Use of Electronic Databases by Final year Students of the University Of Ghana College Of Health Sciences

by

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DECLARATION

I declare that the dissertation, *Use of Electronic Databases by Final year Students of the University of Ghana College of Health Sciences* which I hereby submit for the degree of Master's in Information Science at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

The author, whose name appears on the title page of this dissertation, obtained the applicable research ethics approval to conduct the research described in this work. The author declares that she has observed the ethical standards required in terms of the University of Pretoria's Code of ethics for researchers and the policy guidelines for responsible research.

Signed: February 2016

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ABSTRACT

Modern trends in medical and biomedical sciences education show the use of electronic databases as an invaluable tool because it provides users with current and up to-date information. It is due to this fact that the University of Ghana subscribes to a host of these databases. In spite of the usefulness of electronic databases, students of the University of Ghana College of Health Sciences do not make full use of these resources. This situation raised the question: *How are final year students at the University of Ghana College of Health Sciences using electronic databases?* Sub-questions included:

- What has been reported on the use of electronic databases by students in academic contexts?

- What are final year students' at the University of Ghana College of Health Sciences level of awareness of electronic databases and other electronic information resources?

- Which electronic databases are used by final year students at the University of Ghana College of Health Sciences?

- Which challenges impact on final year students at the University of Ghana College of Health Sciences as they use electronic databases?

The study employed a quantitative research design using a self-administered questionnaire among final year students of the College of Health Sciences, University of Ghana in October 2015. The participants were 242 final year students (under-graduate final year and post-graduate final year).

The study revealed that 189/242 (78.1%) of the final year students were aware of the electronic databases to which the College of Health Sciences Library subscribes. HINARI, AJOL, EBSCOHOST and ScienceDirect were the most used electronic databases. It was also found that the use of electronic databases mainly improved accessibility to information, improved availability of current information and was perceived by students to enhance the

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quality of assignments and research. However, lack of guidance, lack of appropriate search skills, and internet connectivity problems were the major reasons that impeded the use of electronic databases among the final year students of the College of Health Sciences. Recommendations were made for theory and practice, as well as further research.

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LIST OF ABBREVIATIONS

CHS   College of Health Sciences

CINAHL   Cumulative Index to Nursing and Allied Health Literature

CME   Continuing Medical Education

DBMS   Database Management System

EBIT   Engineering Built Environment and Information Technology

HDSS   Humanities, Development and Social Sciences

HINAR   Health InterNetwork Access to ResearchInitiative

IDL   Integrated Digital Library

MEDLINE   Medical Literature Analysis and Retrieval System Online

NUC   Next Unit of Computing

SBAHS   School of Biomedical and Allied Health Sciences

SMD   School of Medicine and Dentistry

TUMS   Tehran University of Medical Science

UGDS   University of Ghana, Dental School

UMUC   University of Maryland University College

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CHAPTER 1: INTRODUCTION TO STUDY

1.1 INTRODUCTION

Concern about the use of electronic databases and other electronic information resources (e-information resources) by students has been widely reported (Ilo & Ifijeh, 2010; Majid, Hayat, Patel & Vijayaraghavan, 2012; Bhat & Mudhol, 2014). The increased volume of information in electronic format compels students to learn how to search, select and use a wide variety of resources, as do the expectations for information literacy in the academic context (Ratanya, 2012). Students' ability to effectively utilise electronic information resources is a key issue in higher education (Togia & Tsigilis, 2009). According to Romanov and Aarnio (2006) a significant goal of medical education is to enable students to maintain their knowledge of medical science by becoming life-long learners. Knowledge and skills in information seeking and the use of electronic databases (one type of electronic information resource) are essential in this regard.

Over the last few decades studies have shown that electronic databases have proved very useful in the medical profession. Such use impacts on the quality of patient care, the enhanced use of evidence-based treatments, and the maintenance and updating of knowledge (Romanov & Aarnio, 2006). Again evidence-based medicine provides identical strategies that can be followed by undergraduate and postgraduate education, as well as continuing medical education (CME) for professionals (Mahabaleshwara & Jessy, 2014). A study by Pessah and Venturella (2001) reports that medical students sought to fulfil their information needs by using textbooks, but on matters relating to treatments they were more likely to resort to the use of online journals rather than medical textbooks. It also seems as if search engines dominate students' information-seeking strategies. Medical students have been reported to

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use the Internet nearly as much for social communication as they do for their education (Griffiths & Brophy, 2005; Bhat & Mudhol, 2014).

The ability to effectively utilise electronic information resources among health science students may help them to enhance the quality of their learning and healthcare services when they become professionals. There is thus a need to determine usage in specific contexts of training for healthcare professionals.

1.2 BACKGROUND ON COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF GHANA

The University of Ghana was established in 1948 as the University of the Gold Coast, now Ghana. It was founded primarily to provide and promote university education, learning and research. The University of Ghana is the oldest university and the largest of all the nine public universities in Ghana, with a current student population of 29,754 (University of Ghana website 2015).

The College of Health Sciences is one of the four colleges of the university and offers both under-graduate and post-graduate programmes. The College has a size of 2, 860 students and comprises of six schools (i.e. Schools of Medicine and Dentistry, Pharmacy, Nursing, Public Health, Biomedical and Allied Health Sciences), a Clinical Centre (i.e. Centre for Tropical Clinical Pharmacology and Therapeutics) and one Research Institute (i.e. Noguchi Memorial Institute). The College Library was established in 1966 and is responsible for providing accessible library resources and for rendering services with over 40,000 volumes of books and periodicals. It serves the educational and research needs of students, faculty and staff as well as patient care needs of the Korle-Bu Teaching Hospital and other hospitals in Ghana such as the Ridge Hospital and the 37 Military Hospital (all in Accra).

The College of Health Sciences Library makes available access to e-information resources. Two important databases for the College Library are HINARI and PubMed, as well as some

databases available through EBSCOHOST. Various challenges that impact on the use of electronic information resources have been noted in the subject literature such as poor infrastructure, unreliable systems and staff with inadequate skills in the use of Information and Communications Technology (ICTs) and electronic resources.

1.3   PROBLEM STATEMENT

Encouragingly, the use of electronic information resources has instigated a number of research studies worldwide (e.g. Griffiths & Brophy, 2005; Romanov & Aarnio, 2006; Togia & Tsigilis, 2009; Baro, Endouware, & Ubogu, 2011; Ahmed, 2013; Anaraki & Babalhavaeji, 2013; Bhat & Mudhol, 2014). Some of these studies focused on access, satisfaction, attitude and searching skills (Griffiths & Brophy, 2005; Bhat & Mudhol, 2014). Others also specifically focused on medical science students (Anaraki & Babalhavaeji, 2013; Bhat & Mudhol, 2014). Many of these studies concluded that additional research, focusing on other groups of the academic community, is needed in order to get a thorough insight into the use of electronic information resources by students (Togia & Tsigilis, 2009; Baro, Endouware & Ubogu, 2011).

Nevertheless at the College of Health Sciences, there is concern about the limited use of electronic information resources by students. From observations it seems that there is a lack of well-trained staff with appropriate skills and an inadequate ICT infrastructure amongst others that may deprive students of accessing the quality and current information for their academic activities.

Furthermore, the College of Health Sciences have not studied students' concerns with regard to subscribed electronic information resources in order to ensure dynamic teaching-learning interaction, and using such resources in completing assignments and conducting research. This may contribute to an improvement in the under-utilisation of the electronic databases to

which the college subscribes. Thus empirical evidence is required to identify how electronic information resources are used by students in the College of Health Sciences.

The study will thus be guided by the following research question:

How are final year students at the University of Ghana College of Health Sciences using electronic databases?

To answer the research question, the following sub-questions must be answered:

- What has been reported on the use of electronic databases by students in academic contexts?

- What are final year students at the University of Ghana College of Health Sciences level of awareness of electronic databases and other electronic information resources?

- Which electronic databases are used by final year students at the University of Ghana College of Health Sciences?

- Which challenges impact final year students at the University of Ghana College of Health Sciences as they use electronic databases?

1.4 OBJECTIVES OF THE STUDY

The objective of the study is to determine the use of electronic databases by final year students at the College of Health Sciences, University of Ghana. The findings will be used to make recommendations on the provision of electronic databases and other electronic information resources, the training of students in the use of these resources, and on creating teaching and learning environments supporting dynamic use of electronic databases.

1.5 CLARIFICATION OF TERMINOLOGY

1.5.1 Electronic databases

According to Naqvi (2012:3) an electronic database is a 'large, regularly updated file of digitised information (bibliographic records, abstracts, full-text documents, directory entries,

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images, statistics, etc.) related to a specific subject or field, consisting of records of uniform format organized for ease and speed of search and retrieval and managed with the aid of database management system (DBMS) software'. For instance, the Medical Literature Analysis and Retrieval System Online (Medline), Health InterNetwork Access to Research Initiative (HINARI), EBSCOHOST, and ScienceDirect amongst others.

1.5.2   Electronic information resources

Aina (2014: 41) says that 'electronic resources are systems in which information is stored electronically and made accessible through electronic systems and computer networks'. These resources include library catalogues (OPACs), CD-ROMs, electronic databases, electronic journals, electronic books, and Internet resources.

1.6   LITERATURE REVIEW

For the proposed study it is necessary to review related studies on the level of awareness and use of electronic databases among students, electronic information resources mostly used by students and the challenges that impact on students' use of electronic databases. A brief summary of such studies is offered in the sections to follow. A conceptual framework guiding the study will be identified in the full literature analysis that will be presented in Chapter 2 of the dissertation.

1.6.1   Awareness and use of electronic databases among students

Studies by Togia and Tsigilis (2009) showed that only 6.8% of students in Greece became familiar with electronic resources by attending the library training programs. Dadzie (2005) also found that the vast majority of students and faculty she surveyed preferred to use search engines like Google and Yahoo, while very few of them were making use of the OPAC and the electronic databases to which the library subscribes. Mawindo and Hoskins (2008) also

noted that 'only a few electronic resources were actually used by the students', who preferred websites over the scholarly academic databases and electronic (e)-journals.

Baro, Endouware and Ubogu (2011) also found that amongst the medical students at Delta State University in Nigeria, the majority of the students were not aware and did not use the e-information resources such as Medline, Health InterNetwork Access to Research Initiative (HINARI), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the Next Unit of Computing (NUC) virtual library as sources of information to retrieve materials related to medical literature. Further to this, a study in Iraq by Anaraki and Babalhavaeji (2013) indicated that with regard to electronic resources, the awareness and utilisation level of students in the universities were lower than the average.

1.6.2   Electronic resources mostly used by students

A study by Togia and Tsigilis (2009) found that the vast majority of the participants used Internet search engines rather than specialised databases and full-text resources. It is quite interesting, that nearly half of the respondents (49.1%) had never used ERIC, the fundamental resource of education literature. The under-utilization of electronic information resources has also been highlighted by Rehman and Ramzy (2004), who studied health care professionals at the Health Science Centre of Kuwait University. They found that Medline was the most heavily used source, followed by electronic journals.

1.6.3   Challenges that impact on students' use of electronic databases

Electronic journals were reported as the most widely used resource by Kanniyappan, Muthusamy and Nithyanandam (2008), who concluded that most of the respondents faced problems in fully exploiting digital resources mainly because they did not get enough training to use them. Togia and Tsigilis (2009) found that the main problem associated with the non-usage of electronic resources was a lack of adequate searching skills. To Baro, Endouware

and Ubogu (2011) the challenges that impact students' use of electronic databases in Delta State University in Nigeria were as a result of a lack of training in information literacy skills and ineffective user education programmes in the medical libraries and medical schools to equip the students with the necessary skills to use the medical databases and other electronic information resources. Ahmed (2013) also found that students identified limited access to computers and slow download speed as major problems.

1.7 SIGNIFICANCE OF THE STUDY

By examining electronic database usage among College of Health Sciences students, the management of the College of Health Sciences can consider the suggested recommendations to create awareness of the electronic resources among students, provide training to improve on the use of these resources, and to convince them of the advantages of changes in the teaching and learning environment to support dynamic use of electronic databases.

Furthermore, this study will be helpful to librarians in understanding the challenges encountered by College of Health Sciences' students in using electronic databases. It will also serve as a future reference for researchers on the subject of electronic database usage among students.

1.8 DELIMITATION OF THE STUDY

This study is limited to the College of Health Sciences students at the University of Ghana. It is limited to the chosen college because of easy access to respondents and the fact that the researcher is familiar with the college. Due to time and financial constraints the other colleges at the University of Ghana were not included in this study.

1.9 RESEARCH DESIGN

The research design was devised based on the problem statement, the research question and the sub-questions. The nature of data and the problem statement dictate the research

methodology (Leedy, 1993; McCusker & Gunaydin, 2015). This section will be divided into sub-sections which will discuss the research approach (i.e. research methodology), sample frame, data collection procedure, data collection instruments, data analysis techniques, and ethical clearance.

A research design provides a framework for the collection and analysis of data. It constitutes the blueprint for the collection, measuring and analysis of data (Kothari, 2004). A choice of research design reflects decisions about the priority being given to the following: expressing causal connections between variables, generalising to larger groups of individuals than those actually forming part of the investigation, understanding behaviour and the meaning of that behaviour in its specific social context and having a temporal (i.e. over time) appreciation of social phenomena and their interconnections (Bell & Bryman, 2007). Since there is never only one accepted way to conduct research a researcher can customise the research design to suit the research question.

1.9.1 Research approaches

There are two basic approaches to conducting research; these are qualitative and quantitative approaches (Pickard, 2013). Often the decision of a research approach is contingent on the research purpose. Thus the approach to this study will be mostly quantitative which according to Creswell, (2003:18) 'is one in which the investigator primarily uses post-positivist claims for developing knowledge (i.e., cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories), employs strategies of inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data'. It is a very controlled, exact approach to research (Muijs, 2004). The assumptions underlying quantitative methods are that reality is objective and independent of the researcher and the researcher remains distant and independent of what is being researched.

1.9.2 Research methods

The process to select a particular type of quantitative research method is based on the research problem and the purpose of the study. This study used a survey strategy. According to Babbie (1990), a survey can provide a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. The big advantage of survey research is that it has the potential to provide a lot of information obtained from quite a large sample of individuals (Fraenkel & Wallen, 2000). Thus according to Owens (2002), a survey design should be employed because of its uniqueness, that is, it gathers information not available from other sources. It is also standardisation of measurement, that is, the same type of information can be collected from every respondent.

1.9.3 Population

The population for this study was the students of the College of Health Sciences, University of Ghana. A research population (sometimes referred to as the universe in research terms) is the grand total of what is being measured, i.e. people, organisations, industries, firms, departments and sections (Proctor, 2003). Population, in research, could also refer to all members of the target group as defined by the objectives of the study (Nwana, 2008). Students of the College of Health Sciences, University of Ghana, were selected because the researcher works with the College of Health Sciences and gathering data was thus more convenient. The total number of final year students (i.e. final year under-graduate as well as post-graduate students) of the College of Health Sciences for the study numbered 642 (University Of Ghana, College Of Health Sciences Admissions Office, 2015).

1.9.4 Sample and sampling technique

A sampling technique involves taking a representative selection of the population and using the data collected as research information (Latham, 2007). Convenience sampling was used

to select individual respondents. Convenience sampling involves choosing respondents available at a particular point in time and based on the fact that the researcher has easy access to them (Latham, 2007).

1.9.5   Data collection and instruments for data collection

Various methods can be used for data collection (Fraenkel & Wallen, 2000). This study used a self-administered print based questionnaire including mostly closed, but also some open ended questions. The questionnaire was personally handed to participants. The use of print based questionnaires is inexpensive and is able to collect data over a wide geographical area within a short period of time. In addition, questionnaires also offer the opportunity for respondents to remain anonymous and normally do not take a lot of time from the respondents. Questionnaires comprise written communication from the researcher to the respondent as well as their written feedback, although sometimes structured questionnaires are used in interviews (Heather & Stone, 1984; Neuman, 2007; Spark, Pharm & Willis, 2014).

1.9.6   Data analysis

Quantitative analyses techniques were used in analysing and interpreting the data. According to Yin (1994), the ultimate goal of analysing data is to treat the evidence fairly, to produce compelling analytical conclusions and to rule out alternative interpretations. The tool used for the quantitative analysis was Statistical Package for the Social Sciences (SPSS). It is preferable for quantitative analysis because it is more convenient to define variables, input data and to generate outputs or reports. Additionally, SPSS links numerically coded data to its original meaning (Robbins, 2012). Limited qualitative data were collected through open-ended questions. These were analysed through thematic analysis.

1.9.7   Ethical considerations

Several ethical considerations guided the study: the researcher used informed consent forms that had to be signed by all participants, acknowledged all sources of knowledge to avoid any form of plagiarism, and treat all information collected from respondents as confidential. Permission to conduct the research was obtained from the University Of Pretoria Department Of Information Science Research Committee on behalf of the Faculty of Engineering Built Environment and Information Technology (EBIT), Research Ethics Committee, as well as from the institution where the survey was conducted, namely University of Ghana College of Health Sciences Library.

1.10 ORGANISATION OF CHAPTERS

This mini-dissertation is structured into five main chapters:

Chapter One: presents the introduction covering the background of the study, statement of the problem, purpose of the study, objectives, research questions, scope of the study, theoretical framework, significance of the study, and organisation of chapters.

Chapter Two: focuses on the literature review which includes related studies on the use of electronic databases in developed countries, related studies on the electronic database usage in academic institutions in Africa, use of electronic resources in academic institutions in Ghana, and the benefits of the use of electronic databases in academic institutions.

Chapter Three: discusses the research design including the research approach, population of the study, sampling technique and sample size, instrument for data collection, data analysis and problems that might be encountered during the study.

Chapter Four: covers the data analysis and findings.

Chapter Five: outlines a summary of key findings, conclusions and recommendations drawn from the findings of the study, as well as suggestions for further research. Also limitations of

the study, recommendation for practice and theory for the study and finally adapted model were included in this chapter.

CHAPTER 2: LITERATURE ANALYSIS

2.1 INTRODUCTION

To contextualise the research problem, it is necessary to review related studies on the level of awareness of and the use of electronic databases by students, their preferences and the challenges that impact on students' use of electronic databases. The analysis will result in a framework that will guide the empirical component of the study and the compilation of the instruments for data collection. This chapter critically analyses findings on the value of electronic databases in academic contexts, studies on the use of electronic databases by students, electronic databases mostly used by students and the challenges that impact students' use of electronic databases.

2.2 VALUE OF ELECTRONIC DATABASES IN ACADEMIC CONTEXTS

An extensive body of literature reports findings on the use of electronic databases in academic settings, by both academics and students (Kumar & Kumar, 2008; Gakinbayo, Ikoya–Odongo & Okello-Obura, 2013; Kwadzo, 2015). These databases are becoming very important as they are up-to-date, and can be accessed anywhere, crossing all geographical boundaries (Naqvi, 2012). Arguments on the value of electronic databases and the rationale for such studies can serve as an important background to the analysis of this study.

Electronic databases form a common part of the suite of information products offered by most academic libraries (Oriogu, 2015). Today electronic databases provide access to a spectrum of information formats such as: access to statistical databases, image databases, newspaper articles, books, theses and dissertations, maps, conference papers, abstracts, book reviews, patents, and standards amongst others (Naqvi, 2012). The content ranges from

bibliographic descriptions (sometimes including informative, indicative, structured and lately, even graphic abstracts) to full text of articles, books and other information formats.

According to Sahin, Balta, and Ercan (2010) 'academic journals databases provides a rich source of specialized information, and are widely used by many academics and students'; they are 'essential reference tools for these people for detailed research into different subject areas, and are grouped into subjects according to the different disciplines'.

According to Ilo and Ifijeh (2010) 'not only does the Internet have an impact on the research work of final year students of Covenant University, it does the same for other researchers both in other universities and other spheres of life'. Thus, from the literature analysis the value of electronic databases in the academic context cannot be overemphasised. For instance this is also supported by for example Anaraki and Babalhavaeji (2013) and Tripathi and Jeevan (2013).

2.3   REVIEW OF LITERATURE ON THE USE OF ELECTRONIC DATABASES

2.3.1   Awareness of electronic databases and actual use

Against the background of the value of electronic databases, wide use in various academic disciplines has been noted but also concern about poor use has been expressed. These disciplines range from Education (e.g. Togia & Tsigilis, 2010), Social Science (e.g. Meho & Tibbo 2003; Kwadzo, 2015), Medicine (e.g. De Groote & Dorch, 2003; Romanov & Aarnio, 2006; Baro, Endouware & Ubogu, 2011; Anaraki & Babalhavaeji, 2013; Bhat & Mudhol, 2014) amongst others. The developed as well as developing countries are represented in such studies. For instance one important element of a survey at the University of Maryland University College (UMUC) was to obtain in-depth information on students' usage patterns for electronic resources and services. Also an examination of agricultural science students in three Nigerian universities indicated that the Essential Electronic Agricultural Library

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(TEEAL) was the most widely consulted electronic database resources (e.g. Agboola, 2009; Hadebe & Hoskins, 2010; Allah al-Hudayb & Sal-Anz, 2013; Anaraki & Babalhavaeji, 2013; Tripathi & Jeevan, 2013). These studies are explained in more detail in sections 2.3.1.1 and 2.3.1.2 below. Currently it seems as if interest in studies on the use of databases is stronger in developing countries (e.g. Lwehabura, 2008; Mawindo & Hoskins, 2008; Hadebe & Hoskins, 2010; Ingutia-Oyieke & Dick, 2010; Makori, 2015).

2.3.1.1 Use of electronic databases in developed countries

The use of electronic databases in developed countries varies from one developed country to another. For instance, students report different levels of use of electronic databases, as well as different purposes. A study by Romanov and Aarnio (2006) with 837 medical and dental students at the University of Helsinki, Finland, found that twenty-four percent of medical students and nineteen percent of dental students searched Medline for study purposes, and thirty-two percent and twenty-four per cent respectively for research. The authors also found that full-text articles were used by thirty-three percent of medical students and ten percent of dental students. Twelve percent of respondents never utilized either MEDLINE or full-text articles (Romanov & Aarnio, 2006).

Another study in Iran by Anaraki, and Babalhavaeji (2013) found that the utilisation level of electronic resources by students in three universities, that is, Tehran University of Medical Science (TUMS), Iran University of Medical Science (IUMS) and Shahid Beheshti Medical University (SBMU) was lower than expected. Those who are not aware of the existence of the Integrated Digital Library (IDL) portal used general search engines to meet their information needs. The authors also carried out a similar study in Iraq and found that the utilisation level of students in the universities there, were also lower than expected (Anaraki & Babalhavaeji, 2013). Also in Iran, Shabani, Naderikharaji and Abedi (2011) found that the amount of use of electronic databases is highest among students who read technical and

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engineering subjects. The authors again revealed that medical students usually make use of scanning when using electronic databases, whereas postgraduate students generally print out more electronic database documents.

Awareness of the use of electronic databases precedes the use of databases. For instance, a study in Greece (the Aristotle University of Thessaloniki) to ascertain awareness and use of electronic information resources by graduate students in Education showed that the vast majority of the participants used Internet search engines rather than specialised databases and full-text resources. It is interesting to note, that nearly half of the respondents (49.1%) had never used ERIC, the fundamental resource of education literature (Togia & Tsigilis, 2010). The authors also discovered that only 6.8% became familiar with electronic resources by attending the library training programmes (Togia & Tsigilis, 2010). This had already been confirmed in Hong Kong by Chu and Law (2005). In the Chu and Law (2005) study it was found that numerous students were initially unfamiliar with a considerable number of the databases vital to them, and that the familiarity created during the year contributed critically to the advancement of their information search skills. This suggests that much work has to be done to inform and instruct students about these 'treasures'.

Table 2.1 gives a summary of literature from a developed country's perspective and this is arranged by country in alphabetical order showing first the country, followed by the author(s), the research title and their respective contribution to knowledge on the topic.

Country	Author	Title of research	Contribution & recommendations
Finland	Romanov & Aarnio (2006)	A survey of the use of electronic scientific information resources among medical and dental students	In order to support the use of primary scientific information resources, the use of full-text articles should be encouraged in the medical curriculum. Additionally, student's skills in searching references

			from databases, and reading full-text articles should be improved with a revised training program.
Greece	Togia & Tsigilis (2010)	Awareness and use of electronic information resources by education graduate students: Preliminary results from the Aristotle University of Thessaloniki	In order to exploit the full potential of electronic information, the Aristotle University library should undertake a more active role in informing, promoting, and educating the members of the academic community.
Hong Kong	Chu & Law (2005)	Development of information search expertise: research students' knowledge of databases	Much work must be done in order to advice and instruct students about the importance of electronic databases.
Iran	Anaraki & Babalhavaeji (2013)	Investigating the awareness and ability of medical students in using electronic resources of the integrated digital library portal of Iran: A comparative study	There is a need to organise orientation classes and training programs in accessing, searching and downloading of e-resources effectively at regular intervals. Also, adequate awareness among medical students should be created to use e-resources to obtain current information.
Iran	Shabani, Nad -erikharaji & Abedi (2011)	Reading behaviour in digital environments among higher education students	This study will help university authorities and digital library managers to provide better services to users and students.

Table 2.1: Use of electronic databases in developed countries

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2.3.1.2 Use of electronic databases in developing countries

From the perspective of developing countries, Okello-Obura and Magara (2008) investigated electronic information access and utilisation of the East African School of Library and Information Science, Makerere University, Uganda. Out of the 250 targeted students, 190 responded, giving a response rate of 76%. The study discovered that users derived a lot of benefit from electronic resources, gaining access to a wider range of information and improved academic performance as a result of access to quality information. Bhat and Mudhol (2014) also found that students' attitudes seem to be very positive towards electronic databases for their study and research. The study revealed that students depend heavily on electronic databases for their required information and to keep themselves up-to-date in their subject area. Arif and Ameen (2011) also established that among 450 respondents, 379 respondents are using electronic resources in three public sector universities located in the capital territory Islamabad, Pakistan, that is: Allama Iqbal Open University (AIOU), International Islamic University, Islamabad (IIUI) and Quid-e-Azam University (QU).

In a study in the Punjab State of India, Manhas (2008) found in a survey of dental students that the use of electronic resources in order of preference is electronic books (43.6%), electronic databases (34.5%), DVD/CD-ROMs (16.3%) and other electronic resources (7%). Another similar related study in India by Naqvi (2012) revealed that very large majorities (70%) of the postgraduate students were well aware off the available databases and they also used these for their different purposes. Also a study by Dhanavandan, Esmail and Nagarajan (2012) regarding access to and awareness of ICT resources and services in the Medical College Libraries in Puducherry discovered that 87.33% of the respondents used electronic databases for the purpose of their research, while 61.33% of the respondents use the internet for communication purposes, 54.66% of the respondents use electronic databases for finding

relevant information, 34.66% of the respondents use electronic resources for career development and 20.66% of the respondents use electronic resources for other activities.

Contrary to the above, Ivwighreghweta and Onoriode's (2012) study in Nigeria, disclosed that students' use of open access journals is still far from what is expected. However, Baro, Endouware and Ubogu (2011) found that amongst the medical students at Delta State University in Nigeria the majority of the students are not aware and do not use the electronic information resources such as Medline, Health InterNetwork Access to Research Initiative (HINARI), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the Next Unit of Computing (NUC) virtual library as sources of information to retrieve materials related to medical literature.

In addition, a Pakistan study by Majid, Hayat, Patel, and Vijayaraghavan (2012) found that an overwhelming majority (91%) of the participating students were either 'mostly' or 'always' using web search engines for acquiring the needed information. This implies that the use of the internet is high; students may, however, be using unevaluated resources or may be using the internet for purposes other than academic purposes.

Kinengyere (2007) also carried out a study in Uganda to find out the effect of information literacy on the utilisation of electronic databases in selected academic and research institutions and found that some of the available databases have not been utilized at all. That is, users are not aware of the availability of such resources, they do not know how to access them, nor do they know what the resources offer. Another study in Uganda revealed that usage of electronic health databases was low and that there was a significant relationship between usage and information literacy (Kinengyere, Kiyingi & Baziraake, 2012). A similar study in Uganda confirmed these findings and reasoned that the frequency of use of these resources indicated that a lot needs to be done to increase electronic resource use (Gakibayo, Ikoa-Odongo & Okello-Obura , 2013).

In Malawi, Mawindo and Hoskins (2008) also noted that 'only a few electronic resources were actually used by the students', who 'preferred websites over the scholarly academic databases and e-journals'. Besides, a study in Dhaka, Bangladesh to investigate access and usage of scholarly electronic journals at Dhaka University Library (DUL) reports that there is a growing interest in electronic journal usage among the users at DUL (Islam, Alam & Sultana, 2011).

Studies on the use of electronic databases in South Africa appeared to be more focused on postgraduate students than on undergraduate students. For instance Hadebe and Hoskins (2010) established that the majority of Humanities, Development and Social Sciences (HDSS) master's students at the University of KwaZulu-Natal, Pietermaritzburg (UKZN-P) used electronic databases. Also, Soyizwapi and Hoskins (2009) found that while postgraduate students of the Faculty of Science and Agriculture at the University of KwaZulu-Natal, Pietermaritzburg used electronic databases, a few of the databases were not used.

From a Ghanaian perspective Dadzie (2005) found that the vast majority of students she surveyed preferred to use search engines like Google and Yahoo, while very few of them made use of the OPAC and the electronic databases the library subscribes to. However, seven years down the line, contrary to Dadzie's findings, an unpublished study carried out by Apenteng-Obese (2012) revealed that out of the total number of students' surveyed, the majority of the students knew of electronic databases which to them constitute the electronic resources available to the University of Ghana Dental School (UGDS) library. The study further revealed that most library users were aware of electronic resources through their colleagues or friends and not through the library orientation or library staff. This implies that seven years down the road there has been a paradigm shift among students as far as the use of electronic databases is concerned. And finally the most current and recent study in Ghana by Kwadzo (2015) revealed that graduate students of the Departments of Geography and

Development Resources and Information Studies were very much aware of the databases available to them and that they use them as indicated by 96.9% and 93.8% of graduate students respectively.

Table 2.2 gives a summary of literature from a developing country standpoint and this is arranged by country in alphabetical order showing first the country, followed by the author(s), the research title and their respective contribution to knowledge.

Country	Author	Title of research	Contribution and recommendations
Bangladesh	Islam, Alam & Sultana (2011	Access and usage of electronic journals in Dhaka University Library DUL): an empirical study	The results reflect a growing interest in electronic journals among the faculty members and the students of Dhaka University.
Ghana	Dadzie (2005)	Electronic resources: access and usage at Ashesi University College: Campus-wide Information Systems	The introduction of information competency across the curriculum and/or the introduction of an one-unit course to be taught at all levels and the provision of more PCs on campus.
Ghana	Apenteng-Obese (2012)	Investigation on the use of E-resources by Faculty and Students of University of Ghana Dental School (UGDS)	Libraries should swiftly but systematically move to automate their routines such as creating an enabling environment in order to facilitate ease and wider access to electronic resources.
India	Bhat & Mudhol (2014)	Use of e-resources by faculty members and students of Sher-E-Kashmir Institute of Medical	The governments and the management of the concerned medical institutions should support and encourage the

		Science (SKIMS)	libraries and librarians by framing the necessary policies, developing standards and procedures and encouraging specialisation, with an emphasis on electronic resource organisation and control, so that the medical librarians will be enabled to render more productive and efficient services.
India	Manhas (2008)	Use of the internet and electronic resources for dental science information: a case study	The Internet and allied technologies should be included in the curriculum of dental sciences.
India	Naqvi (2012)	Use of electronic databases by postgraduate students and research scholars at GBPUAT Library, India	Due to the paradigm shift in services offered throughout the world, university libraries should subscribe to a large number of databases and other e-resources. More networked computers should also be purchased and installed in the library with appropriate packages or software for searching and browsing the needed information.
India	Dhanavandan *et al*. (2012)	Access and awareness of ICT resources and services in Medical College Libraries in Puducherry	The respondents use electronic resources for their research/study and communication purposes respectively. The study indicated that respondents

			use Google to access information on the Internet and however stated that when it comes to accessing current up to date information they use electronic resources knowing the benefits of it.
Malawi	Mawindo & Hoskins (2008)	Use of print and electronic resources by students at the University of Malawi College of Medicine	Users have a choice between print and electronic resources. At the same time, the use of these resources is determined by what is available to the users and what the users prefer.
Nigeria	Ivwighreghweta & Onoriode (2012)	Awareness and use of open access journals by LIS students at the University of Ibadan, Nigeria	Postgraduate school authorities with strong collaboration of heads of departments should intensify efforts in the creation of awareness of existing research/study aids under which open access journals fall. Such efforts would bring about the practical implementation of an aspect of library functions that talked about awareness creation through workshops or conferences.
Nigeria	Baro, Endouware & Ubogu (2011)	Awareness and use of online information resources by medical students at Delta State University in Nigeria	Librarians and faculties in the College of Health Sciences need to intensify their efforts to create awareness of scholarly online resources such as

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			Medline and HINARI and teach the students the required skills needed to use them effectively.
Pakistan	Majid, Hayat, Patel & Vijayaraghavan (2012)	Information needs and seeking behaviour of Business students	Academic libraries and business schools can collaborate to develop basic information literacy skills among their students which will be useful in the proper identification, selection, acquisition, evaluation and use of high quality information.
Pakistan	Arif & Ameen (2011)	Library electronic resources' use – students' attitude: technology acceptance model	The research concludes that digital libraries are offering a wide range of new access opportunities that are absent in the traditional environment.
South Africa	Hadebe & Hoskins (2010)	Information seeking behaviour of master's students using library electronic databases in the Faculty of Humanities, Development and Social Sciences of the University of KwaZulu-Natal	Recommendations for the library include ensuring that training or user education is ongoing and meets all the various users' needs; improving students' access to the databases by limiting the need for passwords.
Uganda	Okello-Obura & Magara (2008)	Electronic information access and utilization by Makerere University in Uganda	The study concluded that a concerted effort is needed by both LIS lecturers and university librarians in promoting use of the library's electronic resources.

Uganda	Kinengyere (2007)	The effect of information literacy on the utilization of electronic information resources in selected academic and research institutions in Uganda	Information literacy (IL) is vital in influencing utilisation of electronic resources. Information professionals are needed to pass on IL skills to library users, while library users should endeavour to find out what information is available online for their consumption.
Uganda	Kinengyere, Kiyingi & Baziraake (2012)	Factors affecting utilisation of electronic health information resources in universities in Uganda	E-resources are important in medical education because they support study and research. Addressing their utilisation therefore improves library services, study, research and ultimately, healthcare.
Uganda	Gakibayo, Ikoja-Odongo, & Okello-Obura (2013)	Electronic information resources utilisation by students in Mbarara University library	Students need to be encouraged by their lecturers to use e-resources for reference to enable them to use and locate these resources. This may increase the number of students acquiring the necessary information retrieval skills.

Table 2.2: Use of electronic databases in developing countries

In effect, all the studies reviewed shows that interest in electronic databases is highly desirable and that it might lead to increased productivity of work, learning, teaching and

research. Notwithstanding the lack of information literacy skills most students had to contend with as they use electronic databases.

2.3.2 Students' preference for electronic databases and other sources

There are several electronic databases and in the literature a number of studies have addressed students' preferences as far as these electronic databases are concerned. This section of the literature analysis focuses on databases mostly used by students and their preferences for other sources.

2.3.2.1 Most used databases and preferences for other sources in developed countries

In some advanced countries databases appear to have received a favourable amount of responses for usage while in others participants preferred the use of web sites. For instance, in Iran databases such as available through Elsevier, Thomson, Scopus and Proquest were the most utilised among students of Tehran University of Medical Science (TUMS) (Anaraki & Babalhavaeji, 2013).

In Greece a study by Togia and Tsigilis (2010) found that the vast majority of their participants used Internet search engines rather than specialised databases and full-text resources. It is quite interesting, that nearly half of the respondents (49.1%) had never used ERIC, the fundamental resource of education literature. A study conducted in Baltimore by Van Scoyoc and Cason (2006) found that undergraduate students depended predominantly on Internet sites and online instruction modules such as Blackboard or WebCT when it comes to their research instead of the university's funded research sources (Van Scoyoc & Cason, 2006). The underutilisation of electronic databases has also been highlighted by Rehman and Ramzy (2004), who studied health care professionals at the Health Science Centre of Kuwait University. Rehman and Ramzy (2004) found that Medline was the most heavily used source, followed by electronic journals. However, Freeman, Lauderdale, Kendrach and Woolley

(2008) found that with Google Scholar and PubMed, roughly 52% and 15% of respondents indicated that they do not use them.

2.3.2.2 Most used databases and preferences for other sources in developing countries

In developing countries studies on most used databases and preferences for other sources in developing countries appears to be very scanty. A study by Naqvi (2012) indicates that electronic databases such as AGRIS, AGRICOLA, CAB Abstracts, and agriculture and natural resources were highly used among the postgraduate students in India. In Nigeria, Baro, Endouware and Ubogu (2011) found in their study that none of the students they interviewed mentioned using medical databases like Medline, CINAHL and HINARI.

2.4 SEARCH SKILLS OF STUDENTS

The ability to search electronic databases depends largely on the searching skills of users. In other words, searching proficiency is associated with building interest in the use of electronic databases. For instance a study by Wildemuth, Bliek, Friedman, and File (1995) showed that little evidence exists on the relationship between personal domain knowledge and searching proficiency (i.e., search results, selection of search terms, improvement in selection of search terms over the course of the search, and efficiency). Search results, selection of search terms, and efficiency were found to be related to database-assisted problem-solving performance. In other words, one may be able to solve database-assisted problems when one is well vested in searching.

Another study, which examined two groups of nursing students on how they evaluate information from selected bibliographic databases and Internet sites indicated that both groups had a poor understanding of the use of important search and evaluation techniques (Jacobsen & Andenaes, 2011). Similarly, Lwehabura (2008) found that students from

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Tanzanian universities lack adequate knowledge and skills in some aspects of electronic-databases, including searching and evaluation.

Apenteng-Obese (2012) also added that inadequate searching skills hampered the use of electronic databases by final year students at the University of Ghana, Dental School (UGDS), Korle-Bu. Oyewo and Bello (2014) also confirmed among others that lack of guidance on use, and poor computer literacy skills were some of the constraints affecting students' accessibility.

Thus, Chu and Law (2005) underscored the importance of ensuring that searchers have adequate searching skills and this may develop as they become familiar with the databases. They found that many students were initially unfamiliar with many of the databases important to them and that as familiarity developed during the year it contributed significantly to their development of information search expertise.

2.5   CHALLENGES THAT IMPACT STUDENTS' USE OF ELECTRONIC DATABASES

It is also important to know the problems that are faced by the postgraduate students and research scholars in using electronic databases. The analysis of tabulated data reveals that the majority (53.97%) of the postgraduate students in a study in the University of Malaya Kuala Lumpur had problems due to lack of guidance while using electronic databases, followed by slow downloading (25.40%), whereas 31.11 percent (31.11%) of the research scholars also faced connectivity problems in using electronic databases (Janaki & Mohamed, 2007).

Electronic databases were reported as the most widely used resource by Kanniyappan, Nithyanandam and Ravichandran (2008), who concluded that most of the respondents faced problems in fully exploiting digital resources mainly because they did not get enough training to use them. Togia and Tsigilis (2009) again found that the main problem associated with the non-use of resources was a lack of adequate searching skills. To Baro, Endouware and Ubogu

(2011) the challenges that impact on students' use of electronic databases in Delta State University in Nigeria were as a result of a lack of training in information literacy skills and ineffective user education programmes in the medical libraries and medical schools to equip the students with the necessary skills to use the medical databases and other electronic database resources. Ahmed (2013) also found that students identified limited access to computers and slow download speed as major problems. Dadzie (2005) also found in her study that the low usage of these resources was attributed to inadequate information about the existence of these library resources.

2.6   RELEVANCE OF FINDINGS FOR PURPOSES OF THIS STUDY

From the literature in the preceding section regarding the use of electronic databases by students, most used databases by students and their preferences for other sources, searching skills of students and challenges that impact on their use of electronic databases have been analysed from other studies. Issues that stand out and that need to be pursued in a study on the use of electronic databases at the College of Health Sciences are: Do students in the College of Health Sciences know of the various databases to which the college subscribes?; If they know, are they making good use of them?; If yes, how has that impacted on their academic work?; If not, what are the hindrances they experience with the use of the electronic databases? In addition a lesson learnt from this analysis is that librarians need to take responsibility to ensure that students from all walks of academic life make use of a university's subscribed electronic databases in their academic discourse particularly in developing countries.

2.7   FRAMEWORK TO GUIDE THIS STUDY

The study took note of a number of models on information behaviour and information seeking and was guided by one of Wilson's models which addresses information needs and

seeking namely, the 1996 model (Case, 2007: 127; Wilson, 1999: 257). The model is depicted in Figure 2.1. Another model noted were the Leckie, Pettigrew, and Sylvain model dealing with the information seeking of professionals (Case, 2007: 127). The model recognises that it is a professional's needs that will create an awareness of information sources and/or content and will motivate him/her to look for those sources. The study also favoured this model because it focuses on health students who are being trained to become healthcare professionals in the near future and will seek information into diverse health areas as they work as Physicians, Dentist, Gynaecologist and Pharmacist amongst others. Also the Bystrøm and Järvelin model (dealing with task-related information seeking) indicates that whether a person will continue to seek information to fulfil a task is dependent on the extent to which he/she sees the task as complicated (Case, 2007:128,130,133). Again because at times due to the complex nature of information needs of health students (especially during their clinical levels) are often faced with special health complications of patients and need special information to solve it.

This can be addressed by the Bystrøm and Järvelin model (Case, 2007:128,130,133). The Wilson 1996 model however was particularly useful for this study because of the following characteristics: it draws on a variety of fields other than Information Science such as; Decision Making, Psychology, Innovation, Health communication and Consumer research applicable to several contexts, roles, and disciplines and is well established in the field. In addition the model includes intervening variables that can improve or otherwise deter the total process of information-seeking behaviour, including acquisition and use of information (Tury, Robinson & Bawden, 2015).

Context of Information need → **Activating mechanism** → **Intervening variables** → **Activating mechanism** → **Information seeking behaviour**

- Person-in-context
- Stress/coping theory
- Psychological
- Demographic
- Role-related or interpersonal
- Environmental
- Source characteristics
- Risk/reward theory
- Social learning theory
  - Self-efficacy
- Passive attention
- Passive search
- Active search
- Ongoing search

Information processing and use

Figure 2.1: Wilson's 1996 Model (Case, 2007:137; Wilson, 1999:257)

From the model above, the following were specifically addressed in the empirical component for this study: Person in context of the information need and what served as intervening variables to the use of electronic databases in the College of Health Sciences.

2.8 CONCLUSION

With reference to the preceding discussion, it is evident that to some extent students in both developed and developing countries use electronic databases. There are, however, also concerns in some academic contexts that they do not make effective use of electronic databases. In order to fully support the use of electronic resources by students, there is the need for them to recognise the usefulness of electronic databases to their field of study. In addition, librarians should also ensure that they identify all the intervening variables that impact the use of electronic databases in a specific context, such as a specific library and institution to enable them to address problems in using electronic databases. Librarians also

need to consider the contexts of students' information needs, information seeking and information searching behaviour when using electronic databases.

CHAPTER 3: RESEARCH METHODOLOGY

3.1   INTRODUCTION

This chapter seeks to describe the approach employed to collect and analyse data for the study. The methodology covers research design, population of study, sample and sampling techniques, research methods, and instruments for data collection, data analysis and ethical considerations.

3.2   RESEARCH DESIGN

A research design describes a framework or approach for the collection and analysis of data. A research design may deal with the entire research process from preconceiving a problem to the literature review, research question, methods and conclusions (Harwell, 2011). The selection of a particular research design is dependent on how the researcher prefers the outcome of the study to be (Bryman, 2012). A research approach may be quantitative, qualitative or mixed methods.

3.2.1   Quantitative approach

This study adopted a mostly quantitative research approach to the use of electronic databases by final year students of the University of Ghana, College of Health Sciences, Korle-Bu Teaching Hospital. According to Harwell (2011) 'quantitative research methods attempt to maximize objectivity, reliability and generalizability of findings and are typically interested in prediction'. A main feature of quantitative studies is the use of tests or surveys to collect data. There are different types of surveys such as longitudinal, cross sectional, prospective, retrospective and experimental surveys, amongst others (Bowers, 2008). Some benefits are that it is more efficient and has the ability to test research hypothesis and enables the

researcher to objectively distinguish the study from the subject matter. However quantitative research may lack theoretical in-depth facts (McCursker & Gunaydin, 2015).

3.2.2 Cross sectional survey

A cross sectional survey was employed in this study to solicit responses on the use of electronic databases in the College of Health Sciences. According to Bowers (2008), 'a cross-sectional study aims to take a "snapshot" of some situation at some particular point in time, but notably data on one or more variables from each subject in the study is collected only once'. A cross-sectional survey selects sufficient variables according to background characteristics that are useful to determine relationships and associations (May, 2011). The cross-sectional approach was useful because it provided a quick snapshot of the use of electronic databases by final year students of the University of Ghana, College of Health Sciences. A cross-sectional study is generally quick and cheap to perform. It is mostly based on a questionnaire survey (Levin, 2006; Sedgwick, 2014).

3.3 POPULATION OF THE STUDY

The population for the study was the final year students of University of Ghana, College of Health Sciences. The total population of final year students of the College of Health Sciences was 642. A breakdown of the school's population is shown below in Table 3.1.

SCHOOLS	POPULATION
Biomedical and Allied Health Sciences	246
Medicine and Dentistry	146
Nursing	140
Pharmacy	44
Public Health	66

Total	642

Table 3.1: Population of final year students in the College of Health Sciences in 2015

3.4   SAMPLE AND SAMPLING TECHNIQUES

A sample represents a subgroup of a population. Sampling describes the tendency of the researcher to select subjects of the population that is correctly representative of the population. The data that is collected is then used as research information. In the selection of samples, each sample unit must represent the characteristics of a known number of units in the population to ensure representativeness (Latham, 2007).

Employing the right sampling method allows the researcher to reduce costs, conduct research more efficiently in terms of speed, provides greater flexibility and it ensures greater accuracy or minimizes bias (Pandey & Pandey, 2015). The two main categories of sampling techniques include probability and non-probability sampling. For the purposes of this research, a non-probability sampling method was used. The type of non-probability sampling method used in this study was a convenience sampling technique (Latham, 2007).

Convenience sampling was used to select individual respondents. Convenience sampling involves choosing respondents available at a particular point in time (Latham, 2007). The convenience sampling was used to help the researcher reduce the difficulty in locating respondents and speed up the time required in getting respondents.

The researcher administered a print-based questionnaire to the respondents at the end of lectures. All students were approached.

3.5   INSTRUMENT OF DATA COLLECTION

The only data collection instrument adopted for the study was a structured self-administered questionnaire (Appendix A). The reason is that questionnaires are inexpensive to administer. Questionnaires also permit a wider geographical coverage and thus are particularly useful

when undertaking a study with a population geographically scattered (Phellas, Bloch, & Seale, 2011). Questionnaires, however have been reported to experience problems of wrong answers, incomplete responses and sometimes answers may be illegible (Pandey & Pandey, 2015).

Self-administered questionnaires reduce problems of bias produced by the characteristics of the interviewer and the variability in interviewers' abilities The absence of the interviewer offers greater anonymity for the respondents (Phellas *et al*., 2011). When the topic of the research is sensitive or personal the use of a questionnaire can increase the reliability of responses (Phellas *et al*., 2011).

The self-administered questionnaire developed for this study contained questions that helped to collect data on the use of electronic databases by final year students of the College of Health Sciences University of Ghana. The questionnaire included open-ended questions and close-ended questions. Open-ended questions were asked without specific response options so that respondents could phrase answers in their own words and stress what they considered important. These questions could collect rich qualitative data that could reveal the complexity of the research problem.

On the other hand, the use of closed-ended questions has a structure imposed on the respondents' answers and provides the researcher with information which is uniform and lends itself to being quantified and compared. Section A of the questionnaire provided in Appendix A focussed on profile data, Section B covered awareness of electronic databases, Section C focused on the use of electronic databases, Section D dealt with the usefulness of electronic databases and Section E concentrated on problems experienced with the use of electronic databases.

3.6   VALIDITY AND RELIABILITY

Validity and reliability are the two main factors that any researcher should be concerned about while designing a study, analysing results and judging the quality of data (Leedy & Ormrod, 2005; Pickard, 2013).

Validity is the extent to which any measuring instrument measures what is proposed to be measured. It can also be about the association between what is being measured and the nature and use to which the measurement is being applied (Thatcher, 2010).

The researcher ensured the validity of the items in the questionnaire by having a pilot-test with students with the same characteristics as the respondents used for the study. A few questionnaires were administered to students in the library and checked for consistency to fine-tune the items in the questions. The researcher found that there were no ambiguity and no repetition of questions which may have distracted the respondents from providing the appropriate responses to the items. As far as possible the researcher avoided the use of leading questions which can distract the instrument from measuring what was intended. The questions were also based on findings from the literature review.

Reliability on the other hand is the extent to which an experiment, test, or any measuring procedure yields the same result in repeated trials (Thatcher, 2010). To ensure reliability in this study, the researcher tested the validity and feasibility of the items in the questionnaire.

3.7   DATA ANALYSIS AND PRESENTATION

Quantitative methods of data analysis can be of great value to a researcher who endeavours to draw meaningful results from a large body of data.

Quantitative data analyses involve the use of statistical methods to assemble, classify, analyse and summarize the data so as to derive meaning (McCusker & Gunaydin, 2015). The researcher used percentages, tables and graphs to describe the data collected. The results of a quantitative analysis are used to describe the variability of the significant findings among a

larger population, and thus the results can be generalised to the population under study (Guest, MacQueen & Namey, 2012). The data collected from the questionnaires were analysed in SPSS. According to Robbins (2012) SPSS was designed specifically for statistical processing of large amounts of data at an empirical level. An advantage of this specialized design is that SPSS maintains calculated statistics and graphs separate from the raw data. The SPSS software furthermore provides a convenient platform for performing statistical tests as compared to other statistical software. Another advantage of SPSS is that it links numerically coded data to its original meaning (Robbins, 2012). With most data being electronically stored in numerical fashion, this feature of SPSS is highly valuable.

The analysis commenced by checking the number of questionnaires collected from the field and by ascertaining whether the questionnaires have been properly completed by the respondents of the College. The items and the respective responses from the completed questionnaire were coded and entered on the SPSS spreadsheet to have data for the analysis. Responses given to the open and close-ended questions in the survey were edited to do away with errors and inconsistencies.

The descriptive analysis tool in SPSS was used in analysing the responses. In addition, an inferential tool Chi-square was employed to test any association between categorical variables related to the research questions. The qualitative data was also analysed by means of a thematic analysis to identify main issues or themes. Thematic analysis is essential to identify classifications and discover themes or patterns regarding the research data (Braun & Clarke 2006). Also it demonstrates the research data in great detail and addresses various issues through interpretation and provides the prospect to understand the potential of any issue more broadly (Alhojailan, 2012).

3.8 PILOT STUDY

Data collection began with a pilot study during which the suitability of the research instruments for the study was tested (Creswell, 2009). This was conducted using ten students of the College of Health Sciences to enable the researcher to check for inconsistencies (refer to 3.6).

3.9 ETHICAL CONSIDERATIONS

Ethics in research is the study of morality; thus the study and analysis of what institutes good conduct or morals (Schneider, 2006). In this study the researcher took several actions to adhere to ethical considerations, namely:

i. The researcher administered the questionnaire to the respondents at the end of lectures. All students in the class were approached.

ii. Participation in the research was completely voluntary. To ensure that respondents could give informed consent, the researcher explained the purpose of the study to the respondents. All who participated signed an informed consent form.

iii. The researcher ensured that there was no harm to the research participants. Anonymity and confidentiality was ensured. Anonymity was insured by not asking respondents for their names or other identifying information. All results are reported in aggregate format in the next chapter, and no names of individuals are noted in reporting the findings. Data were locked away safely. Computer files with data were password protected.

3.10 CONCLUSION

This chapter outlined the methodology for this study. In addition it stated the study population, gave the sample and sampling techniques used, the instrument of data collection, and how the pilot study was done. It also covers the validity and reliability of the study, data analysis, and ethical clearance. In the next chapter, data analysis and the reporting of findings are covered.

CHAPTER 4: RESULTS AND FINDINGS

4.1 INTRODUCTION

This chapter reports on the data collected by applying the methodology, methods, and the instrument for collecting data as explained in the previous chapter. Analysis of the findings according to the research sub-questions is covered in this chapter. The main research problem was *How are final year students at the University of Ghana College of Health Sciences using electronic databases?* The sub-questions included:

- What has been reported on the use of electronic databases by students in academic contexts covered by the literature analysis?

- What are final year students at the University of Ghana College of Health Sciences' level of awareness of electronic databases and other electronic information resources?

- Which electronic databases are used by final year students at the College of Health Sciences?

- Which challenges impact on final year students of the College of Health Sciences as they use electronic databases?

4.2 SUMMARY OF HOW THE DATA WAS COLLECTED

Prior to the conduct of the research, ethical approval was obtained from the University of Pretoria's Department of Information Science Research Committee, on behalf of the Faculty of Engineering Built Environment and Information Technology (EBIT), Research Ethics Committee, as well as from the institution where the survey was conducted. Upon explanation and obtaining informed consent, questionnaires were administered to the 4th year final undergraduate and final year postgraduate students for 2-3 subsequent lectures for each subject in the respective schools of the College of Health Sciences, namely: School of

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Medicine and Dentistry, Pharmacy, Nursing, Public Health and School of Biomedical and Allied Health Sciences. The data was collected from October, 2015 to November, 2015. Out of the population of 642 final year students of the College of Health Sciences, only two hundred and sixty-five (265) questionnaires representing 41 percent of the potential participants were administered because of the difficulty in finding respondents and because there was limited time to complete the data collection. Out of the total number of 265 questionnaires administered, 254 (96%) were returned and 242 (95%) were useful.

4.3   FINDINGS FROM THE QUESTIONNAIRE

The findings are presented according to the specific sections in the questionnaire. These sections range from A to F: under each main section are sub-questions on which the findings are reported. The main sections include A=profile data, B=awareness of electronic databases, C=use of electronic databases, D=usefulness of electronic databases, E=problems with the use of electronic databases, and F=suggestions to ensure effective and efficient use of electronic databases.

4.3.1   Profile data (Section A)

Under this section (Section A, questions one and two) respondents identified their individual schools and indicated their final year status.

There are five schools in total that make up the University of Ghana, College of Health Sciences: School of Medicine and Dentistry (SMD), Pharmacy, Nursing, Public Health and School of Biomedical and Allied Health Sciences (SBAHS). Out of the 242 respondents who took part in the study, the following numbers apply to the various schools: in the School of Medicine and Dentistry (SMD) (81/242, 33.5%), Pharmacy (17/242, 7%), Nursing (42/242, 17.4%), Public Health (14/242, 5.8%) and School of Biomedical and Allied Health Sciences (SBAHS) (88/242, 36.4%) respectively responded. The findings showed that the School of

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Biomedical and Allied Health Sciences had the largest number of respondents that participated in the study, i.e. 88/242 (36.4%). The profile data on the designated schools are shown in Figure 4.1.
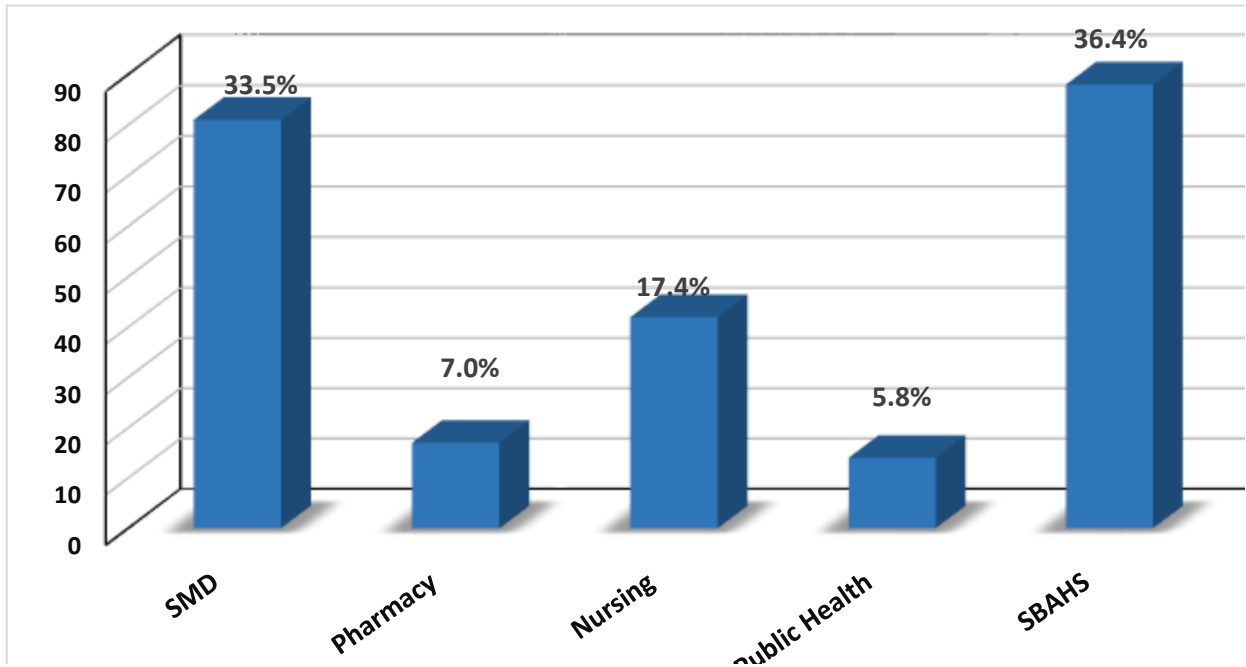
Figure 4.1: Responses according to schools in the College of Health Sciences

4.3.1.1 Final year students' status

The researcher ascertained the status of the final year students; either they are first degree final year or postgraduate final year students. The findings indicated that a majority of 137/242 (56.6%) of the total respondents were first degree finalist whereas 105/242 (43.4%) were postgraduate finalists. The results are shown in the Figure 4.2.

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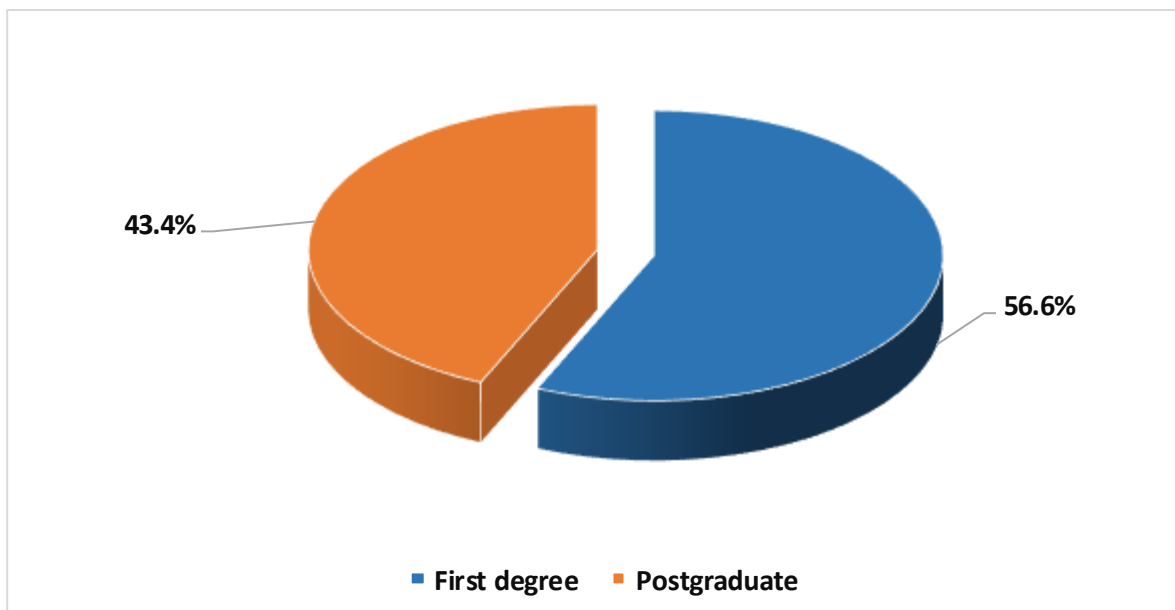
Figure 4.2: Status of final year students and their use of the databases

4.3.2 Awareness of electronic databases (Section B)

This section covered questions 3 to 6. For question 3 respondents specified 'Yes' or 'No' as to their awareness of electronic databases. If they answered in the affirmative they then indicated their source of awareness, frequency of usage of the electronic databases and they also specified the various types of electronic databases they are aware of. These were respectively covered in questions 3 to 6 (see Appendix A).

As for awareness of the electronic databases to which the College of Health Sciences Library subscribes, it was found that out of the total number of respondents (242), the majority of 189/242 (78.1%) were aware of the electronic databases, whilst 53/242 (21.9%) were not aware. Awareness of the electronic databases to which the College of Health Sciences Library subscribes was confirmed by a further statistical test. A chi-square test was appropriate to confirm the final year students' awareness of the electronic databases. When the probability (p) value is less than 0.05 then the test is considered statistically significant. From the analysis, it was found that the p-value was less than 0.05 ($p=0.000 < 0.05$). Thus the association between the two categorical variables; awareness of the electronic databases and

final year students' status was statistically significant. This means that the respondents were very much aware of the electronic databases of the College of Health Sciences (Chi-square value=16.61: *p*-value=0.000). Findings on the awareness of electronic databases are shown in the Figure 4.3.
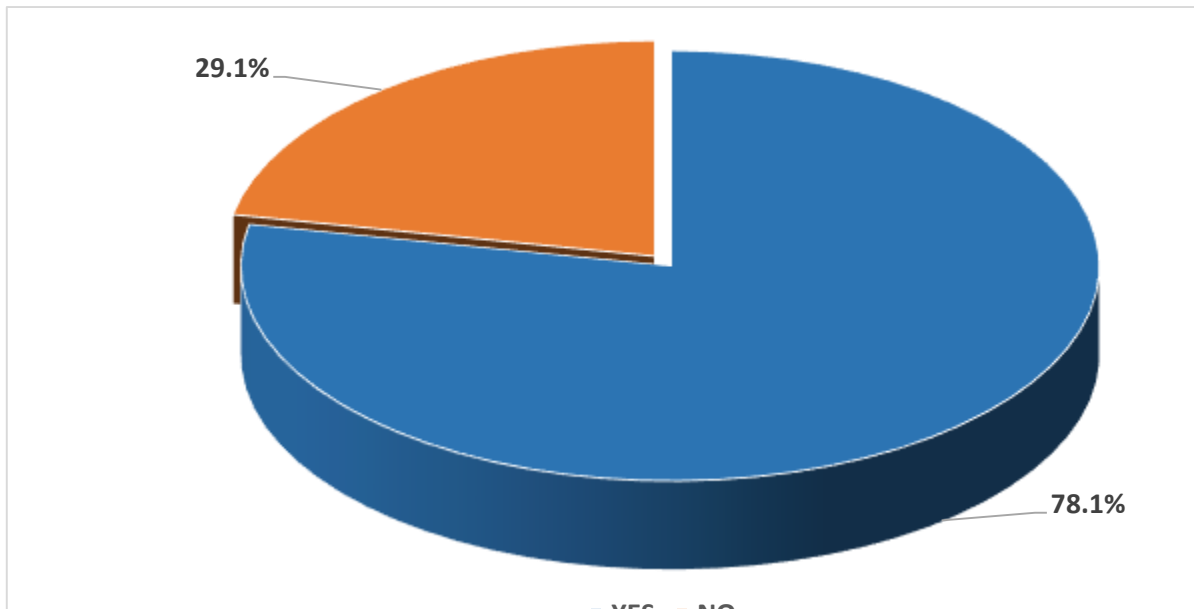
Figure 4.3: Students' awareness of electronic databases

4.3.2.1 Source of awareness of databases

Students who indicated that they were aware of the databases, were asked to tick as many options as applicable on how they got to know of the databases (Question 4 in Appendix A). It was found that 86/242 (35.5%) of the respondents were aware through library orientation, 25/242 (10.3%) through the library's website, 25/242 (10.3%) through notices, 63/242 (26.0%) through colleagues, 2/242 (0.8%) through newsletters, 74/242 (30.6%) through lecturers and 35/242 (14.5%) through library staff. The findings on the sources of awareness of databases are shown in Table 4.1

Sources of awareness	Frequency (%) N=242
Through library orientation	86 (35.5 %)
Through library website	23 (9.5%)
Through notices	25 (10.3%)
Through a colleague	63 (26.0%)
Through newsletters	2 (0.8%)
Through lecturers	74 (30.6%)
From the library staff	35 (14.5%)
Other ways (University of Ghana College of Health Sciences mail notices)	1 (0.4%)

Table 4.1: Sources of awareness of databases among the students

4.3.2.2 Frequency of usage of electronic databases among the students

The findings on the frequency of use as shown in Table 4.2 indicate that among the first degree final year students, 17/184 (9.2%) of the students 'never' used electronic databases, 35/184 (19%) showed that they 'seldom' used electronic databases, 31/184 (16.8%) 'occasionally' used them, 5/184 (2.7%) 'often' used them and 3/184 (1.6) used the electronic databases 'very often'.

Among the postgraduate final year students, 35/184 (19%) never used electronic databases, 34/184 (18.5%) 'seldom' used electronic databases, 11/184 (6.0%) 'occasionally' used electronic databases. None of the students indicated that they used electronic databases 'often'. Only 2/184 (1.1%) said they used electronic databases 'very often'. The results are shown in Table 4.2.

	Frequency of usage of electronic databases (%) N=184					Total
	Never	Seldom	Occasionally	Often	Very often	
First degree final year	17(9.2%)	35(19.0%)	31(16.8%)	5(2.7%)	3(1.6%)	91(49.3%)
Postgraduate final year	35(19.0%)	34(18.5%)	11(6.0%)	8(4.3%)	5(2.7%)	93(50.5%)
Total	52(28.2%)	69(37.5%)	42(22.8%)	3(7.0%)	8(4.3%)	184(99.8%)

Table 4.2: Frequency of usage of electronic databases

4.3.2.3 Awareness of specific electronic databases to which College of Health Sciences Library subscribes

Question 6 (see Appendix A) requested participants to specify which of the various electronic databases listed they were aware of. It was found that 119/242 (49.2%) were aware of HINARI, 68/242 (28.1%) of AJOL, 62/242 (25.6%) of EBSCOhost (Medline Complete, PubMed), 55/242 (22.7%,) of ScienceDirect, 16.1% of the Cochrane Library, 29/242 (12%) of CINAHL Complete, 29/242 (12%) of Oxford Journals, 18/242 (7.4%) of Royal College of Physicians, 17/242 (7%) of Sage Journals Online, 9/242 (3.7%) of Scopus (citation database). Chicago Journal, Mary Ann Liebert and Royal Society Journals Online represent 6/242 (2.5%) of the responses respectively. It was also found that from the responses 4/242 (1.7%) listed Optical Society of America, and 3/242 (1%) Project MUSE. None of the respondents were aware of Nature Publishing. A few (7/242, 2.8 %) of the respondents indicated awareness of other electronic databases such as Agora, OARE, Google, Google Scholar,

Medscape and Royal College of Nursing. The findings on the awareness of specific databases are shown in Figure 4.4.
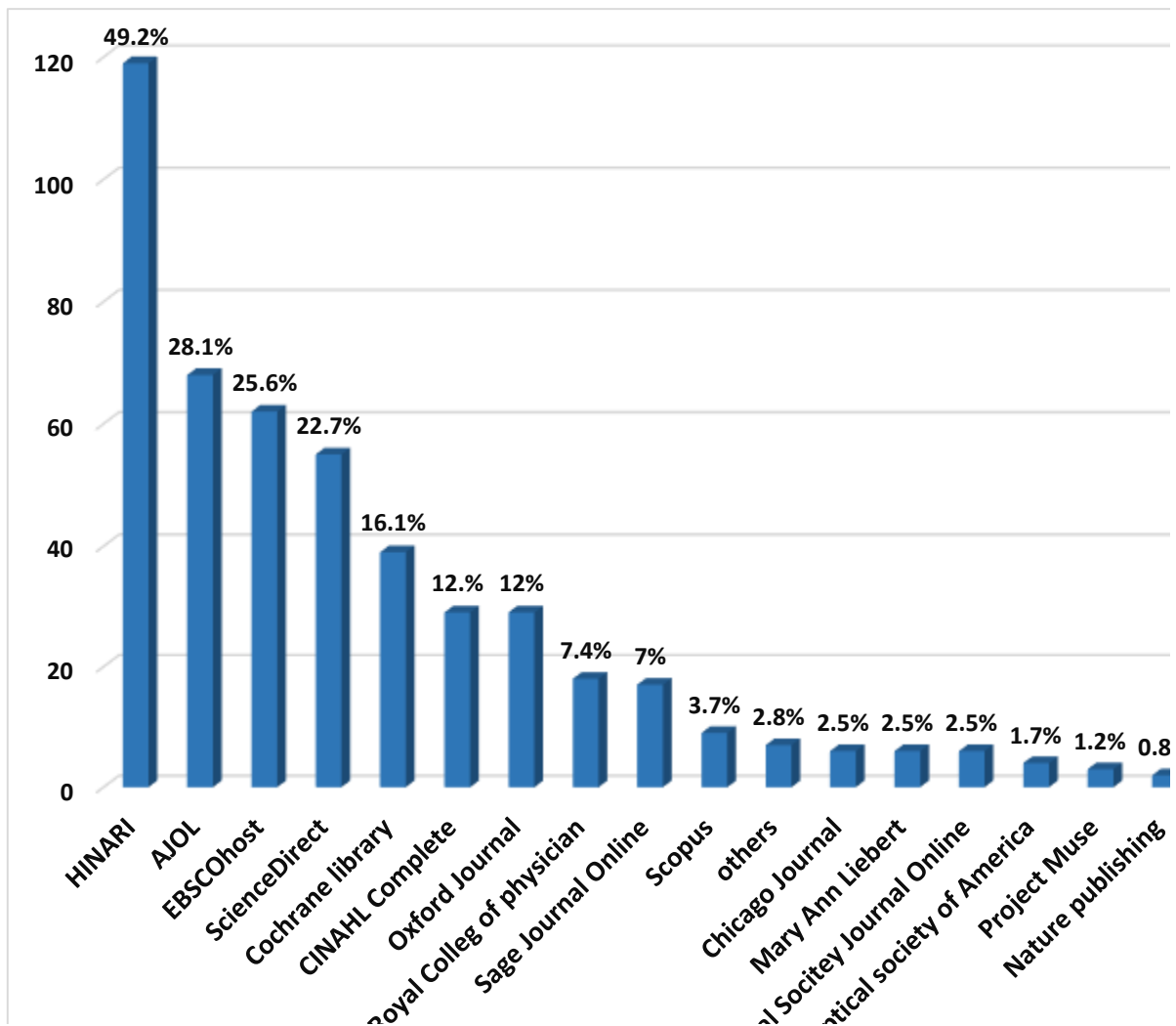
Figure 4.4: Awareness of specific electronic databases to which the College of Health Sciences Library subscribes

4.3.3 Use of electronic databases (Section C)

This section explored students' actual use of the various databases to which the College of Health Sciences Library subscribes. If participants indicated not using any of the electronic databases (i.e. Question 7 in Appendix A), they were asked to give reasons for non-usage by selecting all applicable options from a predetermined list (i.e. Question 8 in Appendix A). If a respondent indicated using the electronic databases he/she also had to select the purpose for

using electronic databases from a predetermined list (i.e. Question 9 in Appendix A). This was followed by a question on where the electronic databases are accessed (Question 10 in Appendix A) and the respondents' level of agreement on how often they use the databases (Question 11 in Appendix A).

For Question 7 (see Appendix A) on the use of electronic databases, respondents were asked to select all applicable options on the electronic databases they use. It was found that 82/242 (33.9%) of the respondents indicated that they do not use any of the electronic databases to which the College of Health Sciences Library subscribes whereas 61/242 (25.2%) use HINARI, 43/242 (17.8%) use AJOL, EBSCOhost (Medline Complete, PubMed), and ScienceDirect respectively. It was found that 19/242 (7.9%) use CINAHL Complete, 16/242 (6.6%) Oxford Journals, 12/242 (5%) Cochrane Library, 10/242 (4.1%), Royal College of Physicians, 8/242 (3.3%) Sage Journals Online and 7/242 (2.9) use Scopus (citation database). Finally 2/242 (0.8%) use Chicago Journal, Mary Ann Liebert and Royal Society Journals Online respectively. Respondents reported that they do not use Optical Society of America, Project MUSE and Nature Publishing. As for the use of other electronic databases not appearing in the list of databases to which the College of Health Sciences Library subscribes, there were responses from 7/242 (2.9%) who indicated that they used other databases such as Google Scholar, Karger, Medscape and search engine such as Google. The results of these findings are shown in the Figure 4.5.
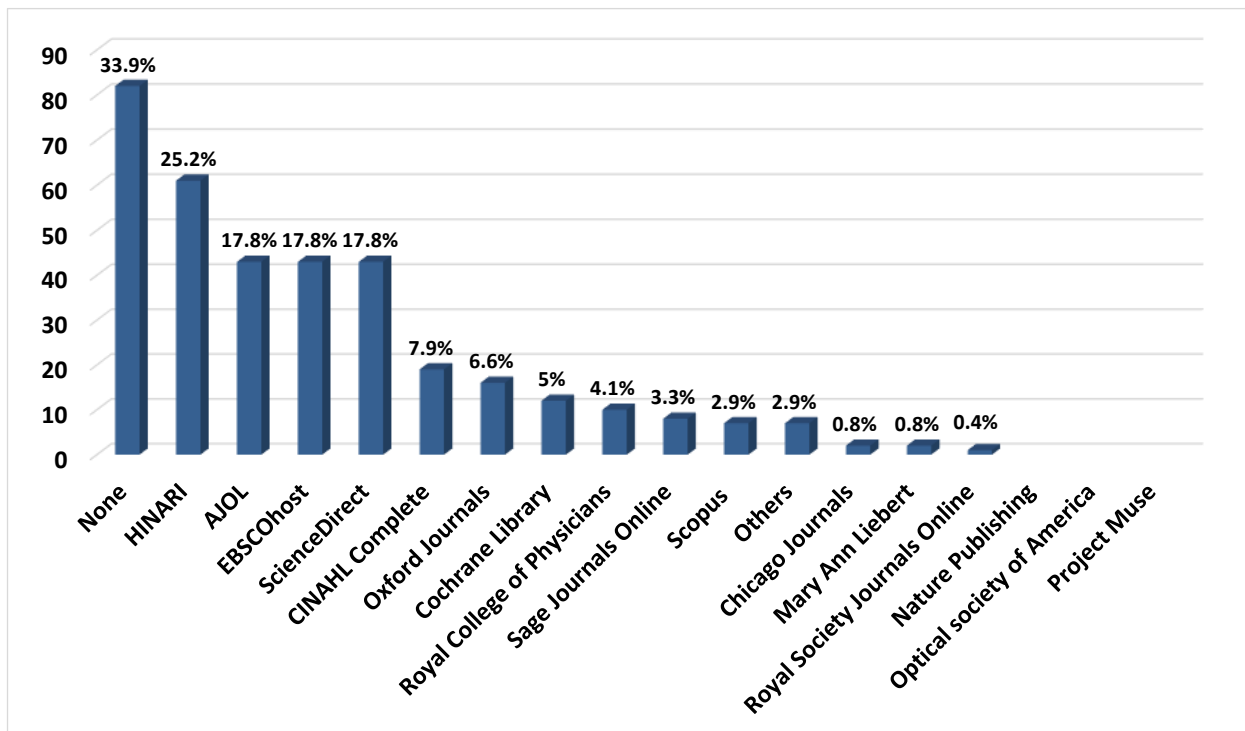
Figure 4.5: Actual use of specific electronic databases to which the College of Health Sciences Library subscribes

If respondents indicated not using any of the electronic databases, they then gave reasons for non-usage from the set of possible answers provided.

4.3.3.1 Reasons for not using electronic databases

Question 8 (Appendix A) asked respondents to indicate from a predetermined list of options their reasons for not using the electronic databases. Participants had to select all appropriate options. It was found that 72/242 (29.8%) indicated lack of guidance, 7/242 (2.9%) slowness in downloading the results, 20/242 (8.3%) Internet connectivity problems in using an electronic database, 35/242 (14.5%) lack of appropriate search skills, 19/242 (7.9%) limited access to computers, 2/242 (0.8%) information overload and 3/242 (1.2%) power surges. Some of the final year students had reported some difficulty in reading from the computer screen due to poor eye sight or preference for hard copy of information to electronic copy. Nevertheless, it was revealed that none of the respondents reported difficulty in reading from

a computer screen as a reason for not using electronic databases. An option was also provided for respondents to note other reasons for not using databases. The 6/242 (6.4%) respondents who noted other reasons mentioned apathy, unawareness, lack of Internet access in the hostels on Korle-Bu campus and lack of interest. The outcome of the above findings is shown in the Table 4.3.

Reasons for non-usage	Frequency (%) N=242
Lack of guidance	72 (29.8%)
Slowness in downloading the results	7 (2.9%)
Internet connectivity problems in using electronic database	20 (8.3%)
Lack of appropriate search skills	35 (14.5%)
Limited access to computers	19 (7.9%)
Information overload	2 (0.8%)
Power surges	3 (1.2%)
Difficulty in reading from computer screen	0 (0.0%)
Others (e.g. apathy, unaware, lack of internet access in the hostels, lack of interest)	16 (6.4%)

Table 4.3: Reasons for not using electronic databases

4.3.3.2 Purpose(s) of usage of electronic databases

If respondents indicated that they used the electronic databases they had to select the purpose for using electronic databases from a predetermined list of options (i.e. Question 9 in Appendix A); they had to select all applicable options. It was found that 104/242 (43.0%) used electronic databases to download articles, 111/242 (45.9%) to search for information for a research topic and related issues, and 85/242 (35.1%) to search for information for assignments. Also 56/242 (23.1%) used electronic databases to access information on a wide

range of health and science topics, 35/242 (14.5%) to access full text articles from peer reviewed publications and 31/242 (12.8%) to keep track of new information (e.g. alerting services). These findings are shown in the Table 4.4.

Purpose(s)	Frequency (%) N=242
Download articles	104 (43.0%)
To search for information for a research topic and related issues	111 (45.9%)
To search for information for assignments	85 (35.1%)
To access information on a wide range of health and science topics	56 (23.1%)
To access full text articles from peer reviewed publications	35 (14.5%)
To keep track of new information(e.g. alerting services)	31 (12.8%)

Table 4.4: Purpose(s) of usage of electronic databases

4.3.3.3 Location of accessing electronic databases

Question 10 requested respondents to select from a predetermined list of options the places where they access the electronic databases. The list of locations included the library, home, information centres, and hostels; respondents also had the opportunity to select other places. Participants could select more than one option. It was found that 71/242 (29.3%) accessed electronic databases from the library, 50/242 (20.7%) home, 19/242 (7.9%) information centres, 73/242 (30.2%) hostels, 6/242 (2.4%) from other places such as the School of Nursing ICT lab and anywhere on their iPads. Fifty four/242 (21.9%) selected more than one location of accessing electronic databases. The majority (73/242, 30.2%) of the respondents chose the hostel to be the place where they mostly accessed the databases, the next was the library (71/242, 29.3%), by more than one locations (54/242, 21.9%), home (50/242, 20.7%)

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and finally the information centre (19/242, 7.9%). Under others, a few 6/242 (2.4%) of the respondents indicated that they accessed electronic databases anywhere. The findings are shown in Figure 4.6.
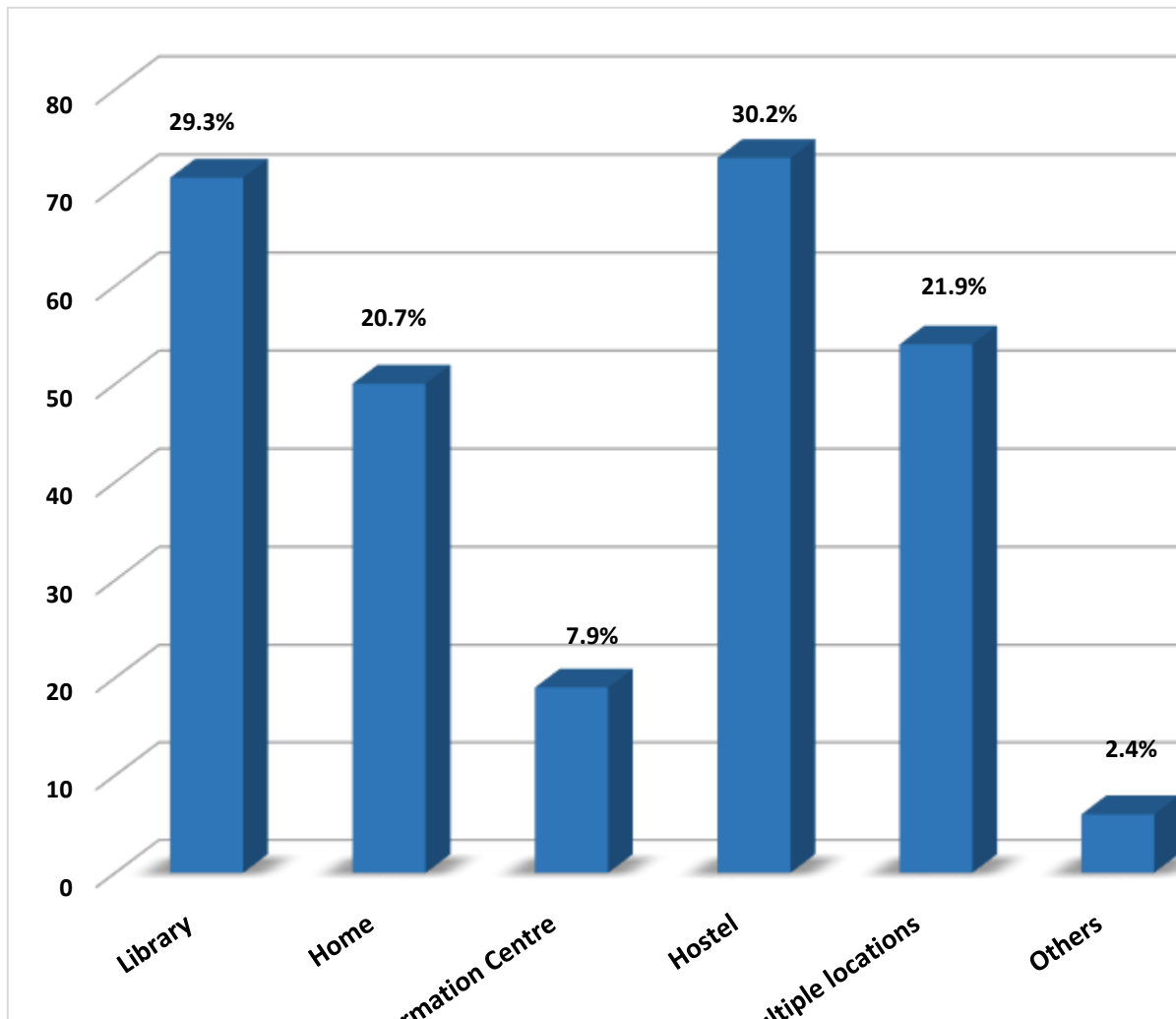
Figure 4.6: Locations for using the electronic databases

4.3.3.4 Level of agreement on the suitability of the electronic databases

Question 11 (see Appendix A) requested respondents to indicate their level of agreement to the use of the electronic databases. A four point Likert scale was used for respondents to agree whether the library's subscriptions meet their academic and research needs, and are appropriate for their level of studies or is not applicable. When asked to indicate, it was found that 11/242 (4.5%) of respondents strongly disagree, 29/242 (12%) disagree, 74/242 (30.6%)

agree and 13/242 (5.4%) strongly agree that the library's subscriptions meet their academic needs. Respondents were also asked to indicate the extent to which they agree that electronic databases are appropriate to their research needs. Seven/242 (2.9%) strongly disagreed, 30/242 (12.4%) disagreed, 75/242 (31.0%) agreed, and 12/242 (5.0%) strongly agreed. There was also a question on whether the library's subscriptions are appropriate for their level of studies and 9/242 (3.7%) strongly disagreed, 17/242 (7.0%) disagreed, 79/242 (32.6%) agreed and 16/242 (6.6%) strongly agreed. Although there was overall agreement that the subscription was useful, a small number (1/242, 0.4%) indicated that the databases were not applicable. For the rest (27/242, 11.2%) strongly disagree, 11/242 (4.5%) disagree, whilst 5/242 (2.1%) strongly agree that the library's subscriptions are not applicable. Respondents' levels of agreement on the suitability of the databases are shown in Table 4.5.

	Level of agreement frequency (%) N=242			
	Strongly disagree	Disagree	Agree	Strongly agree
The library's subscriptions meet my academic needs as final year student	11 (4.5 %)	29 (12.0%)	74 (30.6%)	13 (5.4%)
The library's subscription meet my research needs	7 (2.9%)	30 (12.4%)	75 (31.0%)	12 (5.0%)
The library's subscription are appropriate for my level of studies	9 (3.7%)	17 (7.0%)	79 (32.6%)	16 (6.6%)
Not applicable	27 (11.2%)	11 (4.5%)	1 (0.4%)	5 (2.1%)

Table 4.5: Level of agreement to the suitability of the electronic databases

From Table 4.5 it was clear that combining the strongly disagree and disagree, 16.5% of the students felt that the library's subscriptions do not meet with their academic needs. When

combining agree and strongly agree it was clear that 36% agree that the library subscriptions meet with their academic needs. Also combining strongly disagree and disagree, 15.3% of the students felt that the library's subscription do not meet their research needs. However it was evident that combining agree and strongly agree 36 percent of the students felt that the library's subscription meet their research needs. Finally, combining strongly disagree and strongly agree it is evident that 10.7 percent of the students felt that the library's subscriptions are not appropriate for their level of studies. And when agree and strongly agree were combined it was clear that 39.2% of the students felt that the library's subscriptions are appropriate for their level of studies.

4.3.4 Usefulness of electronic databases (Section D)

Under this section, the researcher wanted to determine students' perceptions on how electronic databases have improved respondents' learning and clinical activities by using a question with a number of options they could choose from, and what motivated them to use the databases.

Question 12 (see Appendix A) asked about how electronic databases have improved respondents' learning and clinical activities. Respondents were allowed to select more than one option from the list of predetermined options. From the responses 22/242 (9.1%) indicated that electronic databases had no impact on their learning and clinical activities, 109/242 (45.0%) specified improvement in the accessibility to information with regard to their learning and clinical activities, 76/242 (31.4%) indicated improved availability of current information with regard to their learning and clinical activities, 68/242 (28.1%) indicated enhanced quality of assignments and research with regard to their learning and clinical activities and 51/242 (21.1%) indicated increased access to the publications by experts with regard to their learning and clinical activities. Only one (1) respondent

representing 1/242 (0.4%) specified that electronic databases make searching for research articles easier. The findings are shown in Table 4.6.

Impact	Frequency (%) *N=242*
No impact	22 (9.1 %)
Improved accessibility to information	109 (45.0%)
Improved availability of current information	76 (31.4%)
Enhanced quality of assignments and research	68 (28.1)
Increased access to the publications of experts	51 (21.1%)
Others	1 (0.4%)

Table 4.6: Usefulness of electronic databases

4.3.4.1 Qualitative findings on motivation for using electronic databases

Questions 13, 16, 17 and 18 (see Appendix A) were open-ended questions; the intention was to collect qualitative data. The questions covered motivation for using electronic databases, perceptions regarding using electronic databases, suggested ways to deal with barriers to the use of electronic databases and additional comments and suggestions.

Question 13 (see Appendix A) asked what motivates the respondents as final year students to use the electronic databases to which the College of Health Sciences Library subscribes. Thematic analysis was used to analyse the responses. Four categories were noted from the responses on motivation to use the databases: (1) easy access; (2) availability of a wide range of information; (3) provision of reliable Internet connection; (4) provision of a reliable source of information. Each of these will be briefly explained, with supporting quotations from the respondents' answers. The responses of participants were not edited.

(1) **Easy access as motivation to use electronic databases**: It was found that 40/242 (16.5%) respondents were motivated to use the electronic databases because of easy access. They stated the following as motivating factors: 'Electronic databases is a quick and easy way to access information'; 'Easy accessibility to needed information pertaining to my assignments'; '…knowing that I will have access to research made by others to help me in my own project work'; 'Accessing information is easy'; and 'It is the easier way to get access to current information concerning nursing and modern research about nursing practice'.

(2) **Availability of wide range of information**: It was found that 54/242 (22.3%) were motivated due to the availability of a wide range of information. Amongst the many responses that were stated are 'To get more scholarly information'; 'To find enough information and related articles'; 'To find enough information and related articles'; 'The need to get adequate information for a good work done'; and 'It provides the information needed for my research, thus the availability of information'.

(3) **The provision of reliable Internet connections**: It was found that 5/242 (2.1%) were motivated to use electronic databases due to the provision of reliable Internet connections. Some responses were as follows: 'Free Internet'; 'Because of the improved internet accessibility and the variety of databases available for my project work'; 'Easy access to the internet and the provision of useful information when needed'; and 'Faster internet connectivity', amongst others.

(4) **The provision of a reliable source of information**: Finally it was found that, 7/242 (2.9%) were motivated to use electronic databases because they considered them to be a reliable sources of information. They noted the following: 'The electronic databases allow availability of current information and enhance quality of one's research'; 'Information in the databases [is] reliable and increase knowledge on

science topics'; 'To better my research and access quality information'; and 'I always get all the information I need from the database'.

Eighty three/242 (34.3%) of respondents did not state their reasons of motivation to use electronic databases.

4.3.5   Problems with the use of electronic databases (Section E)

At this section the researcher required the respondents to specify whether language was a barrier to the use of the electronic databases. It was found that 211/242 (87.2%) of the respondents indicated that language was not a barrier, 14/242 (5.8%) indicated that language was somewhat of a barrier, 11/242 (4.5%) indicated that language was a moderate barrier and 6/242 (2.5%) indicated that it was an extreme barrier. Findings are shown in Figure 4.7.
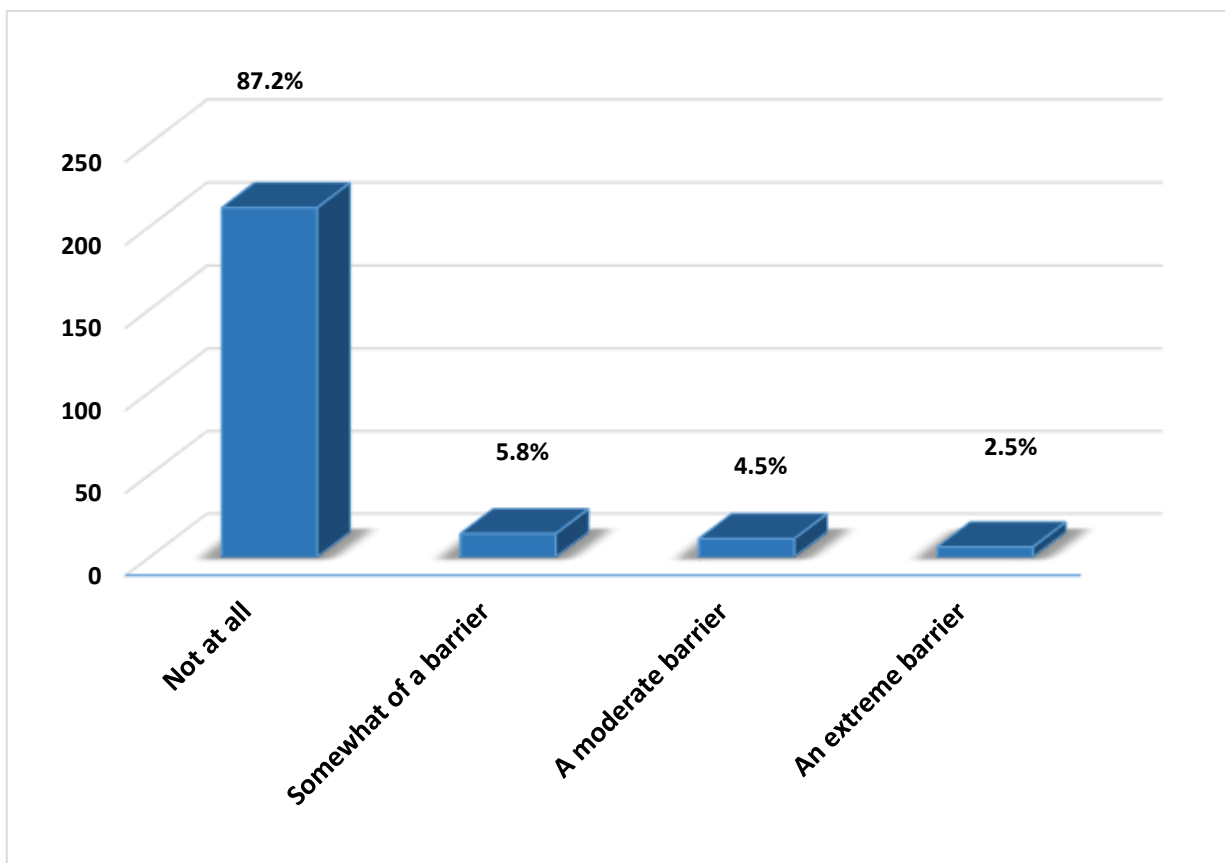
Figure 4.7: Language as a barrier to the use of electronic databases

4.3.6 Suggestions to ensure effective and efficient use of electronic databases (Section F)

In this section, question 15 (see Appendix A) the researcher sought suggestions on how to improve on the use of electronic databases. This was followed by a question on respondents' perceptions of the use of electronic databases. Respondents were asked to select ways to deal with barriers to the use of electronic databases from a predetermined list; they had to respond to all options. Respondents were also asked to write down any additional suggestions not appearing in the list. Respondents had to select all applicable options.

From the responses on ways to improve effective and efficient use of electronic databases, it was found that 192/242 (79.3%) indicated that awareness should be raised on the use of electronic databases, 167/242 (69.0%) selected training in the search and use of the databases, 115/242 (47.5%) marked provision of adequate networked computers, 66/242 (27.3%) indicated the provision of a stand-by generator to solve power problems, 112/242 (46.3%) selected providing more relevant databases for academic purposes, and 163/242 (67.4%) selected the improvement of Internet access as a means to improve effective and efficient use of electronic databases. A few respondents (12/242; 4.8%) added other suggestions. Among the other suggestions were the provision of (24hr) Internet access in the hostels on the Korle-Bu campus, making available access to full text articles and that orientation on the use of electronic databases should be an integral part of students' admission, the equipping of staff to help students, and the creation of a students' portal through which students can access databases remotely. The findings are shown in Table 4.7.

Suggestions	Frequency (%) *N=242*
Raising awareness	192 (79.3%)
Training in searching and using the databases	167 (69.0%)
Providing adequate networked computers	115 (47.5%)

Providing a stand-by generator to solve power problems	66 (27.3%)
Providing more relevant databases for academic purpose	112 (46.3%)
Improving internet access	163 (67.4%)
Others	12 (4.8%)

Table 4.7: Suggestions to improve effective and efficient use of electronic databases

4.3.7 Qualitative findings on perceptions of the use of electronic databases

Question 16 (see Appendix A) asked about the perceptions of respondents on their use of the electronic databases. Thematic analysis was used to analyse the responses. Six categories were noted from the responses on perception. Each of these will be briefly explained, with supporting quotations from the respondents' answers. Their answers were not edited.

(1) **Provision of training for students**: It was found that 3/242 (1.2%) perceived that training should be provided and the following were stated as some of the reasons: '… electronic databases are a very efficient strategy of getting authentic information about a subject so all departments in the college should invest in training students to use them'; 'Education is needed since it is not easily accessible'; 'It is good but a bit difficult to use when you are not adequately skilled'; 'I think it is a great idea, but there should be more information given to students on its relevance and how to access the database'; and '…more training is required to enable students make good use of the facilities or organising regular workshops'.

(2) **Reliable Internet access, giving easy access for use and a good platform for research**: It was found that 2/242 (0.8%) were concerned about the provision of reliable Internet connectivity. They noted the following perceptions: 'There will be more patronage if reliable internet facilities are provided in the hostels'; 'Inadequate internet access on campus has made the use of electronic databases redundant'. Forty eight/242 (19.8%) commented on the ease of access to databases as 'It's very useful

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in providing up to date information on my field of study'; 'It is very important for students to use electronic database since most information in them are relevant and useful in my nursing program'; 'Quick and easy way to access vital information'; 'It helps to get information faster'; 'Electronic databases helps a lot in terms of research work and assignments'; 'It helps in making technology available and convenient'. From the responses 71/242 (29.3%) revealed a perception that the use of electronic database provides a good platform for research and noted the following from the respondents: 'Electronic databases help accessing information on research topics and eases response'; 'The electronic databases helps a lot in terms of research work and assignments'; 'It provides a platform to search for academic materials'.

(3) **Incorporating the use of electronic databases into the College's curricula**: It was found that 2/242 (0.8%) stated that the use of electronic databases should be added to the college's curricula. Some were quoted as 'Creating a course for us to be able to learn its use is important'; 'It should be added as a course right from the first year of admission'.

(4) **Unawareness of the electronic databases**: It was further shown that 4/242 (1.7%) were unaware of the databases and share information on their perceptions including: 'I don't know what it is about; I just heard there is something by the name electronic database of the college, so I have not used it yet'; 'It would be useful if awareness is increased'; and 'It is not widespread or popular among the students'.

(5) **Challenges**: It was found that 27/242 (11.2%) had challenges such as 'It's educative but not easily accessible and needs technical guidelines'; '…available information on these databases are not updated enough to promote current literature searches'; 'Although it can be very helpful there are so many challenges, I view it as complicated and not motivating enough probably because I have very little

knowledge and skills in the use of electronic database'. 'Inability to filter necessary information', and 'It can be very useful but to obtain [a] password before access should be catered for' were also mentioned.

(6) **Apathetic regarding their perception on the use of electronic databases**: Finally, two participants were apathetic and stated 'I'm indifferent' and 'I'm apathetic'.

4.3.8   Findings on suggestions to deal with barriers to the use of electronic databases

Question 17 (see Appendix A) asked respondents to make suggestions on ways to deal with barriers to the use of electronic databases. Thematic analysis was used to analyse the responses. Five categories were noted from the responses on suggestions to deal with barriers to the use of electronic databases: Each of the categories will be briefly explained, with supporting quotations from the respondents' answers. Their responses were not edited.

(1) **Provision of a reliable Internet connectivity**: It was found that 30/242 (12.4%) suggested there should be provision for reliable Internet connectivity and noted the following: 'Fast and reliable internet access'; 'Each school should have its own Wi-Fi and the libraries should have adequate networked computers'; and '…making more computers available in the libraries and internet more accessible'.

(2) **Awareness and training**: It was found that 11/242 (45.9%) suggested that awareness and training should be done. Remarks included: 'Provision of "training"; "orientation"; "awareness", '…organise seminars to educate students on its use and improve Internet access on campus'; '…provide more education'; '…raise more awareness'; and '…inadequate time in training students'.

(3) **Provision of adequate open access journals**: It was found that 7/242 (2.9%) of respondents noted the need for the provision of adequate open access journals. Their suggestions included the following: '…restrictions to certain published works should

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be removed'; '…make more articles free from purchase', and '…make available full articles not just abstracts'.

(4) **Use of the electronic databases should be added to curricula of the college**: It was found that 2/242 (0.8%) suggested that the use of electronic databases should be added as part of the college's curricula.

(5) **Provision of alternative electric power supply in the college library:** One respondent suggested the need to provide alternative electric power supplies. The respondent remarked: 'Due to the frequent power failures there should be acquisition of a power generating plant'.

4.3.9 Qualitative findings on additional comments and suggestions from respondents

Question 18 (see Appendix A) required respondents to give further comments and suggestions. Most of the respondents repeated with emphasis some of the points noted for question 17. Thematic analysis was used for these responses. The comments provided are noted in a descending order of importance:

(1) Awareness and training

(2) Provision of reliable Internet connectivity

(3) Provision of open access journals

(4) Use of electronic databases should be part of the college's curricula

(5) Lecturers to advocate the use of electronic databases

(6) Finally: provision of an alternative power supply

From the above categories of additional suggestions, the only difference among the preceding Question (17) and the responses for Question 18 was category (5) "Lecturers to advocate the use of electronic databases". A respondent explained '…lecturers should be strict on the use of particular electronic databases when assignments are given'.

4.4 CONCLUSION

This chapter reported on the findings in the questionnaire in relation to the use of electronic databases by final year students (under-graduate as well as post-graduate) of the College of Health Sciences, University of Ghana. The researcher investigated respondents' level of awareness of electronic databases, their use of electronic databases, their perceptions on the usefulness of electronic databases and the problems with the use of electronic databases as well as their suggestions to improve effective and efficient use of electronic databases. In the next chapter, the researcher will focus on the discussions, conclusions and recommendations of the findings.

CHAPTER 5: RECOMMENDATIONS AND CONCLUSIONS

5.1 INTRODUCTION

In the beginning of this study, the first chapter commenced with an introduction and background. Chapter Two centred on the review of other works reporting on students' use of electronic databases. Chapter Three depicted the methodology employed to gather and analyse data for this study. In Chapter Four, the findings and an analysis of the data was reported. Chapter Five, the final chapter, aims at giving a summary of all the findings relevant to the research problem and sub-problems, a discussion of the findings, recommendations for theory and practice, suggestions for further research, and a conclusion on the use of electronic databases by the students of the University of Ghana College of Health Sciences − which might also indicate the use of electronic databases by the larger student population of the university.

5.2 SUMMARY OF FINDINGS ON RESEARCH PROBLEM AND SUB-PROBLEMS

This study was conducted in October, 2015 to November, 2015. It mostly employed a quantitative research approach with only limited qualitative data collected. The data required for this study was obtained from the final year students of the University of Ghana College of Health Sciences using a questionnaire. The population of final year students of the College of Health Sciences was 642 but only 242 participated in the study.

The study sought to find out how final year students of the University are using electronic databases. Thus the main research question was '*How are final year students at the*

University of Ghana College of Health Sciences using electronic databases?' The sub-questions included:

- What has been reported on the use of electronic databases by students in academic contexts?

- What are final year students at the University of Ghana College of Health Sciences level of awareness of electronic databases and other electronic information resources?

- Which electronic databases are used by final year students at the University of Ghana College of Health Sciences?

- Which challenges impact on final year students at the University of Ghana College of Health Sciences as they use electronic databases?

The majority of the participants (137/242, 56.6%) were first degree finalists of the College of Health Sciences. It was found that the majority 189/242 (78.1%) of the final year students of the University of Ghana College of Health Sciences were aware of electronic databases to which the College of Health Sciences subscribe. The main sources of awareness of the electronic databases indicated by the final year students were derived from library orientation, lecturers, colleagues, library staff and notices ranging between 10.3% and 35.5%. Among the electronic databases to which the College Library subscribes, the most known and used by the final year students were HINARI, followed by AJOL, EBSCOhost, ScienceDirect and Cochrane Library.

However, out of the majority of the respondents (78.1%) who were aware, 33.9% indicated they never used any of the electronic databases to which the College Library subscribes. The main reasons for non-usage were lack of guidance, lack of appropriate search skills and Internet connectivity problems in using electronic databases. Respondents who used electronic databases indicated that they used them for purposes of searching for information for a research topic and related issues, downloading articles and searching for information for

assignments amongst others. The impact of electronic databases indicated by the respondents included improved accessibility to information, improved availability of current information and enhanced quality of assignments. The majority of the students were motivated to use electronic databases because of the availability of a wide range of information and easy access. A significant number (211/242, 87.2%) of the final year students indicated that language was not at all a barrier to the use of electronic databases. The majority of the students perceived that the use of electronic databases provides a good platform for research and easy access, while others had challenges with the use of electronic databases. Raising awareness, training in searching and using the databases, improving Internet access and lecturers advocating the use of electronic databases were the key areas suggested by students to improve effective and efficient use of the electronic databases.

5.2.1 Student's level of awareness of electronic databases of the College of Health Sciences

Among the participants in the study, the majority belong to the schools of Biomedical and Allied Health Sciences, Medicine and Dentistry and Nursing. These schools also have a relatively higher population of students than the other schools in the College of Health Sciences.

According to the literature reviewed, the level of awareness of electronic databases among students as well as the availability of electronic databases differ from country to country and also differ according to disciplines. This study indicated a clear awareness of electronic databases to which the College Library subscribes. It was found that the majority of the final year students (78.1%) were very much aware of the electronic databases (Chi-square = 16.61: p-value = 0.000<0.05). This finding on the level of awareness was similar to a study by Kwadzo (2015) who revealed that graduate students of the Departments of Geography and Development Resources (96.9%, and Information Studies (93.8%) of the University of Ghana

were very much aware of the databases available to them. A study in India by Naqvi (2012) revealed that a very large majority (70%) of the postgraduate students were well aware of the available databases. However, in the Chu and Law (2005) study they found that numerous research students were initially unfamiliar with a considerable number of the databases vital to them. Furthermore, Baro, Endouware and Ubogu (2011) found that amongst the medical students at Delta State University in Nigeria, the majority of the students are not aware of the electronic information. More recent studies conducted depicted that users of information in an academic setting have become familiar or aware of the availability of electronic resources. This could possibly be due to the impact of information technology and the effort being made by institutions' libraries. In this study, it was found that sources of awareness of electronic databases by the majority of the students were through library orientation (35.5%), through lecturers (30.6%), through colleagues (26%) and from library staff (14.5%) [see Table 4.1]. With the 35.5% ascribed to library orientation it is clear that the College Library is having some impact on creating awareness. Out of the seventeen electronic databases provided by the College Library, the ones the students were mostly aware of were HINARI (49.2%), AJOL (28.1%), EBSCOhost (25.6%), ScienceDirect (22.7%), Cochrane Library (16.1%), CINAHL complete (12%), Oxford Journal (12%), Royal College of Physicians (7.4%), Sage Journal Online (7%) and Scopus (3.7%) [see Figure 4.4].

5.2.2 Electronic databases used by final year students at the College of Health Sciences

In this study, although it was revealed that final year students (78.1%) were very much aware of the electronic databases of the College of Health Sciences Library, it was however discovered that 33.9% of the respondents did not use the electronic databases to which the College Library subscribes. Thus, respondents who were found to use the electronic databases mostly used HINARI, AJOL, EBSCOhost, ScienceDirect, CINAHL complete, Oxford Journal, Cochrane Library, Royal College of Physicians, Sage Journal Online, Scopus

and other electronic databases. A few of the electronic databases (Optical Society Journal Online, Project Muse and Nature publishing) were not used at all by the students [Figure 4.5]. In Iran electronic databases such as provided by Elsevier, Thomson, Scopus and Proquest were the most utilised among students of Tehran University of Medical Science (Anaraki & Babalhavaeji, 2013). On the contrary, a study by Baro, Endouware and Ubogu (2011) found that medical students were not aware and do not use the electronic information resources such as Medline, Health InterNetwork Access to Research Initiative (HINARI), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the Next Unit of Computing (NUC) virtual library as sources of information to retrieve materials related to medical literature. Togia and Tsigilis (2010) also found that among education graduate students, a great majority of the participants used Internet search engines rather than specialised databases and full-text resources. In the respective studies conducted by Baro, Endouware and Ubogu (2011) and Togia and Tsigilis (2010), it was discovered that the majority of the students did not rely on the electronic databases provided by their respective institutions but on other sources. However, in this study among the respondents who used the electronic databases, only a very few (2.9%) used other electronic resources such as Google Scholar, Karger, and Medscape for their academic and research needs. This could therefore mean that the respondents who used electronic databases greatly relied on the electronic databases to which the College Library subscribes. Further statistical tests also showed that respondents who used the electronic databases to which the College Library subscribe did so often and there was no difference in frequency of usage between first degree and postgraduate finalists (Chi-square=16.94; p-value=0.002<0.05). Respondents who used the electronic databases stated that they were motivated to use electronic databases of the College Library because of easy access (16.5%), the availability of a wide range of information (22.3%), the provision of a

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reliable source of information (2.9%), and the provision of a reliable Internet connection (2.1%) [see Section 4.3.3.1].

Furthermore, the importance of electronic databases in the academic context cannot be overlooked. They are essentially required for different purposes. Reports have shown that students use different electronic databases for various purposes including research, communication, finding relevant information, career development and other activities. In this study, it was found that the majority of the respondents used electronic databases for the purposes of searching for a research topic and related issues. This finding is similar to the studies done by Romanov and Aarnio (2006) and Dhanavandan *et al.* (2012). Respondents also used electronic databases for downloading articles, searching for information on a wide range of health and science topics, keeping track of new information, and accessing full text articles from peer reviewed publications. As a results of this, respondents who used the electronic databases to which the College Library subscribes indicated their importance as having improved their learning and clinical activities, improved accessibility to information, improved availability of current information, enhanced quality of assignments and research and increased access to the publications of experts (see Table 4.6).

5.2.3 Challenges that impact on final year students of the College as they use the electronic databases

Although electronic databases have been reported on as widely used resources to serve various purposes in academic settings, users may encounter difficulties in fully using them. This study thus identified lack of guidance, slowness in downloading, Internet connectivity problems, lack of appropriate search skills, and limited access to computers, information overload, power surges and others as challenges faced by respondents who do not use the electronic databases subscribe to by the College Library. It was found that among respondents who did not use electronic databases, the majority of them lacked guidance while

using electronic databases, which impacts on their use. This finding is similar to the study by Janaki and Mohamed (2007). This undoubtedly, could be due to the limited time allotted to the library during the general orientation of the newly admitted students. Also, after this orientation, there is no subsequent training to further orient students on the use of the electronic resources. In addition, lack of appropriate searching skills was another major challenge faced by respondents on the use of electronic databases, as indicated also in Togia and Tsigilis (2009) and Baro, Endouware and Ubogu's (2011) studies respectively. With respect to this challenge, it was evident from their study that most of the library staff at the reference desk, the first access point of the college library, also lacked knowledge on the electronic databases and so cannot assist students on their use. Ahmed (2013) also found that students identified limited access to computers and slow download speed as major problems. However, in this study limited access to computers and slow downloads were not considered by students as major problems impeding their use of the electronic databases of the College Library. Language was not a problem at all to using electronic databases. Other major challenges perceived by respondents included lack of updated information on the available electronic databases, lack of knowledge and skills and the inability to filter the necessary and relevant information.

Respondents thus perceived and indicated that to overcome these challenges there should be provision of training, reliable Internet connections, provision of adequate networked computers, stand-by generators and more relevant databases for academic purposes and that lecturers should be advocates on the use of electronic databases and incorporate the use of databases into the College's curricula.

5.3   LIMITATIONS OF THE STUDY

This study was conducted among the final year students (under-graduate and post-graduate) of the College of Health Sciences. Therefore its findings may not extend fully to other

colleges of the University of Ghana. The study was limited to this college due to limitations of time and funds available. Again as far as the use of electronic databases is concerned, the study did not attempt to ascertain the searching skills and information seeking behaviour of the respondents. This might be a limitation, but needs to be approached due to its scope, as a separate study. Finally, this study employed mostly quantitative data with only limited qualitative data. Richer data could be collected with a stronger focus on qualitative data and using individual interviews and focus group interviews.

5.4   RECOMMENDATIONS

The study has identified a number of challenges that impede use of electronic databases by the final year students of the University of Ghana College of Health Sciences. In an effort to solve the various challenges indicated by respondents the following recommendations are made:

5.4.1   Recommendations for practice

In recent times, many academic libraries have been able to obtain full access to electronic databases and to retrieve all sorts of information, search remote online catalogues of other libraries, and share information sources with other organizations. Electronic databases perform crucial roles in all disciplines, and access and use of these resources is key to the users of any university library. Library users and their needs is one of the defining key subjects in digital library assessment. There are various measures needed to enhance and improve the use of electronic resources by students. The following practical recommendations to improve the use of electronic databases can be added: consultative or partnership meetings, collecting information on literacy and learning skills, brochures, guides, seminar and workshop training, and improvements on public relations. These will be briefly explained.

(1) Consultative or partnership meetings: Periodic meetings with faculty members, library staff and students can provide exceptional opportunities to share and exchange information. It is recommended that the College of Health Sciences Library explore the use of such meetings.

(2). At the time of writing the College administration, library, researcher and student representatives both under-graduate and graduate levels work hand in hand to provide orientation to all new students at the beginning of each academic year; however the time allotted is too short for practical sessions to be held. It will therefore be appropriate for the College Library to increase the time slot for the general orientation period.

(3) Brochures: It is recommended that a more attractive brochures detailing the electronic resources to which the college subscribes is prepared for distribution on a regular basis at all the various Schools.

(4) Guides on the use of electronic databases: Such guides can be both print-based and electronic. They can provide updated information on how to access and use library information services, including electronic journals, databases and books, database search skills and online catalogues and remote access to library resources. In order to reach a wide range of users in remote areas, the electronic guides are widely used. There is a web 2.0 content manager known as LibGuides to which many academic libraries subscribe which also promotes library resources to their users. Guides in all its forms are invaluable tools. Therefore the College of Health Sciences Library should provide a wide range of guides to their electronic resources to inform students of their latest additions.

(5) Seminars and workshops: The University of Ghana College of Health Sciences should plan and conduct seminars where resource persons from database providers and publishers could be invited to give lectures on the use of electronic databases. The library can also

organise regular workshops providing hands-on training with the use of electronic databases in order to enable students to improve upon their skills.

(6) Finally, the College Library should promote good public relations by maintaining a positive image with students, faculty and the entire campus community. For instance, library staff should be trained in public relations to take good care of users, to show professionalism in interacting with students, know the diverse users and satisfy their information needs in a timely and efficient way. A good marketing strategy is also recommended. In this respect Kotler's (2003) quote of the words of Stewart Henderson is worth noting: "doing business without advertising is like winking at a girl in the dark. You know what you are doing, but nobody else does". It is therefore recommended that an intensive marketing effort through posters, emails, and notices are adopted to publicise these electronic resources to increase the patrons awareness of the available resources be it newly acquired or add on. In view of the benefits of using electronic resources, under-utilization must be addressed by all stakeholders. Input to promote the use of electronic databases need to be collected from other stakeholders such as university top management, academic departments and other service departments such as human resource (Molopoyane & Fourie, 2015).

In this study, respondents indicated lack of guidance in the use of electronic databases as a major challenge. Thus the study recommends that means should be explored to enable students of the College to fully use the resources such as the databases; there should be adequate orientation for students. The time allotted to the College Library to provide orientation should be extended to enable students to be introduced to the electronic databases right from the onset of the various schools' academic programmes.

Lack of appropriate search skills is the second challenge noted by the respondents. In order to provide opportunities for students to gain the necessary skills, there should be regular formal training programmes organised by the library (from time to time) for all students in the

Schools of the College. Training should not therefore be limited to only newly admitted students. For consistent, efficient and effective training, the College administration should also have an allotted budget set aside for students' training. All these, when put in place could help to provide opportunities for students to improve their search skills in the use of electronic databases.

The challenge of slowness in downloading articles has also deterred many students from using the databases. With respect to this challenge, this study seeks to recommend that the College administration invests in bigger bandwidth to enhance downloads which could also increase the use of the databases. There should be a research commons, well furnished with laptops, air-conditioners and hotspots for graduate students to conveniently sit and access the electronic databases which could in turn enhance their research.

The issue of information overload should also be tackled with the provision of opportunities to gain the appropriate skills. It is evident that if students master the required skills to search the electronic databases, their use of the databases might increase.

Although electric power surges have been a general problem in Ghana for some time now, the College of Health Sciences can do well to curb that in the library. There should be an alternative power provision to back-up what the College Library already have so that any time the power outages occur or there is a drop in voltage, the standby plant will supply electric power to the whole library. To also ensure effective and efficient use of electronic databases, respondents were asked to choose from a predetermined list of suggestions. Most of the respondents indicated that orientation on the use of electronic databases should be an integral part of students' admission and library staff be well equipped to help students.

Furthermore, respondents' perceptions on the use of electronic databases gave a clear indication that the library alone cannot succeed in creating awareness to the use of databases. Lecturers are also to be trained to be campaigners for the use of these electronic databases.

The issue of raising the awareness level was significant in both suggestions indicated and perceptions by respondents. Even though most indicated that they were aware of the electronic databases to which the college subscribes, 33.9% stated they do not use them. This study recommends that serious attention is given to the awareness creation on the uses of the electronic databases to enable students to improve on their academic and research activities. Raising awareness should thus be aligned with examples demonstrating the actual value of using electronic databases e.g. case studies, and stories and experiences from users who use these databases on a frequent bases.

5.4.2 Recommendations for theory

Theories are a set of ideas that are properly presented with the intention to explain facts or procedures. Examples of theories that might hold value for studies of the use of electronic information sources are Affordance theory, Self-efficacy theory, and Theory of Reasoned Action (TRA) (Shidi, 2013). Based on the findings of this study it is suggested to use affordance theory to investigate the use of electronic databases in libraries. The framework for the study, Wilson's 1996 model, can also be adapted.

According to Norman (1999) affordance refers to the possibilities of the environment upon which one can act. They are action possibilities within an environment or the ways in which the environment allows one to interact. There are two types of affordances, real and the perceived affordances. The real affordances are those related to the characteristics of a physical object which allows its use whiles the perceived affordances are the type related with the appearance of the object which gives clues on how it can be used (Norman, 1999).

In any planned environment, the affordances envisioned by the planners and the affordances perceived by its users may not always match. This situation could occur with reference to the use of electronic databases by final year students in the College of Health Sciences. The College library could perceive prospects in the utilisation of electronic databases that the

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students may not and this could underestimate their possible prospects for using the databases. From the findings of the study it seems as if there might be an affordance gap. The "affordance gap" according to Sadler and Given (2007) occurs when the designers of a tool or a service believe they are providing an opportunity for action, but this opportunity is not recognized by users. It is also evident from the findings that the electronic databases to which the College of Health Sciences library subscribes are not fully utilised by the final year students this creates a gap that needs to be closed. Affordance theory can direct future research.

5.4.2.1 Adaptation of the Wilson model

A model such as the Wilson 1996 model guiding this study, offers a foundational basis on which a study can be built. This study took cognisance of other models but was guided by the Wilson 1996 model (Section 2.7). This model was considered because it seeks to explain information seeking behaviour. Although the model does not totally fit in this study it can be modified to some extent because information seeking behaviour precedes use of information hence aid the use of information resource such as electronic databases. The model will be analysed in the light of the main research question and some of the sub-questions (Section 1.3) and in relation to the findings of this study.

Context: The Wilson 1996 model allows for a person in context which can be final year students both undergraduate and postgraduate of the College of Health Sciences to be affected by a particular need of information. Due to their speciality in the disciplines of health sciences, respondents played a peculiar role in their environment. The discipline might have an impact. This was however, not exploited in the study.

Intervening variables: The variables that will motivate students' use of electronic databases (See section 4.3.4.1), can also be seen as the intervening variables that the model classifies as psychological, demographical, role-related or interpersonal, environmental and source

characteristics. The findings on motivation stated by respondents' points mostly to the environmental variables.

Information processing and use: Respondents noted the consequences of electronic databases for their academic activities (Section 4.3.3) which can be modified as information process and use in the Wilson's 1996 model.
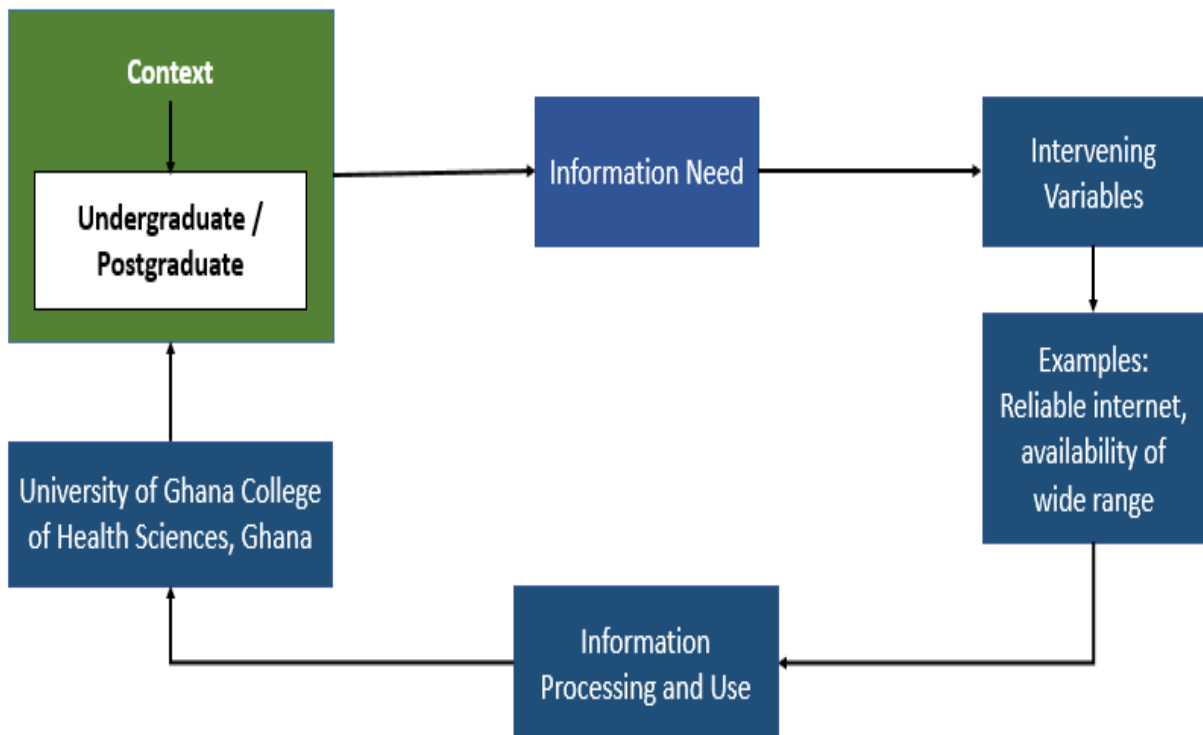
Figure 5.1: Adapted Model

5.5   SUGGESTIONS FOR FURTHER RESEARCH

In view of the limitations identified for this study (Section 5.3), the researcher suggests that further research should be undertaken focusing on the other Colleges of the University of Ghana. This should also take into consideration the actual assessment of the searching skills of the students in the use of electronic databases. A repetition of this study using a different methodological approach such as photovoice and focus groups which may reveal more on the use of electronic databases by students is also recommended. Photovoice is a participatory

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research strategy commonly implemented in health research for personal and community change and focus groups is a research technique in which a group of approximately six to twelve people, who share similar characteristics or common interest are interviewed (Kuratani & Lai 2011; Evaluation Research Team, 2008).

5.6   CONCLUSION

The results of the study addressing the research problem and sub-questions indicate that awareness of electronic databases was prevalent among the final year students of the College of Health Sciences. The students are thus aware and use electronic databases to which the college subscribes, most predominantly HINARI, AJOL, EBSCOhost, ScienceDirect and Cochrane library. Lack of guidance, lack of appropriate search skills, Internet connectivity problems, inadequate availability of current information and difficulty in obtaining passwords were the most important challenges that impact on the final year students' use of electronic databases. The fact that the databases are in English and not their native languages was not inhibiting the use of electronic databases.

With the current technological trends in higher learning where education can now be conducted virtually where students are remote, it is imperative for all academic organisations to step up their effort to meet the challenge of technological advancement in education. Also to improve teaching and research and to produce highly qualified health professionals in accordance with the College of Health Sciences' mission statements, management of the College should consider all the suggested recommendations of this study to improve on students' use of the electronic resource.

Findings of this study should be helpful to librarians in understanding the challenges that impacted on by students in the College of Health Sciences' in using electronic databases and further serve as a future reference for researchers on the subject of use of electronic databases among biomedical and health students.

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Appendix A: Questionnaire

TITLE OF PROJECT: Use of electronic databases among final year students of the College of Health Sciences, University of Ghana.

Dear Potential Research Participant,

I am a student at the University of Pretoria, South Africa. This questionnaire is designed to solicit information from you for a study I am conducting on the topic: 'Use of electronic databases among final year students of the College of Health Sciences, University of Ghana'. The study is part of the requirements for a Master's in Information Technology (M.IT) degree.

Researcher's Contact Details:

Name: Rita Oduro Anane

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Supervisor's Contact Details:

Name: Prof. Ina Fourie (Department of Information Science, University of Pretoria)

Email: ina.fourie@up.ac.za

It would be appreciated if you could make time to complete the questionnaire. It will take approximately 15 minutes. Your responses will be treated with strict confidentiality and anonymity and will be used for academic purposes only.

If you are willing to participate, please ensure that you also complete the form giving your informed consent.

QUESTIONNAIRE FOR FINAL YEAR STUDENTS OF THE COLLEGE OF HEALTH
SCIENCES, UNIVERSITY OF GHANA

TITLE OF PROJECT: Use of electronic databases among final year students of the College
of Health Sciences, University of Ghana.

The questions have been categorised into 6 sections labelled A to F, each addressing a
different facet of the study. Kindly read and answer the questions according to the
instructions for each question.

Section A: **Profile Data** (Please select only one option as appropriate)

1. To which School do you belong?

   a) Schools of Medicine and Dentistry   [ ]

   b) Pharmacy   [ ]

   c) Nursing   [ ]

   d) Public Health   [ ]

   e) Biomedical & Allied Health Sciences [ ]

2. What is your final year status?

   a) First degree final year student   [ ]

   b) Postgraduate final year student   [ ]

Section B: Awareness of electronic databases

3. Are you aware of the electronic databases to which the College of Health Science
   Library[1] subscribes?

   a) Yes [ ]   b) No [ ]

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[1] In all instances this refers to the College of Health Sciences, University of Ghana

4. If you answered yes to question 3, how did you get to know of these electronic databases? *(Tick as many as applicable)*

   a) Through library orientation   [ ]

   b) Through library website   [ ]

   c) Through notices   [ ]

   d) Through a colleague   [ ]

   e) Through newsletters   [ ]

   f) Through lecturers   [ ]

   g) From Library staff   [ ]

   h) Others (please specify)

………

………………………………………………………………………………………

5. Kindly indicate how often you use the electronic databases by ticking in the box using the 5 point Likert scale provided: Never [1], Seldom [2], Occasionally [3], Often [4], Very often [5]

Use of electronic databases	1	2	3	4	5
Frequency of use of the electronic databases available from the College of Health Sciences Library.					

6. Which of the following electronic databases from the College of Health Science Library are you aware of? (*Tick as many as applicable)*

   a) African Journals Online (AJOL)   [ ]

   b) Chicago Journals   [ ]

   c) CINAHL Complete   [ ]

d) Cochrane Library   [ ]

e) EBSCOhost(Medline Complete, PubMed)   [ ]

f) HINARI   [ ]

g) Mary Ann Liebert   [ ]

h) Nature Publishing   [ ]

i) Optical Society of America   [ ]

j) Oxford Journals   [ ]

k) Project MUSE   [ ]

l) Royal College of Physicians   [ ]

m) Royal Society Journals Online   [ ]

n) Sage Journals Online   [ ]

o) ScienceDirect   [ ]

p) Scopus (citation database)   [ ]

q) Others that you are aware of (*please specify*)

Section C: Use of Electronic Databases

7. Which of the following databases do you use? (*Tick as many as applicable*)

a) None   [ ]

b) African Journals Online (AJOL)   [ ]

c) Chicago Journals   [ ]

d) CINAHL Complete   [ ]

e) Cochrane Library   [ ]

f) EBSCOhost(Medline Complete, PubMed)   [ ]

g) HINARI   [ ]

h) Mary Ann Liebert   [ ]

i) Nature Publishing   [ ]

j) Optical Society of America   [ ]

k) Oxford Journals   [ ]

l) Project MUSE   [ ]

m) Royal College of Physicians   [ ]

n) Royal Society Journals Online   [ ]

o) Sage Journals Online   [ ]

p) ScienceDirect   [ ]

q) Scopus (citation database)   [ ]

r) Others (please specify)

8. If you indicated for question 7 that you do not use electronic databases to which the College of Health Sciences Library subscribes, please indicate your reasons by marking all applicable options from the list below.

a) Lack of guidance on using electronic databases   [ ]

b) Slowness in downloading the results   [ ]

c) Internet connectivity problems in using electronic databases [ ]

d) Lack of appropriate search skills   [ ]

e) Limited access to computers   [ ]

f) Information overload   [ ]

g) Power surges   [ ]

h) Difficulty in reading from computer screen   [ ]

i) Others (please specify)

9. For what purpose(s) do you use electronic databases? Please mark all applicable options.

a) To download articles   [ ]

b) To search for information for a research topic and related issues   [ ]

c) To search for information for assignments   [ ]

d) To access information on a wide range of health and science topics   [ ]

e) To access full text articles from peer reviewed publications   [ ]

f) To keep track of new information (e.g., alerting services)   [ ]

g) Others (please specify)

10. Where do you access the electronic databases? Please mark all options that apply.

a) Library   [ ]

b) Home   [ ]

c) Information centre   [ ]

d) Hostel   [ ]

e) Others (*please specify*)

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

………………………………………………………………………………

11. Kindly indicate your level of agreement to the following statements regarding the College of Health Science Library's subscriptions to electronic databases. Please do so by ticking the appropriate option for the following Likert scale: 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree.

	1	2	3	4
The library's subscriptions meet my *academic needs* as a final year student				
The library's subscriptions meet my *research needs* as a final year student				
The library's subscriptions are appropriate for my level of studies				
Not applicable				

Section D: Usefulness of Electronic Databases

12. How have the electronic databases improved your learning and clinical activities?

   (Tick as many options as applicable)

   a) No impact   [ ]

   b) Improved accessibility to information   [ ]

   c) Improved availability of current information   [ ]

   d) Enhanced quality of assignments and research   [ ]

   e) Increased access to the publications of experts   [ ]

   f) Others (please specify)

13. What motivates you as a final year student to use the electronic databases subscribed

   to by the College of Health Sciences Library?

Section E: Problems with the use of electronic databases

14. To what extent is language a barrier to your use of electronic databases?

      a) Not at all   [ ]

      b) Somewhat of a barrier   [ ]

      c) A moderate barrier   [ ]

      d) An extreme barrier   [ ]

Section F: Suggestions to ensure effective and efficient use of electronic databases

15. In your opinion, how can the use of electronic databases to which the College of

   Health Science Library subscribes be improved? (*Please mark all options that apply*).

a) Raising awareness   [ ]

b) Training in searching and using the databases   [ ]

c) Providing adequate networked computers   [ ]

d) Providing a stand-by generator to solve power problems [ ]

e) Providing more relevant databases for academic purposes [ ]

f) Improving Internet access   [ ]

g) Others   (Please

specify)………………………………………………………....

16. What is your perception of the use of electronic databases?
……………………………………………………………………………

17. Please suggest ways to deal with barriers to the use of electronic databases.
……………………………………………………………………………

18. Please write down additional comments and suggestions you would like to bring to my attention.

……………………………………………………………………………………

Thank you for your time.

Appendix B: Researcher declaration

APPLICATIONS MUST INCLUDE THE FOLLOWING STATEMENTS

Hereby I, Rita Oduro Anane in my capacity as a Masters in Information Technology (MIT) student at the University of Pretoria, Faculty of Engineering, Built Environment and Information Technology declare, that

1   Research subjects will be informed, information will be handled confidentially, research subjects reserve the right to choose whether to participate and, where applicable, written permission will be obtained for the execution of the project (example of permission attached).

2   No conflict of interests or financial benefit, whether for the researcher, company or organisation, that could materially affect the outcome of the investigation or jeopardise the name of the university is foreseen.

3   Inspection of the experiments in loco may take place at any time by the committee or its proxy.

4   The information I furnish in the application is correct to the best of my knowledge and that I will abide by the stipulations of the committee as contained in the regulations.

5 Signed: _____   Date: 12/01/16

Appendix C: Form for informed consent

(Form for research subject's permission)

(Must be signed by each research subject, and must be kept on record by the researcher)

1   Title of research project: Use of Electronic Databases by Final year Students of the University of Ghana, College of Health Sciences.

2   I ………………………………………… hereby voluntarily grant my permission for participation in the project as explained to me by: Rita Oduro Anane.

3   The nature, objective, possible safety and health implications have been explained to me and I understand them.

4   I understand my right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for the purposes of publication.

6   Upon signature of this form, you will be provided with a copy.

Signed: _____   Date: _____

Witness: _____   Date: _____

Researcher: RITA ODURO ANANE   Date: 14/7/2015