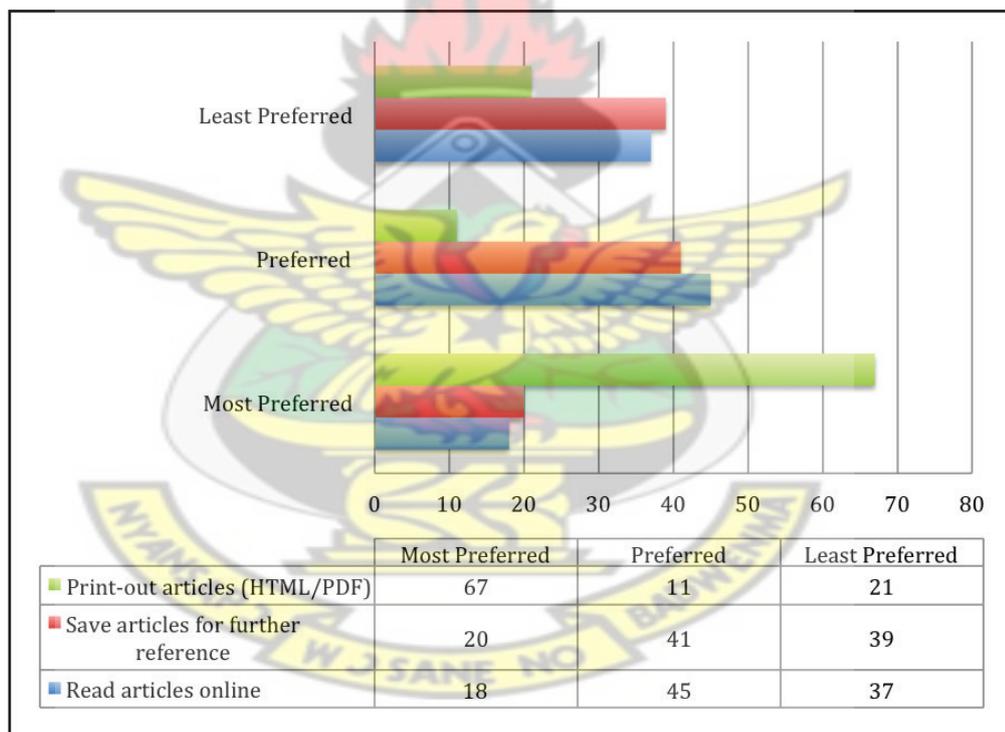
submitted any at all. Appendix 6 gives a detail analysis of submission of articles across ranks and years of service in the University.

#### 4.1.3.3 Method of using E-journals

Still on usage, respondents were asked to indicate their preference on how they used electronic journals from the following options:

- Read articles online
- Save articles for further reference
- Print out HTML/PDF format.

Responses of respondents indicative of their preferences are shown in Figure 4.10.



**Figure 4.10:** Method of using E-journals

Figure 4.10 shows three (3) methods, ranked from the 'Most preferred' to the 'Least preferred'. 67% of the respondents ranked 'print-out articles' as the most preferred. 45% preferred to read articles online. The results also showed that respondents prefer to read from

the print out HTML/PDF format, as 67% chose this option as most preferred method to compared to reading articles online (18%) and save articles for further reference (20%).

At the college level, the trend was the same except in the College of Health Sciences where respondents mostly preferred saving articles for future reference. From the gender point of view, most male respondents preferred to read online than their female counterparts. Notwithstanding, preference for saving or printing of articles all stood at 79%.

With regard to validity of electronic journal, respondents were asked how they evaluated electronic journals before using them. Respondents had the option of choosing more than one category from the list of options, as result, computation of responses in percentages were more than 100%. The frequency represents the numbers of respondents that selected the option of the total valid responses. The responses are shown in Table 4.9.

**Table 4.10:** Evaluation of electronic journal articles

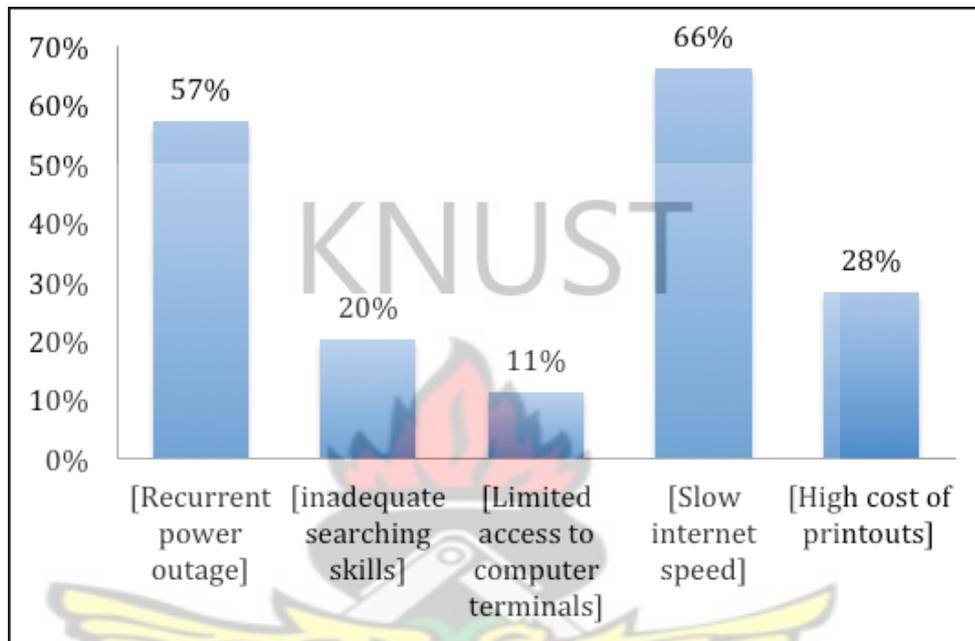
Evaluation Method	Frequency	Percentage
Check in other works to see the extent to which the author has been cited	37	34
Reputation of the journal publishers	56	51
Check how relevant article speaks to the area I am working on	90	83

Out of the total valid responses (n=109) 37% checked with other publications (print or electronic) to see the extent an author of an article has been cited before using the article. Majority of respondents (83%) went ahead to use the article as long as it was relevant to their research area. 51% checked for the reputation of the journal publisher.

#### 4.1.3.4 Challenges in using e-journals

The respondents were asked to indicate the challenges they faced in using electronic journals. With the set of categories given, respondents were at liberty to select more than one option. For analysis purposes, the variables were set as categories with a “Selected” and “Not

selected” values. The total response rate was 100% for each of the categories. Only selected values were used in the data analysis. Figure 4.11 describes the overall challenges respondents indicated in their use of electronic journals. It must be stated that issues of format and reader availability was not considered in this study.



**Figure 4.11:** *Challenges in use of electronic journal*

Slow Internet speed and recurrent power outages are major challenges faced by academic staff of KNUST. The challenge of inadequate searching skills was although higher in some colleges (see Appendix 7).

## **4.2 Summary and discussion of findings**

This section discusses the findings of the survey conducted to understand the level of awareness, access and usage of electronic journals by academic staff of Kwame Nkrumah University of Science and Technology (KNUST).

In the section, I shall describe the outcome of the survey in relation to the objectives stated in chapter 1, drawing relationships with events where applicable as discussed in chapter

2. This shall bring to light an understanding of academic staffs' perception of their use and challenges of electronic journals.

Out of the total responses (n=109), majority of respondents were from the College of Art and Social Sciences (39%). Across the colleges, majority of the respondents were males (83%) ranked as lecturers (69%) with 6 – 10 years of service (29%). The study reported a low female participation because of the lower ratio of female lecturer in the university. The low level of female participation at higher levels of academia can be attributed to the low levels of female enrolment at both the basic and secondary levels of our educational system because of some socio-cultural factors.

#### **4.2.1 Access and awareness of electronic journal**

According to Esseh (2011) citing (Gakio, 2006), there has been significant improvement in the provision of ICT infrastructure on many university campuses across Africa at very low pace; with Internet connectivity shifting from dial-up connections to wire, fibre or radio link and satellite connections with increasing bandwidth across many African Higher institutions from what was reported in 2004. Esseh explains that continual marginal fall in bandwidth cost has led to the establishment of campus networks across about 97% of the academic institutions in Africa. These factors perhaps explain why, only 9% of the respondents indicated that they do not have access to Internet on campus. This shows that KNUST is doing well in the provision of ITC infrastructure across the university campus if compared to other studies carried out across Africa (Manda, 2005; Shija, 2009). With this improvement in ICT infrastructure and internet accessibility, it is expected that faculty would increase their research capacities and have a lot of collaboration among themselves, within and outside their domain.

Computer literacy forms the basis for the use of Internet technology, and the use of electronic journals requires some level of technical skill to access, retrieve, store or print

information. When respondents were asked to indicate their levels of computer skill, 87% had adequate skills (advance and intermediate levels). The College of Science had the highest respondents with advanced computer skills (12%).

Out of the 13% who had basic computer skills, 8% were from the College of Art and Social Sciences. It is therefore evident that respondents from the sciences had a higher level of computer skills than those in the art and humanities. This reveals a higher user awareness and usage among the sciences; affirming studies carried out by Borrengo *et al.*( 2007) and Chandrakumar (2009).

On the issue of awareness, analysis of the data collected for this study indicated that academic staff at KNUST were well informed about the presence of electronic journals on the Internet. This finding corroborates similar studies carried out at Loughborough University (Brown, Lund, & Walton, 2007), University of Georgia (Smith, 2003) and Catalan Universities (Borrengo et al, 2007), where faculty members were found to be well informed about electronic journals. This shows a global awareness of availability of electronic journals in academia.

The data further indicated that their knowledge or awareness of e-journals first came through colleagues, followed by browsing the Internet, and thirdly through workshops organised by the University Library. This suggests that, to some extent, the Library's e-journal awareness campaign had less reaching effects. The fact that most faculty members and researchers became acquainted with e-journals through other means is an indication that libraries, that are major host to these electronic journals, have to re-evaluate their awareness campaign strategies.

In supporting availability of information to faculty, the University Library provides electronic services such as finding and downloading information, requesting for articles that they do not have access to, as well as other services for those who do not possess the requisite

skills to use these new technologies. Respondents were asked whether they are aware of these services rendered by the University Electronic Resource Centre; 85% responded in the affirmative. This seems to suggest that majority of faculty members around the world are aware of electronic services provided by their respective libraries (Kaur & Verma, 2009). As regards how they got this information about such services, only 55% of respondents said they heard it through the library's educational activities, emphasizing the deficiencies in the educational campaigns of the University Libraries as stated above.

Out of the percentage (85%) that is aware of such services, only 4% of respondents patronise these services and were mainly from the College of Art and Social Sciences, College of Agriculture and Natural Resources, and the College of Engineering. Through the study, it came to light that many of the faculties under these colleges do not have Internet access in their offices because the ICT Infrastructure expansion was still underway, and as a result, majority of the respondents rather browsed from their homes or mobile modems to access electronic journals. The lack of patronage to these electronic services is attributed to delays on the part of the Electronic Resource Centre in responding to requests from respondents. Respondents also complained about restrictions to access to databases subscribed to by the university outside of campus and requested that the University Library should find ways to enable users have direct access from any location without restrictions.

On where academic staff access electronic journal, majority indicated that they use their offices (89%) and home (58%). Many indicated that they access these electronic journals through common search engines like Yahoo, Google and Google Scholar and the university Library database (Figure 4.4). The use of search engines like Google Scholar by academics is global as indicated by Ollé & Borrego (2010). The use of search engines like Google Scholar is perhaps popular among faculty members because of its ability to search wider databases or

its user friendliness compared to some of the search engines that are normally used on these subscription database sites.

On use of remote access, only those respondents who had access to their professional institution databases and those trained overseas who still have clearance pass to their schools' databases used this means to obtain electronic journals; these constituted 20% of the total respondents. On the bases of subscription, majority of respondents relied on the University's subscription due to the high cost involved. Despite the cost, some academic staff stated that they would have liked to subscribe to databases that are relevant to their areas of specialisation that the University does not, but the under-development of electronic payment systems in Ghana is hampering this.

#### **4.2.2 Use of electronic journals**

As regards frequency of use, approximately 56% of academic staffs fall within the daily or weekly users of electronic journals. These high usage of electronic journals among academics have also been confirmed in other studies across Africa and the world (Omotayo, 2010; Ansari & Zuberi, 2010). According to Tenopir, Wilson, Vakkari, Talja & King (2008), in the United States, for example, on average over half of all journal readings by academics are from electronic resources and in Australia two-thirds are from electronic sources.

The main reason cited for use of electronic journals by majority of respondents (80%) was for writing articles for publications; 73% of respondents also indicated that they use these materials to stay abreast of current trends in their fields of specialisation, and for the preparation of lecture materials. Since faculty members use these electronic journals in teaching, it presupposes that students are exposed to current information and knowledge in their various fields of study.

Although the study recorded some high figures in the number of articles used by respondents per annum (with the maximum being 300 articles from an individual in the College of Art and Social Sciences), on the average respondents read 31 articles per annum. In contrast to a study conducted by King, Tenopir, Montgomery and Aerni (2003), within three universities in the United States of America, it was revealed that the average number of articles read per faculty was 206, it can be generalized that the level of readership of electronic journals is low among KNUST faculty members.

In spite of this low readership level across colleges, the College of Health Sciences had the highest mean of 33.33 articles per annum. The mean ratio across the various colleges was higher among the sciences compared to the humanities, confirming studies by Borrenco *et al*(2007) and Chandrakumar (2009).

While respondents indicated writing articles for publication is their main reason for the use electronic journals, the quantum of papers presented among the various ranks averaged 2 articles per annum. By forecasting, since the number of publications required for promotion is about 5 to senior lecturers, the next five years should see a rise in rank considering the fact that lecturers who formed the majority of respondents would have moved up the academic ladder, taking their responses of submitting at least an article a year.

An issue that requires investigation is what accounts for low reading patterns of electronic journals among faculty members and the low rate of article submissions.

In the handling of electronic journals, 67% printed out downloader journals. This trend is basically the same across Colleges except in the College of Health where the preference for saving for further use was higher. Respondents' preference for printing might be due to the fact that many enjoy reading from a hard copy because of the side effects associated with the use of the computer screen. Moreso, it gives readers the traditional feel of using a printed

material. It also provides direct access to future reference since retrieving saved electronic files sometimes consumes time because of poor archiving.

With regard to how respondents evaluate electronic journal articles in terms of quality, 83% of respondents said as long as the article speaks to the area they are working on, the material is deemed reliable; others relied on the reputation of the journal publishers. Only 34 respondents relied on citation criterion for evaluation.

#### **4.2.3 Challenges in the use of electronic journals**

The major challenge facing academics in the use of electronic journals is the frequent power outages on campus. It would be appropriate if the university authority could have an alternative power solution to help solve this problem.

More importantly, academics complained bitterly about the slow speed of Internet services as well as access points on the university campus. For improvement in access points, it would be appropriate if the University would invest in the wireless technology by providing hotspots across campus do reduce faculty members' reliance on cable points in their various offices.

Another important issue that came up was the inadequate search skills of some faculty members. It is worrying that in this time and age some lecturers still lack the necessary technological skills required to access information to progress in their chosen fields. This presupposes that some faculty members may not be abreast of new trends in their fields. This can have a negative impact on their students. The University should therefore as a matter of urgency take the necessary steps to help improve the knowledge and skills of such faculty members.

It must be stressed that many of the challenges that came to light throughout the study are common in many universities in developing countries. This is evident in studies

in India (Rao 2004), Nigeria (Omotayo, 2010) and World Business Council for Sustainable Development Report (2000).

In conclusion, it must be noted that the challenges faced in the use of electronic journals around the world is summed up by Tenopir et al (2008) as “Barriers to adoption of e-journals are mainly related to limited access to core resources (Vakkari, 2006), and are often sites pecific, such as lack of training and poor computing infrastructure” (Raza & Upadhyay, 2006).

# KNUST



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# KNUST



# Chapter 5

## Conclusion and recommendations

### 5.0 Introduction

The aim of this final chapter is to summarise the key findings of the study, the limitations of the study and some useful recommendations.

### 5.1 Key findings

As mentioned in chapter 1, this study had the following as its objectives:

- to assess the level of awareness of the existence of electronic journal and electronic journal services provided by the university library among academic staff
- to ascertain the level of usage of electronic journals among academic staff
- to identify challenges associated with the use of electronic journals among academic staff.

Findings relating to the stated objectives above were thoroughly discussed in chapter four. A summary of the various key findings relating to the study is as follows:

The study revealed a significantly higher Internet accessibility among respondents (87%) compared with other studies carried out in other Universities across Africa (indicated in Chapter 4). Access to Internet facilities was mostly from their offices, indicating the extent of Internet infrastructural development within KNUST, and hence the significant role of institutional-based subscriptions in making technology and e-journals widely accessible by individuals on its network.

Majority (91%) of academic staff of KNUST were aware of the existence of electronic journals on the Internet, and they use these journals in their day-to-day activities as

demonstrated in chapter four. This level of awareness was achieved through browsing the Internet, and through workshops and seminars organised by the University Library.

Likewise, majority of staff knew of the electronic services provided by the University Electronic Service Centre even though only a small fraction patronized those services. Reasons given for this low level of patronage ranged from attitudes of service providers, to delays in delivery of information requested, among others.

Responses regarding the usage level of electronic journals showed that a 91% usage level among academic staff of KNUST. Majority used the electronic journals for writing articles for publication. Staying abreast of current happenings in fields of interest, and using the journals as a source of materials for preparing lecture materials were other reasons attributed to the high usage levels.

Many electronic journal users submitted at least an article for publication annually. Interestingly, majority of users attested to using electronic journals for writing articles for publication even though the numbers of articles submitted for publication did not commensurate with the high percentage of purported use for writing articles.

The highest percentage of non-users of electronic journals came from the College of Art and Social Sciences. This phenomenon can be attributed to the poor and in some cases complete lack of Internet infrastructural development within the college.

The challenges enumerated by users of electronic journals at KNUST seem to point to the same challenges many electronic journal users encounter especially across the African continent. Slow Internet speed was recorded as the major concern for many of the users; some respondents also recount the lengthy time they spend to search and worst of all download a single article. Another challenge stated was the frequent power outage on campus. Many also decried the status ascribed to the University as a technological institute and wondered how such an institution did not have a standby power supply.

One major challenge found among some of the academic staff especially from the College of Art and Social Sciences was their inadequate Internet searching skills. Many showed interest in the use of electronic journals but lamented their inadequate skills made them spend long hours on the Internet without finding what wanted. Additionally, many identified the high cost of printing downloaded articles as a major challenge. When asked to save such materials and read on screen, some iterated that it was difficult to constantly read from the screen and that it was time consuming to search for an article on the computer to read, especially when you have a lot of them saved. However, when compared to the cost of subscribing to a printed journal, the cost of printing hard copies was still by far, less expensive.

## **5.2 Limitations of the study**

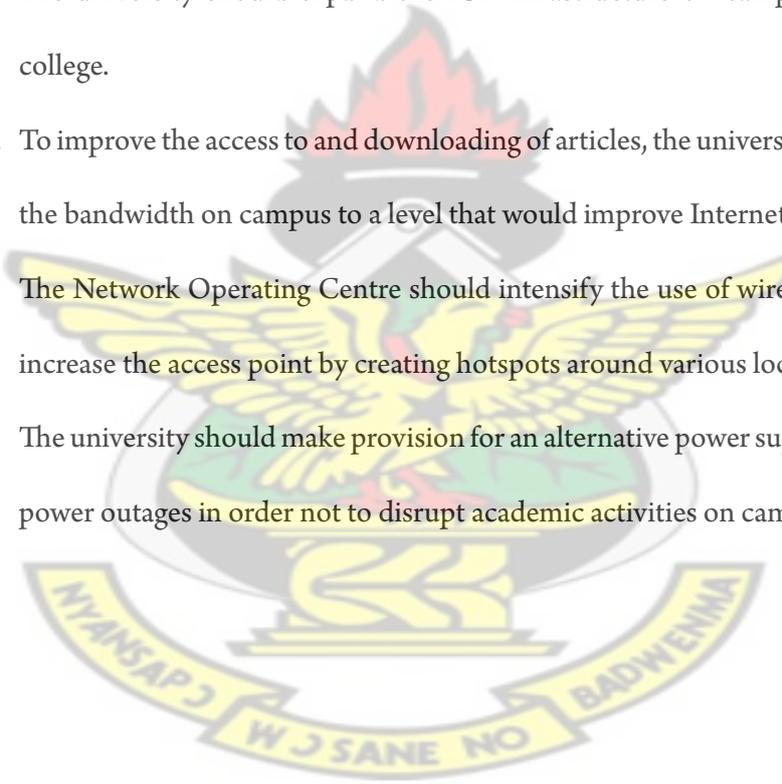
The study was situated within KNUST Campus and was limited to only academic staff. Although the original method for gathering data was to use electronic survey, faculty members' attitude towards this method was not encouraging delaying the study for some period. Even with the use of questionnaires, the responses from the senior designations within the academic hierarchy was not encouraging, all contributing to delays in the gathering of data.

## **5.5 Recommendations**

In order for the KNUST to attain its vision of providing top notch academic and research services to its immediate community and Africa as a whole, as well as encourage the use of electronic journals, the following recommendations are suggested:

1. the library should distribute electronic journals list that the university subscribes to faculty to help promote the level of awareness of such databases

2. The Electronic Service Centre in charge of delivering electronic materials for the users has to be more efficient and responsible to make sure the delivery is successful and faster.
3. The library should find ways by which faculty members can access electronic journals outside the university environment without too many restrictions
4. The library should from time to time conduct research to identify the present needs of faculty members and subscribe to suggested databases recommended by faculty members as well as improve their service delivery to faculty by updating subscription
5. The university should expand the ICT infrastructure on campus to cover every college.
6. To improve the access to and downloading of articles, the university should improve the bandwidth on campus to a level that would improve Internet speed on campus.
7. The Network Operating Centre should intensify the use of wireless technology to increase the access point by creating hotspots around various locations on campus.
9. The university should make provision for an alternative power supply system during power outages in order not to disrupt academic activities on campus.



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# KNUST



## Appendices

**Appendix 1: A cross tabulation of faculties and highest educational qualification based on sample of the study.**

Name of Faculty	Highest educational qualification				Total
	Doctorate, PhD	Masters Degree	Degree	PGDip Cert	
Energy Centre	1	0	0	0	1
Faculty of Civil and Geomatic Engineering	4	0	0	0	4
Faculty of Chemical and Material Engineering	2	0	0	0	2
Faculty of Electrical and Computer Engineering	1	1	0	0	2
Faculty of Mechanical and Agriculture Engineering	4	2	0	0	6
Faculty of Agriculture	2	1	0	0	3
Faculty of Architecture and Building Technology	1	5	0	0	6
Faculty of Art	7	12	1	0	20
Faculty of Biosciences	1	2	0	0	3
Faculty of Law	4	4	0	0	8
Faculty of Renewable Natural Resources	8	2	0	0	10
Faculty of Social Sciences	3	9	0	0	12
Faculty of Planning and Land Economy	0	2	0	1	3
Faculty of Pharmacy and Pharmaceutical Sciences	5	4	0	0	9
Faculty of Physical Sciences	5	5	0	0	10
KNUST School of Business	0	2	0	0	2
School of Medical Sciences	1	4	0	1	6
<b>Total</b>	<b>49</b>	<b>55</b>	<b>1</b>	<b>2</b>	<b>107</b>

**Appendix 2: A cross tabulation of Years of Service and Ranks**

Number of years of service	Ranks							Total
	Professor	Assoc. Professor	Snr. Lecturer	Lecturer	Assist. Lecturer	Technical Instructor		
Less than one year				4	3			7
1-5 years	1		3	22	2			28
6-10 years		1	4	25		2		32
11-15 years		1	4	13		2		20
16-20 years		1		2				3
More than 21 years	1	2	7	9				19
Total	2	5	18	75	5	4		109

**Appendix 3: A cross tabulation of ways of accessing electronic journals and ranking.**

Ways of Accessing Professor Count	Ranking									
	Assoc. Professor	Count	Snr. Lecturer	Count	Lecturer	Count	Assist. Lecturer	Count	Technical Instructor	Count
	Count		Count		Count		Count		Count	
Access through the library database	Yes	0	3	13	27	0	2			
	Not selected	2	2	5	48	5	2			
	Total	2	5	18	75	5	4			
Access through common search engines like google, yahoo etc.	Yes	2	4	12	64	5	4			
	Not selected	0	1	6	11	0	0			
	Total	2	5	18	75	5	4			
Remote Access (using local journal database)	Yes	0	0	1	5	0	0			
	Not selected	2	5	17	70	5	4			
	Total	2	5	18	75	5	4			
By subscription	Yes	0	1	3	15	1	0			
	Not selected	2	4	15	60	4	4			
	Total	2	5	18	75	5	4			

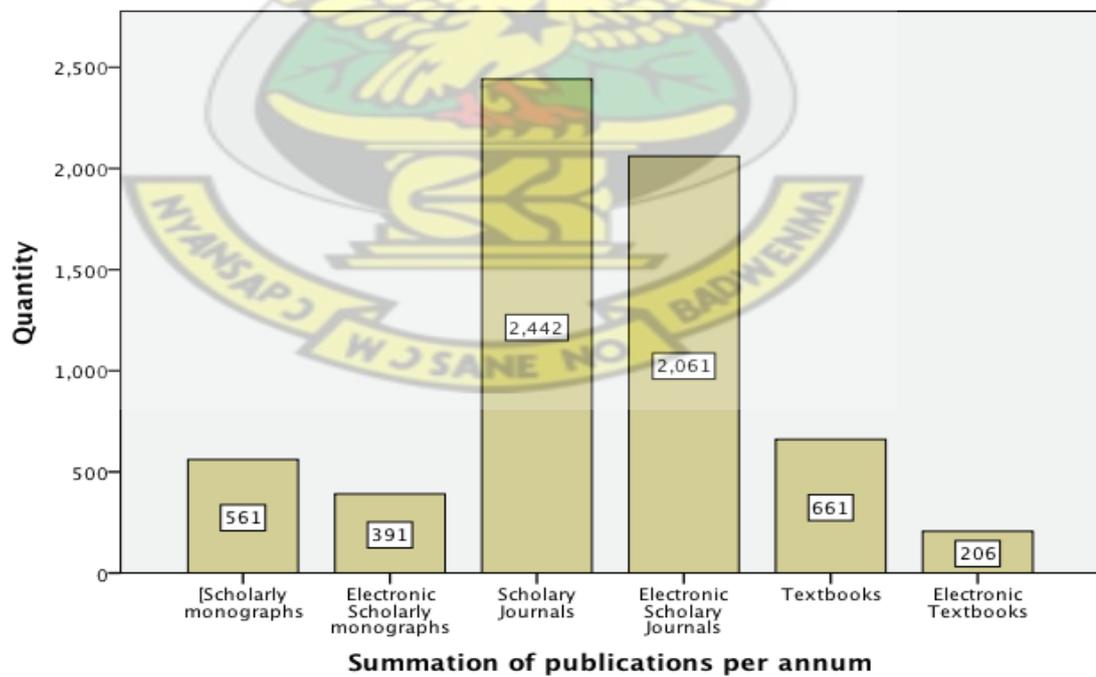
**Appendix 4: A cross tabulation of usage level of electronic journals within colleges.**

Colleges Yes		Do you use electronic journals?		Total
		No		
College of Agriculture and Natural Resources	Count	13	0	13
	Expected Count	11.8	1.2	13
	% within Name of College	100.00%	0.00%	100.00%
	% within Do you use electronic journals?	13.10%	0.00%	11.90%
	% of Total	11.90%	0.00%	11.90%
College of Architecture and Planning	Count	8	1	9
	Expected Count	8.2	0.8	9
	% within Name of College	88.90%	11.10%	100.00%
	% within Do you use electronic journals?	8.10%	10.00%	8.30%
	% of Total	7.30%	0.90%	8.30%
College of Art and Social Sciences	Count	35	7	42
	Expected Count	38.1	3.9	42
	% within Name of College	83.30%	16.70%	100.00%
	% within Do you use electronic journals?	35.40%	70.00%	38.50%
	% of Total	32.10%	6.40%	38.50%

Colleges Yes		Do you use electronic journals?		Total
		No		
College of Engineering	Count	14	2	16
	Expected Count	14.5	1.5	16
	% within Name of College	87.50%	12.50%	100.00%
	% within Do you use electronic journals?	14.10%	20.00%	14.70%
	% of Total	12.80%	1.80%	14.70%
College of Health Sciences	Count	10	0	10
	Expected Count	9.1	0.9	10
	% within Name of College	100.00%	0.00%	100.00%
	% within Do you use electronic journals?	10.10%	0.00%	9.20%
	% of Total	9.20%	0.00%	9.20%
College of Sciences	Count	19	0	19
	Expected Count	17.3	1.7	19
	% within Name of College	100.00%	0.00%	100.00%
	% within Do you use electronic journals?	19.20%	0.00%	17.40%
	% of Total	17.40%	0.00%	17.40%
Total	Count	99	10	109
	Expected Count	99	10	109
	% within Name of College	90.80%	9.20%	100.00%
	% within Do you use electronic journals	100.00%	100.00%	100.00%
	% of Total	90.80%	9.20%	100.00%

**Appendix 5: Summary of quantity of publications used by academic staff annually.**

	Count	Sum	Mean	Mode	Std Error of Mean	Standard Deviation	Max	Min
Scholarly monographs	109	561	11	0	2	16	75	0
Electronic Scholarly monographs	109	391	7	0	2	14	75	0
Scholarly Journals	109	2442	31	5	5	47	300	1
Electronic Scholarly Journals	109	2061	27	10	5	45	300	0
Textbooks	109	661	10	10	2	13	74	1
Electronic Textbooks	109	206	3	0	1	7	50	0



**Appendix 6: Tabulation of rank, years of service and the number of articles a respondent submits for publication.**

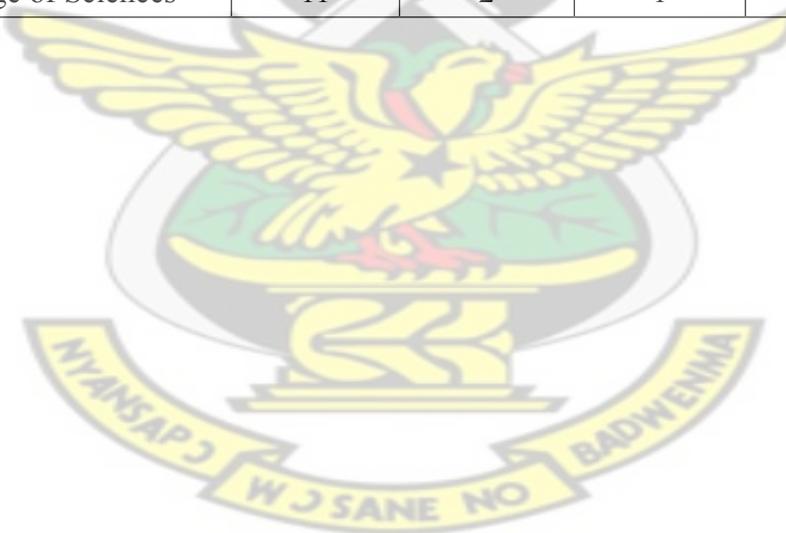
RANK	YEARS OF SERVICE	AVERAGE NUMBER OF ARTICLES SUBMITTED PER ANNUM				
		1	2	3	4 or more	None
Professor	Less than one year	-				
	1-5 years			1		
	6-10 years					
	11-15 years					
	16-20 years					
	More than 21 years			1		
Assoc. Professor	Less than one year					
	1-5 years					
	6-10 years	1				
	11-15 years			1		
	16-20 years		1			
	More than 21 years			2		
Snr. Lecturer	Less than one year					
	1-5 years	1		1		
	6-10 years	1	1		1	1
	11-15 years			3		
	16-20 years					
	More than 21 years			3	2	1
Lecturer	Less than one year	1		3		
	1-5 years	11	4	1	1	2
	6-10 years	7	10	1	2	3
	11-15 years	2		7	3	1
	16-20 years					2
	More than 21 years	2	2	2		3

RANK	YEARS OF SERVICE	AVERAGE NUMBER OF ARTICLES SUBMITTED PER ANNUM				
		1	2	3	4 or more	None
Assist. Lecturer	Less than one year	1	1			1
	1-5 years					2
	6-10 years					
	11-15 years					
	16-20 years					
	More than 21 years					
Technical Instructor	Less than one year					
	1-5 years					
	6-10 years					1
	11-15 years	2				
	16-20 years					
	More than 21 years					



**Appendix 7: Challenges in the use of Electronic Journal across Colleges in KNUST.**

Challenges	Recurrent power outage	Inadequate searching skills	Limited access to computer terminals	Slow internet speed]	High cost of printouts
Name of College					
College of Agriculture and Natural Resources	6	5	2	9	3
College of Architecture and Planning	7	3	2	6	2
College of Art and Social Sciences	23	9	5	27	12
College of Engineering	7	1	1	11	6
College of Health Sciences	6	2	1	7	3
College of Sciences	11	2	1	12	4



## **Appendix 8: Questionnaire for the survey.**

### **Survey Questionnaire**

#### **Topic: The awareness, access and usage of electronic journals among academic staff in KNUST**

Dear Academics

I am a colleague from the Department of Publishing Studies of the College of Art and Social Sciences. I am currently conducting a study on the above topic. The attached questionnaire is meant for gathering information to identify the awareness level, issues with accessibility, and importance of electronic journals in the day-to-day activities of staff, in the pursuit of their academic mandates. Beside that, the questionnaire seeks to collect information on the characteristics of electronic journals that faculty perceive to be important.

Many of the questions do not require a great deal of writing, because you are expected to indicate your choice of answer by ticking (✓) in the appropriate box. In situations where you are to specify your answer by writing, please be as concise as possible. The success of this study depends on your answers to the questions and your views expressed frankly and accurately as possible. Your answers will be treated in the strictest confidence.

Counting on your support and co-operation.

Yours Sincerely  
Francis K. Nunoo

Please you may contact me on  
Tel: 0242318729  
Email: sanfrancios@yahoo.co.uk  
fnunoo.cass.knust.edu.gh

## Survey Questionnaire

**Note:** For the purpose of this study, electronic journals (e-journals) are defined as a digital version of print journal, or a journal-like electronic publication without print Version that is accessible via the Web, e-mail, or other means of Internet access.

### Part A: Demographics of Respondents

#### 1. Name of College

- |  |                          |   |                          |
|--|--------------------------|---|--------------------------|
| 1. College of Agricultural and Natural Resources | <input type="checkbox"/> | 4. College of Architecture and Planning | <input type="checkbox"/> |
| 2. College of Art and Social Sciences            | <input type="checkbox"/> | 5. College of Engineering               | <input type="checkbox"/> |
| 3. College of Health Sciences                    | <input type="checkbox"/> | 6. College of Sciences                  | <input type="checkbox"/> |

2. Name of Faculty

3. Gender Male  Female

#### 4. Number of years of service in the University

- |                       |                          |                  |                          |                            |                          |
|-----------------------|--------------------------|------------------|--------------------------|----------------------------|--------------------------|
| i. Less than one year | <input type="checkbox"/> | ii. 1 - 5 years  | <input type="checkbox"/> | iii. 6 - 10 years          | <input type="checkbox"/> |
| iv. 11 -15 years      | <input type="checkbox"/> | v. 16 - 20 years | <input type="checkbox"/> | vi. vi) More than 21 years | <input type="checkbox"/> |

#### 5. Highest educational qualifications

- |                   |                          |                    |                          |             |                          |           |                      |
|-------------------|--------------------------|--------------------|--------------------------|-------------|--------------------------|-----------|----------------------|
| i. Doctorate, PhD | <input type="checkbox"/> | ii. Masters Degree | <input type="checkbox"/> | iii. Degree | <input type="checkbox"/> | iv. Other | <input type="text"/> |
|-------------------|--------------------------|--------------------|--------------------------|-------------|--------------------------|-----------|----------------------|

#### 6. Designation

- |              |                          |                      |                          |                    |                          |              |                          |
|--------------|--------------------------|----------------------|--------------------------|--------------------|--------------------------|--------------|--------------------------|
| i. Professor | <input type="checkbox"/> | ii. Assoc. Professor | <input type="checkbox"/> | iii. Snr. Lecturer | <input type="checkbox"/> | iv. Lecturer | <input type="checkbox"/> |
| iv. Other    | <input type="text"/>     |                      |                          |                    |                          |              |                          |

### Part B: Access and Awareness of e-journals

7. Do you have access to Internet? Yes  No  If Yes Please, go to question 8, if No then go to question 9.

8. Where do you access Internet?( You may tick (✓) more than one answer. )

- |  |                          |       |                          |               |                          |                      |                          |
|--|--------------------------|-------|--------------------------|---------------|--------------------------|----------------------|--------------------------|
| Office                                 | <input type="checkbox"/> | Home  | <input type="checkbox"/> | Internet café | <input type="checkbox"/> | Faculty computer lab | <input type="checkbox"/> |
| KNUST Library Electronic Resources lab | <input type="checkbox"/> | Other | <input type="text"/>     |               |                          |                      |                          |

9. What is the level of your computer skills? Advanced  Intermediate  Beginner  None

10. Are you aware of the availability of e-journals on the Internet? Yes  No

If Yes, Please proceed to question no. 11. If No, go directly to question no. 12.

11. How did you get to know of the availability of e-journals on the Internet? (You may tick (✓) more than one.)

- |                                   |                          |                             |                          |                    |                          |
|-----------------------------------|--------------------------|-----------------------------|--------------------------|--------------------|--------------------------|
| i. From colleagues                | <input type="checkbox"/> | ii. KNUST Library Workshops | <input type="checkbox"/> | iii. From Students | <input type="checkbox"/> |
| iv. Through browsing the internet | <input type="checkbox"/> | v. Other                    | <input type="text"/>     |                    |                          |

12. How do you access the e-journals? (You may tick(✓) more than one answer)

- |                                 |                          |  |                          |
|---------------------------------|--------------------------|--|--------------------------|
| i. Through the library database | <input type="checkbox"/> | ii. Through common search engines like google, yahoo, etc. | <input type="checkbox"/> |
| iii. Route Access               | <input type="checkbox"/> | iv. By Subscription  | <input type="checkbox"/> |
| iv. Other                       | <input type="text"/>     |  |                          |

**13. Are you aware of the availability of electronic journals services at KNUST Library?**

Yes  No  *If Yes, please proceed to question 14. If No go to question 18.*

**14. How did you know of the existence of such services? (You may tick (✓) more than one answer)**

- i. Library's website  ii. Library Brochure   
 iv. Library guide  v. Posters on Library Notices Boards   
 vii. Colleagues  viii. Library seminars/workshops   
 ix. Other

**Part C : Use of e-journals**

**15. Do you use e-journals? (Please tick (✓))**

Yes  No  *If No, please proceed to the next question, if Yes proceed to question 17.*

**16. Why are you not using e-journals? (You may tick more than one answer)**

i.	Cannot find any relevant ones in my field of study	
ii.	Quality is not equal to print	
iii.	Library does not subscribe to the titles I need	
iv.	Inadequate network facilities (e.g; No. of PCs, No. of Internet connection, Lack of accessibility)	
v.	Have to pay	
vi.	Don't like reading from screen	

**17. How often do you use e-journals? (Please tick (✓) only one answer)**

i. Daily  ii. Weekly  iii. Monthly  iv. Occasionally  v. Other

**18. Please indicate your purpose of using electronic journals:**

Use	Yes	Uncertain	No
1 For writing articles for publication			
2 For preparing teaching/lecture materials			
3 For preparing assignments for students			
4 For writing project proposal			
5 For writing seminar /conference papers			

**19. How many of the following have you read within the last 12 months? (Please indicate in numerical value)**

1	Scholarly monographs ( <i>Detailed work in single volume on a specialized subject within a specialized field</i> )	
2	Scholarly Journals	
3	Textbooks	

**20. How many of those listed in question 19, were in electronic form?**

1	Scholarly monographs ( <i>Detailed work in single volume on a specialized subject within a specialized field</i> )	
2	Scholarly Journals	
3	Textbooks	

**21. On the average how many articles do you submit for publication within a year? Tick (✓) where applicable**

i. 1  ii. 2  iii. 3  iv. 4 and more  v. None

22. How many of such articles were submitted to Electronic Journal Publishers?

23. When using e-journals, what method do you prefer; (Rank 1 to 3)

Ranking: 1 = Most preferred 2 = (preferred) 3 = Least preferred

i.	Read articles online	
ii.	Save articles for further reference	
iii.	Print out HTML/PDF format	

24. How do you evaluate the relevance of articles in the e-journals you have searched? (You may tick more than one answer)

1.	I will check with other articles to see the extent to which the author has been cited	
2.	I will check for the reputation of the journal publishers	
3.	I don't consider relevance of articles	
4.	I will check how relevant the article speaks to the area I am working on	
5.	Other	

25. What problems do you encounter in using an electronic journal? (You may tick more than one answer)

- i. Recurrent power outage  ii. Slow internet speed  iii. High cost of printouts   
 iv. Inadequate searching skills  v. No problem at all   
 vi. Limited access to computer terminal  vii. Other

#### Part D: Characteristics of e-journals

26. Electronic versions of journals may have advantages for some users. Please rank how important are the following characteristics of e-journals to you. (Please tick (√))

Ranking: 1 = Very Important, 2 = Important, 3 = Not Important, and 4 = No opinion (N/A).

Characteristics	1	2	3	4
i. Articles are available in electronic form				
ii. E-journals contain hyperlinks to other articles and related information.				
iii. E-journals are always available - 24 hours a day, every day				
iv. In using e-journals I don't have to go to the library or wait for document delivery.				
v. E-journals include data, which can be downloaded for use.				
vi. Using e-journals avoids photocopy costs for print articles.				

27. When you want to read an article online and the full text is not available, how likely is it that you; (Please tick (√) appropriate response for each item)

Ranking: 1 = Very likely, 2 = Likely, 3 = Unlikely, 4 = Very Unlikely, and 5 = No opinion (N/A).

Action	1	2	3	4	5
i. Try to obtain a print version from your campus library.					
ii. Try to obtain a print copy from a colleague.					
iii. Submit a request for the article through the KNUST library for the article to be purchase.					
iv. Decide to use a similar article with full text online instead.					
v. Rely on the online abstract for the information needed.					

**Thank you very much for your help and God richly bless you.**